

**THE MEDIATING EFFECT OF JOB STRESS ON THE
RELATIONSHIP BETWEEN JOB DEMANDS, JOB
RESOURCES AND SICKNESS ABSENCE:
A STUDY AMONG NURSES IN MALAYSIA**

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**DOCTOR OF PHILOSOPHY
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A STUDY AMONG NURSES IN MALAYSIA**

By

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ABSTRACT

The issue of absenteeism has emerged as one of the main administrative problems in many large as well as small organizations. Sickness absenteeism or involuntary absence also affects the productivity and economic performance of an organization. The main purpose of this study is to examine the predictors of sickness absence and further determine the relationships between job demands, job resources, job stress and sickness absence. About 1,300 hospital nurses of various grades were selected randomly from six regional hospitals located in the northern states of peninsular Malaysia to participate in this study. The study was conducted in two phases. Sick leave data from the employer's sick leave registry was procured in the first phase of the study for a period of four consecutive months from February to May 2011. The second phase commenced in the mid of the sick leave data collection stage with the administration of survey questionnaires to the targeted participants. Hierarchical multiple regression analysis was used to examine the relationship between job demands, job resources, job stress and sickness absence; The study also investigated the mediating role of job stress on the relationship between job demands, job resources and sickness absence. The results found that workloads, co-worker support and job feedback were significantly related to all dimensions of job stress. Physical demands, job complexity, job feedback, job stress (physical and behavioural stress) were correlated with sickness absence. The findings also revealed the mediating effect of job stress (specifically physical and behavioural stress) on the relationship between job demands (physical demand and job complexity), job resources (job feedback) on sickness absence. Overall this study provided support to the job demands-resources (JD-R) model, and filled the research gaps in the mediating role of job stress. The implications, limitation of the study and future research direction were also discussed in this study.

Keywords: absenteeism, sickness absence, job demands-resources, stress, nurses

ABSTRAK

Isu ketidakhadiran telah muncul sebagai salah satu masalah utama pentadbiran dalam organisasi besar mahupun kecil. Ketidakhadiran kerana sakit atau ketidakhadiran kecemasan (*involuntary*) juga mempengaruhi produktiviti dan prestasi ekonomi sesebuah organisasi. Tujuan utama kajian ini adalah untuk mengkaji faktor penentu terhadap ketidakhadiran kerana sakit serta hubungan di antara keperluan pekerjaan, sumber pekerjaan, tekanan dalam pekerjaan dengan ketidakhadiran kerana sakit. Sejumlah 1,300 orang jururawat hospital pelbagai gred telah dipilih secara rawak dari enam buah hospital yang terletak di kawasan utara Semenanjung Malaysia untuk menyertai kajian ini. Kajian ini dilakukan dalam dua fasa. Data berkenaan cuti sakit telah diperolehi daripada senarai daftar cuti majikan pada fasa pertama iaitu dari bulan Februari hingga Mei 2011. Fasa kedua bermula pada pertengahan peringkat pungutan data cuti sakit dengan pengedaran soal selidik tinjauan kepada peserta sasaran. Analisis regresi berganda berperingkat digunakan untuk mengkaji hubungan di antara keperluan pekerjaan, sumber pekerjaan, tekanan pekerjaan dan ketidakhadiran kerana sakit. Kajian juga menyiasat peranan tekanan pekerjaan sebagai perantara dalam hubungan antara keperluan pekerjaan, sumber pekerjaan dan ketidakhadiran kerana sakit. Dapatan kajian menunjukkan bahawa beban kerja, sokongan rakan sekerja dan maklum balas pekerjaan mempunyai hubungan signifikan dengan kesemua dimensi tekanan dalam pekerjaan. Keperluan fizikal, kerumitan pekerjaan, maklum balas pekerjaan dan tekanan pekerjaan (tekanan fizikal dan tekanan tingkah laku) mempunyai hubungan dengan ketidakhadiran kerana sakit. Penemuan kajian juga menyokong kesan perantara tekanan pekerjaan (terutamanya tekanan fizikal dan tekanan tingkah laku) terhadap hubungan di antara keperluan pekerjaan (keperluan fizikal dan kerumitan pekerjaan) dan sumber pekerjaan (maklum balas pekerjaan) terhadap ketidakhadiran kerana sakit. Secara keseluruhan, hasil kajian ini menyokong andaian model keperluan-sumber pekerjaan (JD-R), serta telah menjelaskan lompang dalam kajian terhadap tekanan pekerjaan sebagai faktor perantara. Implikasi, batasan kajian dan sasaran kajian masa hadapan turut dibincangkan.

Katakunci: ketidakhadiran, ketidakhadiran kerana sakit, keperluan-sumber pekerjaan, tekanan, jururawat

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LIST OF ABBREVIATIONS

Abbreviation	Description of Abbreviation
ACTU	Australian Council of Trade Unions
AIDS	Acquired Immune Deficiency Syndrome
AN	Assistant Nurse
CAN	Canadian Association of Nurse
CBI	Confederation of British Industry
CCH	Commerce Clearing House
CFA	Confirmatory Factor Analysis
CIPD	Chartered Institute of Personnel and Development
CN	Community Nurse
CNS	Clinical Nurse Specialist
COR	Conservation of Resources
CPD	Continuing Professional Development
CPG	Clinical Practice Guidelines
CPS	Current Population Survey
CRC	Clinical Research Centre
CT	Computerized Tomography
DCM	Demand Control Model
DD	Divided Duty
DG	Director General
df	Degree of Freedom
DG	Director General

DON	Director of Nursing
DOT	Dictionary of Occupational Titles
EFA	Exploratory Factor Analysis
ERI	Effort-Reward Imbalance Model
GAS	Generalized Adaptation Syndrome
GCP	Good Clinical Practice
GHQ	General Health Questionnaire
GHS	General Health Survey
GNP	Gross National Product
GP	General Practitioner
HAI	Hospital Acquired Infection
HCW	Health Care Worker
HDU	High Dependency Unit
HIV	Human Immunodeficiency Virus
HMRA	Hierarchical Multiple Regression Analysis
ICU	Intensive Care Unit
IDS	Income Data Services
ILO	International Labor Office
JCQ	Job Content Questionnaire
JDC	Job Demands and Control
JDCS	Job Demands, Control and Support
JDR	Job Demands and Resources
JDS	Job Diagnostic Survey
KMO	Kaiser-Mayer Oikin

MC	Medical Certificate
MEF	Malaysia Employers Federation
MoH	Ministry of Health
MRI	Magnetic Resonance Imaging
MSA	Measure of Sampling Adequacy
MSD	Musculoskeletal Disorders
NBM	Nursing Board Malaysia
NCD	Non-Communicable Diseases
NCI	Noso-comial Infection
NHS	National Health Service
NIH	National Institute of Health
NMRR	National Medical Research Registry
OECD	The Organisation for Economic Co-operation and Development
ORL	Otorhinolaryngology
OT	Operation Theatre
PAF	Principle Axial Factoring
PCA	Principle Component Analysis
PHC	Public Health Care
PTB	Pulmonary Tuberculosis
RN	Registered Nurse
RSI	Repeated Strain Injury
SD	Standard Deviation
SN	Staff Nurse

SR	Sister
TLI	Tucker and Lewis index
UK	United Kingdom
US	United States
VIF	Variance Inflation Factor
WDI	Worst Day Index
WHO	World Health Organization

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Absenteeism is a major concern in human resource and administrative management of any organisation. There is a growing body of research on absenteeism because of its importance to organisational effectiveness. It has been reported that employee absence behaviour is a costly issue and it can result in decreased quality of services to customers and jeopardise the worker productivity and financial performance of an organisation (Biron & Bamberger, 2012; Benson & Leona, 2000). Despite the vast amount of international interest and research spurred by absenteeism, most studies tended to focus on administrative strategies for the prediction or control of absenteeism, rather than on employee attitude and the causes of their absenteeism. Therefore, more effort is needed to uncover the reasons that contribute to absence behaviour.

Miller and Norton (1986) defined absenteeism as unscheduled absences from work, whereas Robbin and Judge (2009) defined it as the failure to report for work. In other words, it is simply a non-attendance at work by an employee, when attendance is expected by the employer. Despite the apparent ease of definition, absenteeism has proved to be a complex phenomenon that resists single or straightforward explanations (Alexanderson, 1998; Briner, 1996). Briner (1996) argued that the above definitions lack holistic explanation, as the absenteeism in that context only reflects the non-occurrence of a specific behaviour, which can be interpreted as an administrative category rather than a behavioural one.

Employees who are absent from work because of sickness obtain sick leave either from a medical doctor who is authorised to issue a medical certificate or self-certified sick leave upon approval from management. Sick leave is one of various forms of unavoidable absence which employees resort to when they are unfit to work. It is a time-off from work that employees use during periods of temporary sickness to stay home and address their health and safety needs without losing pay or their jobs. However, the utilisation of sick leave by employees has become a growing concern to organisations. Sick leave is part of the ‘perks’ for employees and is approved and mandated by work-related laws. The provision of sick leave allows employees to be absent from work due to any illness that make them unfit to work. However, sick leave may be open to abuses by employees. Therefore, instead of being genuinely sick, they may choose to be sick and not be present in their workplaces. Hence, this is a form of voluntary absence that causes a ‘time lost’ to the organization (Romero & Strom, 2011). However, if an employee is sick, it makes sense for him or her to stay home from work and recover from the illness. Hence, the provision of sick leave is for employees who are genuinely too ill to work (Ali, Hussin & Razak, 2008). However, more often than not, illness is not the only real reason for the use of sick leave (Duijts, Kant, Swaen, van den Brandt, & Zeegers, 2007), because the actual use of sick leave involves choice, whereby employees choose to use sick leave to be absent from work. This form of sick leave is referred to as ‘elective sick leave’ by Rogers and Herting (1993), which means sickness absence due to minor medical problems, such as headache, colds, flu, abdominal upsets, backache, menstrual discomfort, elective medical appointment, caring for sick children at home, and attending to personal business and recreation, where no discernible illness is detected. In this elective sick leave, the employee is able to work without any detrimental effect on his/her health or

the health of other employees or on job productivity as a whole but he or she chooses not to work (Ali *et al.*, 2008).

Undeniably, absenteeism is very disruptive for employers. For instance, a survey in the United Kingdom (UK) found that 2% of the working population can be expected to be absent from work on any given work schedule (Barham & Leonard, 2002), and the estimated average direct cost to UK employers of unscheduled absenteeism is £694 per year per employee. This does not include lost of work productivity or the additional costs for overtime pay or hiring temporary employees to cover the absent worker (Britt, 2002). Comparatively, the costs due to absenteeism in the United States of America (USA) are also high, approximately USD789 per employee per year (USA Work Management, 2001). Studies conducted by business consultants in the UK posited a 5% absence rate - equivalent to every employee receiving two weeks paid absence per year (Furnham & Bramwell, 2006). In addition, the Confederation of British Industry (CBI) (2013) estimated absenteeism in United Kingdom has incurred a direct cost to the local economy of over £14 billion per annum. However, to the best of our knowledge, there is no study so far that has estimated the absenteeism cost per employee per year in Malaysia.

It is estimated that the annual costs of up to USD 46 billion in the USA and USD 10 billion in Canada are attributed to 'sick pay', lost productivity, and chronic overstaffing to compensate for absentees (Johns, 2008). There are more time lost days due to absenteeism compared to strikes and other industrial disputes (Johns, 2008). In Malaysia, according to Malaysian Employers' Federation's report, on average, each employee took about nine days per year of sick leave or up to four per cent of working time. The cost of sickness absence was estimated at about RM100 per day. With the additional costs of replacing absent workers, the total loss due to sick leave

stands about RM9 billion yearly or one per cent of Malaysia's gross domestic product (GDP) (Latiff, 2014).

Many different circumstances and behaviours may underlie absenteeism from work. Instead of viewing absenteeism as a single behaviour, making careful distinctions between types of absenteeism is vital to comprehend and manage absenteeism. Briner (1996) succinctly distinguished different types of absenteeism, including: absence attributable to sickness; voluntary versus involuntary absence; and paid versus unpaid leave. He also made distinctions between absence events, i.e., the number of absence periods or spells of absence behaviour that occur, and the absence duration which measures the time lost.

1.2 The Interest in Sickness Absenteeism Research

This research focuses on absenteeism due to sickness as the main theme of the study. According to Taimela *et al.* (2007), sickness absence is a non-attendance by an employee due to a certified health complaint, when the employer expects attendance. However Searle (1997) viewed sickness absence as, absence attributed by the employee to illness or injury and accepted as such by the employer. Taylor and Pocock (1981) shared the same notion with Searle (1997) and view sickness absence as an absence from work attributed to incapacity. In addition to incapacity due to illness, Briner (1996) associated the phenomenon of sickness absence with demographical and socioeconomic factors, organisational features, job content and employee attitudes to work. However Reiso, Nygard, Brage, Gulbrandsen and Tellnes (2001) and Virtanen, Kivimiki, Elovainio, Vahtera and Ferrie (2003) asserted that the

individuals' own perceptions of health and working ability are the predominant psychosocial predictors of sickness absence.

Grundemann and Vuuren (1997) maintained that the main reason for sickness absence from work is ill health; nonetheless, ill health is not always equated to incapability for work. The ability to work is greatly influenced by a person's own perception about his/her capability or incapability, and absence can be viewed as a very personal decision based on both the ability and motivation to go to work (Rhodes & Steers, 1981; Kristensen, 1991).

Sickness absence is a major public health problem, and has important economic impact in terms of loss of productivity, employment, replacement and insurance costs (Roelen, Van der Pol, Koopmans & Groothoff, 2006). Employer surveys conducted in the UK revealed that 89% of employers view sickness absence as a burden on business (Chartered Institute of Personnel and Development (CIPD), 2012). The impact of sickness absence on business economy in various parts of the world is enormous. In the UK, 131 million work days are lost due to sickness absence which lead to businesses losing £14 billion a year (Confederation of British Industry (CBI), 2013). The UK National Health Service (NHS) reported that 117 million days were lost and has incurred cost of £11 billion because of sickness absence (Grundemann & Vuuren, 1997). In addition, it was calculated that the cost of £140 million a year, is equivalent to 1% of NHS employees' pay due to 1% or 2 ½ days per staff per year of sickness absence (NHS, 2012). Sickness absence has also been calculated to represent between 2 and 16% of an organisation's annual salary bill (Bevan & Hayday, 2001). In Hong Kong, 47,500 work days were lost because of employee sick leave and average duration of sick leave per incidence is 11.7 days (Population by census, 2000). In Sweden, an average of 10% of the country's

workforce is on sick leave at any given time (Hoge, 2002).

Most managers agree that sickness absence among employees is an important issue in manpower planning. It is one of the major administrative and staffing problems for managers in different occupations. To tackle the issue of sickness absence, managers need to plan strategies and devise policy decisions to manage and control it effectively and efficiently. These strategies and policies preferably should be made on evidence-based practices. Most extant studies have been conducted in Western societies, where workers' movements are more apparent and the medical profession has a greater interest in the health of workers. In Asia, a limited number of studies was done in Singapore, Hong Kong and Malaysia to examine the pattern of sickness absence (e.g., Collins, 1962; Fong & Cheng, 1991; Cheng, 1984; Chan, Gan & Chia, 1997; Saroja, Ramphal, Kasmini, Ainsah, & Bakar, 1999; Indran, Gopal & Omar, 1995; Chee & Rampal, 2003; Ali, Hussin & Razak, 2005, 2008). Nonetheless, many of these studies just focus on incidence and the influence of social demographic factors but neglected to examine the relationship of sickness absence to stress and job-related factors. According to Siu (2002), the stress-related outcomes, particularly absenteeism and turnover are costly. Cooper and Cartwright (1996) estimated that almost 12% of the USA's and 10% of the UK's Gross National Product (GNP) is lost because of stress-related absenteeism and turnover.

There is quite a significant number of studies in psychological literature that have examined individual and organisational predictors of sickness absence (e.g., Clegg, 1983; Hammer & Landau, 1981; Jenkins, 1985; Parkes, 1987; Michie & Williams, 2003). Similarly, several research in occupational and environmental health literature have examined determinants of sick leave (e.g. Beemsterboer, Stewart, Groothoff & Nijhuis, 2008, 2009; Duijts *et al.*, 2007; Marmot, Feeney, Shipley, North

& Syme, 1995; North, Syme, Feeney, Shipley & Marmot, 1996; Hornquist, Zar & Hansson, 1993; Isacson, Hanson, Janzon & Kugelberg, 1992; Alavinia, van den Berg, van Duivenbooden, Elders & Burdorf, 2009; Voss, Floderus & Diderichsen, 2001). Nevertheless, the results of these studies produced contradictory and inconclusive findings in regards to the determinants of sickness absence.

According to a survey in the USA, at least 145 countries provide paid sick days for short- or long-term illnesses, with 127 countries providing a week or more annually; while 98 countries guarantee one month or more of paid sick days (Heymann, Earle & Hayes, 2007). In Malaysia, under the Malaysian Labour Law, First Schedule Section 2(1) EA 1955 - Employment Act 1955, employees in private sectors are permitted an allocation of sick days per year based on tenure. For instance, employees who have worked less than two years are entitled to 14 sick leave days. Those who have worked between two to five years are entitled for 18 days and those who has been employed for five years or more are entitled for 22 days (Gross, 2001). Employees must have a certification from a doctor and provide advanced notice when taking sick leave. If these conditions are not met, then the employee is considered absent and the absent days will count against his or her annual leave. The sick leave allocation in the government sector is binded by General Order Chapter C 15/17(a) for government employees (Public Service Department of Malaysia, 2011). The government policy allows civil servants to take not more than 90 days of paid sick leave in a year, but civil servants may take additional sick leave of up to 180 days, subject to approval.

A survey carried out in the UK shows public sector employees took about 35% more sick leave than employees in the private sector. Each employee took an average of 9.8 days sick leave per year, with public sector employees recording 11.7

days, compared to the private sector with seven days (CIPD, 2006). In Canada, each employee had an average sick leave rate of 8.6 sick days per year (Caverley, Cunningham & MacGregor, 2007); the USA had an average of 8.4 sick days for exempt employees, while non-exempt employees had 7.6 sick leave days on average (Compensation Data Annual Survey, 2006). In Singapore, employees had an average of 4.6 days of sick leave (Singapore Human Resources Management, 2009). In Malaysia, a study done by Ali *et al.* (2008) among civil servants indicated an average of 2.65 days sick leave in a year. Studies also have shown that health service jobs (CIPD, 2006), shift work and blue-collar jobs (Drago & Wooden, 1995) produce more absence due to personal health problems. In addition, Cant, O'Loughlin and Legge (2001), in their study, found that employees who were past retirement age generally had lower absence rate.

The fiscal impact of sick leave usage is significant (Kroesser, Meckley & Ranson, 1991). Buchan and Seccombe (1995) highlighted several management issues arising from absence, particularly in the hospital environment. They pointed out the implications not only on quality of patient care, but also on job productivity, organisational costs, effects on other staff and the time and money spent on organising a replacement. Kopelman, Schneller and Silver (1981) described how sick leave usage can affect organisations. First, there are direct expenses, such as covering for the absent employee by paying others overtime, hiring temporary staff and providing training to them. Second, there are fringe benefit expenses which absent workers still accrue during their absence. Third, there are the costs of maintaining an absence control system, such as accounting procedures for sick leave usage. Fourth, absenteeism means an increase in supervisory time spent in adjusting to absent workers, or in managing the absenteeism policy. Fifth, there are indirect costs of

lower morale among workers who resent doing someone else's work, or who are concerned about the legitimacy of others' absences. Hence, absenteeism, whether voluntary or involuntary in nature, has a negative impact on organisational growth. It is one of the most persistent obstacles to productivity, profitability and competitiveness of an organisation (Ali *et al.*, 2008). Therefore, it is essential that all organisations, whether public or private, become more aware of the degree of employee absenteeism, since it is an unnecessary cost and should be reduced to a minimum if they are to survive in the current world of globalisation. To tackle these management issues of absenteeism, Kroesser, Meckley and Ranson (1991) suggested that a better understanding of the dynamics resulting in the greater use of sick leave would allow managers to run organisations more efficiently. This efficiency could lead to more effective projections of sick leave use; knowing reasons of sickness absence by employees may enable administrators to develop cost effective methods for reducing sick leave usage and increase employee morale and productivity in the process. As a result, managers could plan their budgets and staffing patterns more realistically.

For the last two decades, sickness absence has increasingly been recognized as a considerable public health problem, with consequences on individuals, families, workplaces and society (Alexanderson & Hensing, 2004). Despite the importance and consequences of sickness absence, the scientific knowledge base on this issue is surprisingly limited. Furthermore, when scientific standards of evidence-based medicine were used, the results from different studies only generated very limited scientific evidence regarding both causes and consequences of sickness absence. Because of this knowledge gap, it has spurred the interest for the researcher to explore and further address the issue of absenteeism in this study.

1.2.1 The Importance of Studying Absenteeism in Nursing Professionals

Nursing is a service profession in healthcare setting which focuses on the care of individuals, families and communities and helping them to achieve and maintain optimal health. In fact nursing is primarily to help sick people in the performance of activities contributing to their recovery, that they would perform unaided if they had the necessary strength, will, or knowledge (Henderson, 1978). In other words, the nursing profession needs integration of knowledge and practice to comprehend the state of health and illness of patients and their needs. Therefore, this profession demands high clinical competence, reflection capacity, critical thinking and reasoning from nursing professionals to provide holistic care for their clients. The issue of absenteeism among nursing professionals is therefore a concern in the healthcare industry (Becker & de Oliveira, 2008), as it may interfere with efficiency and quality of nursing care rendered to clients (Schreuder *et al.*, 2011).

In the hospital work environment, nurses are regularly exposed to occupational hazards related to physical, chemical, and biological agents, and also to risks of ergonomic and psychosocial factors (Amosu, Degun, Atulomah, Olanrewju & Aderibigbe, 2011). Working environment for nurses imply long hours, working on rotating shifts, multiple and complex task and functions, repetitive, ambiguous and conflicting work roles, excessive and intensive workload, constant physical effort and awkward positions. Besides, hierarchical control in decision making in nursing is posing a risk of causing stress and diseases that may harm nurses' health because nurses work in various levels of hierarchical structure, and this may impede flexibility in decision making (Becker & de Oliveira, 2008). This demanding and stressful work environment may contribute to low job satisfaction for both the current and future

workforce, because the less satisfied nurses are, the more likely for them to exhibit withdrawal behaviours by being absent from work (Siu, 2002; Gauci Borda & Norman, 1997; McShane, 1994).

Sickness absence remains high on the agenda in both government and business sectors as it poses inevitable impact on productivity and costs to the organization (Rauhala *et al.*, 2007). Besides, sickness absence is being perceived as withdrawal behaviour in the organizational context (Borda & Norman, 1997; Hackett & Bycio, 1996). Sickness absence among healthcare workers is likely to exacerbate human resources for health inadequacies and undermine demand for, quality of and efficiency of delivery of health services (Belita, Mbindyo & English, 2013). In addition sickness absence is a barometer for the psychological and physical well-being of health workers and a valuable measure of health systems performance (Belita, Mbindyo & English, 2013).

According to the report by Chartered Institute of Personnel and Development (CIPD, 2010) in UK, a worker takes an average sick leave of eight days per year. Thomas (2005) reported that in UK, the highest absence levels are found in healthcare workers with 11.6 days per employee per year. CBI /Pfizer absence survey for general population recorded 6.5 days for each employee in the UK (CBI, 2011). In Malaysia and Singapore, the sick leave for each employee was 2.5 and 3.2 days per year respectively (Chee & Rampal, 2003; Chan *et al.*, 1997). In term of sickness absence rate in percentage, nurses reported a higher sickness absence rate of 5.2%, while the other healthcare staff was about 3.8% (NHS, 2011). The survey on sickness absence by Chartered Institute of Personnel and Development (CIPD, 2010) in UK revealed that around 150 million working days are lost each year to sickness absence and it

costs the UK economy over £100 billion per year. The average cost of sickness absence incurred was estimated £692 per employee per year in UK (CIPD, 2010).

Sickness absence is an important issue in health care, as is associated with all levels of ill health, both physical and psychological. As nurses comprise 80% of the total healthcare workforce in United States (Buchan & Calman, 2004) and 75% in Malaysia (Siew, Chitpakdee & Chontawan, 2011). This phenomenon is likely to jeopardize the quality of patient care if it is prevalent among healthcare workers (Williams, Michie & Pattani, 1998). Since most healthcare services are provided by staff working in teams, sickness absence in any one individual is likely to cause increased work and stress for other staff. Moreover, it disrupts the work routine, teamwork and create dissatisfaction among employees, because it overburdens the existing staff when they are required to 'cover' the absent nurse. This temporarily covering for the absent employee may not elicit the quality and quantity of care expected. Besides, the time delay to deliver care when someone is absent will affect the productivity of nursing professionals and interfere with the efficiency and continuity of professional care to the clients, and may undermine employee morale (Cavanagh, 1989; Davey, Cummings, Newbum-Cook & Lo, 2009). Absenteeism is an expensive and difficult problem in organisations, as it incurs financial costs to pay for absent employee's salary, the overtime pay for temporary cover, the cost to recruit and train new staff and indirect cost for management and administrative matters with regards to absenteeism. Thus, it has an impact on economic performance and effectiveness of the organisation.

1.3 Problem Statement

Absenteeism is a costly problem for organizations. In large U. S. companies employing more than 1000 workers, absenteeism costs estimated to reach \$1.17 million per year (Erickson, Nichols & Ritter, 2000). In European countries, direct and indirect costs produced by absenteeism are also an issue of concern (Gonzalez-Roma, Vaananen, Ripoll, Caballer, Peiro, & Kivimaki, 2005; Grundemann & van Vuuren, 1997). Thus, from a practical point of view, research efforts aimed at identifying the correlates of absenteeism are justified. However, absenteeism is a complex phenomenon with multiple factors impacting on it. Thus, from a theoretical point of view, research efforts are needed to improve our understanding about the role of these factors in the genesis of absenteeism.

Several types of absenteeism can be distinguished (Harrison and Martocchio, 1998). The present study focus on sickness absence which refers to medically-certified absence. This type of absence is considered a composite outcome, comprising health and social behavior, that is primarily a proxy measure of ill health implying reduced occupational functioning, but that can also be seen as a social outcome, a form of illness behaviour leading to withdrawal from work, which may be related to a wide range of job-related factors (Rael *et al.*, 1995). Nicholson and colleagues (Chadwick-Jones, Nicholson & Brown, 1982; Nicholson & Johns, 1985) argued that the work environment in which absence is examined must also be taken into account when studying absence behavior. The results of the meta-analysis carried out by Farrell and Stamm (1988) are congruent with this assertion that work environment and organization based correlates were better predictors of employee absence than psychological correlates. Conceptually, absenteeism and turnover are behaviours that have attracted a great deal of attention from scholars (Harrison &

Martocchio, 1998). Yet, there is a limited number of studies dealing with absenteeism among nursing professionals, and those that do, generally assign greater importance to turnover rather than absence (Cohen & Golan, 2007). Previous studies on the relationship between job demands, job resources and absenteeism particularly conducted by social and organizational researchers have emphasised on voluntary absenteeism, as they claimed that the study on voluntary absenteeism will give a better insight on its impact on organisations so that they can formulate absenteeism policies and strategies to tackle the absenteeism problem. Involuntary or unavoidable absenteeism is not given fair attention (Saroja *et al.*, 1999) and many researchers assert that this is an important issue that warrants our concerns (Driver & Watson, 1989). Thus, by examining involuntary absence particularly sickness absence in greater detail is pertinent (Bourbonnais & Mondor, 2001; Marmot *et al.*, 1995) because it provides useful measure of the working population's wellbeing and organization productivity (Grundemann & van Vuuren, 1997). Moreover, past studies on involuntary absenteeism have neglected the impact of social, organizational, behavioural, psychological components on sickness absence (Taimela *et al.*, 2007). These studies also fail to address the influence of work environment and resources that contribute to job stress and sickness absences. In addition, many of the previous studies do not ascertain the possible relationships between job demands and job resources factors that contribute to sickness absence.

Nurses, in both developing and developed countries, are most often the first contact and the direct interface between patients, their families and the healthcare system. They interact with patients and other health workers at many levels, from hospital and clinic, to school, and the workplace (Hoty, 2007). Nursing is generally considered to be a stressful profession (e.g., Foxall, Zimmerman, Standley & Bene,

1990; Healy & McKay, 1999, 2000; Taylor, 1991; Kwandt, 1992; Razavi *et al.*, 1993; Tsai & Crockett, 1993; Maria, Pavlos, Elmi, Thammé & Constantinidis, 2010; Yeh, Ko, Chang & Chen, 2007; Melchior *et al.*, 1996; Berg, Hansson & Hallberg, 1994; Russler, 1991; Carson *et al.*, 1999; Benoliel, McCorkle, Georgiadou, Denton & Spitzer, 1990; Shader, Broome, West & Nash, 2001; Schmitz, Neumann & Opperman, 2000; Stordeur, D'Hoore & Vandenberghe, 2001; Bratt, Broome, Kelber & Lostocco, 2000; Griffiths, 2000; Fresco & Norfolk, 2000; Lee & Crockett, 1994;; Demerouti, Bakker, Nachreiner & Schaufeli, 2000b; Proctor, Stratton-Powell, Tarrier & Burns, 1998; Tyler & Ellison, 1994; Hope, Kelleher & O'Connor, 1998; Lees & Ellis, 1990; Hillhouse & Adler, 1997; Baglioni, Cooper & Hingley, 1990; Tyler & Cushway, 1995; Leveck & Jones, 1996; Morrison, Jones & Fuller, 1997; Lucas, Atwood & Hagaman, 1993). A survey in Great Britain revealed that nurses, together with managers and teachers, reported the highest levels of perceived stress at work (Smith, Brice, Collins, Mathews & McNamara, 2000). It seems that nurses are particularly susceptible to the job stress mainly because of the nature of their profession (Lindsey & Attridge, 1989; Foxall, Zimmerman, Standley & Bene, 1990); their irregular working hours and shift work to care for the sick round the clock (e.g., Healy & McKay, 2000; Demerouti, Bakker & Bulters, 2000a; McVicar, 2003; Wedderburn, 1967; Berger & Hobbs, 2006). Siu (2002) in her study on hospital nurses claimed that the main stressors among nurses are high workload, lack of staff support and contact with critically ill patient. It was postulated that these sources of stress may affect their well being and lead to organizational outcomes such as job satisfaction, poor performance, absenteeism and turnover (Siu, 2002; Schnall & Perlo, 2004).

One model that theoretically explain the relationship between job demands, job resources, burnout and organizational outcomes is Job-Demands-Resources (JD-

R) model. JD-R model argues that while job demands can lead to burnout and absence behavior, job resources are functional to mitigate burnout and improve work attendance and reduce absence behavior (Bakker & Demerouti, 2007). While JD-R has contributed much to explaining sickness absenteeism (Bakker & Demerouti, 2008; Bakker, Demerouti & Verbeke, 2004; Bakker, Van Emmerik, & Van Riet, 2008; Dwyer & Fox, 2006; Lang, Thomas, Bliese & Adler, 2007; Xanthopoulou, Bakker, Aheven, Demerouti & Scaufeli, 2008), previous studies have generally considered job demands or job resources singly or separately (Bakker, Van Veldhoven, & Xanthopoulou, 2010; Demerouti, Bakker, Nachreiner, & Schaufeli, 2000; Van den Broeck, Vansteenkiste, De Witt, & Lens, 2008). Till date no study in nursing arena has examined at the differential effects of each factor in determining sickness absence. Such theoretical knowledge is necessary as both factors do not occur in isolation at work; rather they are perceived to exist simultaneously and each has a different role to influence absence behavior (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003b; Schaufeli & Bakker, 2003).

The present study also notes that previous studies conducted on absenteeism particularly in the nursing sector assume that work-related factors influence absence behaviors directly (Jamal, 1984; Verhaeghe, Mak, Van Maele, Kornitzer, & De Backer, 2003; Leiter, 1993; Vaananen, Kumpulainen, Kevin, Ala-Mursula, Kouvonen, Kivimaki, Toivanen, Linna, & Vahtera, 2008; Woo, Yao, Oh & Fischer, 1999). However, according to Conservation of Resource (COR) theory, when job demands and job resources are present at work, they can lead to job stress characterized by various types of physiological, emotional and psychological responses (Burnard, 1991; Watson & Clark, 1984). JD-R model asserts specifically that when these job demands-resources factors are not favorably managed, this will lead to job stress and

employees can exhibit withdrawal behaviors such as absence from work. Activation theory supplement JD-R and COR by further explaining how individuals cope with job stressors, initially the body will be activated to respond through manifestation of physical, emotional, psychological and behavioral symptoms (Hockey, 1993). With the use of protectional strategies such as utilization of available personal and job resources such as social support, job feedback, job autonomy and self-efficacy, ones will be able to prevent or reduce physical and psychological cost that will affect the employee's health and lead to sickness absence. In addition, Johns (1997); Fullagar and Kelloway (2009) highlighted that the mediating effect of stress on stressor-absenteeism relationship have been neglected in the past studies. In the context of nursing in which job stress is characteristic of the profession due to the nature of work itself (Maria, Pavlos, Elmi, Thammé & Constantinidis, 2010; Yeh, Ko, Chang & Chen, 2007; Shader, Broome, West & Nash, 2001; Schmitz, Neumann & Opperman, 2000; Stordeur, D'Hoore & Vandenberghe, 2001), ignoring the role of job stress in explaining sickness absence is unfortunate because it has been consistently found that nurses who are stressful at work tend to absence from work (Borritz *et al.*, 2006; Virtanen *et al.*, 2007; Callaghan & Field, 1991; Larson, 1987; Bourbonnais & Mondor, 2001; Kristensen, 1991; Brooke, 1986; Spielberger, Vagg, & Wasala, 2003; Moreau *et al.*, 2004; Gatchel & Baum, 2009; Lambert, Edwards, Camp & Saylor, 2005). Thus by incorporating job stress in a nursing setting to investigate the sickness absence is indeed timely because it is essentially important to understand the degree to which job stress mediates the relationship between job demands resources and sickness absence. In consistent with the theoretical prepositions of JD-R, COR, activation theory and the recommendations of previous studies, the present study attempts to fill the gap.

Johns (1997) explains that absence behaviour is a reaction to job stress, where stress is conceived as a failure to cope with job demands. This explanation stipulates that absenteeism may be used as a coping mechanism to deal with job strain and is not simply a behavioural reaction to dissatisfaction. On the other hand, Bourbonnais, Vinet, Meyer and Goldberg (1992) and Marmot *et al.* (1995) pointed out the importance of examining sickness absence in greater detail, because it is the measure of the working population's wellbeing and can contribute to lost productivity (Grundemann & van Vuuren, 1997).

Research has revealed that job demands, such as a high work pressure, emotional demands, and role ambiguity may lead to burnout, exhaustion, and impaired health (e.g. Halbesleben & Buckley, 2004; Martin, 1984; Estryn-Behar *et al.*, 1990; Arsenault, Dolan, & van Ameringen, 1991), whereas job resources, such as social support, performance feedback and autonomy may instigate a motivational process leading to job-related learning, work engagement, and organisational commitment (e.g., Demerouti *et al.*, 2001a; Taris & Feij, 2004; Salanova, Agut & Peiro, 2005). Previous studies claimed that it could have a long list of antecedents of job strain and absenteeism; however theoretical progress has been exiguous (Bakker & Demerouti, 2007). Many past studies have used a laundry-list approach of antecedents to investigate its effects on employee well-being, using few influential job stress models, such as DCM (Karasek, 1979), and the ERI model (Siegrist, 1996). Only a few studies investigated the relationship between job demands and job stress, and most of them focused on job strain and burnout. Job strain and burnout are not equated to job stress. Job strain refers to negative physical and psychological toll that job stress takes on one individual when his/her job involves high demand and low control or little decision making power (Karasek, 1979). Burnout is the consequence of

excessive and prolonged stress that results in emotional, mental, and physical exhaustion, characterised by helplessness, depersonalisation and disengagement (Potter, 2005). When someone has burnout, Maslach, Jackson and Leiter (1996) described it as a state of exhaustion, where one is cynical or doubtful of his/her capacity to perform. In short, job stress is the responses to stressors while job strain and burnout are its consequences. Since there is dearth of literature on job stress and its relationship with job demands and jobs resources, it is justifiable to explore this area.

The review of related literature on antecedents of absenteeism (job demands and resources factors, job characteristics) has highlighted the paucity of research involving the healthcare industry. The application of these constructs to the hospital setting is limited to a few studies (e.g., Hackett, Bycio & Guion, 1989; Cohen & Golan, 2007; Buchan & Seccombe, 1995; Siu, 2002; Bekker, Croon & Bressers, 2005). As such, the present study investigates job demand and job resources dimensions as predictors of sickness absence among hospital nurses. The hospital setting is selected due to the nature of work of nurses (e.g. rotating work schedule). It has been suggested that the study of employee absenteeism is most applicable to either blue-collar workers or shift-related jobs, as studies have found that workers on rotating work schedules have higher anticipated absenteeism than workers on fixed shift schedules (Jamal, 1981; Blau, 1985a). Therefore the present study hope to address the missing link by exploring in deeper dimensions how the job demands and resources factors can impact the sickness absence among nurses.

A significant number of previous studies have examined the relationships between job demands, job resources and sickness absence (Bakker, Demerouti & Schaufeli, 2003a; Bakker, Demerouti, De Boer & Schaufeli, 2003b; Karasek, 1979;

North *et al.*, 1996; Dwyer & Ganster, 1991; Kristensen, 1991; Bourbonnais & Mondor, 2001; Gimeno, Benavides, Amick III, Joan Benach & Martinez, 2004; Lund *et al.*, 2005; Lund, Labriola, Christensen, Bultmann & Villadsen, 2006; Christensen, Lund, Labriola, Villadsen & Bultmann, 2007). Some have found positive relationship between job demands and sickness absence (Karasek, 1979 ; Van Yperen & Snijders, 2005; Kivimaki, Vahtera, Pentti & Ferrie, 2000b), and some revealed negative relationship between job resources and sickness absence (Karasek, Gardell & Lindell, 1987; North *et al.*, 1996; Niedhammer, Bugel, Goldberg, Leclerc & Gueguen, 1998; Vahtera, Kivimaki, Pentti & Theorell, 2000b; Ala-Mursula, Vahtera, Kivimaki & Pentti, 2002), or a combination of both (North *et al.*,1996; Dwyer & Ganster, 1991; Kristensen, 1991; Bourbonnais & Mondor, 2001); while other studies have found insignificant relationship (de Jonge, Reuvers, Houtman, Bongers & Kompier, 2000; Voss, Floderus & Diderichsen, 2001; de Jonge *et al.*, 2001). Past studies have also demonstrated the association between job stress and sickness absence (Brooke, 1986; Spielberger, Vagg & Wasala, 2003; Moreau *et al.*, 2004; Gatchel & Baum, 2009; Lambert, Edwards, Camp & Saylor, 2005). By integrating these two strands of research, it is possible to theorize a link between job demands resources factors and sickness absence, mediated by job stress. None has considered the theoretical possibility before and the present study attempts to fill the gap. By doing so, our theoretical understanding on the dynamics and mechanics of sickness absence in explaining the effect of job demands resources factors on sickness absence is enhanced.

According to JD-R model, theoretical link exists between job demands resources, burnout and sickness absence. This model argues that job demands and job resources predict burnout and the consequence of burnout can lead to employee

exhibits absence behavior. However scholars have suggested to incorporate job stress into this model to enhance understanding the mechanics of the occurrence of such withdrawal behaviour (Johns, 1997; Fullagar & Kelloway, 2009). Significant amount of studies used burnout as mediator in the relationship between job demands resources and organizational outcome (Bakker & Demerouti, 2007), however job stress was neglected. Although it is generally agreed that job demands resources could possibly influence job stress, their effects on stress have received little attention in empirical studies (Hoogh & Hartog, 2009) with some notable exceptions (e.g. Chen & Lien, 2008; Khtak, Quarat-ul-ain and Iqbal, 2013; Jex, Hughes, Storr, Baldwin, Conard, & Sheehan, 1991). Even then, these studies only focused on burnout and not job stress. And to the researcher's knowledge, no studies have considered to examine the mediating effect of job stress on job demands resources-sickness absence relationship. Therefore the present study attempts to advance knowledge in absenteeism research by investigating the mediating effects of job stress on the relationships between various dimensions of job demands and job resources on sickness absence in the context of hospital among nursing professionals.

1.4 Research Questions

This study examines the main effects of job demands and job resources dimensions on sickness absence. In addition, job stress in this study is the mediating variable in the relationship between job demands and job resources on sickness absence. Hence specific research questions are formulated in this study to set the direction and objectives of the research. The research questions are formulated as follows:

1. Are job demands associated with sickness absence?

2. Are job resources associated with sickness absence?
3. Are job demands related to job stress?
4. Are job resources related to job stress?
5. Is job stress related to sickness absence?
6. Is there a mediating effect of job stress on the relationship between job demands, job resources and sickness absence?

1.5 Research Objectives

Consistent with the research questions as above, the general objective of this study is to examine the relationship of job demands, job resources and job stress, and how these impact the sickness absence among nursing professionals in Malaysia. Thus, the present study seeks to achieve the following specific objectives:

1. To determine the relationship between job demands and sickness absence;
2. To determine the relationship between job resources and sickness absence;
3. To determine the relationship between job demands and job stress;
4. To determine the relationship between job resources and job stress;
5. To determine the relationship between job stress and sickness absence; and
6. To examine the mediating effect of job stress on the relationship between job demands, job resources and sickness absence.

1.6 Scope of the Study

According to Cooper and Schindler (2006), scope is the breadth and depth of topic coverage; this usually infers the utilisation of information of a secondary source (by

time frame, geography, criteria for inclusion, etc.). Likewise the scope of this study addresses all these issues.

The focus of this study is hospital nurses of various job grades from government hospitals located in the northern states of Malaysia, i.e., the states of Kedah, Perlis and Pulau Pinang. Nurses working in community clinics, nursing homes, factories or industrial sites, private agencies and other government agencies, such as prisons, city and town councils, army, aviation industry, rail services and national electric boards are excluded as the target samples in this study are nurses working in hospital environment which form more than 70% of total nursing workforce in Malaysia (MoH, 2012).

The secondary source of absenteeism data obtained from employers' records are sick leave of employees certified by government medical officers or general practitioners (but endorsed by a government medical officer). The sick leave includes all certified illness or disability, regardless of severity and magnitude. However, leave due to maternity and paternity reasons, and long-term chronic diseases are not included as these leaves are leave sanctioned by government and government officers are entitled according to general order chapter C (Public Service Department of Malaysia, 2011).

The unit of analysis is an individual nurse working according to scheduled hours (divided duty or shift duty) in a hospital setting. All nurses working in various units and wards of the hospital are included. These nurses include nurse manager, registered nurse, community nurse, midwife and assistant nurse, but exclude nursing aides and hospital attendants as nursing aids and hospital attendants are not directly involved in patient care and providing services to the patients.

The present study was conducted among nurses of public hospitals in Malaysia for several reasons. Firstly, the healthcare sector is among the most dynamic and rapidly growing industries in the world economy (Liow, 2013), since the sickness absence is high on the agenda in healthcare sector, it may pose inevitable impact on productivity and costs to the organization (Rauhalaa *et al.*, 2007). Secondly, nurses comprises the largest human resource element in healthcare sector in Malaysia, and thus the sickness absence issue may have a huge impact on the quality of care and patient outcome (Davey *et al.*, 2009; Williams *et al.*, 1998). Moreover the public sector hospitals under the jurisdiction of Ministry of Health Malaysia is the main provider of healthcare services providing 82% of the health services in the nation (Jaafar, Mohd Noh, Muttalib, Othman & Heaky, 2013).

1.7 Significance of the Study

This study can contribute to the existing literature in several aspects. First, this study extends beyond previous research by investigating job demands and job resources as predictors of absenteeism. A study by Bakker *et al.* (2003b) investigated the effects of job demands and job resources on sickness absence. Similarly, a study by Bakker and Demerouti (2007) examined the effects of job demands and job resources on organisational outcome. The present study is different from their studies in several facets. This study goes a step further by including job stress as mediating variable and its effects on the relationship between job demands and job resources on sickness absence; hence, this study determines which of the variables in job demands and job resources dimensions are related and how they are related to job stress and sickness absence, thus providing valuable insights into the job characteristics and sickness absence, as well as a guide to managerial intervention.

This study's second contribution would be to complement the findings of previous studies on job stress related to physical, emotional, psychological and behavioural outcomes, such as health complaints, burnout, and absenteeism (Kahn & Byosiere, 1992). This is because job stress and absenteeism investigated in this study are also related to organisational effectiveness (Bakker *et al.*, 2003b), whereby it can have negative impact on the management outcome of the organisation (Benson & Leona, 2000).

The third contribution of this study is the use of various dimensions of job demands and job resources that permit identification of which types of job demands and job resources dimensions affect job stress and sickness absence. This can facilitate efforts by the organisation to decide which dimensions should be given more attention or otherwise.

The fourth contribution is the findings of this study are anticipated to contribute to the development of theory, particularly organisational theory concerning the healthcare industry. Besides, the findings of this study can benefit the development of theory concerning attitude and behaviour. Practically, the application of organisational behaviour concepts in the healthcare industry can improve the development of employee well-being and performance, specifically among healthcare workers in public healthcare institutions. In short, the findings of this study would benefit the healthcare industry and organisations in the management and control of absenteeism. It would also serve as a basis for future policy decision, and at the same time, as a template of reference for the managers and other healthcare workers. It is envisaged that the findings would make them realise the importance of balancing job demands and job resources to ameliorate the impact of job stress upon sickness absence. The body of knowledge from the present study could be a guide for any

organisation to devise strategies to reduce employee absenteeism, making the workplace more conducive for employees. At the same time, the knowledge and lessons gained from this study can help to strengthen the existing theories and models employed in absenteeism research.

In line with government efforts to build a nation with good human capital, one of the important thrusts in the Ninth Malaysia Plan is to provide and improve health and well-being of each individual, family and community, through equitable, and affordable health services that are accessible by all (MoH, 2007b), in tandem with the ultimate goal of good health for all as proposed by the WHO (WHO, 2005). However, to carry out this noble task, healthcare providers should play an exemplary role in promoting and maintaining their own health, reducing the burden of disease and harnessing resources available to prevent the occurrence of unwanted withdrawal behaviours. It is anticipated that by embarking on this study to identify contributing factors toward job stress that impact on sickness absence among hospital workers, this study can give an insight into planning strategies for reducing the absenteeism problem. The findings of this study will benefit hospital management in human resource planning and improving employees' well-being, eventually increasing work productivity and upgradig quality of patient care for the betterment of the nation.

The final contribution is the outcome of this study is anticipated to contribute to the development of more effective preventive and promotional strategies of stress management among nursing practitioners in the clinical field as one of the role of nurses is to provide training and continual nursing education among peers. This will help practitioners to function in a safe environment when providing care to their clients. Knowledge of job stress and sick leave would provide them a better insight of various dimensions of nursing job demands and job resources as important

determinants. Besides, it would add professional value to the nursing profession, whereby nursing practitioners will be able to carry out the noble nursing tasks, in spite of facing daunting challenges of stress and sickness absence in the workplace.

This study is very significant and timely in terms of the demands of the nursing profession, coupled with global trends and issues of nursing shortage and turnover. The stress and health risks related to the nursing jobs leading to sickness absence has greatly impacted the human resources planning and resulted in adverse financial implications.

Looking into the extent and characteristics of absenteeism in the perspective of job demands, job resources and job stress among nursing professionals, this study will provide a guide for managers to reiterate the importance of absenteeism, in terms of job content and job context factors. In addition, managers should be aware and be able to evaluate the effectiveness of absenteeism policies and contribute to the development of related initiatives to ensure prudent management of sickness absence (Johnson, Croghan & Crawford, 2003). For those organisations that do not have a proper absenteeism policy, this study will be of value to both the occupational health departments and management, to help them undertake health needs assessment and design appropriate policies for absenteeism and occupational healthcare services for all healthcare workers (Ritchie, Macdonald, Gilmour & Murray, 1999).

The significance of this study has been mentioned above. In addition, the investigation into mediating effects of job stress on the relationship between job demands and job resources on sickness absence might be relevant for theory, practice and future research. It is essential for the study to be undertaken in view of the scarcity of empirical research exploring this important issue in Asia. This research is also related to the field of organisational behaviour, psychology, human resource

management, economics and health, as it extends the knowledge base that currently exists in these fields.

1.8 Conceptual Definitions

It is necessary to explain the phenomena and constructs that form the structure of relationship in this research model. This section provides the conceptual definitions of key variables in this study.

1.8.1 Sickness Absence

The dependent variable in this study is sickness absence. Sickness absence refers to involuntary absence by an employee attributed to illness or injury when attendance is scheduled or clearly expected by the employer (Searle, 1997). The non-attendance at work is unavoidable due to a health complaint certified by medical practitioner (Taimela *et al.*, 2007).

1.8.2 Job Demands

Job demands refer to those physical, psychological, social, or organisational aspects of the job that require continued physical and/or psychological (cognitive and emotional) effort or skills, and are therefore associated with certain physiological and/or psychological costs (Bakker & Demerouti, 2007). Under job demands, seven dimensions are identified in this study:

- i) Workload refers to the quantity of work received by an employee. It is the work overload which exists when employees have either too much to do in too

little time, or they work too many hours on the job (Schnall, Landsbergis & Baker, 1994).

- ii) Physical demand is a way of describing the physical activities that a job requires (Hernandez, 2006), and are actually stressors associated with a job's physical setting, such as humidity, seating and position, movement during work, lighting, noise, temperature, etc.
- iii) Emotional demand refers to the extent to which employees are confronted in their job with things or persons that touch them personally (Demerouti & Geurts, 2004). It encompasses the emotional requirements of the job, the frequency and duration of an emotional task, the seriousness of patient problems and the degree to which employees depersonalise themselves from their job (Hartel, Zerbe & Ashkanasy, 2005).
- iv) Job scope refers to the number of different activities that a specific job requires and the frequency with which each activity is performed (Lewis, Goodman, Fandt & Michlitsch, 2007). It is the combination of three dimensions: i) Skill variety: the extent to which the job requires an individual to perform a variety of tasks that necessitates him or her to use different skills and abilities; ii) Task identity: the extent to which the job requires an individual to perform a whole or completely identifiable piece of work. In other words, task identity is high when a person works on a product or project from the beginning to end and sees a tangible result; iii) Task significance: the extent to which the job affects the lives of other people within or outside the organisation (Hackman & Oldham, 1976, 1980).
- v) Role conflict refers to the degree to which role expectations are incompatible or incongruent with the requirements of the role where compatibility is judged

relative to a set of standards which impinge on role performance (Rizzo, House & Lirtzman, 1970).

- vi) Role ambiguity is the degree to which role expectations are unclear (Rizzo, House & Lirtzman, 1970).
- vii) Job complexity is the degree of uncertainty and low divisibility of work process in a job given (Kivimaki, Vahtera, Thompson, Griffiths, Cox & Pentti, 1997b).

1.8.3 Job Resources

Job resources refer to those physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals (Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Bakker *et al.*, 2003a). Under job resources, five dimensions are identified:

- i) Autonomy refers to the extent to which the job enables an individual to experience freedom, independence, and discretion, in both scheduling and determining the procedures used in completing the job (Hackman & Oldham, 1976).
- ii) Job feedback refers to the extent to which an individual receives direct and clear information about how effectively he or she is performing the job (Hackman & Oldham, 1976).
- iii) Social support is conceptually defined as the assistance and protection given to others, especially individuals (Langford, Bowsher, Maloney & Lillis, 1997). Assistance may be tangible or intangible and protection involves shielding others from adverse effects of life stress. Social support can be a support given

by co-workers or supervisors (Fillion *et al.*, 2007). Co-worker support is the assistance and protection given to individual by co-workers or colleagues, while supervisor support is the assistance and protection given to individual by supervisors (Langford, Bowsher, Maloney & Lillis, 1997).

- iv) Task/Time control refers to the extent to which workers are able to exercise discretion in dealing with heavy workload and work pressure (Smith, 1998).
- v) Self-efficacy is defined as the confidence in one's ability to perform a behaviour (Bandura, 1977). It refers to a person's belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully (McShane & Glinow, 2008, p.59).

1.8.4 Job Stress

Job stress is the mediator in this study. This phenomenon is seen as a dynamic process of interaction between individuals and their job environment. It is also a process of responding to an imbalance between perceived demands and the perceived resources available for meeting those demands (Appley & Trumbull, 1986). Job stress is defined by European Agency for Safety and Health at Work (2002) as "a pattern of emotional, cognitive, behavioural and physiological reactions to adverse and harmful aspects of work content, work organisation and the working environment" (p. 3). It is a state characterised by high levels of agitation, anxiety, distress, tension and often feelings of not coping (Lexshimi, Tahir, Santhna, & Nisam, 2007). This resultant state which affects the mind, body and behaviour in many ways occurs specifically when individuals feel stressful in facing with different negative aspects of job content, job context and work environment factors. According to Kreitner and Kinicki (2007)

stress is manifested by behavioural, emotional, physical or psychological symptoms to stressors, and these symptoms are named as physical, emotional, psychological and behavioral stress. Physical stress is the physiological symptoms manifested by individuals through illness of the physical body such as increased or irregular heart rate, increased blood pressure. Emotional stress is the emotional responses as a result of stressful condition which affect their mood and feeling for instance anxiety, depression and restlessness. Psychological stress is the symptoms manifested that affect cognitive and mental health state for example inability to concentrate and memory problem. Behavioral stress is the action taken or behaviours exhibited by individuals to confront a stressful situation for example eating more or less, sleeping too much or too little, isolate oneself, using drug or alcohol to relax. In sum, the definition of key terms in this study can be recapitulated as in the table below:

Table 1.1
Definition of Key Terms

Variables	Conceptual definitions	Sources
Sickness absence	Involuntary absence by an employee attributed to illness or injury when attendance is scheduled or clearly expected by the employer.	Searle (1997)
<u>Job demands</u>	Physical, psychological, social, or organisational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills, and are therefore associated with certain physiological and/or psychological costs.	Bakker and Demerouti (2007)
Workload	Work overload or work pressure or too much to do in too little time or work too many hours on the job.	Schnall, Landsbergis and Baker (1994)
Physical demand	The extent the job requires strenuous movements like bending, physical strength, lifting, or carrying objects.	Hernandez (2006)
Emotional demand	The extent to which employees are confronted in their job with things or persons that touch them personally.	Demerouti and Geurts (2004)
Job scope	The extent of different activities that a specific job requires and the frequency with which each activity is performed.	Lewis, Goodman, Fandt and Michlitsch (2007)

Table 1.1 (Continued)

Role conflict	The degree to which role expectations are incompatible or incongruent with the requirements of the role.	Rizzo, House and Lirtzman (1970)
Role ambiguity	The degree to which role expectations are unclear.	Rizzo, House and Lirtzman (1970)
Job complexity	The degree of uncertainty and low divisibility of work process in a job given.	Kivimaki <i>et al.</i> (1997b)
<u>Job resources</u>	Physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals.	Demerouti, Bakker, Nachreiner and Schaufeli (2001); Bakker <i>et al.</i> (2003a).
Autonomy	The extent to which the job enables an individual to experience freedom, independence, and discretion, in both scheduling and determining the procedures used in completing the job.	Hackman and Oldham (1976)
Job feedback	The extent to which an individual receives direct and clear information about how effectively he or she is performing the job.	Hackman and Oldham (1976)
Supervisor support	Assistance and protection given to individual by supervisors.	Langford, Bowsher, Maloney and Lillis (1997)
Co-worker support	Assistance and protection given to individual by coworkers or colleagues.	Langford, Bowsher, Maloney and Lillis (1997)
Task/time control	The extent to which workers are able to exercise discretion in dealing with heavy workload and work pressure.	Smith (1998)
Self-efficacy	A person's belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully.	McShane and Glinow (2008)
<u>Job stress</u>	A pattern of physical, emotional, psychological and behavioural reactions to adverse and harmful aspects of work content, work organisation and the working environment.	European Agency for Safety and Health at Work (2002)
Physical stress	Physiological responses by body to stress.	European Commission's
Emotional stress	Emotional responses to stress.	Directorate-General for Employment and Social Affairs (2000)
Psychological stress	Cognitive and mental responses to stress.	
Behavioural stress	Behavioral responses to stress.	

1.9 Organisation of the Thesis

This thesis has five chapters, with chapter 1 presenting the overview of the background information, theme of the study, problem statement, research interest, research questions, research objectives, scope of the study, significance of the study and conceptual definitions of the study variables. Chapter 2 provides the preview of past research studies pertaining to underlying theories, sickness absenteeism, job demands, job resources and job stress, and proposed hypotheses and theoretical framework. Methods and procedures for conducting the research, including sampling, operationisation of variables and measurement, instrumentation, collection and statistical methods used to examine data are discussed in chapter 3, while chapter 4 presents the data analysis and research findings. Finally, chapter 5 discusses the results of the research, in tandem with research objectives, implications, limitation, future research direction and ends with a conclusion.

1.10 Summary

By focusing on the issue of absenteeism and sickness absence, this chapter has discussed the background of the study, problem statement, research questions, research objectives, scope and significance of study, and conceptual definitions of all study variables. This study generally seeks to investigate the relationship between job demands, job resources, job stress and sickness absence; specifically, the study examines the mediating effect of job stress on the relationship between job demands and job resources on sickness absence. The next chapter discusses the literature related to this issue.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter looks at previous studies on absenteeism, its antecedents and the relationships between these antecedents and absenteeism. The mediating role of job stress in the relationship between job demands and job resources on absenteeism is also explored. The current issues about absenteeism are debated from a theoretical perspective, as well as from practical viewpoints. This review looks for a well-developed theory underlying any new development in understanding absenteeism. In short, we are looking for a clear operationalised concept of absenteeism and the job-related predictors of job stress and sickness absenteeism in this study. Besides, this chapter would like to specify the fundamental mechanism that explains absence behaviours. As Goodman *et al.* (1984) suggested that fundamental mechanisms do not denote a listing of variables or predictors, but get to the root of psychological process that explains absence.

2.2 The Underlying Theories

To explain the phenomena and constructs that form the structure of relationship in the research model, several well-known theoretical models and theories were consulted and debated upon before the construction of research framework for the present study. However, in consideration of the principle of parsimony and the plausible underpinnings, only few concrete theories are utilised to explicate the underlying

concept behind the phenomena put forward in the proposed theoretical framework, as it is considered critical to understand the extent to which job demands and job resources among nursing professionals predict job stress and influence their sickness absenteeism behaviours. Hence, the following underpinning model and theories are proposed:

2.2.1 Job Demands-Resources (JD-R) Model

Steers and Rhodes' (1978) process model has provided an explanation of employee work attendance for more than three decades. This model asserts that employees' attendance at work is influenced by motivation and ability to attend. It seems that attendance motivation is strongly influenced by job satisfaction, whereas ability to attend is influenced by sickness, injury and other unavoidable reasons. However, this model fails to address the role of job stress on the association between job demands and absenteeism. On the other hand, the JD-R model (Demerouti & Bakker, 2011; Bakker & Demerouti, 2007; Bakker *et al.*, 2004; Demerouti *et al.*, 2000b; Demerouti, Bakker, Nachreiner & Schaufeli, 2001b) seems to function as a more comprehensive model to support the research framework of this study because it combines both job strain theory and motivation theory.

The underlying mechanism that explains the relationship between job demands, job resources, job stress and sickness absence, can be drawn from the JD-R model. This model explains how individuals exhibit job strain reaction from job demands and how job strain reaction can be mitigated from job resources. This model explains that every occupation has its own specific risk factors associated with job-related stress which are classified into job demands and job resources. Job demands

can be translated into stressors when those demands are difficult to meet and require high effort from which the employees fail to recover adequately (Meijman & Mulder, 1998). On the other hand, job resources are available in the workplace at the organisational, task and interpersonal levels to provide the necessary support to buffer or reduce the strain from job demands. For example, at the interpersonal level, the support from supervisor and co-worker will provide motivation and help to solve the work problems encountered by employees. The resources available at the task level, for example, job autonomy, will provide more independence for employees in decision-making, while resources provided at organisational level, for example, job feedback received from supervisors, may provide opportunity for personal learning, professional growth and career development. The availability of these job resources provide avenue for employees to mitigate the strain and pressure from their jobs.

The JD-R model builds on the premise of two important processes: health impairment process and motivation process. Health impairment process suggests that jobs with demanding features, for example, work overload and emotional demands, can exhaust employees' mental and physical resources and may lead to stress characterised by physiological, emotional, psychological and behavioural symptoms. If activation of stress response is continuously unchecked, individuals may be inflicted with health problems, for example, burnout, depression and other medical illnesses, and eventually resort to taking sick leave to recover from illness. In other words, sickness absence is for individuals to cope with stressful events. On the other hand, motivational process involves the presence or availability of job resources in the workplace. This process involves intrinsic and extrinsic motivation roles to fulfill basic human needs and foster employees' learning, growth and development (Deci & Ryan, 2000). Some examples of these motivation forces include the need for

autonomy, competence and relatedness (Baumeister & Leary, 1995). In other words, the accessibility of sufficient job resources provide motivation for employees to achieve their working goals, thereby reducing the stress from job demands; ultimately, employees will have less sickness absence. For example, in the workplace, constructive job feedback to employees by superiors fosters learning, thereby increasing job competence, while providing the right job autonomy and social need for belonging (Van den Broeck, Vansteenkiste, De Witte & Lens, 2008). This may help to ameliorate the stress from job demands and prevent employees from falling victims to health problems and taking sickness absence leave.

Job resources can also play an extrinsic motivational role. The work environment offers many resources that foster the employees' willingness to dedicate their efforts and their abilities to be engaged in their tasks appropriately. This enables tasks to be completed successfully and attain working goals. For example, the support from colleagues and proper feedback from superiors can increase the work engagement and the success of achieving one's work goals. However, the absence of resources, may evoke a cynical attitude by employees towards work (Demerouti *et al.*, 2001b; Lewig, Xanthopoulou, Bakker, Dollard, & Metzger, 2007; Schaufeli, Bakker & van Rhenen, 2009). This can develop into job stress and eventually employees will resort to sickness absence behaviour.

As shown in Figure 2.1, the JD-R model of burnouts (Bakker & Demerouti, 2007) delineating job strain is positively predicted by job demands and negatively predicted by job resources. The effect of job demands on job strain is mitigated by job resources, while job strain is exhibited by depersonalisation and disengagement (Bakker *et al.*, 2004). The prolonged strain reaction will ultimately contribute to organisational outcomes; for example, low job performance, absenteeism, high

turnover and low satisfaction. By applying the JD-R model, this study incorporates job stress as mediator in the relationship between job demands and job resources on sickness absence. Specifically, the relationship between job demands and job resources on sickness absence is mediated by job stress. Since the JD-R model postulates that the job demands and job resources at workplace predict burnout through health impairment and motivation process, this study attempts to examine how different types of job demands and job resources can influence and modify job stress and consequently affect the sickness absence behaviour.

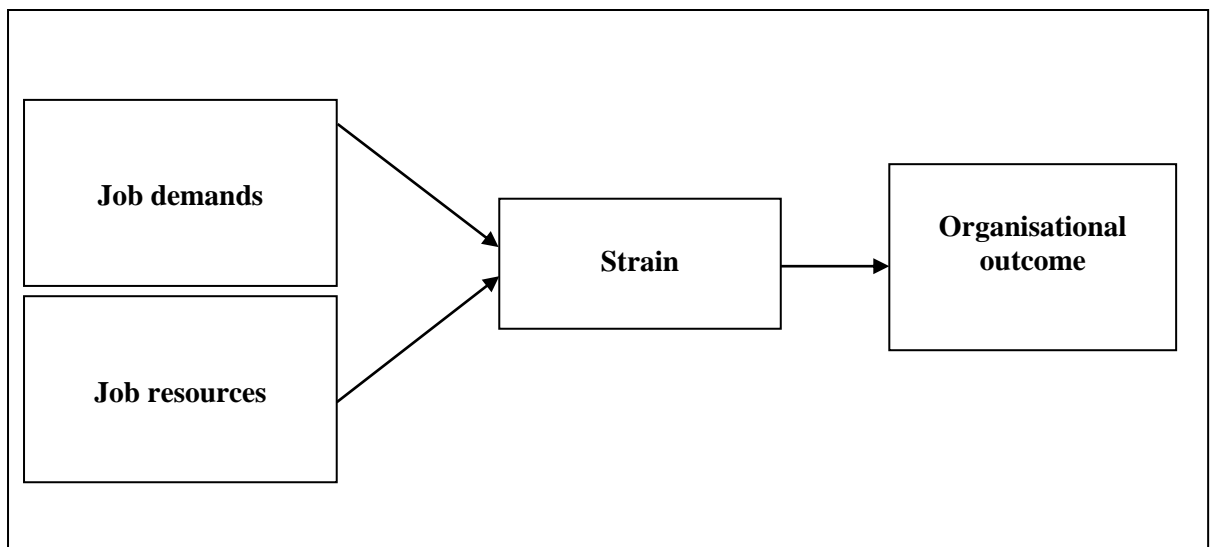


Figure 2.1
The Job Demands-Resources model
Adapted from Bakker and Demerouti (2007)

2.2.2 Conservation of Resources (COR) Theory

This theory serves to complement JD-R model in support of the research framework in the present study. Conservation of resources (COR) theory states that the prime human motivation is directed towards the maintenance and accumulation of resources

(Hobfoll, 2001). This theory proposes that people basically seek to obtain, retain, protect, and restore resources. It is perceived that these resources are valued in their own right or because they are means to the achievement or protection of other valued resources. According to Bakker and Demerouti (2007) job resources may be located at the different levels of organization namely organizational level (e.g. e.g. pay, career opportunities, job security), task level (e.g. skill variety, task identity, task significance, task/time control, autonomy, performance feedback), the interpersonal and social relation level (e.g. supervisor and co-worker support, team climate), the work organization level (e.g. role clarity, participation in decision) and personal level (self-esteem, self efficacy, optimism). These differentiation of resources are classified by Hobfoll (1989) into four categories, namely objects, conditions, personal characteristics, and energies.

Conservation of resources theory predicts that the availability of resources influences the ability and the motivation for change (Hobfoll, 1989). Employees can draw on social resources available at their workplace. However, Hobfoll, Freedy, Lane, and Geller (1990) suggest that people may be reluctant to use social resources to call on support out of fear of being a burden. In fact Buunk, Schaufeli, and Ybema (1994) found that nurses who lacked personal accomplishment actually avoided others at work who performed better. Nevertheless with strong need for social comparison, these nurses who were stressed out may be motivated to affiliate with their better performing colleagues and access to the available resources to achieve their work goals. Hence Buunk *et al.* (1994) conclude that nurses who experienced job stress may use their social environment in a way that helps them to reduce stress and to cope effectively with the stress imposed by their profession.

Conservation of resources (COR) theory (Hobfoll, 2001) reiterates that people seek to obtain, retain, and protect the resources which they value. The theory proposes that stress experienced by individuals can be understood in relation to potential or actual loss of resources. COR can be applied in workplace for instance in hospital environment, nurses may bring in resources in order to prevent the loss of resources. Hobfoll and Shirom (2000) claimed that individuals with a greater pool of resources are less susceptible to resource loss. They also argued that individuals who do not have access to strong resource pools are more likely to experience increased loss (loss spiral); and those individuals that seek opportunities to risk resources may experience increased resource gains (gain spiral). On the other hand, this theory also implies that job resources gain their motivational potential particularly when employees are confronted with high job demands. Thus the main motivational process in job stress is preventing the loss of resources because if losing resources, it creates strains, and coping responses are enacted with the goal of protecting and restoring resources. Therefore in facing the loss of resources, individuals may strive to develop surplus resources, which are the source of higher levels of well-being.

This study used COR to support the research framework which link job demands and job resources to job stress. The reason was evidenced from Lee and Ashforth (1996) meta-analysis of burnout correlates that found significant support for the basic propositions of COR theory. In their analysis they found that majority (five out of eight) of job demand factors were strongly related to job stress reaction with $r > .50$. On the other hand job resources were found to buffer the effects of job demands on the job stress.

COR theory also provides a framework for understanding the nature of stress, based on the belief that individuals seek to obtain, build and protect their resources.

The theory has been applied to a variety of settings, including community psychology, disaster research, and organizational research. Furthermore, the model has been tested across many different cultures, including (but not limited to) China, Germany, Hong Kong, Israel, Mexico, the Netherlands, Singapore and the United States. Based on the literature, the COR model appears to be a promising perspective for advancing the understanding of work stressor-stress-stress outcome relationships. Empirical studies have used COR to examine the effect of interrole conflict on well-being (Grandey & Cropanzano, 2000). Future researchers should continue using the COR model as an underlying framework for studying the link between work and nonwork roles and their relationships to stress.

2.2.3 Activation Theory

This stress theory was first proposed by Scott (1966) and later enhanced by Hockey (1993) and Xie and Johns (1995). The theory posits that every person has a characteristic level of activation and provides a viable explanation for the causes of job stress. Job stress occurs whenever job-related stimuli cause an individual to experience activation level to the extent that it can deviate substantially from one's characteristic level of activation (Gardner & Cummings, 1988). Hockey (1993) explained that individuals use performance-protection strategies to deal with the influence of environment and job demands, and this protection strategy is achieved by the mobilisation of sympathetic activation of the human body. In other words, it involves physiological and psychological responses through manifestation of stress symptoms, for example, rapid heartbeat, inability to concentrate, irritability, sleep problems, etc. Another protection strategy undertaken by individuals is by increasing

subjective effort, i.e., the use of active control in information processing; use of job resources such as social support etc.. The response by subjective effort denoting responses by individuals is different and it depends on their activation level to deal with the demands. However, the greater the activation, the greater the effort required to deal with it, in addition to greater physiological costs. The increase in physiological costs for individuals may affect the performance, and in the long-term, may drain individual energy, resulting in breakdown and burnout. According to Hockey' (1993), several different patterns of indirect degradation may be identified. These are referred to as compensatory costs (increased activation and/or subjective effort) which can be exhibited by adjustment of strategy, for example, narrowing of attention, increased selectivity or redefinition of task requirements; increased job autonomy and obtaining constructive job feedback etc. Xie and Johns (1995) asserted that the relationship between job demands and stress is strongly underpinned by activation theory. They argued that too high job demands scope may exceed individual activation level to cope and lead to stressful reaction. On the other hand, evidence shows that stress reduced when a job is less demanding for a job holder (Edwards & Parry, 1993). Job that exerts high physical and mental demand (London & Klimoski, 1975) may exceed the characteristic activation level that individuals can withstand (Schaubroeck & Ganster, 1993). If prolonged, it can provoke stress characterised by sympathetic activation and manifestation of physiological and behavioural symptoms. Thus, the compensatory costs from the activation responses may lead to health problems and eventually individuals may exhibit sickness absence behaviour.

2.3 Absenteeism

Absenteeism is a complex multi-dimensional issue involving the interaction and subtle interplay among many factors, for example worker, employer, workplace, organizational, social and economic factors (Duijts *et al.*, 2007; Briner, 1996). Workplace attendance and absenteeism are of fundamental importance to an industrialised and developing society because primarily, it can affect work productivity and impact on financial performance of the organisation. In addition, the cost implication of absenteeism may jeopardise the quality of goods and services provided by the organization. Absenteeism in the workplace may cause additional burdens to the employers and workers, because it disrupts continuity and effectiveness of work process, and demoralise co-workers who have to do the cover for the absentee. In fact many organisations have placed high agenda on their strategic plan to deal with employee absenteeism and improving their work attendance, because to attain and sustain competitiveness in business world, a good management of human capital by improving employees' work commitment, reducing absenteeism behaviour would increase work productivities and financial performance of the organization. Thus management of workplace absenteeism is important administrative matter for the company to continue survive in the competitive business world.

Absenteeism is a serious workplace problem, costing the developed countries as well as the worldwide economy billions of dollars annually (CBI, 2005). Academic and business literature reveals that absenteeism is a widespread behaviour in the workplace, and has economic impact on both employers and employees; for example, absent employee may cause unscheduled needs by employer to hire less efficient replacements, the scheduled employee needs to bear excessive workload to

compensate for work process of absentees (Ferguson, Ferguson, Muedder & Fitzgerald, 2001). It seems that till now, for several decades researchers and practitioners are still facing challenges to seek for appropriate antecedents of absenteeism to explain the mechanism of such behaviour because of its unpredictable and multifactorial nature.

2.3.1 Definition

There is no universal or standard definition for workplace absenteeism. According to Alexanderson (1998) there is no consistent definition and it varies among different institutions and thus making interpretation of the literature particularly difficult especially for comparison purposes. However institutions are advised to adopt a standard system for recording of absenteeism data, so that these data can be utilised for organizational planning and policy formulation.

Non-work attendance can be categorized partly by sanctioned leave, such as annual leave, long service leave and non-illness related leave, for example maternity or parental leave (Congiu *et al.*, 2012). A more generalised definition of absenteeism (unplanned absence) includes non-attendance at work where work attendance is scheduled. This includes sickness absence leave; special leave, such as bereavement leave; and may also include time lost through industrial disputes. Given the wide variety of employment conditions within different industries and organisations, it is difficult to formulate a complete list which may not change substantially with time.

It has been acknowledged indeed that an accurate definition of absenteeism is a difficult effort (Fichman, 1984). Many definitions offered by several researchers; and these definition are based on tacit theories bound to specific measures which are

often poorly operationalised to the intended meaning of the concept. Sometimes it is more difficult to understand these tacit theories rather than the simple conceptual definition of absenteeism. Fichman (1984) emphasised:

“Absence definitions should be bound to theory, not data.

Data should be ordered by theory and definition” (p. 20).

Taking an example of definition by Gibson (1966), he said that “absence from work means an inability, an inappropriateness, or an unwillingness to work”. He noted that “absence events are a sub-class of the events that constitute the behaviour of workers”. Fichman (1984) argued that this definition still needs legitimacy, roles, willingness to work and other concepts to help define whether an absence occurs. He further argued that the difficulty of characterising behaviour that is signaled by a non-event is apparent. He suggested that it is necessary to impute motives and causal factors to give meaning to absence events. Another definition of absence is the “allocation of time across non-work activities when an individual is expected to be working” (Fichman, 1984). This definition allows us to study absence duration and the process of returning to work because it highlights absence as allocation of time and a change from one activity to another (Atkinson, 1981). Hence, a dynamic theory of framework suggested by Atkinson (1981) with the structuring of absence as a change from presence to absence or vice versa can address problems concerning the lack of coordination between theories of absence and operationalisation of absence (Muchinsky, 1977; Atkin & Goodman, 1984).

From another perspective, Johns (2007) defined absenteeism as failing to report for scheduled work. As such, it is the violation of a social obligation to be in a particular place at a particular time. Traditionally, absenteeism is viewed as an

indicator of poor individual performance and a breach of an implicit contract between employee and employer. Thus, it is seen as a management problem and often quoted in term of its effect on economic and financial performance of the organisation. Consistently economists often view absenteeism in labour supply terms. More recently, absenteeism has increasingly been viewed as an indicator of psychological, medical, or social adjustment to work.

Absence from work can be a persistent and challenging problem confronting organisations (Sheikha & Younis, 2006). Hence organization needs to have a well structured policy to deal with absenteeism. Often than not management tries to ask for a reason of the absence. From this perspective, Abate (2002) viewed absenteeism as the frequent absence from work or other duties without good reason. This definition of absenteeism provide management a clear concept to ask for a plausible reason why employee is absent, for example illness, personal and family matter, or more clear term whether it is avoidable or unavoidable absence. Therefore Abate argued that the time when an employee is being scheduled to be on the job is important because he or she has promised to the management to work unless he or she is granted leave of absence such as vacation or other approved leave.

2.3.2 Impact of Absenteeism

Absenteeism is one of the important phenomena that exists in many organisations. It has far-reaching consequences toward organisational development because it can create problems for managers, co-workers, workers themselves and their families. The economic implication is also great. In 2005, it was reported that in the USA that a day of absence can cost an organization USD660 per-employee, and the average annual

costs associated with employee absenteeism can range from an estimated USD60,000 for a small company to over USD1 million for a large company (Commerce Clearing House (CCH), 2005). According to Atkin and Goodman (1983), the management of absenteeism is a long daunting task because till now there are no any concrete theories and consistent measures that are able to inform the management practice the best way to manage absenteeism in the organisation.

The impact of absenteeism on the organization is great. Employers are frustrated more than employees who fail to report for work, because organisations suffer in terms of shortage of human resources and this may affect the efficiency of job process. A survey was conducted in USA on 700 managers indicated that 20% of them called in sick without any convincing reasons (Gurchiek, 2005).

In the UK, Income Data Services (IDS) Ltd. (1988) mentioned six main categories of employee absence, with sickness absence top in the list follows by statutory time-off; strikes or other industrial action; holidays; special leave; and personal/domestic leave. However, Huczynski and Fitzpatrick (1989) notion of absence differs from IDS Ltd. (1988), as they referred to voluntary absence as the non-attendance of employees for scheduled work when they are expected to attend. This definition is logical in the sense that it helps to avoid a judgment on the legitimacy associated with absence from work. This highlighted the importance of differentiating voluntary absence from involuntary absence; thus organisations can exercise attendance control policy and procedures to deal with this problem accordingly. The identification of whether voluntary or involuntary absence provides a useful guide to supervisors and managers to dispel doubts about the employee attendance status before making any disciplinary decision on employees.

2.3.3 Causes and Explanation of Absenteeism

There is no single explanation for absence behaviour; the cause may be simple, or multiple, complex and inter-related. Causes can vary between different groups of employees in the same organisation, and fluctuate for the same employees over their working life (Johnson, Croghan & Crawford, 2003).

Huczynski and Fitzpatrick (1989) added that many organisations have misconception about causes of absenteeism; most perceive that these are similar to employees' turnover. They fail to understand that absenteeism is one of the employee withdrawal behaviours that is different from employee turnover. This is agreed by Rhodes and Steers (1981) who argued that the problem of employee absenteeism is seldom examined systematically. Many researchers, have in fact, demarcated employee absenteeism from turnover. Considering that the negative consequences associated with absenteeism are typically fewer than those associated with turnover, absenteeism is more likely to be spontaneous and relatively easy decision for the employee, while decision to leave is more carefully thought of over a long period of time; and absenteeism is often indicative of a wish to leave the organisation (Rhodes & Steers, 1981; Huczynski & Fitzpatrick, 1989).

A study conducted by Joseph Jackson a few decades ago (Gaudet, 1963) found that employees with above-average rates of absence had the following traits in sequencing order of importance, and these traits are still relevant today. They are poor work habits; personal maladjustment; dissatisfaction with work; irresponsibility; difficulties encountered with external factors (for instance personal business, transportation, and housing difficulties) and lastly, sickness or fatigue.

It seems that sickness is the last in the sequence of importance and people will have no option but to be absent because it is inevitable and involuntary and beyond their control. Gaudet (1963, p.71) reported that the above employees' traits operate when 'their problems' are aggravated on the job by boredom, discouragement, a poor working environment or a bad relationship with the colleagues or boss.

2.3.4 Sickness Absence

Sickness absence means non-attendance by an employee at work due to a (certified) health complaint when the employer expects attendance (Taimela *et al.*, 2007). Despite this direct definition, sickness absence has proved to be a complex phenomenon (Duijts *et al.*, 2007). In addition to illness, Briner (1996) associated this phenomenon with demographical and socioeconomic factors, organisational features, job content factors and attitudes to work. However, the key psychosocial predictors of sickness absence include individuals' own perceptions of health and working ability (Reiso *et al.*, 2001; Virtanen *et al.*, 2003).

Searle (1997) defined sickness absence as absence attributed by the employee to illness or injury and accepted as such by the employer. The main reason for absenteeism from work is ill health, although, ill health is not always equated to incapability to work (Grundemann & Vuuren, 1997). The ability to work is greatly influenced by a person's own perception about his/her capability or incapability and absence can be viewed as a very personal decision based on both the ability and the motivation to attend (Kristensen, 1991). Absences result when an individual decides to stay away from the workplace during scheduled work periods. Certainly, not all absences can be avoided, as Allen and Higgins (1979) claimed that we live in an

absenteeism culture. Taking a day off and calling in sick is supported and encouraged by our society.

Long-term absence is most likely to be associated with medical problems, whereas short-term absence is likely to be because of social and personal factors rather than illness, and is therefore open to management control (Searle, 1997; Evans & Walters, 2002).

Sickness absence is an important issue in healthcare, as this phenomenon is relatively prevalent among healthcare workers associated with high levels of job stress (Bourbonnais, Comeau, Ve'zina & Guylaine, 1998; Greenglass, Burke & Fiksenbaum, 2001; Tummers, van Merode & Landeweerd, 2002). This creates insufficient healthcare workers to cater for the needs of health services and implicates the quality of healthcare provided to the sick. Hence, much attention has been paid to sickness absence in the healthcare sector. The withdrawal behaviour in health services, especially among the nurses is costly; it destabilises patient care and undermines employee morale (Cavanagh, 1989).

A study conducted by Wortsman and Lockhead (2002) found that in any given week, more than 13,000 Registered Nurses (RNs) in Canada or 7.4% of all RNs, are absent from work because of injury, illness, burnout or disability. To tackle the sickness absence problem, overtime has become a regular staffing strategy to accommodate staffing shortages. With this overtime strategy adopted by authority, a study was conducted by O'Brien-Pallas, Alksnis and Wang (2003) found that every quartile increase in overtime hours worked by the staff has caused a increase of Musculo-Skeletal Disorder (MSD) by 70%. Thus it can be perceived that the management has taken more time and energy to manage sickness absence rather than

focus on improving the professional development, health status and welfare of existing employees (Lavoie-Tremblay & Brabant, 2006).

In the UK, the most frequently reported factor associated with ill health and sickness absence among nurses is workload (Tyler & Cushway, 1992). In two studies on sickness absence among healthcare workers in the UK, one found a negative association between sickness absence and job demands (Parkes, 1982), while the other found no association between sickness absence and job control (Rees & Cooper, 1992). Consistent results of association between sickness absence and job related factors are found among healthcare workers in the rest of Europe, the USA, and Australia. A study of nurses in the USA (Marshall & Barnett, 1992) and Australia (Pisarski, Bohle & Callan, 1998) found an association between co-worker support and sickness absence. A study conducted on Swedish nurses associated sickness absence with job influences (Pettersson, Arnetz & Arnetz, 1995). Another study conducted in the USA linked sickness absence with role ambiguity (Revicki & May, 1989). Sickness absence was also associated with workload and lack of training (Landeweerd & Boumans, 1994), unsupportive management style (Gray-Toft & Anderson, 1985), and low pay (Brooke & Price, 1989). All these studies point to the relationship between job-related factors and sickness absence.

In the UK, sickness absence is high among healthcare workers and is associated with their physical and psychological ill health (Williams *et al.*, 1998). This phenomenon is likely to jeopardise the quality of patient care because most healthcare services are provided by healthcare workers working in team. Therefore sickness absence of any one individual is likely to cause increased work and stress for other healthcare staff.

Cox and Griffiths (1995) argued that the causes of ill health and sickness absence among healthcare workers across UK hospitals are basically due to nature of work in hospital, organizational changes and workloads. They pointed out that the rate of ill health was alarmingly high among healthcare workers which range from 17% to 33%. Nevertheless Wall *et al* (1997) reported that those hospitals that allow more job flexibility, more training opportunities, better communication and good cooperation and support among staff and management have lower rate of ill health and sickness absence. Hence it can be perceived that organisational factors can influence ill health and sickness absence to certain extent.

According to Johnson *et al.* (2003), stress and strains of modern working life in today's fast paced society, have been put forward as an explanation for sickness absence, They argued that a paradox has emerged in the UK, and several other developed countries., where improvements in the standards of living, healthcare provision, and the working environment are associated with rising trends in medically certified incapacity. This may reflect changing expectations of society, for example, people would expect to be absent when ill than to be ill at work.

Johnson *et al.* (2003) suggest measures to prevent the exacerbation of sickness absence, organisations should examine comprehensively their sickness absence problem and understand the organisation's unique cultural features before executing sickness absence policy and procedure. Otherwise it may exacerbate the absence problem.

Rogers and Herting (1993) conducted a study on sick-leave usage patterns among workers at a USA naval base in California. The study distinguished genuine sick leave from 'elective sick leave'. Genuine sick-leave was identified when employees being genuinely too ill to work. Elective sick-leave, on the other hand,

occurred when employees who could go to work without any detrimental effect to their own health, and to that of other employees or to job productivity, chose not to do so. The study identified elective sick leave as leave due to slight headache, minor menstrual discomfort, minor backache, elective medical appointments, and attending to sick children at home. The study obtained data on sick leave from employee payroll and personal records. An attitude survey questionnaire also elicited responses as to the circumstances under which sick-leave would be used. The analyses of the sick leave data yielded a significant positive correlation between the use of sick leave and age. As age increased, sick leave usage also increased. The response towards how sick-leave would be used was consistent across different age groups. This suggested that age did not significantly affect the way employees felt about the use of sick leave.

Generally previous studies (Chadwick-Jones *et al.*, 1982; Hackett & Guion, 1985; Ilgen & Hollenback, 1977) found typically weak relationship between age and absenteeism. In terms of relationship between supervisory style and absenteeism, a study conducted by Zaccaro, Craig and Quinn (1991) revealed no significant relationship. On the other hand, job satisfaction, as one of the attitudinal factors has been found to associate with absenteeism. Farrell and Stamm (1988) conducted a meta-analysis found a significant number of literature support the relationship between job satisfaction and absenteeism.

2.3.5 Impact of Sickness Absence

Sickness absence is an important occupational problem and has an inevitable impact on productivity and on costs of health insurance (Rauhalaa *et al.*, 2007). The cost of sickness absence to the British economy has been estimated to be similar to the total

annual expenditure for the NHS (Taylor, 1974). In 1994, because of sickness absence, 177 million days were lost totalling £11 billion (Grundemann & Vuuren, 1997). Such cost estimates have pressured the UK government to set targets to reduce sickness absence in the public sector. It is estimated that sickness absence among nurses in the UK costs £90.5 million per year, and £714 million per year when all NHS costs are considered (Williams *et al.*, 1998). With the average cost of absence from sickness running at £599 per employee in the UK, many firms are taking radical action to keep staff at work (Wigham, 2006). According to the CIPD (2004), the average worker now misses eight days each year due to sickness, while the CBI (2001b), claimed that the overall cost of sickness has reached more than £13 billion, i.e., the highest ever level.

Several authors have shown that sickness absence (especially long spells of absence or medically certified absence) can be an indicator of general health (Marmot *et al.*, 1995), and bring about financial implication to the industry and organisation. Other authors have found sickness absence to be a reliable indicator of subsequent serious morbidity (Jenkins, 1985). Because sickness absence is strongly related to health and has an important economic impact in costs of health insurance and loss of productivity, identification of the predictors of absenteeism is essential as a guide to preventive measures (Niedhammer *et al.*, 1998).

2.3.6 Illness, Disease and Workplace Attendance

Sickness absence is believed to have multifactorial aetiology, in which illness and injury may be two of the many causes (Niedhammer *et al.*, 1998). In the literature, several of the factors have proved to be associated with sickness absence, including

societal conditions (social insurance and security, economic fluctuations, etc.), conditions specific to a given workplace or organisation (policy towards the personnel, size, and type of industry), occupational conditions, such as physical, chemical and psychosocial stressors, seniority, educational level, occupation, social and demographic characteristics, i.e., sex, age, marital status, number of children, social network, commuting distance to work, smoking habits, type of personality, and health conditions also seem relevant (Prins & De Graaf, 1986; Kristensen, 1991).

It is also believed that many individual factors appear to be linked to absenteeism: past absence history, education, personality and the abuse of drugs and alcohol. The largest single component of sickness absenteeism is associated with genuine incapacity attributable to illness and injury. Surprisingly, health status is only a minor contributor as health status (by self-report) was not found to influence absenteeism significantly (Brooke & Price, 1989). This, in part, supports the hypothesis that sick leave use also has non-medical determinants. Disease and illness are rarely discussed in most models of workplace absenteeism, yet they form the bulk of the cause and provide a legitimate explanation for much of its occurrence. Many of these factors are prevalent in society and are open to interventions in the public arena as well as in the workplace. For example, the workplace can be a vehicle for the amplification of public health messages dealing with cigarette smoking, drug and alcohol use, diabetes and influenza. Thus, illness related leave might be unfairly considered as unavoidable from a workplace or from a medical perspective. In Australia, various studies have indicated that disease accounts for 50 to 75% of work absences, and “colds and flu” are most likely to account for short absences of 1-2 days (The Australasian Faculty of Occupational Medicine, 1999). A health survey in Australia found that 61.9% of all employed persons experienced some illness

throughout their working history. Taking into account the incidence of various illnesses, “flu” accounted for 18.5 % of absences, injuries 13%, musculoskeletal disorders 12%, digestive disorders 10.6% and “colds” 6.6% (Wooden & Robertson, 1989). Whist studies have showed that the incidence of illness may increase with age, however the sickness absence did not, thus, it appears that age has opposite effect upon the incidence of sickness absence (Wooden & Robertson, 1989).

2.3.7 Absenteeism Measures

One of the problems acknowledged by many authors is the measurement of absenteeism. The measurement of absence has long been recognised as one of the confusing areas in absence research. In his literature review, Muchinsky (1977) expressed his doubts about absence measurement:

“the single, most vexing problem associated with absenteeism as a meaningful concept involves the metrics or measure of absenteeism.....more than any other consideration, the methodological “hodgepodge” surrounding absenteeism indices plagues the evaluation and interpretation of absenteeism research” (p. 317, 320).

According to Hinrichs (1980), one must clearly differentiate between avoidable and unavoidable absences. While differentiation is not always easy (Chadwick-Jones, Brown, Nicholson & Sheppard, 1971; Chadwick-Jones, Brown & Nicholson, 1973), several studies have looked at the relationships among an array of different possible measures of absenteeism, such as the overall frequency, ‘attitudinal’ absences (one-day absences), total time lost, lateness indicators, ‘blue Monday index’,

medical absences, etc. (Huse & Taylor, 1962; Muchinsky, 1977). In several of these studies, the overall absence-frequency measure was found to be the most reliable, and many of the other measures exhibited marginal or non-existent measurement reliability. Steers and Rhodes (1978) justified that absenteeism behaviour is simply not a reliable phenomenon over time and that test-retest reliabilities of absenteeism measures should not be expected to be high.

Taylor (1982) stated that absenteeism is a repetitive event which needs a measuring tool to monitor its impact and consequences. He suggested three methods of measuring absence: using absence rate, absence percentage rate and absence frequency rate. Absence rate refers to total number of days that a person is absent each year. This actually refers to the time lost or absence duration. However, absence percentage rate expresses the number of absent days as a percentage of the total time that a person is expected to be at work. Lastly, absence frequency rate refers to the number of spells or instances of absence and is expressed as a number.

Chadwick-Jones *et al.* (1973) suggested the use of five categories of absence measures to capture the operation of choice in voluntary absence: (i) time lost (the length of any particular absence); (ii) frequency (the number of absent days in a given period); (iii) short-term (one and two day absences); (iv) 'blue Monday' (the difference between the total absence rates between Mondays and Fridays); and (v) worst day (the difference between the total absence rate on the 'worst'; (highest) and 'best' (lowest) days of the week). As for reliability, internal consistency of the absence indices was conducted using the split-half method. The result indicated that time lost index was highly reliable and consistent with short-term and frequency indices of acceptable reliability. 'Blue Monday' and 'worst' day indices did not seem

to be reliable. As for validity, the intercorrelations of the different absence indices were calculated based on the convergent and discriminant validity techniques.

Chadwick-Jones *et al.* (1973) categorised absenteeism into voluntary and involuntary absence. Their study also distinguished sickness: sanctioned and time-lost absence as unavoidable absence; and casual, unsanctioned absence frequency as avoidable absence. As discussed in the above paragraph, there are various indices of absenteeism which have been presented in different forms. However, the frequency index has been reported to be the most reliable and consistent measure of absence across different studies (Muchinsky, 1977).

Time lost or duration denotes the total amount of time lost (hours, days, months) resulting from employee absences for a certain time period. In a review of past literature on absenteeism for the purpose of meta-analysis, Scott and Taylor (1985) found that 74 out of 114 cases they studied used absence duration indices, in comparison with only 40 cases used by an absence frequency measure to correlate job satisfaction and absenteeism. Despite widespread employment of frequency and duration measures in absence research, these traditional measures of absence have been criticised as deficient in grasping all aspects of absence events because these measures can be subjected to biases (Hammer & Landau, 1981; Atkin & Goodman, 1984; Stone & Chacko, 1984).

Numerous studies were conducted in the west by government offices, and by the industry, especially in the UK, Europe and the USA, to determine the absence trends. However, many of these survey results are not convincing and authoritative because of problem of survey coverage, response rate and overlapping findings. Comparable figures on absence measures are both difficult to obtain and inherently unreliable. Hensing, Alexanderson, Alleback and Bjurulf (1998) concurred with Huse

and Taylor, (1962); Muchinsky, (1977); Taylor (1982); Chadwick-Jones *et al.* (1973), that generally, absence can be measured with absence frequency and ‘time lost’ or absence duration index. Hensing *et al.* (1998) argued that absence frequency is considered to be an indicator of “voluntary absenteeism” and a function of employees’ motivation, whereas, absence duration is generally considered to be an indicator of “involuntary absenteeism” that results from the inability rather than the unwillingness to come to work (Bakker *et al.*, 2003b), for example as a result of ill health or accidents or injuries. To support the link between these two measures, Farrell and Stamm (1988) demonstrated in their study that correlation between absence frequency and duration ranges between a low -0.05 and a moderately high 0.60 .

According to Thomson, Griffiths and Davison (2000), there are a number of difficulties when dealing with measurement issues related to voluntary and involuntary absence. First, it can be argued that frequency and duration measures are not valid operationalisations of voluntary and involuntary absence, respectively. Although different causes may underlie high levels of absence frequency and high levels of absence duration, it may be too large an inference to assign the former simply to voluntary and the latter to involuntary causes. Frequency measures, for example, may also include absence due to involuntary factors, such as sickness, and duration measures may include voluntary or avoidable absence. Second, the frequency and duration of absence measures are not particularly informative. For example, two individuals could each be absent five times in a year, and, in terms of the dependent variable of absence frequency, in statistical analyses, they would be treated equivalently. However, the first employee may have had five spells of absence of over seven days in length due to illness (as evidenced by a medical certificate), while the

second person may have had five single days off work. It is not possible to infer much about the nature of an employee's absence behaviour simply from knowing absence frequency, or similarly, simply from knowing the absence duration. Therefore, additional information is required: either by combining the two measures in some way or by including information about whether an absence is accompanied by a medical certificate. Most employers' human resources policies make provision for employees to produce medical certificates when they have been absent from work due to ill health. The reason for doing so is to avoid the abuse of sick leave by employees who are not genuinely sick when they absent themselves from work.

The third difficulty concerning the distinction between voluntary and involuntary absence is the judgmental quality of those terms. The use of such categorisations is reliant on the attributions of the researcher rather than a definitive characteristic obvious from the data (Atkin & Goodman, 1984). Nevertheless, a study examined the relationship between two measures of absence from work and four conceptually separate groups of predictors (job satisfaction, personal characteristics, leadership style and job content), and found that frequency of absence was a more sensitive criterion than time lost, and significant correlates of absence were noted in each predictor group. The regression analysis used indicated substantial redundancy within and between these groups of predictors (Johns, 1978).

2.3.7.1 Subjective versus Objective Measures

More recently, alternative indices of absence behaviour that reflect objective distinctions between absence events, together with additional information, have been increasingly used. Two such measures are certified and non-certified absence

(Hensing *et al.*, 1998; Kivimaki *et al.*, 1997a; Marmot, Shipley & Rose, 1984; North *et al.*, 1993; Vahtera, Virtanen, Kivimaki & Pentti, 1999). These measures are more informative because they indicate: (i) the total time lost; (ii) the length of absence spells (non-certified absences are shorter spells, with longer spells requiring a physician's sickness certificate; and (iii) when illness is a causal factor in the absence (certified absence being validated by a physician). Furthermore, the distinction between the two measures is based on an objective characteristic from the raw data set (i.e., the presence of a physician's certificate in support of an illness), rather than an attribution by the researcher.

Evidence also suggests that these two measures represent different causes of absence (Hensing *et al.*, 1998). In certified absences, the influence of actual illnesses, such as musculoskeletal disorders, psychiatric diseases and injuries has been shown to be large, while in non-certified sickness absences, the influence of milder symptoms, such as headache, nausea and fatigue may prevail (Hensing, Spak, Alexanderson & Alleback, 1997; Marmot *et al.*, 1995). Therefore, using certified absence can be claimed as representing longer periods of absence related to illness, whilst non-certified absence reflects shorter periods of absence that may be related to milder illness or other factors (such as lack of motivation or domestic crises). Furthermore, the evidence available using these measures has found age to be correlated positively with long, medically-certified absence, morbidity and mortality, but negatively or not at all with short, self-certified absence (Ferris, Bergin & Wayne, 1988; Johns, 1978; Leigh, 1986; Schalk, 1987; Vahtera, Uutela & Pentti, 1996).

The majority of the research on employee absenteeism relies on actual absence data from organisational records. However, over the years, a growing number of research has adopted self-reported absenteeism data instead of record-based

information (Johns, 1994a). The use of self-reported absenteeism data is justified due to several reasons, such as incomplete records and records not comparable across companies, time constraints, maintenance of respondent anonymity or confidentiality, possible errors in organisational records and distributional problems of record-based data (Johns, 1994a). Nevertheless, the data concerning sickness absence derived directly from the employee records would eliminate the potential bias involved in self-reporting (Niedhammer *et al.*, 1998).

Self-reported absenteeism was first developed by Price and Mueller (1986) using frequency measures. Some studies found that self-reported absenteeism consistently correlates with record-based measures (Hackett *et al.*, 1989; Spector, 1987a), which also provides some psychometric property of self-reported absenteeism (Johns, 1994a). Research has found that self-serving bias occurs in self-report absenteeism, i.e., people normally under-report their own actual absence (Johns, 1994b). It seems that majority of self-serving perception of absence occurs in western culture, where it is considered as an individualistic orientation (Hofstede, 1991). However, in Asian countries, the society mirrors the collectivist orientations of the social contexts, and with modesty and interdependent traits inherent in Asian culture, they are said to prevent self-serving biases (Johns & Xie, 1998). In other words, the unique characteristics of Asian culture may influence Asians to provide a reliable self-reported data on their own absenteeism. Nevertheless, the data concerning sickness absence is best derived directly from the employee records, and this objective measure still remains as the best viability of alternative measures of absenteeism (Goldberg & Waldman, 1999), as it would eliminate the potential bias involved in self-reporting (Niedhammer *et al.*, 1998; Harrison & Shaffer, 1994). Harrison and Shaffer (1994) termed this self-report bias as the "Lake Wobegon effect" because

their research found that 85% to 95% of respondents reported being above average in their attendance record. This situation was traced to a small negative bias (under-reporting) in self-reports and a large positive bias (over-reporting) in perceived norms, usually in the attendance. Research also shows that self-reports correlated strongly with the observation record (Harrison & Shaffer, 1994). Hence, this discussion provides justification for the selection of organisation record data for sickness absence in the present study.

According to Rentsch and Steel (1998), short-term assessments of absence are highly susceptible to bias. For example, a 3-month absence measure may not be able to differentiate between the usually reliable employee who suffers a single lengthy illness and the truly absence-prone individual. Therefore, they suggested that cumulated absence measures are better equipped to capture reliable patterns of attendance behaviour than are short-run absence measures.

Many previous studies that have compared self-reported and recorded absence data have taken the employers' register data as the reference standard (van Poppel, de Vet, Koest, Smid & Bouter, 2002). Many studies are in support that employers' register should remain as the gold standard. However, empirical studies indicate that self-reporting is less of a problem and there is little difference in the strengths and association between these two sickness measures and physical illness (van Poppel *et al.*, 2002; Ferrie *et al.*, 2005).

There are over 41 different absence measures which have been used and practiced by the organisations (Gaudet, 1963). It seems that frequency and time lost (duration) measures are the most commonly used methods due to their relative conceptual and operational clarity (Hensing *et al.*, 1998; Atkin & Goodman, 1984).

However, Chadwick-Jones *et al.* (1971) claimed that the time lost measure is the most universally accepted and used by the organisations.

An annual sickness absence rate of 4.59% was reported for nursing staff in the NHS in the UK (NHS, 2012a). However, for all healthcare staff under NHS, the figure was slightly lower with 4.16% (NHS, 2012a). With the survey done for general population, the UK recorded 4.5% (ONS, 2012); Singapore reported 3.5% (Singapore Human Resources Department, 2009); the lowest was reported in Switzerland with 1.78%, and Sweden had quite high sickness absence rate with 6.31% (Barnby, Ercolani & Treble, 2002).

In terms of annual time lost in days for nursing staff in 2011, the NHS, UK recorded 5,107,461 days based on nursing workforce of 319,919 in year 2011 (NHS, 2012b). The average sick leave per employee per year was 6.5 days for each employee for the general population of the UK in 2011, and the figure estimated for public sector employees in the UK was 8.4 days (CBI, 2011). However, the average duration of sick leave per employee per year from previous studies in Malaysia and Singapore was lower with 2.5; 3.2 and 4.27 days respectively for these three studies (Chee & Rampal, 2003; Chan *et al.*, 1997; Chia, 1988).

2.3.7.2 Measuring Cost of Absenteeism

Measuring of cost due to absence by companies can actually reflect the true magnitude of absence costs incurred. Taylor (1982) identified not only direct costs of employee absence, but also indirect costs that often are not apparent to managers. He described direct costs as sick pay and continued payment of fringe benefits to the absent employee (for example, insurance, pension and holidays), overtime payment

for those who replace the absentee and costs incurred in overstaffing. His notions of indirect costs ranged from costs incurred due to disruption or shutdowns of sections, reduced productivity, lower product quality, management time lost in revising work schedules, counselling, disciplining and quality checking, administrative cost to maintain and run absence control programme, cost of recruitment, selection and training of replacements and adverse effects of dissatisfaction of other employees when they see unwarranted absence and resent doing the absentee's work.

The IDS (1998) estimated the annual cost of absence to the UK economy to be around £13billion, an average of £581 per employee. These estimates are supported by the CBI (2001b), which estimated that in year 2000, around 192 million working days were lost through absence. This represents an average of 7.8 working days per employee or about 3.4% of working time – at an estimated cost to the economy of £10.7 billion.

Other authors have concluded, however, that the true cost of absence is even greater; once indirect costs, such as lower quality products or services and lower customer satisfaction are included. For example, Ho (1997) argued that the economic impact of employee absenteeism is derived mainly from the costs of decreased productivity because of absence from work, less experienced replacements and the additional expense of hiring substitute labour. On the basis of data collected by the CBI (1999), it is estimated that when indirect costs are included, absenteeism costs British employers around £1,092 per employee per year.

One study attempted to itemise the fixed costs associated with each incident of absenteeism using the job of bank tellers in one of the banks in the USA. This study estimated that each incident of absenteeism cost a total of USD66.45 (Mirvis & Lawler, 1977). However, these are only the tangible and easy to estimate costs; the

actual costs in terms of reduced efficiency, inferior customer service, supervisory workload and unrealised opportunities were not included. This incident price tag of only a minimum cost of USD 66 per incident has caused a productivity drag on the USA economy of over USD 36 billion. The statistics from the Bureau of Labour Statistics in the USA reflect an absence rate of 3.5% of normally scheduled hours among a total of 60.2 million wage and salary employees in 1978, averaging out to 10.54 million days lost per week, or 548 million days per year (Taylor, 1979; Hinrichs, 1980).

Important issues, such as employee absence and the need to focus management attention on it, are especially significant when organisations are pressurised to achieve enhanced levels of performance. At such times, the detrimental effects of absence upon organisational well-being is most strongly felt, and its incompatibility with desired improvements become very apparent. Furthermore, employee absence and its manifestations may represent a significant threat to change management in circumstances where organisational systems, structures, processes, and management practices, are contributing to the level of absence (Bennett, 2002). Therefore, the importance of measuring absence costs underscores the keeping and monitoring of accurate records and employing of effective absence control strategy. The act of measurement is itself an absence control tool. In most companies, the source of information on attendance comes from time clock (punch card or biometric thumb print system), attendance sheet or recording book, medical records, personal files or 'return to work' interviews.

Up to now, no robust data exists in many organisations to calculate sickness absence costs (Bevan & Hayday, 2001). Most of the organisations are ill-equipped to calculate their absence costs systematically and only 15% of them manage to estimate

it appropriately (Bevan, Dench, Harper & Hayday, 2004). Previous estimation of sickness absence costs in European countries (Grundemann, 1997; Bevan *et al.*, 2004; Organisation for Economic Co-operation and Development (OECD), 2009) showed discrepancy in methods of computing costs, thus making it difficult and unreliable for comparison across different countries.

According to Mercer, Carpenter and Wyman (2008), direct cost is the pay or benefit provided to an employee for time not worked. The indirect costs include the effects on productivity, administration, quality of service, insurance contributions and the hiring of replacement workers.

Estimation for sickness absence cost in the UK health sector was £692 (RM3,314.68) per employee per year (CIPD, 2011). However the sickness absence cost reported by recent survey on health and well-being in the UK revealed a more alarming figure of £1,958.40 (RM9,380.74) per employee per year (Black & Frost, 2011).

In the whole of the UK, sickness absence costs the economy £100 billion with about 150 million working days lost each year in 2010 (CIPD, 2011). A study was conducted on seven organisations in Europe and estimated sickness absence costs ranged from between 2 to 16% of employees' annual salary costs (Bevan & Hayday, 2001).

2.3.7.3 Reliability and Validity of Absence Measures

Traditionally, employee absenteeism has been measured and understood in a static way. Previously, the most widely used measures of absence are simply indices of the frequency and duration of absence from scheduled work over a period of time or time

lost. In many previous studies, these measures of absence were flawed by statistical defects, such as instability of absence data and/or non-normal simple distributions. Such methodological problems led to questions about the usefulness of the ordinary least-square regression and relationship between employee attitude and absenteeism (Hammer & Landau, 1981).

A number of past researches and literature reviews addressing the reliability issue was carried out by many researchers (For example, Muchinsky, 1977; Steers & Rhodes, 1978; Chadwick-Jone *et al.*, 1982; Fichman, 1984). Hammer and Landau (1981) focused on the methodological problems associated with absenteeism research after dividing absenteeism data into the voluntary and involuntary categories as mentioned earlier. Their findings confirmed the methodological problems inherent in traditional approaches: instability in absence behaviour and non-normal distributions. These statistical problems are due to wide fluctuation of absences between periods; both voluntary and involuntary absences are often considered as random behaviour. Such an instability characteristic limited the use of least-square regression and correlation models in the analysis of absence data. Nevertheless, Hammer and Landau (1981) demonstrated that aggregate data on absence for a longer period were more consistent than the data for the shorter duration. They suggested using Tobit analysis in preference to the ordinary least-square model employed in previous research. Low and inconsistent validity coefficients in absenteeism research have also been attributed to theoretical deficiencies as well as methodological problems (Steers & Rhodes, 1978). Many scholars (such as Latham & Pursell, 1975, 1977; Smith, 1977; Steers & Rhodes, 1978; Harrison & Martocchio, 1998; Johns, 2003) have advocated the use of attendance indices and diverse methods rather than measures of voluntary absenteeism. However, the use of attendance measures has met with strong resistance

because the construct validity of such measures is not comparable to that of absence behaviour, suggesting that they may be criterion-contaminated (Ilgen, 1977; Smulder, 1980). Cascio (1987) argued that the contamination may occur when the operational or actual criterion contains variance that is unrelated to the ultimate criterion.

2.3.7.4 Stability of Employee Attendance and Absence

In appraising employees' performance, organisations often use attendance or absenteeism as criteria, even though attendance or absenteeism is necessary, but not sufficient conditions for performance appraisal (March & Simon, 1958). Attendance may be regarded as a more accurate criterion of employee reliability or stability, in that attendance is more consistently observable than absenteeism. An employee may be viewed as relatively stable if he or she attends for a long interval between only a few absences. Thus, stability refers to continuous and cyclical aspects of both employee attendance and absence over time. To date, neither absence nor attendance data is used in reliable and valid ways to predict work-related attitudes associated with withdrawal behaviour.

2.3.8 Empirical Evidences on Predictors of Sickness Absence

Employee absenteeism is linked to many factors, with the major, though not sole determinant, being disease-related incapacity. There has been a considerable amount of investigation on the causes of absenteeism. Much of this takes the form of exploring associations between various factors and individual or group behaviour (Hammer & Landau, 1981; Clegg, 1983; Jenkins, 1985; Parkes, 1987; Michie &

Williams, 2003; Clegg, 1983; Hammer & Landau, 1981; Jenkins, 1985; Parkes, 1987; Isacson *et al.*, 1992; Hornquist *et al.*, 1993; Marmot *et al.*, 1995; North *et al.*, 1996; Michie & Williams, 2003; Beemsterboer *et al.*, 2008, 2009).

In order to understand better the relationship between the sickness absence and its correlates, several related empirical studies regarding the predictors of sickness absence are presented below. The following Table 2.1 summarises the literature's findings related to sickness absence in various contexts.

Table 2.1
Related Empirical Studies on Predictors of Sickness Absence

Selected study	Subject	Findings
Voss, Floderus and Diderichsen (2004)	Swedish post employees	Workers with more physical demands and workload at work showed an increase in incidence of sickness absence.
Vaananen <i>et al.</i> (2003)	Finnish public employees	Low job autonomy, low job complexity and lack of social support are associated with long episode of sickness absence.
Vaananen <i>et al.</i> (2004)	White and blue-collar employees	In white-collar men, role ambiguity is positively associated with sickness absences. Weak associations between work-related psychosocial factors, mental demands and sickness absence in white-collar women.
Vaananen <i>et al.</i> (2008)	Finnish municipal employees	Positive relationship between role conflicts and sickness absence. Occupational grades, gender, having young children moderate the effects of role conflicts on sickness absence.
Landstad, Vinberg, Ivergard, Gelin and Ekholm (2001)	Swedish hospital cleaners	Negative link between job tenure and sickness absence. Social support contributes to decrease in sickness absence.
Huibers <i>et al.</i> (2004)	Dutch population-based cohort study	Older age, female sex, low autonomy, working night shift are predictors of long-term sickness absence.
Bekker, Rutte and van Rijswijk (2009)	Dutch male and female working adults	More females than males are absent from work because of short-term sickness absence.
Verhaeghe, Mak, Van Maele, Kornitzer and De Backer (2003)	Belgium nurses	Positive association between job demands and sickness absence; and negative association between social support and sickness absence.
Hanebuth, Meinel and Fischer (2006)	Employees at manufacturing plant in Germany	Lack of social support was significantly associated with sickness absence.
Woo, Yao, Oh and Kong (1999)	Singapore civil servants	Environmental stressors and psychosocial aspects of the workplace environment were positively linked to sickness absence.

Table 2.1 (Continued)

Chee and Rampal (2003)	Malaysian semi-conductor workers	Environmental stressors were positively linked to sickness absence.
Indran <i>et al.</i> (1995)	Malaysian private agency workers	Female workers had more sickness absence than male workers.
Lowe, Schellenberg and Shannon (2003)	US working adults	Employees in healthier work environments had significantly lower absenteeism.
Vahtera, Kiwimaki and Pentti (2000a)	US working adults	Low task control led to high sickness absence.
Roelen <i>et al.</i> (2006)	Dutch administrative workers	Age was negatively associated with sickness absence.
Punnett, Greenidge and Ramsey (2007)	Working adults in Barbados	Negative association between self-efficacy and absenteeism.
Moreau <i>et al.</i> (2004)	Belgium cohort study	Significant association between social support and sickness absence.
Lund <i>et al.</i> (2006)	Dutch working adults	Positive association between physical demands of the job and long-term sickness absence.
Weinberg and Creed (2000)	British health care professionals	Negative link between social support and sickness absence.
Lipley (2003)	Canadian health care professionals	Providing feedback reduces the sickness absence frequency.
Petren, Petzall, Preber and Bergstrom (2007)	Swedish dental hygienists	Role ambiguity was positively associated with sickness absence.
Eriksen, Bruusgaard and Knardahl (2003)	Norwegian nurses' aides	Perceived lack of supportive culture in a workplace was associated with a higher risk of sickness absence.
Eshoj, Jepsen and Nielsen (2001)	Occupationally active residents of a Danish county	Heavy-duty work was found to correlate with sickness absence.
Voss, Floderus and Diderichsen (2001a)	Sweden Postal staff	Repetitive work and heavy lifting was found to correlate with sickness absence.
Melchior, Niedhammer, Berkman and Goldberg (2003)	Prospective study GAZEL cohort	Co-worker support correlated with sickness absence.
North <i>et al.</i> (1996)	British civil servants	Psychosocial work environment predicted rates of sickness absence.

By studying the above Table, it seems that there are a significant number of empirical studies carried out in the last 10-15 years that show relationships between job demands, job resources and sickness absence. Some of the job demands dimensions, such as physical demand, workload, mental demand, role conflict, role ambiguity, job complexity and environmental stressors showed positive link with sickness absence. On the other hand, there are also some job resources dimensions that showed negative links to sickness absence. These factors include social support,

task/time control, job autonomy, job feedback and self-efficacy. Hence, out of 26 studies documented as above, 9 studies demonstrated association between job demands and sickness absence, while 11 studies found association between job resources and sickness absence. Four studies provided evidence of association between psychosocial work environment and sickness absence. Three studies were linking age and gender with sickness absence and one supported the influence of organizational culture on sickness absence.

2.4 Job Demands

Under the job demands dimensions, few important variables have been identified in this study in relation to job stress and sickness absence. These variables are workload, physical demand, emotional demand, job scope, role conflict, role ambiguity and job complexity.

Like other sectors, the healthcare structure in most parts of the world has to comply with economic principles, which emphasise on cost reduction and increased productivity. Over the last few decades, this has led to a reduction of scarce resources (Verhaeghe *et al.*, 2003). As one of the cost cutting strategies, the length of hospital stay for patients has been shortened (Kominski & Witsberger, 1993; Kirchheimer, 2001). Nevertheless, patients in a hospital need more intensive care during the period of admission which results in increased job demand on the wards. In addition, with fast technological advance in medical field and the shift from more mechanical and distanced nursing (primary nursing) to a more holistic approach (integrated nursing) has resulted in a larger individual involvement and pressure on hospital nurses (Verhaeghe *et al.*, 2003).

A study was carried out by Verhaeghe *et al.* (2003) to compare 315 hospital nurses with 615 non-nursing workers, as a control group. Their study found hospital nurses have higher job demands and lower job control than the non-nursing group. They also showed important positive association between job demands and absenteeism among the hospital nurses.

This study utilises Job Demand/Resources (JD-R) model (Demerouti *et al.*, 2000b; Demerouti, Bakker, Nachreiner & Schaufeli, 2001b; Bakker *et al.*, 2003a). According to this model, job demands refer to those physical, psychological, social, or organisational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs (Bakker & Demerouti, 2007). Examples of job demands are high work pressure, an unfavourable physical environment, and emotionally demanding interactions with clients. Meijman and Mulder (1998) agreed that job demands are not necessarily negative, but they may turn into job stressors when meeting those demands requires high effort for which the employee is not adequately prepared.

Poorly designed jobs or chronic job demands (e.g., work overload, emotional demands) exhaust employees' mental and physical resources and may lead to the depletion of energy and exhaustion and even health problems (e.g. Leiter, 1993; Demerouti *et al.*, 2000a). The following section discusses these factors in detail.

2.4.1 Workload

Workload can be either work underload or work overload. Work underload exists as a possible stressor when an employee is receiving too little work or having tasks that do not sufficiently use his or her talents. However, work overload is a far more common

stressor in today's work setting. Employees have either too much to do in too little time, or they work too many hours on the job. Long work hours lead to unhealthy styles, which, in turn, can cause heart diseases and strokes (Schnall *et al.*, 1994). In Japan, death from overwork has its own name – 'karoshi' which seems to reflect the health implication of the workload phenomenon occurring in Japanese workplace (McSahne & Glinow, 2008). To highlight the effect of workload at workplace, the Australian Senate Community Affairs References Committee (2002, cited in Hegney, Plank & Parker, 2003) stated:

'Workloads must be addressed in relation to their effect on burnout and stress. Burnout contributes to job dissatisfaction, absenteeism and turnover. Burnout is the consequence of specific social and situational factors that can be changed, if the will is there.' (p. 314).

During recent years, many changes in healthcare working areas have increased the burden of care for nurses. These include, for example, an increase in the number of patients and their needs, an increase in patient acuity rates with a decrease in the length of stay, relative lack of economic resources, claims of better productivity and increased competition in healthcare.

Work overload has been found to be associated with reduced levels of staff well-being (Cavanagh & Coffin, 1992; Bryant, Fairbrother & Fenton, 2000; Hegney *et al.*, 2003; McVicar, 2003), with impaired quality (Aiken, Clarke, Sloane, Sochalski & Silber, 2002), and with adverse outcomes for patients (Needleman, Buerhaus, Mattke, Stewart & Zelevinsky, 2002). Thus, scarce nursing resources should be allocated appropriately so that excessive workload is avoided. However, little objective evidence has been available on the negative consequences of work overload

for nurses' health or sickness absence. One of the reasons for this is the lack of comprehensive, reliable and well-validated measures of nursing workload (Mark, 2002). Rauhalaa *et al.* (2007) recommended the use of a new system of nursing care intensity classification - the RAFAELA system that analyses the association between nurses' sickness absence and their patient-associated work overload. An advantage of this assessment system is that it enables the monitoring of nurses' patient-associated workload in relation to an optimum.

One of the main reasons for the negative attitudes, occupational stress and job dissatisfaction among nurses is suggested to be work overload (Bryant *et al.*, 2000; McVicar, 2003). In a study of British nurses by Adams and Bond (2003), adequate staffing resources were found to be strongly associated with job satisfaction. The greatest motivation for hospital staff is giving high quality of service to patients (Ham, 2003), and if workload is too high, there is no time for quality. In an Australian study (Hegney *et al.* 2003), a large proportion of nurses expressed anger and frustration about their inability to complete their work to their professional satisfaction in the working time available.

Only a small number of studies have examined the association between sickness absence and employees' workload. Sick leave among women in the public sector has been found to be associated with physical or mental demands at work that were experienced to be higher than one's own capacity (Vingard *et al.*, 2005). In a questionnaire-based study of Swedish postal workers (Voss *et al.*, 2004), an association with sick leave was observed for complaints attributed to heavy, arduous work and, for women, a high total workload. Some physical characteristics of work, such as heavy lifting, are also known to be associated with a higher incidence of sick leave (Voss *et al.*, 2001a).

Rauhalaa *et al.*'s (2007) study on 877 nurses in Finland hospitals found workload among nurses exceeding the optimum by about 15% or more, which may increase the risk of sickness absence. Workload among nurses exceeding the optimum by 30% or more, increases the risk of self-certified sickness absence by 44% and medically certified sickness absence by 49%. About 5–6% of the increased productivity resulting from nurses' work overload is lost in increased periods of sick leave. They suggested that measuring nurses' workload may be an important part of strategic human resource management of nurses to reduce sick leave among nurses.

Khowaja, Merchant and Hirani (2005) found the majority of the focus group subjects in their study gave workload as the main reason for job dissatisfaction. They felt that because of the shortage of staff and absenteeism, performing non-nursing tasks, such as providing water, tea, and removing linen from washrooms increased their workload. Regardless of the work area, the nurses felt that their workload was high. The participants of this study also responded that that they even sacrificed their breaks or meals due to high workload. Another factor mentioned in this study was too much nursing documentation which increases workload, and they suggested nursing management needs to analyse workload in order to understand how busy they are.

According to Al-Kandari and Thomas (2008), nurses' workload is made up of nursing and non-nursing tasks/activities. Nursing tasks refer to the tasks/activities carried out by a nurse during a shift. They include patient assessment, developing care plans and providing comprehensive nursing care. Non-nursing tasks/activities refer to the activities carried out by a nurse during a shift which do not require professional nursing skills and are not related to direct patient care. They include clerical work, housekeeping, dietary services, coordinating ancillary services and transporting patients.

As nurses have to work harder, time spent for each patient will be less. The concomitant need to continuously ‘rush to catch up’ and the frustration of leaving important work undone have taken their toll on nurses’ health and patient outcome (Shannon & French, 2005). In a study by Greenglass and Burke (2001), nurses reported that the quality of healthcare and services provided to patients were seriously compromised as a result of management cost cutbacks. This study pointed out that because of this changing environment, the amount of time nurses have to assess, monitor and provide appropriate nursing care, as well as to be teachers, comforters and communicators has shrunk (Canadian Nursing Advisory Committee, 2002).

O’Brien-Pallas *et al.* (2003) found that technological innovations, such as day care procedures designed to decrease the number of hospital beds and the number of nurses required, actually increased the level of work intensity of the nursing staff. Thus, more not fewer nurses were needed to deal with the increased patient acuity.

Bekker *et al.* (2005) concluded in their studies that workload was related to emotional exhaustion and to sickness absence. In particular, the high workload within nursing has been mentioned as one of the contributing factors to these negative outcomes. The influence of high workload has been well documented, especially in terms of its negative implications on job satisfaction and burnout (Karasek, 1979; Armstrong, Cameron & Horsburgh, 1996; Greenglass *et al.*, 2001).

One study supports the idea that workload is a significant stressor associated with a variety of deleterious psychological reactions, including burnout, in several different samples of workers (Greenglass, Burke & Moore, 2003). Excessive workload occurs when an employee perceives that he or she has too many tasks to do in a period of time. Theoretically, stress results from a situation of chronic imbalance, in which the job demands more than the organisation can give and provides less

resources than the individual needs. Considerable research supports the idea that excessive workload contributes to job stress (e.g. Leiter, 1991; Greenglass *et al.*, 2003; Greenglass, Burke & Konarski, 1998). A meta-analysis by Lee and Ashforth (1996) showed that workload and time pressure shared, on average, 25 to 42% of variance with emotional exhaustion in a subscale of the Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1986). Research on work stressors supports the idea that workload was more likely to contribute directly to emotional exhaustion (Leiter, 1991; Greenglass *et al.*, 1998).

Quantitative workload is a consistent stressor in nurses, as demonstrated by Moore, Kuhrik, Kuhrik and Katz (1996), in their study of acute care nurses and by Armstrong-Stassen (1994) among general nurses. Workload among nurses is one of the most significant predictors of stress (Gray-Toft & Anderson, 1983; Kaufman & Beehr, 1986; Moore *et al.*, 1996). Therefore, measuring nurses' workload may be an important part of strategic human resource management of nurses to reduce sick leave among nurses (Rauhala *et al.*, 2007).

Several studies have concluded that increased workload from job demands in nursing tasks, such as high patient to nurse ratios, overtime, and increasing patient acuity were significantly associated with job strain and exhaustion (Aiken *et al.*, 2002; O'Brien-Pallas, Thomson, Alksnis, & Bruce, 2001; Demerouti *et al.*, 2000b; Janssen, de Jonge, & Bakker, 1999).

2.4.2 Physical Demand

No universally appropriate strategy has been used to identify and define physical demand for a specific job or task that may cause an increased risk for health

complaints (Bos, Kuijer & Frings-Dresen, 2002). Hence, before any measure taken in the prevention of work-related health complaints and sickness absence, more emphasis should be given to the definition and assessment of specific job demands.

Physical demand is a way of describing the physical activities that a job requires (Hernandez, 2006), and are actually stressors associated with a job's physical setting, such as humidity, seating and positions during work, lighting, noise, temperature, etc. According to the Dictionary of Occupational Titles, US Department of Labor (Hernandez, 2006), the physical demands of a job or task can be graded into sedentary, light, medium, heavy and very heavy based on the evaluation of the force and physical effort a person must exert.

In many industries, jobs to be performed still require physical demand (van der Molen & Delleman, 2006). As claimed by van der Molen and Delleman (2006), physical work demand is the most important cause of absenteeism and disability. In a 30-year prospective study conducted in Denmark on 5,249 employed men aged 40–59 years, it was found that men exposed to high physical work demand had an increased risk of cardiovascular mortality (Holtermann *et al.*, 2010). More than half of the cases of sick leave among Dutch construction site workers were the result of musculoskeletal complaints and disorders, mostly related to the lower back region. To reduce or eliminate health risks relating to the back, neck, and limbs, the Dutch authority has examined which tasks particularly overload their construction workers and consequently making the provision of guidelines and standards on physical workload mandatory.

Koningsveld and van der Molen (1997) suggested that radical changes in working methods, work organisation, and working conditions are prerequisites for the future of companies and the well-being of their workers. They asserted that

improvement processes by means of applying ergonomic standards, particularly using technical, organisational, or individual measures, can help in reducing physical work demands.

Nursing is a physically demanding job (Trinkoff, Storr & Lipscomb, 2001; Kant, de Jong, van Rijssen-Moll & Borm, 1992), and nurses have higher rates of musculoskeletal disorders (MSD) than most other occupational groups (Ando *et al.*, 2000; Engels, van der Gulden, Senden & van't Hof, 1996; Larese & Fiorito, 1994). The physical demands of nursing may lead to nurses leaving the profession, contributing to the shortage of registered nurses in many workplaces, and the issue of nurses shortage is a major concern in many organisations (Trinkoff, Lipscomb, Geiger-Brown, Storr & Brady, 2003).

In their study, Trinkoff *et al.* (2003) found that moderate to high physical demand was significantly associated with reported neck, shoulder, and back MSD cases, even after adjustments for demographic and lifestyle-related co-variates. Adjusted odds ratios for highly demanding work (versus low demanding work) ranged from 4.98 to 6.13 depending on type of work involved. When their analyses were restricted to staff nurses only, the odds ranged from 9.05 to 11.99. This study concurred with Harrison and Nixon (2002) who perceived physical demand is associated with reported MSD, and the associations were stronger among staff nurses than other nursing groups, perhaps reflecting the high proportion of direct patient-care activities in staff nurses' jobs, and the study also reported association between physical demand and absenteeism.

Physical work demands that contribute to MSD often result in employee disability leave and sickness-related absenteeism in the workplace (Eshoj *et al.*, 2001; Voss *et al.*, 2001a; Roelen, Koopmans, Notenbomer & Groothoff, 2008; Ariens,

Bongers, Hoogendoorn, van der Wal & van Mechelen, 2002; Frings-Dresen & Sluiter, 2003). Several other studies have shown a relationship between physical demand in patient-lifting frequency, working posture, repetitive arm movements and arm, neck and low back problems (Lagerstrom, Hansson & Hagberg, 1998; Pope, Silman, Cherry, Pritchard & Macfarlane, 2001; Engels *et al.*, 1996; Mehlum, Kjuus, Veiersted & Wergeland, 2006). A study by Nabe-Nielsen, Fallentin, Christensen, Jensen and Diderichsen (2008) showed that among hospital personnel, the physical demand due to the frequency of patient handling tasks seem to be more strongly associated with low back pain. However arguably the physical demand involved in each patient varies, as it depends on the cooperation of each patient. Thus, the physical demand can be very unspecified and difficult to measure.

Physical demand in the hospital sector can be measured by asking a specific question about the daily number of patient handling tasks, and generic questions on working postures and lifting. According to Nabe-Nielsen *et al.* (2008), there is a moderate correlation (0.596) between these measures of physical demands, and the number of daily patient handling tasks, and these factors explain 33.1% of the total variance in the physical load index.

2.4.3 Emotional Demand

According to Hartel *et al.* (2005), emotional demand is the frequency and duration of the emotional requirement of the job that has an impact on the employee well being. This impact may depersonalize themselves from their job; in other word, it may lead them to stress and mental exhaustion.

It is likely that working in jobs that need high levels of emotional demand may result in withdrawal behaviours (Maslach & Pines, 1977; Cordes & Dougherty, 1993; Singh, Goolsby & Rhoads, 1994; Grandey, 2000). According to Grandey (2000), emotional demand can result in physiological arousal and over the long-run, may lead to withdrawal behaviours, such as absenteeism and turnover. Emotional demand is highly prevalent in some specific occupations, for example nurses, doctors and teachers (Hochschild, 1983; Morris & Feldman, 1996; Bakker, Schaufeli, Sixma, Bosveld & Van Dierendonck, 2000). According to Fillon *et al.* (2007), psychological demand and emotional demand serve as indicators to job demands. In their integrative stress model, job resources would have job control, rewards, and self-efficacy as indicators. In turn, job demands are expected to predict low job satisfaction and high emotional distress, whereas job resources would lead to high job satisfaction and low emotional distress. Schaubroeck and Ganster (1993) found that high mental demand was associated with job stress. On the other hand, Van Sell, Brief and Schuler (1981) viewed that this job stress is caused by inability to meet various expectations of psychological and emotional demands.

In jobs that warrant increased emotional demand, a person may experience high blood pressure; however it is unsure whether the increase is associated with emotional demand or physical demand of the job concerned (Rose & Fogg, 1993). Schaufeli and Enzmann (1998), in their review of studies, found that patient-related stressors are sources of emotional demands among healthcare workers. These stressors are interaction with difficult patients, frequency of contact with chronically or terminally ill patients or confrontation with death and dying. But these patient-related stressors are not highly correlated with job stress compared to job-related stressors, such as workload, time pressure or role conflict. A study on a sample of

nurses by Mallet, Price, Jurs and Slenker (1991) found weak correlation between death of patients and emotional exhaustion and depersonalisation. Obviously, confrontation with death and dying of patients is not the disturbing part of the nurses' job. It is likely that nurses have developed adaptive mechanisms that prevent negative long-term effect, such as burnout.

Emotional demand due to interpersonal relationship in helping patients, for example, in nursing professions, are considered to be the root cause of burnout (Maslach, 1993). French and Caplan (1973) found that high responsibility for others was associated with stress. Maslach (1993) argued that patient contacts are emotionally charged by their very nature, because healthcare professionals, like nurses, deal with troubled people who are in need of care. To deal with emotional demand and increased job performance among health care employees, Carayon (2007) suggested healthcare professionals to adopt techniques of detachment, whereby patients are treated in a more remote, objective way; it then becomes easier to perform tasks without suffering strong emotional discomfort.

A study conducted by Conjuga, Hammig, Bauer and Laubli (2010) revealed that the emotional demand of the job, had contradictory impacts on short- and long-term absenteeism due to MSD. Schaufeli, Bakker and Van Rhenen's (2009) study of 201 telecom managers showed increases in job demands characterised by overload, emotional demand, and work-home interference and decreases in job resources (i.e., social support, autonomy, opportunities to learn, and feedback) predict job stress. This study also showed job stress positively predicts sickness absence.

In a study on a sample of 98 call centre workers in Australia, Lewig and Dollard (2003) found emotional demand relates to job satisfaction and emotional exhaustion. One interesting finding is that emotional demand with emotional

dissonance was found to exacerbate the level of emotional exhaustion and reduce job satisfaction. Emotional dissonance is the feeling of uneasiness to individual identity when someone tries to evaluate his or her emotional experience (Janzs & Timmers, 2002). Thus this study indicates that jobs with combined high levels of both kinds of demands are at risks of leading to job strain and withdrawal behaviours.

Another concept that is inextricably linked to mental demand is emotional labour. Managing emotions for a wage has been termed as emotional labour (Hochschild, 1983). According to Ashforth and Humphrey (1993), emotional labour is a 'double-edged sword'. In its functional capacity, emotional labour facilitates task effectiveness by providing service workers with a means to regulate what are often dynamic and emergent interactions, thus providing the workers with a sense of self-efficacy. Emotional labour may also facilitate self-expression by enabling the service workers to 'project at least some of the authentic self' into their job perspective (Ashforth & Humphrey, 1993). On the other hand, emotional labour can be dysfunctional to the worker when emotional dissonance is experienced. This emotional dissonance is the incongruence between feeling and action, and it may lead to lowered self-esteem, depression, cynicism and alienation from work.

2.4.4 Job Scope

Job scope refers to the number of different activities that a specific job requires and the frequency with which each activity is performed (Lewis *et al.*, 2007). However, in the job characteristics model proposed by Hackman and Oldham (1976, 1980), job scope is viewed as one of the most important job characteristics variables that influences organisational outcomes. Hackman and Oldham (1980) identified five job

characteristics under job scope dimensions: skill variety; task identity; task significance; autonomy and job feedback. These dimensions are measured with the Job Diagnostic Survey (JDS) devised by Hackman and Oldham (1980). According to Xie and John (1995), high job scope is beneficial for organisations and their members. In the field of organisational commitment, it is suggested that highly committed employees perform better in high scope work than less committed ones (Larson & Fukami, 1984; MacKenzie, Podsakoff & Ahearne, 1998). The performance and commitment in the more challenging job scope are regarded as useful indicators of organisational effectiveness (Lum, Kervin, Clark, Reid & Sirola, 1998; Naumann, Widmier & Jackson, 2000).

Several empirical studies of job design have demonstrated relationships between job characteristics and their outcomes, particularly that between job scope and general satisfaction, growth satisfaction, and motivation (Champoux, 1978, 1980, 1992). Mowday and Spencer (1981) found a relationship between job scope and turnover, and between job scope and absenteeism. Xie and Johns (1995) found that job scope has U-shaped effects on some job outcomes (e.g., job strain and exhaustion). A study conducted by Singh (1998) found that curvilinear influences of job scopes are supported for job tension, turnover intentions, absenteeism and performance, but not for job satisfaction or organisational commitment. Job scope in Singh's study consists of autonomy, feedback, task variety and participation, but does not include task identity per se. It seems that job scope for nurses should rightfully focus on patient care; however Drucker (1993) found the opposite. Drucker (1993) describes the nurses' scope of practice and non-nursing tasks:

'the task of nurses in hospital is patient care. But every study shows that they spend three quarters of their time on work that does not contribute to patient care...This not only destroys productivity, it also destroys motivation and pride'. (p. 90)

According to Shannon and French (2005), lack of support staff is a chronic phenomenon in hospitals in Canada. The perverse consequences of this are that nurses attend to ancillary yet essential needs, like meal tray delivery, getting patients to the operating rooms and fetching equipment, medications and supplies, rather than attending to the core work of nursing. Baumann *et al.* (2001) pointed out that the job dissatisfaction that ensues is one thing, but the decreased self-esteem over time that arises from the perception of nurses in patient care is more pernicious. Therefore, different perceptions on this phenomenon prevail among nurses. Whether conscious or not, nurses are routinely expected to reduce their scope of practice and use their precious time to perform necessary, yet unskilled work, at the expense of their expertise to care, monitor clinical progress and educate patients and families.

Shannon and French (2005) concluded that the organisational and system changes have contributed to the nursing shortage, increased costs and creation of work environments, that are resulting in a flight of talent and high levels of absenteeism associated with sickness and injuries. The changes in the work environment have impacted negatively on the numbers entering the nursing profession and retaining existing nurses in the workforce. The impact on nursing is related directly to negative outcomes for patients.

Consistent with the positive connotation of high job scope and the negative connotation of job stress, Xie and John (1995) supported the negative relationship

between job scope and job stress and they conceptualise this relationship as a link between role problems and emotional exhaustion. In terms of relationship between job characteristics and stress, previous studies found that task identity, autonomy, and feedback were negatively associated with anxiety, stress and emotional exhaustion, but skill variety and task significance were not related to these stress factors (Kelloway & Barling, 1991; Spector & Jex, 1991). In addition, some of these interactive effect of job characteristics on stress have also attracted academic attention. It was believed that the Job Demands-Decision Latitude model (Karasek, 1979) has stimulated a large amount of such research on interactive effects of job characteristics and stress. According to this model, individuals in occupations with high job demands and low decision latitude experience high level of stress. Earlier studies (e.g., Karasek, Baker, Marxer, Ahlbom & Theorell, 1981; Alfredsson, Karasek, & Theorell, 1982) generally supported the model, but Ganster and Schaubroeck (1991) pointed out that many confounding factors need to be taken into account in explaining the association. Several tests using interactive model have reported mixed results. For instance, Dwyer and Ganster (1991) found that job demands and lack of control were jointly associated with sickness absence, while other investigators (e.g., Spector, 1987b; Tetrick & LaRocco, 1987) have failed to support interactive effects on affective outcomes. Although this stream of work has proven useful, it has not provided integrated knowledge regarding the specific effect of numerous job elements. Very few studies have examined the possibility that job characteristics that are usually thought to have positive effects can provoke stress when present at high levels. In regards to the relationship between job scope and job stress, previous studies have focused on a linear, negative relationship between job scope and stress (Jackson & Schuler, 1985), however a empirical study by French,

Caplan and Van Harrison (1982) revealed the nonlinear relationship between job scope and stress as this study has emphasized on "good characteristics" of job scope that reduce stress and the "bad characteristics" that provoke stress. On the other hand, Kahn and Byosiere (1992) highlighted that many of these past studies produce inconclusive results because of the limited knowledge on integrated effects of job scope on job stress and sickness absence.

In job characteristics theory, Hackman and Oldham (1980) proposed that enriched and intrinsically motivating jobs are characterised by high level of job scopes (Xie & John, 1995), which encompass five job characteristics as mentioned in previous section. They hypothesised that employees performing enriched jobs will have higher intrinsic motivation and, as a consequence, higher attendance levels than employees in unenriched jobs.

According to Hackman and Oldham (1980) three job characteristics, i.e. skill variety, task identity and task significance, combine to determine experienced meaningfulness of work. Skill variety is the extent to which the job requires an individual to perform a variety of tasks and require him or her to use different skills and abilities. Task identity is defined as the extent to which the job requires an individual to perform a whole or completely identifiable piece of work. In other words, task identity is high when a person works on a product or project from the beginning to end and sees a tangible result (Hackman & Oldham, 1980).

Hackman and Oldham (1976) recognised that every employee does not want a job containing high amount of the five core characteristics. They incorporated this notion into their model by identifying three attributes that affect how individuals respond to job enrichment. These attributes are concerned with the individual's knowledge and skill, growth need strength (representing the desire to grow and

develop as an individual) and context satisfaction. Context satisfaction represents the extent to which employees are satisfied with various aspects of their job, such as satisfaction with pay, co-workers and supervision.

According to Hackman and Oldham's (1980) job characteristics model, task significance is the extent to which the job affects the lives of other people within or outside the organisation. Hirschfeld, Schmitt and Bedeian (2002) conducted a study that explored relationships of job-content perception (i.e., skill variety and task significance), and performance-reward expectations, with absenteeism among 134 low-wage public-sector clerical employees. This study indicated that those employees considered to be either higher on skill variety or task significance, were likely to be absent more often. Moreover, the link between skill variety and absenteeism was moderated by instrumentality, in a manner suggesting that respondents may have utilised absenteeism as a means of compensating for perceived workplace contributions not extrinsically rewarded. Hirschfeld *et al.* (2002) suggested that employees in occupational settings, for which performance-related extrinsic rewards are less favourable, may not respond to favourable job-content perceptions in the positive manner generally predicted by the job characteristics theory.

2.4.5 Role Conflict

Role conflict or role strain as Westman and Eritzion (2001) described, is one of the important approaches in role theory research. Role conflict arises when expectations associated with one role contradict the expectations of another role (Westman & Eritzion, 2001). It is central to a commonly used theoretical foundation within industrial and organisational psychology, and in the context of work and non-work

relationships (Thompson, Beauvais & Allen, 2006). While there are different types of role conflict (e.g., intra-role and inter-role conflict), the intra-role conflict is the most relevant in the context of this study. This conflict occurs when an employee receives contradictory messages from different people about how to perform a task or work with organisational values and work obligations that are incompatible with his or her personal values (also called person-role conflict) (Ashforth & Humphrey, 1993; Edwards, 1996; Cluskey & Vaux, 1997).

On the other hand, the inter-role conflict happens when role pressures associated with one domain (e.g., work place) are in conflict with pressures from another domain (e.g., family members, leisure). The basic assumption of the role conflict model is that work and family constitute conflicting domains, since both make claims on an individual's limited and finite resources of time and energy (Barnett & Gareis, 2006; Kanter, 2006). The argument is that each individual has limited resources of time and energy and that the allocation of these resources to each domain (work, non-work) influences whether an individual experiences conflict or balance between the domains. The rational approach goes even further and assumes that the extent of inter-role conflict (conflict between the roles within different domains) is directly proportional to the amount of time or energy spent in each domain (Adams & Jex, 1999; Gutek, Searle & Klepa, 1991). According to this view, the more roles a person occupies, the greater the pressure on the finite resources of time and energy, and the more depleted is his/her capacity. The expected consequences of role conflict are for example, job stress with psychological distress and burnout (Barnett & Gareis, 2006).

The role conflict perspective can be approached from a work-family or a family-work angle, which occurs when there is an incompatibility between the

demands of work and family (Greenhaus & Beutell, 1985). Greenhaus and Beutell (1985) identified three types of work-family conflicts: (i) time-based conflict, concerning time demands; ii) strain-based conflict, marked by symptoms of psychological strain (e.g., anxiety, fatigue, irritability); and iii) behaviour-based conflict, based in expected or appropriate behaviours (e.g., expressiveness, emotional sensitivity).

Within the organisation, certain behaviours and demands are associated with the role fulfilled. However, dysfunction may occur at two different levels, i.e at job level where one receive inconsistent instruction to job performed and domain level whereby one has to perform two roles in different domains (Kahn, Wolfe, Quinn, Snoek & Rosenthal, 1964) as explained in previous section; these can be a major source of employee stress. Role conflict is one of the important sources of job stress due to conflicting job demands; whereas role ambiguity occurs when there is lack of clarity about the task to be performed. Rizzo *et al.* (1970) suggested that role conflict and ambiguity are related to job dissatisfaction and inappropriate organisational behaviours, such as lateness to work, absence from work and social isolation.

McSahne and Glinow (2008) said that role-related stressors include conditions where employees have difficulty understanding, reconciling, or performing the various roles in their lives. The four main role-related stressors are role conflict, role ambiguity, workload or work pressure and task or time control. Workload or work pressure has already been discussed in previous sections, while time control is covered later.

Role conflict is the degree to which role expectations are incompatible with the job done (Rizzo *et al.*, 1970; Johns, 2007). Role conflicts occur when people face competing demands (Kahn *et al.*, 1964; Kelloway & Barling, 1991; Siegall &

Cummings, 1995). Inter-role conflict exists when employees have two roles that conflict with each other. For example, sales staff in the banking industry experience inter-role conflict when they try to balance the needs of their bank and the needs of customers (Stoneman & Holliday, 2001).

According to Johns (2007), role conflict is a condition of being faced with incompatible role expectations. It can be distinguished from ambiguity in that role expectations might be crystal clear but incompatible in the sense that they are mutually exclusive, cannot be fulfilled simultaneously, or do not suit the role occupant. From John's (2007) perspective, there are two categories of role conflict. The first one is intra-sender role conflict. It occurs when a single role sender provides incompatible role expectations to the role occupant. Thus, the individual receives an assignment without sufficient personnel to complete the task successfully. The second one is inter-sender conflict. This type of conflict happens when the individual is asked to behave in such a manner that one person will be pleased with the result, while another will not be. On the other hand, Sutherland and Cooper's (1988) perspectives of role conflict are different from other authors. They included person-role conflict and role overload into the categories of role conflict, other than intra-sender conflict and inter-sender conflict discussed earlier. The person-role conflict occurs when the individual would like to do the task differently from that suggested by the job description; whilst role overload may arise when the individual is assigned more work than he or she can effectively handle. Kahn *et al.* (1964) found that men who suffered more conflict have lower job satisfaction and higher job tension. French and Caplan (1970) conducted a study on a group of male office workers and showed that role conflict is related to physiological stress, as the telemetry records of these workers illustrated an increase of heart rate and feelings of tension about the job.

Shirom, Eden, Silberwasser and Kellerman (1973) conducted a large scale study on 762 adult male community members in Israel, which indicated that there is a difference between occupational groups in terms of stress arising from role conflicts. They found that occupations requiring greater physical exertion, e.g., agricultural workers, did not show a pronounced relationship between role conflict, role ambiguity and their physical health. The study by Kotlarska *et al.* (1956 cited in ILO, 1986) in Poland found a high incidence of hypertension among elementary school teachers and bank clerks who were exposed to conflicting situations (role conflict, role overload) as compared to miners and labourers. These findings concurred with the study by Kasl (1978) that blue-collar workers may suffer less from the interpersonal dynamics of the organisation, but more from the physical working conditions. However, these studies do not report a psychological response to role conflict.

Kasl (1978) stated that the correlation between role conflict, role ambiguity and job dissatisfaction are strong while correlation with mental health measures tends to be weak, and hence personality traits are an important determinant of response to role conflict.

Cooper and Marshall (1978) pointed out that role conflict is a more serious problem for the individual working at organisational boundaries. This is especially for those supervisors or middle managers who are likely to suffer from job stress in the boundary role situation (Margolis, Kroes & Quinn, 1974).

Changes in work intensity and population demographics have created increasing opportunities for multiple roles to clash with one another (Beauregard, 2006). Work-home interference (WHI) is also a form of inter-role conflict in which the demands of work role and the demands of home role are mutually incompatible (Parasuraman & Greenhaus, 1997). Beauregard's (2006) study demonstrated that

WHI will be more when employees perceive that their co-workers, superiors and the management in general expect them to work extra long hours or assign them to work at home in order to progress in their careers.

2.4.6 Role Ambiguity

Social roles are sets of activities and relations expected of a person occupying a particular position in society, and of others, in relation to that person (Bronfenbrenner, 1979). Kahn *et al.* (1964, p13) described the concept of roles as follows:

“Associated with each office is a set of activities, which are defined as potential behaviours. These activities constitute the role to be performed, at least approximately, by any person who occupies that office”.

To be a worker, spouse or friend, etc., prescribes a set of expectations that constitute an individual's roles. Role expectations go beyond one's self and others, as they are rooted in ideologies and institutional structures. Role ambiguity can emerge when an individual does not receive enough information about the expectations associated with a certain role (Kahn *et al.*, 1964). Role ambiguity is the degree to which role expectations are unclear (Rizzo *et al.*, 1970). Role ambiguity exists when employees are uncertain about their job duties, performance expectations, level of authority, and other job conditions. The ambiguity tends to occur when people enter new situations, such as joining the organisation, or taking a foreign assignment, because they are uncertain about the task and social expectations (Nelson & Sutton, 1990; Saks & Ashforth, 1996).

There is also substantial evidence that role ambiguity can provoke stress (Fineman & Payne, 1981; Jackson & Schuler, 1985). Role ambiguity occurs when the

goals of one's job or the methods of performing the job are unclear. Such a lack of direction can prove stressful, especially for people who are low in their tolerance for such ambiguity. Jackson and Schuler (1985) in their meta-analysis revealed relatively low correlations between job characteristics and role ambiguity and conflict. On the other hand, Jackson (1983) demonstrated that role ambiguity and role conflict had a direct effect on job stress and job satisfaction, and also indirectly affected turnover intention. Role ambiguity had positive direct and indirect effects on absenteeism (Brooke & Price, 1989). The indirect effect was mediated by job satisfaction. The finding that employees who are bothered by unclear role expectations are less satisfied and absent more frequently also supports the notion of role stress by Steers and Rhodes (1978). The direct positive effect of role ambiguity on absenteeism as mentioned by Steers and Rhodes (1978) is consistent with Mobley (1982) 'safety valve' concept of absenteeism as a temporary retreat from job-related stress.

2.4.7 Job Complexity

According to London and Klimoski (1975), job complexity can be defined as the physical and mental demands placed upon an employee. Kivimaki *et al.* (1997b) view the complexity of job can be distinguished by its degree of uncertainty, low divisibility of work process, more abstract activities and less repetitive task. However Hackman and Lawler (1971) evaluate job complexity on four core dimensions: perceived variety, autonomy, task identity, and feedback. The core dimension of perceived variety and task identity have been discussed in previous section, whereas the dimensions of autonomy and feedback are discussed under the section of job resources.

London and Klimoski's (1975) notion of job complexity concurred with Scott (1966) and Hockey's (1993) activation theory. This theory explains why job complexity is such a critical variable in understanding worker behaviour. Scott (1966); Oldman, Kulik and Stepina (1991) held that job complexity, effectiveness and satisfaction are positively related. Task performance is believed to increase as activation level rises. The hypothesis implicit here is that a person who perceives his or her job to be of low complexity, will become frustrated, whereas he or she will be motivated when he or she perceives his or her job to be of high complexity. However, the relationship may be curvilinear. A job which is overly complex may overburden the worker to such an extent that he or she cannot fulfill its requirements (Blum & Naylor, 1968).

A study carried out by Tummers *et al.* (2002) which focused on health implications of working on various types of nursing units, showed that nurses employed in intensive care units reported significantly higher job uncertainty, job complexity and decision authority compared with their colleagues who worked in other hospital units; the study also reported higher job stress. However, they cannot rule out its relationship to absenteeism. Nevertheless, a longitudinal study conducted by Vaananen *et al.* (2003) in Finland on 3,895 employees in a private industrial sector found low job complexity predicted long sickness absence.

Job complexity has its a priori dimension to job enrichment. According to Herzberg (1968), job enrichment provides an opportunity for the employee's psychological growth, whereas job enlargement merely makes a job structurally bigger. Katz and Kahn (1978) stated that if intrinsic job satisfaction or identification with the work is to be aroused and maximised, then the job itself must provide

sufficient variety, challenge and complexity that require enough skill to engage the abilities of the worker.

London and Klimoski (1975) argued that the assumption of these job enrichment theorists (e.g. Argyris, 1964; Katz & Kahn, 1978; Herzberg, 1966) is that the variety, challenge and complexity of the job brings about job satisfaction by allowing the employee to express his or her own abilities to carry out his or her own decisions. London and Klimoski (1975) further reiterated that enriching the job may be more difficult in manufacturing or service operations, where assembly line methods and simplified service procedures are most efficient (even though accompanied by lowered motivation and satisfaction). However, Thompson (1967) found job enrichment may be useful in organisations with intensive technologies which deal with human beings as products (e.g., educational institutions, hospitals, and remedial institutions). Such institutions should not (but often seem to be) satisfied by only a minimum of effort of employees guaranteed by the typical organisational control techniques (Katz & Kahn, 1978). Hence, it is important to study the effects of job complexity in those institutions in which job enrichment can be most beneficial.

2.4.8 Shift Work and Work Hours

Shift work and extended working hours are increasingly adopted in many industries and organisations in many parts of the world. It is estimated that about 25% of employees are involved in working outside normal regular daytime hours (Australian Council of Trade Unions (ACTU), 2000). While shift work is unavoidable in many industries, such as essential services and factories, however schedules which include shift work and extended hours are sometimes unsuitable for some types of work, for

example, administrative and clerical work. Shift work has become employment policy for some employers to make use of the 24 hours of the clock other than a standard working day. The term 'shift work' includes both long-term night shift and work schedules in which workers change or rotate shift.

Shift work and extended working hours have often been introduced with little or no consideration of the risks to health and safety of the employees. Employers owe a legal duty of care to employees which includes considering their health and safety in planning for duty rosters and work assignments (ACTU, 2000). In Malaysian healthcare services, medical staff including nurses are working in a three-shift pattern. These rotating shifts include morning shift from 7.00 am to 2.00 pm; afternoon shift from 2.00 pm to 9.00 pm and night shift from 9.00 pm to 7.00 am.

One of the relevant job characteristics might be the fact that nursing often implies shift work, where nurses have to face uncertainty, and work within a certain decision structure. With respect to uncertainty, Jamal and Baba (1997), in their study among nurses working in a psychiatric hospital, failed to find any evidence for the assumption that shift work played a role in absenteeism, although nurses on rotating shifts and night shifts appeared to suffer more seriously from health problems than did nurses on other shift types. A study by Tummers *et al.* (2002), focusing on health implications of working on various types of nursing units, showed that nurses employed in ICU reported significantly higher uncertainty, complexity, and decision authority compared to their colleagues, who worked in other hospital units, and also reported higher job stress and burnout. Nevertheless, the relationships of these job content variables with absenteeism have not been clearly established.

Haider, Kundi and Koller (1981) and Kogi (1985) found that shift work has implications for the whole way of life of human beings because shift work can be

seen as one of the many factors and conditions associated with the health, safety, and well-being of industrial workers. Ahasan, Campbell, Salmoni and Lewko (2001) viewed that the traditional day time work is being replaced by a complex schedule, along with changing work patterns, through the comparative advantage of production using new technology and machinery.

Shift work, in general, is linked to the basic manifestations of general fatigue, involving decrements in behavioural performance, decline of physiological function, subjective complaints and perceived stress (Khaleque & Rahman, 1982, 1984; Khaleque, Wadud & Chowdhury, 1988). Increased fatigue, after long-term exposure, resulting from shift work, has been reported by Dahlgren (1981). The workers seem to run health risks (Koller, 1983), coping with problems that are related to shift work (Monk, 1988; Khaleque & Rahman, 1984; Khaleque, 1991). Workers' illness, fatigue and psychosocial imbalance, leading to increased accidents and lower work output, were identified (Ahasan, Khaleque, Sadeque & Uddin, 1997; Ahasan, Khaleque & Mohiuddin, 2000; Nag & Patel, 1998).

Shift work also has been identified as a source of risk factors of persistent fatigue, symptoms of various illnesses, tiredness and maladaptation (Kawakami, Chavalitsakulchai, Kongmuang & Pongkaeo, 1994; Costa, 1996, 1997). It also causes illness with acute manifestations within the first month, marked by fatigue and sleepiness during work hours (Harma, 1997; Smith & Garaner, 1997; Harma, Seitsamo & Ilmarinen, 1997). Therefore, some people are opposed to shift work on the grounds of health and safety risks, but others find certain advantages in it, as it allows more freedom to plan their leisure, making for a happier social and family life.

Increased absenteeism occurs with increased working hours and overtime. Shift work has an inconsistent relationship with attendance (Taylor, Pocock &

Sergean, 1972a, 1972b), even though good evidence exists for an increased association with adverse health effects. This probably depends upon the degree of self-selection of the workforce involved and the operation of other incentives. Decreasing absenteeism has been associated with flexible working hours and the converse with inflexible hours (Leigh, 1991).

Many previous studies found inconclusive results on the association between shift work and sickness absence (Tuchsen, Christensen & Lund, 2008; Ritson & Charlton, 2006; Kleiven, Boggild & Jeppesen, 1998). Brooks (1997) argued that the availability of a choice of shift work might influence sickness absentee rates; hence, it is suggested that nurse managers should be advised to involve their staff in shift-rostering decisions to reduce the problem of sickness absence. A systematic review by Merkus *et al.* (2012) showed that there is strong evidence for a positive association between fixed evening work and sick leave in female healthcare workers. Their findings implied that the association between shift work and sick leave is schedule-specific.

2.5 Job Resources

According to the JD-R model (Demerouti *et al.*, 2001b; Bakker *et al.*, 2003a, 2003b), job resources refer to those physical, psychological, social or organisational aspects of the job that are functional in achieving work goals. Job resources help to stimulate personal growth, learning, and development. Job resources are not only necessary to deal with job demands; they are also important in their own right (Bakker & Demerouti, 2007). This statement concurred with Hackman and Oldham's (1980) job characteristics theory that highlights the motivational potential of job resources at the

task level, including job autonomy, performance feedback, and task significance. The notion of job resources mentioned in the JD-R model is in agreement with Hobfoll's (2001) conservation of resources (COR) theory, which states that the prime human motivation is directed towards the maintenance and accumulation of resources. To support the usefulness of job resources, Bakker and Demerouti (2007) argued that resources are valued in their own right, because they are a means to the achievement or protection of other valued resources.

Bakker and Demerouti (2007) placed job resources at four levels: (i) the level of the organisation (for e.g., pay, job security, career opportunities); (ii) the level of interpersonal and social relations (for e.g., social support {supervisor and co-worker support}, team climate); (iii) the level of organisation of work (for e.g., role clarity, participation in decision making); and (iv) the level of the task (for e.g., autonomy, performance feedback, skill variety, task identity and task significance). Nevertheless, this study examines some of the job resources at relevant levels related to nursing profession and mostly at task, work organisation and social relation levels, namely social support (supervisor and co-worker support), autonomy, job feedback, task/time control and self-efficacy. The following section discusses these factors in detail.

2.5.1 Social Support

Social support is conceptually defined as the assistance and protection given to others, especially individuals (Langford *et al.*, 1997). Assistance may be tangible or intangible, and protection involves shielding others from adverse effects of life stress. Emotional support, manifested by allowing a person to express emotions, can

therefore constitute a potential resource to protect nurses from negative stress outcomes. This variable appears to complement the concept of general social support suggested by the Job-Demand-Control-Support (JDCS) model (Johnson & Hall, 1988), in which a person receives attention and instrumental support from co-workers and supervisors (Fillion *et al.*, 2007). In other words, social support refers to helpful social interaction available on the job from co-workers and supervisors (Johnson, Hall & Theorell, 1989; Karasek & Theorell, 1990).

According to Fillion, Dupuis, Tremblay, Breitbart and De Grace (2006); Hochwarter, Kacmar, Perrewe and Johnson (2003) and Dean (1998), workplace support is related to three categories of job resources: self-efficacy, emotional support and people-oriented culture in the workplace. Social support at work is found to be a significant predictor of absenteeism. Employees who reported high levels of social support at work had less spells and days of absence than those with low levels of support. They asserted that social support has an important influence on the frequency and duration of absence among healthcare workers.

A large epidemiological survey on perceived job stress and health called Belgium Job Stress Project (BELTRESS) was carried out in Belgium by Verhaeghe *et al.* (2003), targeted at 315 nurses and 612 non-nurses as control group. This study found an important association between absenteeism and social support at work among nurses, but not among the control group. It seems that sickness absence decreases significantly when social support increases. In addition, past studies (Rael *et al.*, 1995; Unden, 1996; Niedhammer *et al.*, 1998; Hemingway & Smith, 1999; Melchior *et al.*, 2003; Lidwall & Marklund, 2006) also provide support for the association between social support and sickness absence. Apparently these studies found that low social support will result in higher rates of sickness absence and

conversely, good social support helps to mitigate the effects of chronic stressors, thereby resulting in less sickness absence. However, few previous studies (Kivimaki *et al.*, 1997a; Roelen *et al.*, 2006) found the opposite - social support is not related to sickness absences.

A prospective cohort study based on the Whitehall II study conducted by Stansfeld, Rael, Head, Shipley and Marmot (1997) on 4,202 civil servants in the UK, revealed that social support from co-workers and supervisors at work is related to lower risk of short-term sickness absence from mental causes. Social support at work appears to protect against short-term sickness absence. This implies that levels of sickness absence might be reduced by increasing social support at work. Stansfeld *et al.*'s (1997) findings concurred with the study by Bourbonnais and Mondor (2001) that supports the association between short-term sick leave and job stress, coupled with low social support at work. Nonetheless, the results from Bourbonnais and Mondor (2001) failed to substantiate the moderating role of social support on the association between job stress and sickness absence, though social support at work is associated with all types of sick leave. This is contrary to previous theories proposed by French and Caplan (1970); House, McMichael, Wells, Kaplan, and Landerman (1979) that support the moderating role of social support, i.e., high levels of stressful situations do not result in job stress if employees have supportive associates. However Kaufman and Beehr (1986) found social support does not exert moderating effect on the relationship between work stressors and job stress.

In comparison, the effects of social support at work were less marked for women than for men (Niedhammer *et al.*, 1998). As discussed in the previous section, the evolution of fast and advanced medical technology and the increased complexity of care have transformed task-orientated nursing to a more holistic nursing, which has

resulted in a more intensive individual involvement and increased job demands on hospital nurses (Verhaeghe *et al.*, 2003). These changes have had a huge impact on the nursing job, but the effect of an exponential increase of job stress and the need of social support among hospital nurses is very relevant (Llewellyn, 1993). Previous studies (e.g. Kaufman & Beehr, 1986; Johnson *et al.*, 1989; Karasek & Theorell, 1990; North *et al.*, 1996) provided evidence of the association between social support and job stress and their results postulated that good social support helps to reduce the effect of job stress on health.

Social support is probably the most well known situational variable that has been proposed as a potential buffer against job stress (Johnson & Hall, 1988; Haines, Hurlbert & Zimmer, 1991). In work settings, social support is cited as an important factor in managing job-related stress among nurses (Boyle, Grap, Younger, & Thornby, 1991; Fletcher, Jones & McGregor, 1991).

2.5.1.1 Supervisor Support

Supervisor support is defined as assistance and protection provided to individual by supervisors (Langford, Bowsher, Maloney & Lillis, 1997). Supervisory support reflects the degree to which one's supervisor is viewed as both caring and able to provide emotional and instrumental assistance in times of need (Bacharach & Bamberger, 2007). Supervisor support is important in the workplace because if there is no support from immediate superiors, the accomplishment of goals would be difficult. Besides, it might affect the relationship and cooperation between the supervisors and subordinates. Thus, high quality relationship with one's supervisor is useful to alleviate job stress from job demands (e.g., work overload, emotional and physical

demands). In addition, getting appreciation from supervisors, for example, praise and encouragement, will motivate and instill positive feeling among employees. Studies have shown that the support from supervisors helps workers to tide over demanding periods of job engagement, increases their coping ability and facilitates good performance (Vaananen *et al.*, 2003). A study conducted by Billings, Folkman, Acree and Moskowitz (2000) found that healthcare workers who care for AIDS patients are able to maintain stable emotional state and experience less job stress if their superior provides continued work support with regards to patient care. It is also evidenced from studies that this support may act as a protector against ill health and other pathological consequences from job demands and stressful experiences (Vaananen *et al.*, 2003; Cohen & Wills, 1985).

2.5.1.2 Co-worker Support

Co-worker support is defined as assistance and protection provided to individual by coworkers or colleagues (Langford, Bowsher, Maloney & Lillis, 1997). This type of social support is important and functional in achieving work goals. This social support from colleagues is instrumental to get the work done in time, and may therefore alleviate the impact of work overload or job strain (Van der Doef & Maes, 1999). Bradley and Cartwright (2002) advocated the importance of this support and recognised that nurses need this support greatly because their jobs involve teamwork with other healthcare professionals. The extent to which nurses feel that the support by peers and organisation add value to their profession and enhances their job satisfaction, will avert unnecessary withdrawal behaviours (Vaananen *et al.*, 2003).

Research studies suggest that workplace interventions aimed at increasing social support at work and improving psychosocial working conditions may reduce levels of sickness absence (Michie, Wren, & Williams, 2004; Head *et al.*, 2006). Besides, measures such as creating an encouraging and supportive culture in the workplace (Eriksen *et al.*, 2003), and maintaining healthy psychosocial work environment, seem to prevent ill health as a result of work stressors, and ultimately reduce sickness absence among employees (Hemingway, Martin, Stansfeld & Marmot, 1997).

2.5.2 Autonomy

According to Hackman and Oldham (1980) in their job characteristic model, the second important critical psychological state for employees to achieve their job outcomes is responsibility. In other words, the outcome of the work is elicited by the job characteristics of autonomy. Hackman and Oldham (1980) defined autonomy as the extent to which the job enables an individual to experience freedom, independence, and discretion in both scheduling and determining the procedures used to complete the job.

Jenkins (2006) provided evidence as to the importance of three basic psychological needs: competence, relatedness and autonomy, that foster intrinsic motivation and well-being. According to the self-determination theory (Deci & Ryan, 2000), the expectations to which these needs are satisfied at work would predict job satisfaction and job performance. Baard, Deci and Ryan (2004), indicated the importance of these relationship between the fulfillment of psychological needs and job satisfaction and performance in work setting. Besides, past studies found the

positive effects of job autonomy on job performance (Langfred & Moye, 2004; Gellatly & Irving, 2001). Job autonomy enhances performance because employees with high job autonomy perceive that he/she are trusted to perform the task. This positively effects their intrinsic motivation and their effectiveness.

Job autonomy may be crucial for employee health and well-being because greater autonomy is associated with more opportunities to cope and avert stressful job situations (Karasek, 1998; Jenkins, 1991). Autonomy has proven to be the most important buffer of job demands for job burnout (Fox, Dwyer & Ganster, 1993; Demerouti, Bakker, De Jonge, Janssen & Schaufeli, 2001a; Xanthopoulou, Bakker, Demerouti & Schaufeli, 2007). According to Liu, Spector, Liu and Shi (2011), high job autonomy means independence, freedom and control over one's work, whereas low job autonomy involves supervisory control and close supervision. Low levels of job autonomy can be stressful to employees and are associated with various forms of job strains, such as mental illness, emotional distress, job dissatisfaction, poor performance, absenteeism, turnover and physical symptoms (Baard *et al.*, 2004; Bond & Bunce, 2003; Spector, 1986). Job autonomy allow individuals to limit their exposure to stressors and to choose their tasks appropriately, thereby reducing feelings of threat and encouraging positive coping behaviors (Thompson & Prottas, 2005; Elsass & Veiga, 1997). Vaananen *et al.* (2003) conducted a longitudinal study in Finland on 3,895 employees in a private industrial sector and found job autonomy was negatively associated with sickness absence rate. Other past studies (Elsass & Veiga, 1997; Karasek, 1979; Spector, 1986; Thompson & Prottas, 2005) are also in concurrence with Vaananen *et al.*'s (2003) notion that job autonomy is negatively related to job stress. However, the recent study by Saragih (2011) on 190 banking salespersons in Indonesia showed that job autonomy is not significantly related to job

stress, but has significant relationship with job satisfaction and performance. Besides, high job autonomy will lead to reducing job stress because the presence of control may encourage individuals to believe positive outcomes are possible, thereby reducing feelings of threat (Spector, 1986; Elsass & Veiga, 1997). Further, it was also found that job autonomy enhances job competence and encourages work creativity (Kauffeld, 2006).

2.5.3 Job Feedback

According to Hackman and Oldham (1980), knowledge of results is fostered by the job characteristic of feedback. Job feedback is the degree to which carrying out the work activities required by the job provides the individual with direct and clear information about how effectively he or she is performing the job (Hackman & Oldham, 1976; Kulik, Oldham & Hackman, 1987), whereas London's (2003) notion of job feedback is the information people receive about their performance. It conveys an evaluation about the quality of their performance behaviours.

Hackman and Oldham (1976) recognised that constructive feedback not only helps employees to do their work more effectively, but also improves communication between supervisors and employees. When specific and accurate information is provided in a constructive way, both employees and supervisors can improve or change their performance (Bakker & Demerouti, 2007). Appraising employees for good performance helps maintain their motivation and signals them to continue in this direction (Hackman & Oldham, 1980). In addition, communicating with employees in a positive manner when they need to improve their performance will help prevent work problems. Job feedback may help reduce the level of job stress because it

provides employees with the information necessary to maintain their performance and to stay healthy (Kahn & Byosserie, 1992).

A longitudinal survey conducted by Schaufeeli, Bakker and Van Rhenen (2009) using JD-R model on 201 telecom managers in Netherlands found job resources namely social support, autonomy, job feedback and opportunities to learn indirectly predict sickness absence via job strain. In their meta-analysis of job characteristics, Eby, Freeman, Rush and Lance (2000) found that job feedback, autonomy and skill variety are significant predictors of absence. However a study by Latha and Panchanatham (2010) found positive relationship between job feedback and absence as this study found job feedback creates high level of stress for call centre employees. This is because negative feedback on their performance and not a single word of praise on their work are the features of job feedback in call centres. According to this study, most of the call centre employees agree that abusive and negative feedback creates mental stress.

Few studies (Parker & Decotiis, 1983; Jandaghi, Fard, Saadatmand, Sharahi & Rajabi, 2011) found insignificant relationship between job feedback and job stress. Obtaining **feedback** from other people at work enhanced feelings of meaningfulness and impact, but not competence. In addition, obtaining constructive **feedback** from others also directly influenced intrinsic motivation in a positive manner and boosted morale and reduced job stress (Gagne, Senecal & Koestner, 1997; London, 2003). In regards to the outcome of job stressors, Parker and Decotiis (1983) highlighted the first-level outcome, which is referred to as stress and stressor-stress relationship. Second-level outcomes are viewed as individual and organisational consequences which are affected by stress. These second-level outcomes might include decrements

in organisational commitment, satisfaction, motivation, and job performance, and avoidance behaviour, such as absenteeism and turnover.

2.5.4 Task/Time Control

Task/time control refers to the extent to which workers are able to exercise discretion in dealing with heavy workload and work pressure (Smith, 1998). When employees have to work under time pressure, for instance, to meet deadlines, or when the workload is unrelentingly high, then the job stress is high (Smith, 1998). It is suggested that from an ergonomic point of view, workload should be established using scientific methods of time and motions study (International Labour Organisation (ILO), 1986).

Employees are more stressed when they lack control over how and when they perform their tasks, as well as the pace of work activity (Elsass & Veiga, 1997; Marmot, Bosma, Hemingway, Brunner & Stansfeld, 1997; Sargent & Terry, 1998; Vahtera *et al.*, 2000b). Work is potentially more stressful when it is paced by a machine or involves monitoring equipment, or when the work schedule is controlled by someone else (Arnetz, 1997; Karasek & Theorell, 1990). In this era of globalisation, information communication technology has had a severe impact on office workers because they are always on call through e-mail, pagers and cell phones. One medical equipment installer in Ohio, USA said. “.... I resent the fact that you can’t get away today”. “It’s always there. You can be found at any time” (Lubinger, 2001 cited in McSahne & Glinow, 2008, pg. 202). Managers, as far as is reasonably possible, need to give employees sufficient control over the way in which they perform their duties (Daniels & Guppy, 1994).

Ala-Mursula, Vahtera, Linna, Pentti and Kivimaki (2005) conducted a prospective cohort study on 16,139 public sector employees in Finland and found that task/time control moderates the association between job stress and sickness absence among women. The combination of high stress and good task/time control was associated with lower absence rate. It was further asserted that good control over task and working times reduced the adverse effect of work stress on sickness absence especially among female employees. Another study performed in Sweden suggested that low control on working hours could be more deleterious to cardiovascular health in high strain jobs (Hammar, Alfredsson & Theorell, 1994). Therefore it cannot be denied that the health benefits of worktime control may stem from advantages in combining work and non-work demands. Worktime control could also be used to flee from particularly stressful work situations and to choose working at times of best possible resources and support (Ala-Mursula *et al.*, 2005). One potential protecting factor could be employee control over working times, which was shown to predict health especially among female employees (Ala-Mursula, Vahtera, Pentti & Kivimaki, 2004; Ala-Mursula *et al.*, 2002), and to improve and maintain the performance of healthcare organisations (Martin-Fernandez, Gomez-Gascon, Beamud-Lagos, Cortes-Rubio & Alberquilla-Menendez-Asenjo, 2007).

2.5.5 Self-Efficacy

Bandura's self-efficacy theory defined this concept as the confidence in one's ability to perform a behaviour (Bandura, 1977). Self-efficacy refers to a person's belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully (McShane & Glinow, 2008). Self-efficacy is usually conceptualised as a

situation-specific belief. Someone may believe that he or she can perform a certain task in one situation, but is less confident with that task in another situation. However, there is also evidence that people develop a more general self-efficacy that influences their beliefs in a specific situation.

According to Bandura (1986), the perception of self-efficacy corresponds to individuals' belief in their capacity to carry out actions required to produce desired results. In nursing, self-efficacy is considered as a nurse's sense of competence and feelings of control in managing a patient (Fillon *et al.*, 2007). Nursing emphasises self-efficacy as a professional resource. It helps nurses to increase their professional care to the patient. On the other hand, Gist and Mitchell (1992) viewed self-efficacy as an important motivational construct because it influences individual choices, goals, emotional reactions, efforts, coping and persistence. In addition, self-efficacy also changes as a result of learning, experience, and feedback.

A study by Schwarzer and Hallum (2008) among teachers found low self-efficacy leads to job stress and burnout. They also found job stress mediates the relationship between self-efficacy and burnout. Their study also revealed that by strengthening self-efficacy, it acts as a protective resource mechanism in diluting job stress. Xanthopoulou *et al.* (2007) conducted a study on 714 employees in electrical engineering and electronic companies in Netherlands and found that self-efficacy, as one of the personal resources, plays a significant role in the JD-R model together with job demands to explain variance in job strain. They also pointed out that self-efficacy has a negative relationship with job stress, suggesting that efficacious employees who report lower levels of job stress might be more resistant to adverse conditions (Hobfoll, 1989, 2002).

According to Saragih (2011), self-efficacy also has a significant positive correlation with job satisfaction and job performance, but no significant relationship with job stress. She claimed that employees with low self-efficacy are apt to give up, believing the difficulties merely prove that he or she is unable to do the job. On the other hand, employees with high self-efficacy will put forth more effort and are more likely to persist when encountering obstacles or negative experiences (Saragih, 2011; Kreitner & Kinicki, 2007).

With regards to the association between self-efficacy and sickness absence, a study conducted by Sommer, Thomsen and Labriola (2013) in Denmark on DREAM (Danish Register for Evaluation of Marginalisation) project found a negative association between self-efficacy and sickness absence among male and female employees. Self-efficacy declines with increasing length of sickness and sickness absence spells. Another study by Borgogni, Russo, Miraglia and Vecchione (2013) on 1,160 white-collars in Italy revealed the indirect relation of self-efficacy and sickness absence via job satisfaction.

2.6 Job Stress

Stress is seen as a dynamic process of interaction between individuals and their environment, and it is also a process of responding to an imbalance between perceived demands and the perceived resources available for meeting those demands (Appley & Trumbull, 1986). The outcome of the process is determined by the individual's appraisal of the balance between these demands and resources. Basically job stress is stress involving work. It refers to the harmful physical, emotional and mental responses that occur when job demands do not match the employees' capabilities,

resources and needs (National Institute of Occupational Safety and Health, 1999). According to The European Agency for Safety and Health at Work (2002) job stress is defined as “a pattern of emotional, cognitive, behavioral and physiological reactions to adverse and noxious aspects of work content, work organization and work environment...” (p. 8). Specifically, stress is a physiological or psychological adaptive response to the interaction of external events such as environment and people (Gibson *et al.*, 2009; Matterson & Ivancevich, 1982).

Numerous studies have been done on stress, and stress has been the object of various research (de Smet *et al.*, 2005). Job stress is a complicated psychological construct which must be first conceptualised by its parent construct known as stress (Colligan & Higgins, 2005). The most noted job strain research is the Demand-Control model (DCM) developed by Karasek (1979); Karasek and Theorell (1990). This model involves two major dimensions of job strain: psychological demands and decision latitude at work. The association of high demand and low decision latitude leading to a highly-strained situation is proposed to be the cause of adverse health outcomes (Johnson & Hall, 1988; Schechter, Green, Olsen, Kruse & Cargo, 1997).

Job stress has been viewed as dysfunctional for organisations and their members (French *et al.*, 1982; Kahn *et al.*, 1964). Many studies have been done on relationships between job stress and job satisfaction. Because a person’s job satisfaction fluctuates according to his or her work environment, majority of the literature and research demonstrate a general consensus regarding the negative relationship between job stress and job satisfaction (Cooper, Sloan, & Williams, 1988; Sullivan & Bhagat, 1992).

Based on the JD-R model (Demerouti *et al.*, 2001b; Bakker *et al.*, 2003a), it is assumed that every job may have its own specific risk factors associated with job

strain. These factors can be classified into two general categories: job demands and job resources, thus forming a comprehensive model that may apply to various work settings, regardless of the particular demands and resources involved. A study by Bakker *et al.* (2003b) showed that job demands are unique predictors of job strain and indirectly of absence duration, whereas job resources are predictors of absence spell (frequency) indirectly. Bakker, Demerouti & Verbeke (2004) found that job demands, particularly work pressure and emotional demands, are the most important antecedents of job strain, which, in turn, predicted role performance. In contrast, job resources, especially autonomy and social support are the most important predictors of role performance, through their link with work commitment and work engagement. Hence, Bakker *et al.* (2004) claimed that job demands and job resources divide into two different psychological processes, which eventually influence important organisational outcomes, such as absenteeism (Bakker *et al.*, 2003b; Schaufeli & Bakker, 2004). Empirical evidence is supportive of the idea that job demands and resources are responsible for two different processes (Bakker & Demerouti, 2007). Accordingly, job demands are related to strain (including burnout and development of health problems), whereas job resources are influenced by motivational factors, including social support, job feedback, time control and self-efficacy.

Several studies have shown high amounts of job stress among doctors, nurses, and other healthcare professionals working in various situations (e.g., Jex *et al.*, 1991; Tholdy-Doncevis, Romelsjo, Theorell, 1998; van Wiljk, 1997; Hardy, Shapiro & Borrill, 1997). The nursing professionals constitute the “heart” of the medical and health services - 80% of the total health force in the USA (Buchan & Calman, 2004) and 86% in Malaysia are nurses (MoH, 2007a). Nurses, in both developing and developed countries, are most often the first contact and the direct interface between

patients and their families and the healthcare system. They interact with people and their health at many levels, from hospital and clinic, to school, and the workplace (Hoyt, 2007). Nursing is generally considered to be a stressful profession (Martin, 1984; Estry-Behar *et al.*, 1990; Arsenault, Dolan & Van Ameringen, 1991; Foxall *et al.*, 1989; Healy & McKay, 2000; Maria *et al.*, 2010; Yeh *et al.*, 2007; Shader *et al.*, 2001; Schmitz *et al.*, 2000; Stordeur *et al.*, 2001; Bratt *et al.*, 2000; Griffiths, 2000; Fresco & Norfolk, 2000; Demerouti *et al.*, 2000b), and particularly susceptible to job stress. This is due to the nature and the emotional demands of this profession (Lindsey & Attridge, 1989; Foxall *et al.*, 1990). It is argued that stress is intrinsic to nursing profession because nursing is a highly demanding job associated with poor support in work, rapidly changing circumstances, problem of shortage of resources and staff, interaction with difficult patients and their families, working relationships with physicians and other healthcare workers, low institutional commitment to nursing and dealing with death and dying patients (Chang, Hancock, Johnson, Daly & Jackson, 2005; Mann & Cowburn, 2005). It is also claimed that high levels of job stress seem to afflict fresh graduate nurses, particularly those who are just entering the clinical areas for the first time; they seem to experience lack of self confidence in the new work setting (Chang & Hancock, 2003; Chang *et al.*, 2005). In addition to the daily stresses in nursing work, nurses need to constantly upgrade themselves by undertaking continuing professional development (CPD) or part-time education to keep abreast with latest nursing knowledge, skills and technology development (Hogston, 1995; Timmins & Nicholl, 2005; Watson, Deary, Thompson & Li, 2008). This additional role and responsibility may lead to increased level of stress and burnout. Job stress among nurses has been reported to be high in Western and Asian societies (Siu & Donald, 1996; Healy & McKay, 2000). A survey about occupational stress in Great

Britain revealed that nurses, together with managers and teachers, reported the highest levels of perceived stress at work (Smith, Brice, Collins, Mathews & McNamara, 2000).

Job stress is a serious problem. It directly affects the worker and it presents various symptoms, both somatic and psychological (Lindsey & Attridge, 1989; Foxall *et al.*, 1990). It is related to the deterioration of relationships between the nurse and the patients, the co-workers, the family and the social environment (Pines & Kanne, 1982; Jackson & Schuler, 1983; Burke & Deszca, 1986). Additionally, job stress has been closely related to both the absenteeism of nurses from work (Seutjens, 1982), and abandonment (Schaufeli & Janczur, 1994). Finally, the nursing job stress results in poor patient care (Maslach & Pines, 1977; Maslach, 1978a; 1978b; Jackson & Maslach, 1982). The influences from the job stress is immense as it may affect employee well-being which can lead to job-related outcomes, such as job dissatisfaction, poor performance, absenteeism and turnover (Siu, 2002; Schnall & Perlo, 2004).

Research has revealed that job demands, such as a high work pressure, emotional demands, and role ambiguity may lead to burnout, exhaustion, and impaired health (e.g. Halbesleben & Buckley, 2004; Martin, 1984; Estryn-Behar *et al.*, 1990; Arsenault *et al.*, 1991), whereas job resources, such as social support, performance feedback and autonomy may instigate a motivational process leading to job-related learning, work engagement, and organisational commitment (e.g., Demerouti *et al.*, 2001a; Taris & Feij, 2004; Salanova, Agut & Peiro, 2005). Previous studies claimed that it could have a long list of antecedents of job strain and absenteeism; however theoretical progress has been exiguous (Bakker & Demerouti, 2007). Many past studies have used a laundry-list approach of antecedents to

investigate its effects on employee well-being, using few influential job stress models, such as DCM (Karasek, 1979), and the ERI model (Siegrist, 1996). Only a few studies investigated the relationship between job demands and job stress, and most of them focused on job strain and burnout. Job strain and burnout are not equated to job stress. Job strain refers to the negative physical and psychological toll that job stress takes on one individual when his/her job involves high demand and low control or little decision-making power (Karasek, 1979). Burnout is the consequence of excessive and prolonged stress that results in emotional, mental, and physical exhaustion, characterised by helplessness, depersonalisation and disengagement (Potter, 2005). When someone has burnout, Maslach, Jackson and Leiter (1996) described it as a state of exhaustion, where one is cynical or doubtful of his/her capacity to perform. In short, job stress is the response to stressors while job strain and burnout are its consequences.

2.6.1 Symptoms of Stress

Stress is a normal, adaptive reaction to stressors in our environment whereas job stress is the response to demands in the workplace environment. Burnard (1991) viewed stress as physiological, psychological or mental discomfort experienced by a person when environment demands exceed his/her coping ability. According to Seyle (1973), stress is an unspecific response of our body to any demand made upon it. He described the body's short-term and long-term reaction to this environmental demand as Generalized Adaptation Syndrome (GAS). This model states that when the event threatens the organism, the body responds through three stages: stages of alarm, resistance and exhaustion. The first stage is just the fight and flight response when the sympathetic nervous system is activated. The resistance stage is when the body defends

against these stressors and the body remains on red alert. The exhaustion stage is when stressors overpower the body's capacity to cope and the individual is drained of resources and becomes susceptible to diseases.

During the activation of the body to these stressors, the individual begins to exhibit signs and symptoms of stress, which indicate his or her ability to cope. These symptoms can be in the form of physical, psychological, emotional and behavioural responses (Canadian Centre for Occupational Health and Safety, 2000). When stress reactions persist over a longer period of time, they may develop into permanent, chronic health problems, such as strain, fatigue, burnout, depression and other illnesses (European Foundation for the Improvement of Living and Working Conditions, 2007). Stress affects people in different ways and the stress responses can be manifested in various symptoms (Gibson, Ivancevich, Donnelly, & Konopaske, 2009; Wai, Ching, & Rahim, 2006). These symptoms can affect how our body works, how we feel, how we think and how we behave (NHS, 2013; Singapore Ministry of Education, 2013). In proper terms, these symptoms are coined as physiological or physical symptoms when it reflects how our body behaves. How we feel refers to emotional symptoms; how we think is manifested by psychological or cognitive symptoms; while how we behave denotes behavioural symptoms. Physical symptoms of stress are related to physical body ailments which include headaches, high blood pressure, chest pain, etc. Psychological symptoms of stress are related to the mental health condition and cognition of the individual. The symptoms include low satisfaction, inability to concentrate, forgetfulness, frequent negative thought, burnout, etc. Emotional symptoms of stress are anxiety, depression, anger, feeling of helplessness, etc which relate to the feeling of an individual. Behavioral symptoms of stress is manifested through the action taken by the individual to confront stress such

as being absent from work, involved in alcohol and drug abuse, having poor appetite, decreased productivity, being prone to accident, etc. The manifestation of these various symptoms is consistent with what Parker and Decotiis (1983) argued that stress has multidimensional features characterised by physiological, psychological, emotional and behavioural symptoms. Therefore, the present study investigates these dimensions of job stress by examining its relationship with job demands, job resources and sickness absence.

2.7 Hypotheses Development

Hypotheses are developed prior to data collection and generally emerged from literature review, research questions and theory (Hair, Money, Samouel, & Page, 2007). According to Cooper and Schindler (2008), a hypothesis is a proposition formulated for empirical testing, and this declarative statement is of tentative and conjectural nature (p.43). It is a formal statement that presents the expected relationship between an independent and dependent variable (Creswell, 2009). In the present study, the conjectured relationships tested are the theoretical link between job demands, job resources, job stress and sickness absence. The present study conjectures how job demands and job resources could contribute to job stress, which subsequently lead to sickness absence and whether a specific direction of the conjectured relationships could be ascertained. To do so, the underlying theory of JD-R, COR, activation and previous research studies will be utilised to underpin the research framework. The following sections present theoretical arguments on the relationship between job demands, job resources, job stress and sickness absence.

2.7.1 Relationship between Job Demands and Sickness Absence

In the healthcare setting, physical work demand, is perceived as an important job demands factor that contributes to MSD, and often results in employees' disability sick leave and sickness-related absenteeism in the workplace (Eshoj *et al.*, 2001; Voss *et al.*, 2001; Roelen *et al.*, 2008; van der Molen & Delleman, 2006; Ariens *et al.*, 2002; Frings-Dresen & Sluiter, 2003). A study by Trinkoff, Storr and Lipscomb (2001) among 3,727 registered nurses found association of physical demand and absenteeism. Another study by Trinkoff and colleagues (Trinkoff, Lipscomb, Geiger-Brown, Storr & Brady, 2003) also reported physical demand is strongly linked to MSD and absenteeism. Two studies conducted in Sweden among postal staff revealed that physical demands in the form of heaylifting and repetitive work were related to sickness absence (Voss, Floderus & Dedericsen, 2004, 2001a). However, another study by Roelen *et al.* (2006) found the negative relationship between physical job demands and sickness absence.

Previous studies have showed that occupations that need high levels of emotional demand may result in withdrawal behaviours, such as absenteeism and turnover (Maslach & Pines, 1977; Cordes & Dougherty, 1993; Singh *et al.*, 1994; Grandey, 2000); and emotional demand is taken as an important indicator for job demands (Fillon *et al.*, 2007). Emotional demand is common among some occupations; for instance, nurses and doctors, who are required to deal with emotional tasks and patient problems, for which they have to depersonalise themselves from their job (Hartel *et al.*, 2005). Several past studies found significant link between emotional demand and sickness absence (Schaufeli *et al.*, 2009; Grandey, 2000; Singh *et al.*, 1994; Cordes & Dougherty, 1993; Maslach & Pines, 1977).

Role problems, such as role conflict and role ambiguity, can impact employees in their job accomplishments. Limited studies have examined the association between role conflict and sickness absence, notwithstanding few previous studies advocating the association between role conflict and sickness absence (Chung & Schneider, 2002; Jackson, 1983; Rizzo *et al.*, 1970). A study conducted by Vaananen *et al.* (2008) on municipal employees found positive association between role conflict and sickness absence.

Role ambiguity usually occurs when employees are still new in their job position, and thus are uncertain about their job expectation (Nelson & Sutton, 1990; Saks & Ashforth, 1996). A handful of studies found that role ambiguity is related to sickness absence (Vaananen *et al.*, 2004; Brooke & Price, 1989; Jackson, 1983; Rizzo *et al.*, 1970). A study conducted by Petren, Petzell, Preber and Bergstrom (2007) among dental hygienists in Sweden revealed role ambiguity was positively associated with sickness absence.

Previous studies found an association between job scope and absenteeism (Hirschfeld *et al.*, 2002; Singh, 1998; Mowday & Spencer 1981). A study conducted by Vaananen *et al.* (2003) found low job complexity predicted long sickness absence, while a study by Tummers *et al.* (2002) found that nurses working in the ICU ward reported significantly higher job complexity, compared to their colleagues who worked in passive wards, and this study reported negative relationship between job complexity and absenteeism.

The link between workload and sickness absence was found to be significant in several past studies (Rauhalaa *et al.*, 2007; Bekker *et al.*, 2005; Vingard *et al.*, 2005; Voss *et al.*, 2004; Tellnes, Bruusgaard & Sandvik, 1990); and several research studies revealed that workload from overload in stressful work setting was the main

culprit in the contribution towards employee withdrawal behaviours (McVicar, 2003; Hegney *et al.*, 2003; Bryant *et al.*, 2000; Cavanagh & Coffin, 1992). Since all seven job-related factors (workload, physical demand, emotional demand, job scope, role conflict, role ambiguity and job complexity) discussed above are substantiated in the literature that contribute to sickness absence behaviours, thus, it is only justifiable to propose the following hypothesis to gauge the influences accordingly:

Hypothesis 1: Job demands are positively related to sickness absence.

While job demands might influence sickness absence in a positive direction, and since job demands have multidimensional constructs, it is expected that different job demands factors might have different effects on sickness absence. As such, the following hypotheses are further propounded:

Hypothesis 1a: Workload is positively related to sickness absence.

Hypothesis 1b: Physical demand is positively related to sickness absence.

Hypothesis 1c: Emotional demand is positively related to sickness absence.

Hypothesis 1d: Job scope is positively related to sickness absence.

Hypothesis 1e: Role ambiguity is positively related to sickness absence.

Hypothesis 1f: Role conflict is positively related to sickness absence.

Hypothesis 1g: Job complexity is positively related to sickness absence.

2.7.2 Relationship between Job Resources and Sickness Absence

The evidence of relationship between job resources and sickness absence can be demonstrated from previous studies that examined job resources at the level of task

and interpersonal and social relations (Bakker & Demerouti, 2007). Social support is one of the job resources conceived to be most distinct in many previous studies (Verhaeghe *et al.*, 2003; Melchior *et al.*, 2003; Hemingway & Smith, 1999; Niedhammer *et al.*, 1998; Unden, 1996; Rael *et al.*, 1995), i.e., there is an inverse association between social support and sickness absence. On the other hand, these studies also revealed that with good social support, the effects of stressors might be ameliorated, thereby reducing episodes of sickness absence. Nevertheless, few studies (Bourbonnais & Mondor, 2001; Kivimaki *et al.*, 1997a) found no significant association between social support and sickness absence. Supervisor support can increase employees' coping ability to deal with job strain, and thus improve their job performance (Vaananen *et al.*, 2003). Supervisory support reflects the degree to which one's supervisor is viewed as both caring and able to provide emotional and instrumental assistance in times of need (Bacharach & Bamberger, 2007). Supervisor support is found to be negatively associated with stress (Stephens & Long, 2000) and absenteeism (Cropanzano, Rupp, & Byrne, 2003). Support from colleagues enhances peer relationship and increases job satisfaction, thereby reducing withdrawal behaviours (Vaananen *et al.*, 2003). However Tamers, Beresford, Thompson, Zheng & Chedle (2011) conducted a study on 1,240 employee from 33 worksites in USA found co-worker support was unrelated to absenteeism and the study concluded that the relationship between co-worker support and absenteeism is complex and uncertain.

Several previous studies found negative association between task/time control and sickness absence (Ala-Mursula *et al.*, 2005; Ala-Mursula *et al.*, 2002; Hammar *et al.*, 1994). On the other hand, there is evidence of a negative link between job

autonomy and sickness absence, as revealed in a few past studies (Baard *et al.*, 2004; Vaananen *et al.*, 2003; Bond & Bunce, 2003; Spector, 1986).

In terms of the association between self-efficacy and sickness absence, a study conducted by Sommer, Thomsen and Labriola (2013) in Denmark found a negative association between self-efficacy and sickness absence among male and female employees. Another study conducted in Italy on 1,160 white-collar workers revealed the indirect relationship of self-efficacy and sickness absence via job satisfaction (Borgogni, Russo, Miraglia, & Vecchione, 2013).

Schaufeeli, Bakker and Van Rhenen (2009) conducted a longitudinal study on 201 telecom managers using JD-R model in Netherlands found job resources namely social support, autonomy, job feedback and opportunities to learn indirectly predict sickness absence via job strain. In their meta-analysis of job characteristics, Eby, Freeman, Rush and Lance (2000) found that job feedback, autonomy and skill variety are significant predictors of absence. However a study by Latha and Panchanatham (2010) among call centre employees found positive relationship between job feedback and absence as this study found job feedback creates high level of stress. This is because negative comments on their job performance and not a single word of praise on their work are the features of job feedback in call centres.

In addition, providing job feedback to employees by superiors in accurate and constructive manner will improve job performance (Bakker & Demerouti, 2007); and employees will be more satisfied with their jobs, thus reducing unwanted withdrawal behaviours. A study by Mowday and Spenser (1981) on 569 employees in USA revealed that job high in feedback, autonomy, skill variety, task identity and task significance will report lower levels of absenteeism. In addition, a study conducted in Canada on health care professionals demonstrated that providing job feedback will

reduce sickness absence behavior (Lipley, 2003). Therefore, from the literature discussed as above, the following hypothesis is proposed:

Hypothesis 2: Job resources are negatively related to sickness absence

Job resources have multi-faceted factors which might have different effect on sickness absence. As such, the present study advances the knowledge by investigating the specific dimensions of job resources on sickness absence. Hence, the following six hypotheses are proposed:

Hypothesis 2a: Supervisor support is negatively related to sickness absence

Hypothesis 2b: Co-worker support is negatively related to sickness absence

Hypothesis 2c: Autonomy is negatively related to sickness absence

Hypothesis 2d: Job feedback is negatively related to sickness absence

Hypothesis 2e: Task/Time control is negatively related to sickness absence

Hypothesis 2f: Self-efficacy is negatively related to sickness absence

2.7.3 Relationship between Job Demands and Job Stress

Many past studies have examined the influence of job demands on burnout and strain. However, limited studies have been done on the effect of job demands on job stress. Conceptually, stress and burnout are different variables, because job stress is the physiological, cognitive, emotional and psychological reaction when the job demands do not match one's capacity to perform (Potter, 2005). On the other hand, burnout and strain are the consequence of job stress, when someone is helpless, depersonalised and cynical to his/her ability to perform the job (Maslach, Jackson and Leiter, 1996).

Few previous studies examined the association between job demands and job stress found extra role and responsibility of nurses contributed to increased level of job stress (Watson *et al.*, 1995; Timmins & Nicholl, 2005). The argument of this escalating stress is that nurses not only have to provide nursing services in their daily chores; in addition, they have to upgrade their professional knowledge and skills through continuing professional development (CPD) to keep abreast with latest nursing knowledge, skills and technology. Caplan, Cobb, French, Van Harrison and Pinneau (1975) asserted that job-related factors, particularly the pacing and timing of the work, the variety of the work, and the overwhelming demanding nature of the nursing work contribute to job stress. Besides, several previous studies (Aiken *et al.*, 2002; Demerouti *et al.*, 2000b; Janssen, de Jonge & Bakker, 1999; O'Brien-Pallas *et al.*, 2001) noted that high patient to nurse ratios, overtime work, increasing patient acuity, especially in high dependency and intensive care wards, are important perceived workloads that may cause job stress.

Tsai and Liu (2012) who conducted a study on 775 hospital staff in Taiwan, found that high demands, with low levels of social support are associated with the development of job stress. On the other hand, Parker and Decotiis (1983) conducted a study on 367 restaurant managers in the USA and found significant effect between role conflict and job stress. This study also noted that job stress is multidimensional characterised by physiological and psychological symptoms and is considered as a first level outcome.

Previous studies using the JD-R model found job demands are the main predictors of negative job strain (Bakker, Demerouti, Taris, Schaufeli, & Schreurs, 2003; Bakker *et al.*, 2004). A longitudinal study by Schaufeli *et al.* (2009) on 201 telecom managers found increases in job demands, specifically work overload and

emotional demand, predict burnout. Many previous studies (Leiter, 1993; Demerouti *et al.*, 2000a; Bakker & Demerouti, 2007; Bryant *et al.*, 2000; McVicar, 2003; Karasek, 1979; Armstrong *et al.*, 1996; Greenglass *et al.*, 2001; Bekker *et al.*, 2005; Leiter, 1991; Greenglass *et al.*, 2003; Greenglass *et al.*, 1998; Lee & Ashforth, 1996; Gray-Toft & Anderson, 1983; Kaufman & Beehr, 1986; Moore *et al.*, 1996; Armstrong-Stassen, 1994) support the relationship between job demands, specifically workload and job strain. Some studies found that employees' role ambiguity can provoke job stress and intention to leave, when the goals of one's jobs are ambiguous (Fineman & Payne, 1981; Jackson & Schuler, 1985; Jackson, 1983). It has been argued that employees in boundary roles are most likely to suffer from job stress (Cooper & Marshall, 1978; Margolis *et al.*, 1974). Several past studies revealed the significant link between role conflict and job stress (McShane & Glinow, 2008; Barnett & Gareis, 2006; Margolis *et al.*, 1974; French & Caplan, 1970; Kahn *et al.*, 1964). Johns (2007); Rizzo *et al.* (1970) distinguished between inter-role and intra-role conflict to understand better whether conflict is due to incompatibility of role expectation (inter-role conflict) or receiving contradictory instruction from different people in task engagement (intra-role conflict).

Nursing jobs involve physical activities, like patient lifting, maintaining posture, positioning and repetitive movement during nursing procedures. Previous studies found significant effect between these physical demands and job stress (Holtermann *et al.*, 2010; van der Molen & Delleman, 2006; Trinkoff *et al.*, 2003; Trinkoff *et al.*, 2001; Kant *et al.*, 1992). Some studies examined the association of physical demand to MSD among hospital personnel (Lagerstrom *et al.*, 1998; Pope *et al.*, 2001; Engels, van der Gulden, Senden, & van't Hof, 1996; Nabe-Nielsen *et al.*, 2008), and the results are significant.

Emotional demand is prevalent among nurses because they encounter patient-related stressors, for example, contact with the chronic or terminally ill, dying or dead patients. These stressors may contribute to job stress symptoms (Schaufeli *et al.*, 2009; Fillon *et al.*, 2007; Lewig & Dollard, 2003; Grandey, 2000; Maslach, 1993; Van Sell *et al.*, 1981).

Several previous studies have inconsistent findings on the relationship between job scope and job stress. Few previous studies found curvilinear relationship between job scope and job stress (Xie & John, 1995; Singh, 1998; French *et al.*, 1982), while Jackson and Schuler (1985) revealed inverse relationship between job scope and job stress.

Tummers *et al.* (2002) conducted a study on 184 ICU nurses and 927 non-ICU nurses in 15 general hospitals in Netherlands, and found nurses with high job complexity, particularly ICU nurses, reported higher job stress than non-ICU nurses. On the other hand, London and Klimoski (1975) conducted an empirical study on 153 registered nurses in four hospitals in the USA and found the opposite link between job complexity and job stress.

Given that empirical studies that examined the relationship of job demands and job stress are scant, and many of them tend to focus on job strain and burnout, hence, a study to understand the effect of job demands on job stress is necessary. The rationale for the present study to investigate job stress instead of burnout is because organisations and nursing managers are able to detect earlier the deleterious effect of job stress in workplace and take prompt action to reduce stress before it deteriorates into serious mental symptoms. If job stress is not managed at the early stage, the chronic effect of job stress will lead to burnout, mental exhaustion and other health

problems, which could have more serious consequences to the individual's health and organisation. Thus, the following hypothesis is proposed:

Hypothesis 3: Job demands are positively related to job stress

Previous studies have addressed few factors of job demands; this study uses other factors which have been less employed in past studies. Besides, very limited research has been conducted to examine these job demands factors on specific symptoms of job stress. As such, the following hypotheses are propounded:

Hypothesis 3a: Workload is positively related to job stress.

Hypothesis 3a(i): Workload is positively related to physical stress.

Hypothesis 3a(ii): Workload is positively related to emotional stress.

Hypothesis 3a(iii): Workload is positively related to psychological stress.

Hypothesis 3a(iv): Workload is positively related to behavioural stress.

Hypothesis 3b: Physical demand is positively related to job stress.

Hypothesis 3b(i): Physical demand is positively related to physical stress.

Hypothesis 3b(ii): Physical demand is positively related to emotional stress.

Hypothesis 3b(iii): Physical demand is positively related to psychological stress.

Hypothesis 3b(iv): Physical demand is positively related to behavioural stress.

Hypothesis 3c: Emotional demand is positively related to job stress.

Hypothesis 3c(i): Emotional demand is positively related to physical stress.

Hypothesis 3c(ii): Emotional demand is positively related to emotional stress.

Hypothesis 3c(iii): Emotional demand is positively related to psychological stress.

Hypothesis 3c(iv): Emotional demand is positively related to behavioural stress.

Hypothesis 3d: Job scope is positively related to job stress.

Hypothesis 3d(i): Job scope is positively related to physical stress.

Hypothesis 3d(ii): Job scope is positively related to emotional stress.

Hypothesis 3d(iii): Job scope is positively related to psychological stress.

Hypothesis 3d(iv): Job scope is positively related to behavioural stress.

Hypothesis 3e: Role ambiguity is positively related to job stress.

Hypothesis 3e(i): Role ambiguity is positively related to physical stress.

Hypothesis 3e(ii): Role ambiguity is positively related to emotional stress.

Hypothesis 3e(iii): Role ambiguity is positively related to psychological stress.

Hypothesis 3e(iv): Role ambiguity is positively related to behavioural stress.

Hypothesis 3f: Role conflict is positively related to job stress.

Hypothesis 3f(i): Role conflict is positively related to physical stress.

Hypothesis 3f(ii): Role conflict is positively related to emotional stress.

Hypothesis 3f(iii): Role conflict is positively related to psychological stress.

Hypothesis 3f(iv): Role conflict is positively related to behavioural stress.

Hypothesis 3g: Job complexity is positively related to job stress.

Hypothesis 3g(i): Job complexity is positively related to physical stress.

Hypothesis 3g(ii): Job complexity is positively related to emotional stress.

Hypothesis 3g(iii): Job complexity is positively related to psychological stress.

Hypothesis 3g(iv): Job complexity is positively related to behavioural stress.

2.7.4 Relationship between Job Resources and Job Stress

There is a scarcity of empirical evidence that examined the association between job resources and job stress. Most of the past studies focused on the link between job resources and burnout or job strain. Several previous studies using the JD-R model showed negative association between job resources and burnout (Schaufeli *et al.*, 2009; Bakker *et al.*, 2004; Bakker, Van Emmerik & Van Riet, 2008; Bakker, Demerouti & Euwema, 2005; Bakker *et al.*, 2003a). In addition, disengagement, one of the dimensions of burnout is found to be predicted by job resources and several empirical studies using the JD-R model support this prediction (Hakanen, Bakker, & Schaufeli, 2006; Bakker *et al.*, 2003b; Demerouti *et al.*, 2001b; Demerouti *et al.*, 2001b). According to Bakker and Demerouti (2007), job resources are some aspects of job that can be used to achieve working goals, reduce job demands or stimulate personal learning and development. The present study employs six types of job resources (i.e., supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy) to examine its prediction on job stress. Thus, the literature on these job resources has been further discussed in previous section.

Few empirical studies have found association between social support and job stress (Kaufman & Beehr, 1986; Johnson *et al.*, 1989; Karasek & Theorell, 1990; North *et al.*, 1996). A review of nursing literature revealed that social support is cited as one of the important factors in managing job-related stress (Boyle *et al.*, 1991; Fletcher *et al.*, 1991). Traditionally, nursing profession has a very strong social character with high mental pressure (Verhaeghe *et al.*, 2003) because working with

patients can create additional work pressure, for example managing difficult patients. Thus, such a work situation requires social support. Since nurses' job requires teamwork in providing care, without proper social support, social relations will be affected and nurses will be in stress, thus compromising quality of care. Social support can come in the form of formal or informal processes. Supervisors may provide support through the provision of resources and assist employees in managing workload. Co-workers provide support through practical help and emotional advice. The co-workers in the workplace are the closest peers that nurses trust. Nurses can share their job-related problems, seek attention and support (Fillion *et al.*, 2007) and have useful social interactions on the job (Johnson *et al.*, 1989). Bradley and Cartwright (2002) claimed that the nitty gritty of social support is not reflected in current theoretical models of social support. Booth (1992) suggested that to improve social support for nursing professionals, it should come from four sources: the organisation, supervisors, co-workers and confidantes. A study conducted by Iqbal (2013) on 240 employees from service sector in Pakistan found co-worker is negatively related to job stress.

Several previous studies that examined the effect of job feedback on job stress noted job feedback helps employees to improve their job performance and boosts their work motivation to stay healthy by averting job stress (Bakker & Demerouti, 2007; Kahn & Byosserie, 1992; Hackman & Oldham, 1980).

Self-efficacy is the belief and motivation in a person that he or she has the ability to accomplish a task successfully (McShane & Glinow, 2008). A few past studies found negative relationship between self-efficacy and job stress (Schwarzer & Hallum, 2008; Xanthopoulou *et al.*, 2007). However, Saragih (2011), who conducted

an empirical study on 190 banking salespersons found no significant link between self-efficacy and job stress.

Previous studies have documented a negative link between job autonomy and job stress (Saragih, 2011; Thompson & Prottas, 2005; Spector, 1986; Karasek, 1979; Elsass and Veiga, 1997). These past studies postulated that job autonomy allows employees to carry out their job the way they wish to and this leads to reducing feelings of threat. Besides, job autonomy also allows employees to limit their exposure to stressors and be able to choose their task or allow them to limit the more stressful tasks, thereby reducing feelings of threat and encouraging positive coping behaviours (Elsass & Veiga, 1997). Employees with high job autonomy have reduced job stress because the presence of control may encourage individuals to believe positive outcomes are possible, thereby reducing feelings of threat (Spector, 1986; Elsass & Veiga, 1997). High job autonomy allows employees more personal control over their jobs, to carry out tasks with own decision, thus reducing feelings of threat and stress. However, Saragih's (2011) study found no significant association between job autonomy and job stress.

Previous studies found significant association between task/time control and job stress. (Vahtera *et al.*, 2000b; Sargent & Terry, 1998; Smith, 1998; Elsass & Veiga, 1997; Marmot *et al.*, 1997). It is argued that employees who are given sufficient control over the way in which they perform their tasks suffer less stress (Daniels & Guppy, 1994). Thus, with all these evidences regarding the relationship between job resources and job stress, the following hypotheses are proposed:

Hypothesis 4: Job resources are negatively related to job stress

Hypothesis 4a: Supervisor support is negatively related to job stress

- Hypothesis 4a(i): Supervisor support is negatively related to physical stress
- Hypothesis 4a(ii): Supervisor support is negatively related to emotional stress
- Hypothesis 4a(iii): Supervisor support is negatively related to psychological stress
- Hypothesis 4a(iv): Supervisor support is negatively related to behavioural stress
-
- Hypothesis 4b: Co-worker support is negatively related to job stress
- Hypothesis 4b(i): Co-worker support is negatively related to physical stress
- Hypothesis 4b(ii): Co-worker support is negatively related to emotional stress
- Hypothesis 4b(iii): Co-worker support is negatively related to psychological stress
- Hypothesis 4b(iv): Co-worker support is negatively related to behavioural stress
-
- Hypothesis 4c: Autonomy is negatively related to job stress
- Hypothesis 4c(i): Autonomy is negatively related to physical stress
- Hypothesis 4c(ii): Autonomy is negatively related to emotional stress
- Hypothesis 4c(iii): Autonomy is negatively related to psychological stress
- Hypothesis 4c(iv): Autonomy is negatively related to behavioural stress
-
- Hypothesis 4d: Job feedback is negatively related to job stress
- Hypothesis 4d(i): Job feedback is negatively related to physical stress
- Hypothesis 4d(ii): Job feedback is negatively related to emotional stress
- Hypothesis 4d(iii): Job feedback is negatively related to psychological stress
- Hypothesis 4d(iv): Job feedback is negatively related to behavioural stress
-
- Hypothesis 4e: Task/Time control is negatively related to job stress
- Hypothesis 4e(i): Task/Time control is negatively related to physical stress

Hypothesis 4e(ii): Task/Time control is negatively related to emotional stress
Hypothesis 4e(iii): Task/Time control is negatively related to psychological stress
Hypothesis 4e(iv): Task/Time control is negatively related to behavioural stress

Hypothesis 4f: Self-efficacy is negatively related to job stress
Hypothesis 4f(i) Self-efficacy is negatively related to physical stress
Hypothesis 4f(ii): Self-efficacy is negatively related to emotional stress
Hypothesis 4f(iii): Self-efficacy is negatively related to psychological stress
Hypothesis 4f(iv): Self-efficacy is negatively related to behavioural stress

2.7.5 Relationship between Job Stress and Sickness Absence

Extensive literature reviews generally conclude that prolonged exposure to certain job demands can lead to a variety of pathological outcomes, including job stress, absenteeism, mental and physical disorders and reduced productivity (Ivancevich & Ganster, 1987; Sharit & Salvendy, 1982). On the other hand, theories of stress also have received some attention in relation to absenteeism; nevertheless, the association between job stress and sickness absence remains ambiguous (Joensuu & Lindstrom, 2003). Further, the link between job stress and absenteeism has been described as every “push” to absence due to stress is equalled by a “pull” to work due to the factors related to stress (Aronson, Gustafson & Dallner, 2000; Bakker *et al.*, 2003b).

Although, a number of international organisations have linked stress with absenteeism, there have been very few empirical studies to support this relationship (Leontaridi & Ward, 2002). The link between job stress and absence from work was first proposed by Hill and Trist (1955). Previous studies also showed that workplace

that is characterised by low worker-control and autonomy creates job stress, which can result in absenteeism (Spector, Dwyer & Jex, 1988; Frankenhaeuser & Gardell, 1976).

According to Kahn and Byosiere (1992), responses to job stressors can provoke a range of work withdrawal behaviours, such as lateness, absenteeism, turnover and intention to leave. Reviews on 153 studies by Darr and Johns (2008) found positive but small association between job stress, illness, and absenteeism. It was estimated that job stress accounts for between 6% and 29% of the variance in absenteeism. The review also cited that absence is primarily a response to a noxious workplace or a function of illness. Johnson and Indvik (1997) pointed out that stress does not emanate from the nurses' work situation alone but is also related to other factors outside their workplace, for example, work-home interference.

Different forms of stress, for example, somatic (physical), behavioural, emotional and psychological stress are correlated moderately to sickness absence (Nielsen, Kristensen & Smith-Hansen, 2002). Psychological stress, both general and job related, predict increased absences irrespective of demographic variables (Hardy, Woods & Wall, 2003). Two models of stress components, namely, the DCM model by Karasek (1979), as well as the ERI model of Siegrist (1996), have received support in many studies as a risk factor for various illnesses, such as coronary heart disease (Schnall *et al.*, 1994; Kivimaki, Vahtera, Elovainio, Lillkrank & Kevin, 2002). They also documented non-significant results in some studies as predictors of sickness absences (North *et al.*, 1996; Siegrist, Peter, Junge, Cremer & Seidel, 1990). However, Kahn and Byosiere (1992) revealed in their study the association of job stress to physical and behavioural outcomes, such as health complaints, burnout, and absenteeism.

One study showed that nurses who experienced stress have higher absenteeism rates, lower job satisfaction and are more likely to voluntarily leave the organisation (Larson, 1987; Callaghan & Field, 1991). A study by Bourbonnais and Mondor (2001) found employees with job stress and low social support accounted for more short-term sick leave.

An empirical study conducted in Denmark on 4,407 slaughterhouse workers found workers with high job stress have a significantly higher absence rate. The study also found significant association between sickness absence and perceived health. Absence was seen as one of the patterns of coping strategy against job stress in response to a stressful working environment (Kristensen, 1991).

Borritz *et al.* (2006) conducted a three year prospective study on 824 participants from different human service organisations in Denmark. The results indicated that job stress predicts sickness absence. It was suggested that reducing job stress is likely to reduce sickness absence. Duijts *et al.* (2007) recommended the implementation of preventive measures to identify stressors and institution of public health interventions to improve psychosocial health and reduce sickness absence.

Virtanen *et al.* (2007) performed a prospective study among a cohort of 7,986 public sector employees aged 18 to 62 years, using the General Health Questionnaire (GHQ-12), and found that job stress has an independent effect on medically certified sickness absence.

An 18 months Maastricht Cohort Study conducted by Bultmann *et al.* (2005) on 6,403 employees in Netherlands showed that job stress is related to long-term sickness absence. Besides, several studies (Parker & Kulik, 1995; Vasse, Nijhuis & Kok, 1998; Tennant, 2001; Verhaeghe *et al.*, 2003; Kedem, 2005) support the association between job stress and sickness absence. According to Kedem (2005),

nursing is one of the most susceptible professions to job stress. He stated that higher levels of job stress would result in more days of sickness absence; specifically, this phenomenon is more prominent among nurses in intensive care wards than in other general wards.

There are a few studies that did not find such an association between job stress and sick leave (Parkes, 1982; Houtman, Bongers, Smulders & Kompier, 1994). One study from Whitehall II reported an association between job stress and short-term sick leave among male white collar workers who occupied the lowest grades of employment (North *et al.*, 1996). Nonetheless, they did not find an association between job stress and long-term sick leave among men. For women, their findings also demonstrate that job stress did not predict significantly on short-term sick leave.

Most organisations tend to link stress with absenteeism. Many research studies suggest organisation and managers need to step-up health promotion efforts to reduce problems of employee absenteeism (Manning & Osland, 1989). The notion of absenteeism which is associated with job-related stress, was first proposed by Frankenhaeuser and Gardell (1976), and is perceived as the withdrawal behaviour from job stress, and how individuals can cope with their social environment.

Previous studies that empirically measured the relationship between absenteeism and stress, have generally examined how environmental, work or personality characteristics explain individual differences in absenteeism rate (Woo *et al.*, 1999). One study among lumbermen relates the connection of job characteristics to absenteeism. The perceptions of stress and absenteeism were highest among lumbermen whose work could be described as skilled but low in autonomy (Frankenhaeuser & Gardell, 1976). The study concluded that work, perceived as low in control and autonomy, creates stress that results in absenteeism.

A study done among nurses found there is a strong association between stress and absence frequency (Jamal, 1984; Manning & Osland, 1989). The associations reported were job stressors caused by role ambiguity, role overload, role conflict and resource inadequacy. Generally, most of the literature that supports stress-absenteeism relationship reported lower magnitude of association between these two variables.

In spite of several studies showing the job stress-absenteeism relationship (Frankenhaeuser & Gardell, 1976; Farrell & Stamm, 1988), results from these studies are still surprisingly inconclusive about how environmental and personality characteristics explain individual differences in absenteeism rate. It seems that a lot of focus on individual factors or explanations of job stress with dimensions of personality characteristics have been the dominant framework for the study on absenteeism. Farrell and Stamm (1988) highlighted a few constraints facing absenteeism research. Firstly, many absenteeism studies have neglected organisational variables in the understanding of the influence of environmental or job characteristics on absenteeism; secondly, there is a lack of studies that employed meta-analysis to project a global view (Hackett & Guion, 1985; Scott & Taylor, 1985); and lastly, is the need to consider the important distinction of involuntary from voluntary absence.

An absence survey conducted by the CIPD on more than 1,000 organisations in the UK, found the average absence levels in the public sector stand at 10.3 days per employee per year, compared to 6.8 days in the private services sector (Thomas, 2005). The study showed that stress is one of the leading and growing causes of absence in the public sector, with around half of public sector organisations citing stress as a leading cause of long-term absence for non-manual workers. The highest absence levels are found in health sector (11.6 days per employee per year), food, drink and tobacco sectors (11.2 days), care services (11.2 days) industry and local

government (10.9 days). The cost of absence has escalated to £601 per employee per year from £588 the previous year (Thomas, 2005). Meanwhile, the study reported that stress and absence levels are highest in the local government and the health sector (Thomas, 2005), specifically among police, healthcare, teaching and social service workers, who are believed to be working under target-driven environments. According to Barnett (2005) job stress is responsible for 30 per cent of sickness absence in the NHS and costs the services between £300m and £400m each year (Barnett, 2005).

Historically different time periods have been used to measure absenteeism per unit of time. Chadwick-Jones *et al.* (1982) proposed that one-day absences are usually voluntary and could represent an "unauthorised vacation" (Staw & Oldham, 1978). Lengthier absences, on the other hand, may be perceived as involuntary or unavoidable absences, possibly due to illnesses. In fact, measures that give equal weight to all absences, regardless of length, may be the most effective measure of stress research.

The psychosocial work environment characterised by the combination of high levels of psychological demands and low levels of decision latitude, has been found to be an important contributor to health, especially cardiovascular health (Schnall *et al.*, 1994). Some authors have reported an increased risk of sickness absence among workers exposed to adverse psychosocial factors at work, especially low levels of decision latitude (Kristensen, 1991; Karasek, 1979; Karasek *et al.*, 1987; North *et al.*, 1996). Other studies also reported that job stress is widespread in the working population and can lead to sickness absence and even work disability (Schaufeli *et al.*, 2009; Molenaar-Cox & Deursen, 2002; Paoli & Merllie, 2001; Jones, Huxtable, Hodgson & Price, 2003; Spreeuwes, Pal, & van der Laan, 2005).

Even though job stress and absenteeism can be detrimental to the organisation, it is not necessarily harmful to those employees who are absent from work. Quite the contrary, their absence may be instrumental for recuperating from experienced job stress (Bakker *et al.*, 2003b). Several researchers (such as Ho, 1997; Borritz *et al.*, 2006; Virtanen *et al.*, 2007; Duijts *et al.*, 2007) suggested the identification of employees with high job stress and the improvement of their working conditions through public health intervention measures, which should be considered as an important target in the prevention of adverse consequences of job stress.

Although several previous studies have focused on job stress and its association with sickness absence, however, the specific symptoms of job stress have not been explored in majority of these studies. One study by Nielsen, Kristensen and Smith-Hansen (2002) found different forms of stress e.g. somatic, behavioural, emotional and cognitive stress are correlated moderately to sickness absence. Another study by Hardy, Woods and Wall (2003) predict increased absences irrespective of demographic variables. Hence, the understanding of this relationship of the four dimensions (physical, emotional, psychological and behavioural) of job stress to sickness absence is essential, because it will provide insight for researchers and managers into the types of stress that may contribute to sickness absence. With this knowledge, preventive and occupational health interventional measures can be instituted in organisations to avert the burden of job stress and sickness absence. Therefore, the following hypotheses are proposed to test these relationships:

Hypothesis 5: Job stress is positively related to sickness absence

Hypothesis 5a: Physical stress is positively related to sickness absence

Hypothesis 5b: Emotional stress is positively related to sickness absence

Hypothesis 5c: Psychological stress is positively related to sickness absence

Hypothesis 5d: Behavioural stress is positively related to sickness absence

2.7.6 Mediating Effect of Job Stress on the Relationship between Job Demands, Job Resources and Sickness Absence

Research conducted over several decades has produced relatively little concrete knowledge regarding the determinants of employee absenteeism (Brooke & Pice, 1989). Reviews of the literature have consistently demonstrated weak, contradictory, and generally inconclusive findings due to a lack of theory building and too much focus on association between job satisfaction, job-related attitudes and absenteeism (Porter & Steers, 1973; Chadwick-Jones *et al.*, 1982; Goodman *et al.*, 1984; Steers & Rhodes, 1978, 1984).

The scientific evidence on the effects of work-related factors on sickness absenteeism is exiguous (Allebeck & Mastekaasa, 2004). So far, previous studies (Bakker *et al.*, 2003b; Niedhammer *et al.*, 1998; Melchior *et al.*, 2003; North *et al.*, 1996; Bourbonnais & Mondor, 2001; Rael *et al.*, 1995; Kivimaki, Elovainio & Vahtera, 2000a) have only examined the three aspects of job demands (i.e., workload, mental demands and problem with reorganisation); five aspects of job resources (job control, participation, decision latitude, social support; fairness); and job strain and job commitment on absenteeism. Therefore, this study builds on past research by examining the relationships between five more dimensions of job demands (physical demand, role conflict, role ambiguity, job scope, job complexity) and four more dimensions of job resources (task/time control, job feedback, autonomy and self-efficacy) on job stress and sickness absenteeism.

Similarly, there is scarcity in research that used job stress as mediator (e.g., Chen & Lien, 2008; Khattak, Quarat-ul-ain and Iqbal, 2013). Chen and Lien (2008) used job stress as mediator on the effect of workplace factors on turnover intention, while Khattak *et al.* (2013) conducted a study on retail banking employees showing mediating role of job stress on the relationship between role ambiguity and job satisfaction. On the other hand, Bakker *et al.* (2004); Bakker *et al.* (2008) found that burnout mediated the relationship between job demands and performance, while the study by Vasse *et al.* (1998) revealed the mediating effect of stress on the relationship between work stressors and alcohol consumption. Another study by Jex *et al.* (1991) noted stress has a mediating effect on the relationship between stressor and stress outcome. Nevertheless, no studies have used job stress as mediator on the relationship between job demands and job resources on sickness absence. Hence, this study extends beyond previous research (Bakker *et al.*, 2003a; Bakker & Demerouti 2007; Demerouti & Bakker, 2011), by including seven job demands dimensions (workload, physical demand, emotional demand, job scope, role conflict, role ambiguity and job complexity) and six job resources dimensions (supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy) as predictors for job stress and sickness absence. This study is one of the first to use job stress as mediator on the relationship between job demands and job resources on sickness absence. Therefore, the following hypotheses are proposed to advance knowledge and fill the research gap in the present study:

Hypothesis 6: Job stress mediates the relationship between job demands and sickness absence.

- Hypothesis 6a: Physical stress mediates the relationship between job demands and sickness absence.
- Hypothesis 6a(i): Physical stress mediates the relationship between workload and sickness absence.
- Hypothesis 6a(ii): Physical stress mediates the relationship between physical demand and sickness absence.
- Hypothesis 6a(iii): Physical stress mediates the relationship between emotional demand and sickness absence.
- Hypothesis 6a(iv): Physical stress mediates the relationship between job scope and sickness absence.
- Hypothesis 6a(v): Physical stress mediates the relationship between role ambiguity and sickness absence.
- Hypothesis 6a(vi): Physical stress mediates the relationship between role conflict and sickness absence.
- Hypothesis 6a(vii): Physical stress mediates the relationship between job complexity and sickness absence.
- Hypothesis 6b: Emotional stress mediates the relationship between job demands and sickness absence.
- Hypothesis 6b(i): Emotional stress mediates the relationship between workload and sickness absence.
- Hypothesis 6b(ii): Emotional stress mediates the relationship between physical demand and sickness absence.
- Hypothesis 6b(iii): Emotional stress mediates the relationship between emotional demand and sickness absence.

- Hypothesis 6b(iv): Emotional stress mediates the relationship between job scope and sickness absence.
- Hypothesis 6b(v): Emotional stress mediates the relationship between role ambiguity and sickness absence.
- Hypothesis 6b(vi): Emotional stress mediates the relationship between role conflict and sickness absence.
- Hypothesis 6b(vii): Emotional stress mediates the relationship between job complexity and sickness absence.
- Hypothesis 6c: Psychological stress mediates the relationship between job demands and sickness absence.
- Hypothesis 6c(i): Psychological stress mediates the relationship between workload and sickness absence.
- Hypothesis 6c(ii): Psychological stress mediates the relationship between physical demand and sickness absence.
- Hypothesis 6c(iii): Psychological stress mediates the relationship between emotional demand and sickness absence.
- Hypothesis 6c(iv): Psychological stress mediates the relationship between job scope and sickness absence.
- Hypothesis 6c(v): Psychological stress mediates the relationship between role ambiguity and sickness absence.
- Hypothesis 6c(vi): Psychological stress mediates the relationship between role conflict and sickness absence.
- Hypothesis 6c(vii): Psychological stress mediates the relationship between job complexity and sickness absence.

- Hypothesis 6d: Behavioural stress mediates the relationship between job demands and sickness absence.
- Hypothesis 6d(i): Behavioural stress mediates the relationship between workload and sickness absence.
- Hypothesis 6d(ii): Behavioural stress mediates the relationship between physical demand and sickness absence.
- Hypothesis 6d(iii): Behavioural stress mediates the relationship between emotional demand and sickness absence.
- Hypothesis 6d(iv): Behavioural stress mediates the relationship between job scope and sickness absence.
- Hypothesis 6d(v): Behavioural stress mediates the relationship between role ambiguity and sickness absence.
- Hypothesis 6d(vi): Behavioural stress mediates the relationship between role conflict and sickness absence.
- Hypothesis 6d(vii): Behavioural stress mediates the relationship between job complexity and sickness absence.
- Hypothesis 7: Job stress mediates the relationship between job resources and sickness absence.
- Hypothesis 7a: Physical stress mediates the relationship between job resources and sickness absence.
- Hypothesis 7a(i): Physical stress mediates the relationship between supervisor support and sickness absence.
- Hypothesis 7a(ii): Physical stress mediates the relationship between co-worker support and sickness absence.

- Hypothesis 7a(iii): Physical stress mediates the relationship between autonomy and sickness absence.
- Hypothesis 7a(iv): Physical stress mediates the relationship between job feedback and sickness absence.
- Hypothesis 7a(v): Physical stress mediates the relationship between task/time control and sickness absence.
- Hypothesis 7a(vi): Physical stress mediates the relationship between self-efficacy and sickness absence.
- Hypothesis 7b: Emotional stress mediates the relationship between job resources and sickness absence.
- Hypothesis 7b(i): Emotional stress mediates the relationship between supervisor support and sickness absence.
- Hypothesis 7b(ii): Emotional stress mediates the relationship between co-worker support and sickness absence.
- Hypothesis 7b(iii): Emotional stress mediates the relationship between autonomy and sickness absence.
- Hypothesis 7b(iv): Emotional stress mediates the relationship between job feedback and sickness absence.
- Hypothesis 7b(v): Emotional stress mediates the relationship between task/time control and sickness absence.
- Hypothesis 7b(vi): Emotional stress mediates the relationship between self-efficacy and sickness absence.

- Hypothesis 7c: Psychological stress mediates the relationship between job resources and sickness absence.
- Hypothesis 7c(i): Psychological stress mediates the relationship between supervisor support and sickness absence.
- Hypothesis 7c(ii): Psychological stress mediates the relationship between co-worker support and sickness absence.
- Hypothesis 7c(iii): Psychological stress mediates the relationship between autonomy and sickness absence.
- Hypothesis 7c(iv): Psychological stress mediates the relationship between job feedback and sickness absence.
- Hypothesis 7c(v): Psychological stress mediates the relationship between task/time control and sickness absence.
- Hypothesis 7c(vi): Psychological stress mediates the relationship between self-efficacy and sickness absence.
- Hypothesis 7d: Behavioural stress mediates the relationship between job resources and sickness absence.
- Hypothesis 7d(i): Behavioural stress mediates the relationship between supervisor support and sickness absence.
- Hypothesis 7d(ii): Behavioural stress mediates the relationship between co-worker support and sickness absence.
- Hypothesis 7d(iii): Behavioural stress mediates the relationship between autonomy and sickness absence.
- Hypothesis 7d(iv): Behavioural stress mediates the relationship between job feedback and sickness absence.

Hypothesis 7d(v): Behavioural stress mediates the relationship between task/time control and sickness absence.

Hypothesis 7d(vi): Behavioural stress mediates the relationship between self-efficacy and sickness absence.

2.8 Theoretical Framework

Based on the review of previous literature, theoretical models and theories related to absenteeism, stress, strain and burnout, the theoretical framework for this study was constructed. These past models and theories encompass Steers and Rhodes's (1978) process model; Demand-Control model (DCM) (Karasek, 1979, 1998); Job Demands-Control-Support (JD-CS) model (Johnson & Hall, 1988; Johnson *et al.*, 1989); and ERI (Effort and Reward Imbalance model (Siegrist, 1996) were being examined and found no suitable to employ as underpinning theories. The theoretical framework of this study was adapted and underpinned by JD-R model (Demerouti *et al.*, 2000b; Demerouti *et al.*, 2001b; Bakker *et al.*, 2003a; Bakker *et al.*, 2004); Conservation of Resources (CPR) theory (Hobfoll, 1989, 2001; Hobfoll, Freedy, Lane, & Geller, 1990) and activation theory (Scott, 1966; Hockey, 1973). This model has integrated two different processes responsible for sickness absenteeism behaviour. The first process is health impairment process starting with high job demands, which lead to job stress characterised by physical, emotional, psychological and behavioural symptoms, and subsequently contribute to sickness absence. The second process accountable for sickness absence is motivational in nature, and it starts with job resources, whereby employees who obtain sufficient job resources are more motivated to do their job, feel committed to their organisation, report less job stress, and consequently take less sick leave.

As illustrated in Figure 2.2, this study proposes that job demands and job resources have direct relationship with job stress. Additionally, this study also postulates that job demands, job resources and job stress directly influence sickness absence. This assumption concurs with researchers, such as Verhaeghe *et al.* (2003); Vaananen *et al.* (2003); Voss *et al.* (2004); Vaananen *et al.* (2004); Hanebuth *et al.* (2006), who found job demands, job resources and job stress influence sickness absence. Further, the framework also proposes that job stress mediates the relationship between job demands and job resources on sickness absence. So far, no research has used job stress as mediator on the relationship between job demands and job resources on sickness absence. A few studies using stress as mediator have examined different independent and outcome variables. For example, Vasse *et al.* (1998) conducted a study on 471 employees from Municipal Garbage Collecting Departments and a Pharmaceutical Company in Netherlands, and found stress mediates the relationship between work stressors and alcohol consumption. On the other hand, Chen and Lien (2008) conducted an empirical study on 255 retail banking employees in Taiwan and found a mediating effect of job stress on the relationship between workplace factors (role conflict, role ambiguity, role overload and job autonomy) and turnover intention. The recent study conducted by Khattak *et al.* (2013) on 350 retail banking employees in Pakistan found job stress mediates the effect of role ambiguity on job satisfaction. The other two studies (Bakker *et al.*, 2004; Jex *et al.*, 1991) examined the mediating role of burnout and psychological strain respectively in their study and the results of both studies support mediating role of burnout and strain on stressor and stress outcome relationship. Therefore, this study attempts to fill the research gap by using job stress as mediating variable on the relationship between job demands, job resources and sickness absence. The proposed

mediation model of this study is among the first to integrate all four variables (job demands, job resources, job stress and sickness absence) in a single model. The research model is illustrated as follows:

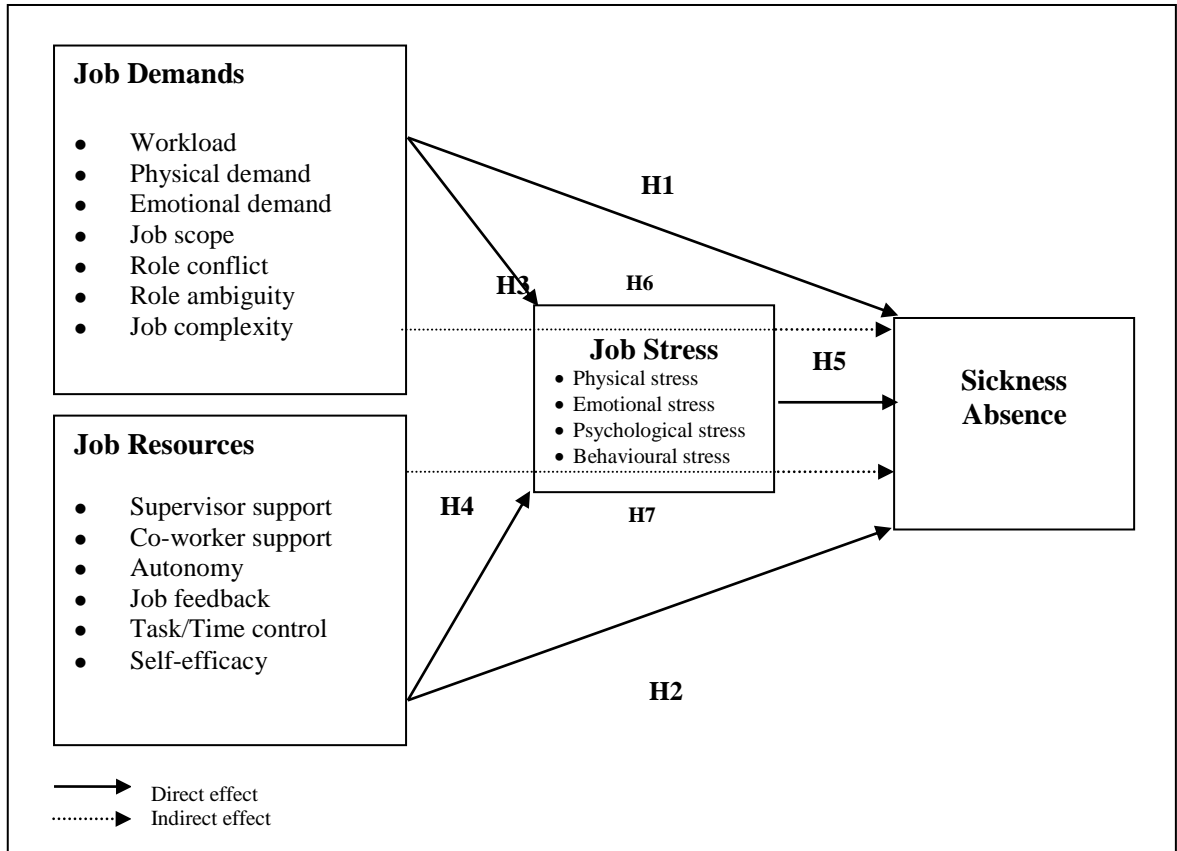


Figure 2.2
Theoretical Framework of the Relationship Between Job Demands, Job Resources, Job Stress and Sickness Absence

2.14 Summary

This chapter provides a discussion on the theoretical foundation used to underpin the research framework. A thorough literature review on the concept of absenteeism and sickness absence were explored and the issues relating to absenteeism measures were

also highlighted. The use of mediating role of job stress in the relationships between job demands and job resources on sickness absence is justified. Predictors of job stress and sickness absence are also discussed with an in-depth review of the past empirical studies on job demands, job resources and its links with job stress and sickness absence. Seven dimensions of job demands, including workload, physical demand, emotional demand, job scope, role conflict, role ambiguity and job complexity are discussed. Similarly, six dimensions from jobs resources, namely supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy are also elaborated. The most significant finding from the literature review is that there is basically no research to date that examines the mediating role of job stress on the relationship between job demands and job resources on sickness absence. It is envisaged that by addressing this gap, this research will advance new knowledge and shed light on the absenteeism research, particularly in sickness absence. The following chapter presents the research methodology used in this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapters 1 and 2 reviewed the previous studies related to job demands, job resources, job stress and sickness absence. This chapter spells out the research philosophy, research methodology and procedures undertaken in this study. It contains an overview of the research paradigm, research design, operationisation of variables, discussion of the population, sample and sampling technique, description of the instrument selected for data gathering and process of data collection, data analysis, statistical tests used in the study and formula for calculation of sickness absence. Further, a preliminary or pilot study and its results are also presented.

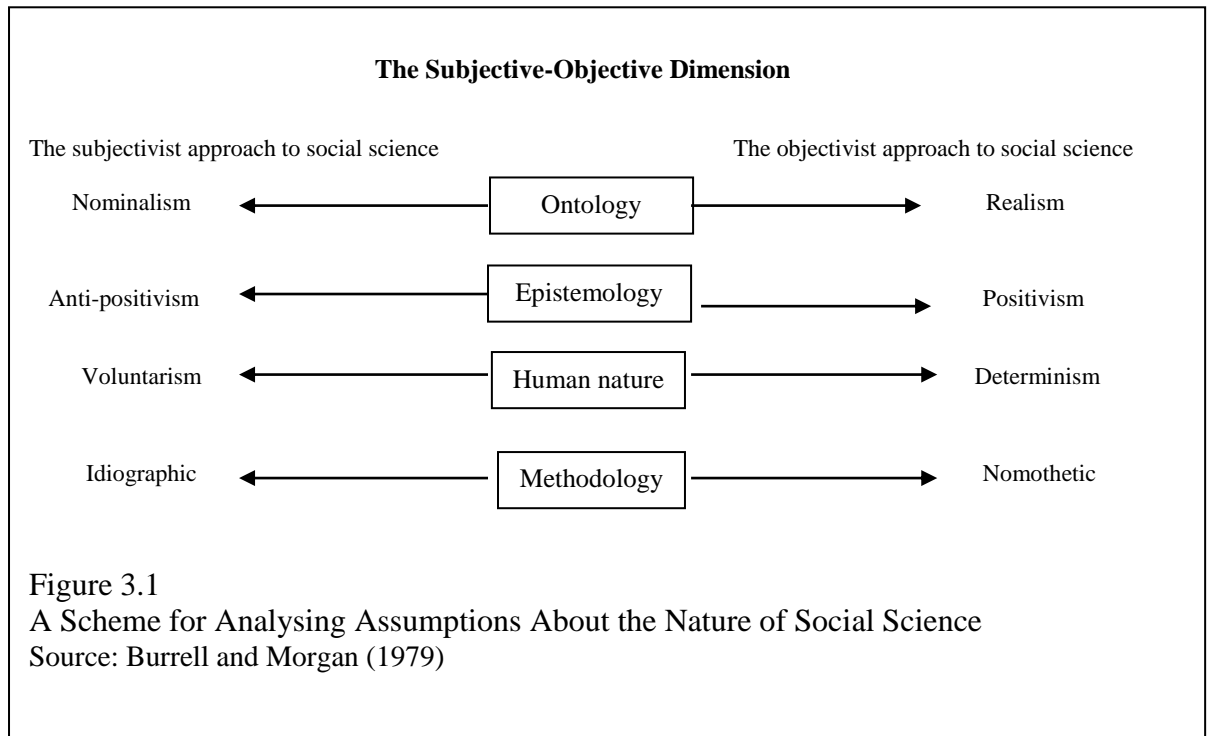
3.2 Research Philosophy

In every research process, two fundamental questions people have always been asked by researchers. The first is how is knowledge created? The second is whether there are any truths awaiting to be discovered or the truths people perceived as such are socially constructed? The answers to these questions are dependent on the philosophical perspective the research is to be adopted (Easterby-Smith, Thorpe & Lowe, 2002). Such philosophical perspective helps to locate researcher's beliefs and assumptions about the nature of reality (i.e. ontology) and truth of the knowledge (epistemology), and this influences the methodology of research selected (Easter-Smith *et al.*, 2002; Remenyi, 1998).

Scotland (2012) asserts that research methods can be traced back, through methodology and epistemology, to an ontological position. He argued that it is impossible to engage in any form of research without committing to ontological and epistemological positions. Therefore researchers with differing ontological and epistemological positions often lead to different research approaches towards the same phenomenon (Grix, 2004).

Developing a philosophical perspective requires the researcher to consider four core assumptions about the nature of social science (Burrell & Morgan, 1979). The first is the ontological assumption about whether the 'reality' to be investigated is an objective nature or the product of individual cognition. The second is epistemological assumption about the how the knowledge can be acquired or the truths can be found. The third assumption is concerning human nature, and the relationship between human beings and their environment, this entail views whether human being are the product of their environment or human beings create environment. These three assumptions have direct implications on the methodological approach because different ontologies, epistemologies and models of human nature are likely to influence researchers towards different type of methodology to be used. As the dimension of science involves either an objectivist or subjectivist approach to research and these two major philosophical paradigms are further delineated by four core assumptions as discussed as above. The objectivist approach to social research developed from the natural sciences, hence social science researcher decided to employ highly successful methods of the natural sciences to investigate social science phenomena. As indicated in Figure 3.1, the objectivism and subjectivism have been described as a continuum's polar opposites with varying philosophical positions aligned between them. Generally social scientists will assess the best approach that

could generate reliable and valid information about the social phenomena under investigation.



The underlying philosophy of this research is rooted to the positivist objectivism design (Crotty, 1998). Hence, all research process, procedures and activities were derived from this paradigm. Thus in accordance with objectivist paradigm and ontological assumption, the researcher considers reality as the actual and present phenomena, which is independent of knower and waiting to be discovered (Cohen, Manion & Morrison, 2007).

As positivists assume knowledge is objective, they view phenomenon have independent existence which can be discovered via research. Positivist statements are descriptive and factual and free from prejudices and this knowledge is considered to be absolute and value free (Burrell & Morgan, 1979). Based on methodological view in objectivist-subjectivist paradigm, the nomothetic approach to social science lays

emphasis on the importance of conducting research using systematic inquiry and technique. This is epitomized in the quantitative approach employed in scientific method which focus upon the process of testing hypothesis in tandem with the scientific rigour. This approach is inclined towards the construction of scientific tool and the use of quantitative techniques for the analysis of data. Surveys, questionnaires, and standardized instruments are prominent tools used in nomothetic approach of methodology (Burrell & Morgan, 1979). Cohen *et al.* (2007) added that this nomothetic approach is designed to discover general laws and provide empirical evidence to test established theories.

Creswell (2009) asserted that positivist methodology is directed at explaining relationships, it also attempts to identify causes which influence outcomes. The purpose of positivist methodology is to formulate general laws to explain phenomenon, thus yielding a basis for prediction and generalization (Scotland, 2012).

This study specifically adopted a quantitative approach because it employs empirical methods, and the data collected and analyzed with statistical tools (Creswell, 1994). Quantitative research has the merit of providing an opportunity to cover a wide range of situations and useful in testing existing theory (Easterby-Smith *et al.*, 2002). Quantitative research also used statistical measurement to test relationships among variables specifically job demands, job resources, job stress and sickness absence in this study. Moreover, this study is consistent with requirements for quantitative research in which social reality is objectively determined using systematic guides in the process of data collection and analysis (Creswell, 1994).

3.3 Research Design

Research design is a roadmap for researchers, it constitutes the blue-print for collection, measurement and analysis of data (Cooper & Schindler, 2008). A suitable research design is important in determining how, when and where data are to be collected and analyzed (Parahoo, 2006) because research design is the researcher's overall for answering the research question or testing the hypothesis (Polit & Beck, 2012). The present study utilizes quantitative research design in an attempt to investigate the relationship between job demands resources factors and sickness absence, and additionally the job stress as a mediating variable in the said relationship among Malaysian nurses.

A quantitative research design is suitable as it helps in examining a large sample of respondent's attitudes towards the phenomenon under study and consequently the researchers are able to obtain a particular perspective of human behavior (Williams, 2007). Quantitative research design seeks explanations and predictions of the phenomenon. The intent is to establish, confirm, or validate relationships and to develop generalizations that contribute to theory (Leedy & Ormrod, 2001). At such, the researcher make use of survey questionnaire for primary data collection. Survey is a measurement process that utilises a measurement tool called a questionnaire or interview schedule to procure data (Cooper & Schindler, 2008). Surveys are designed to provide a snapshot of how things are at a specific time (Kelly, Clark, Brown & Sitzia, 2003). Surveys are well suited to descriptive studies, but can be used to seek explanation and provide data for testing hypothesis (Kelly *et al.*, 2003). Questionnaire is an organized set of questions or measures used by respondents or interviewers to record answer (Hair, Money, Samouel, & Page, 2007).

The questionnaire is the most common information collection tool in business research (Cooper & Schindler, 2008) and is the most extensively used information collection technique in a survey study (de Vaus, 2002).

The use of survey was appropriate in the present study because the researcher is interested to obtain opinion of respondents on certain issues of interest. In the present study, the researcher aimed at obtaining information on how the participants view their job. In addition, a survey provides a fast, inexpensive, efficient, and precise means of assessing data about a population (Zikmund *et al.*, 2010). Furthermore, due to the majority of survey study is descriptive in nature; the term survey is most often linked with quantitative finding (Zikmund *et al.*, 2010).

3.4 Operationalisation of Study Variables and Measurements

The research framework of this study contains thirteen independent variables (workload, physical demand, emotional demand, job scope, role conflict, role ambiguity, job complexity, supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy) and one dependent variable (sickness absence). The mediating variables comprise of job stress (physical, emotional, psychological and behavioral stress).

Measurement of the variables in the theoretical framework is an integral part of research, and an important aspect of research design. Operationalising the concept in research is the reduction of abstract concepts to render them measurable in a tangible way (Sekaran & Bougie, 2009). Concepts need to be operationalised in a way which enables facts to be measured quantitatively. Based on the theoretical

framework, the following section discusses the operationalisation and measures of variables in the present study:

3.4.1 Sickness Absence

Sickness absence refers to non-attendance by an employee at work due to a certified health complaint when the employer expects attendance (Taimela *et al.*, 2007). It is an involuntary absence by an employee attributed to illness or injury when attendance is scheduled or clearly expected by the employer.

Sickness absence is measured by time lost measure. Time lost refers to total duration of of sick leave taken by respondent within the period of study. Sickness absence was recorded for a period of four consecutive months. This study used four months data due to limitation of time and reluctance of nursing authority to provide data for longer duration. To ensure the data can be collected more systematically, a customized tracking form was used to obtain sick leave from sick leave record and employee duty rota. All the sick leaves recorded were checked and verified with the evidence of medical certificate endorsed by medical practioners.

The use of objective measure to obtain sick leave from employee record is the method of choice in sickness absence research (Price & Muller, 1986). In fact, the availability of this archival absence records has been cited as a contributing factor in the high quality and more credible research (Johns & Nicholson, 1982; Hulin, 1991). There were many absenteeism research used subjective self-reported measures because of convenience and difficulty in obtaining registry records. Nevertheless, this study had used the objective measure instead of self-report because in terms of precision and accuracy and therefore objective measure is still the recommended

option (Grovle *et al.*, 2012; Hensing *et al.*, 1998; Atkin & Goodman, 1984). It has been reported in several studies that retrospective measure by self-report of sick leave and recall of sickness absence tends to progressively deteriorate after a period of more than two months and this may affect the reliability and validity of the data (Severens, Mulder, Laheij & Verbeek, 2000; Grovle *et al.*, 2012).

Time lost measure has been used by different studies to measure sickness absence level in different settings. Chadwick-Jones *et al.* (1971) claimed that the time lost measure is the most universally accepted and used by the organisations. In hospital setting, one study using time lost measure on recorded sickness absence among hospital physicians and nurses in Finland found significant association between work-related factors (specifically workload, teamwork, job control and social support) and sickness absence (Kivimaki, Sutinen, Elovainio, Vahtera, Rasahen, Toyry & Ferrie, 2001). In nursing setting, one study on medical-certified sickness absence specifically using time lost measures among hospital nurses in Saudi Arabia revealed sickness absence is significantly higher in female Saudi nationals than non-Saudi nationals (Khawaja, Sikander, Khawaja, Jareno & Halepota, 2012). In United Kingdom, NHS (2010) has used time lost measure to estimate the sickness absence level among healthcare workers in NHS facilities.

The present study used the objective measure whereby the sickness absence was recorded using a sick leave recording form (Appendix 12). The first parameter to obtain in the recording is the total scheduled worked day (TSWD), this information was taken from monthly duty rota; the second parameter is the total duration of sick leave (TDSL), this information was available from staff sick leave recording book and it has to be verified with the medical certificate endorsed by authorised medical officer; the last parameter is other approved leave, this excluded maternity leave,

emergency leave and other long-term leave approved by the authority. The data were obtained for a consecutive four months from February 2011 to May 2011.

3.4.2 Job Demands

Job demands refer to those physical, psychological, social, or organisational aspects of the job that require continued physical and/or psychological (cognitive and emotional) effort or skills, and are therefore associated with certain physiological and/or psychological costs (Bakker & Demerouti, 2007). This describes the nurses' perception of aspects of nursing job that they evaluate as demanding on their physiological and psychological wellbeing. The job demands variables in this study comprise workload, physical demand, emotional demand, job scope, role conflict, role ambiguity and job complexity. Thirty six items were used to measure job demands variables.

3.4.2.1 Workload

Workload is defined as the quantity of work received by an employee. It specifically refers to work overload when employees have either too much to do in too little time, or they work too many hours on the job (Schnall, Landsbergis & Baker, 1994). A total of three items adapted from Job Content Questionnaire (JCQ) (Karasek, 1985) were used to measure workload. A four-point Likert scale, ranging from "1" "strongly disagree" to "4" "strongly agree" was employed. Participants were asked to indicate the extent of agreement about their work that exerts pressure or overload to complete their task. For example "My job is very hectic", "My job requires long periods of

intense concentration on the task” (Table 3.2). JCQ has been used in different studies in many countries to measure job demands. The internal scale reliability of workload measure based on national data in USA sample among nurses was 0.61 (Achat, Kawachi, Byrne, Hankinson & Colditz, 2000). In nursing setting, Choobineh, Ghaem and Ahmedinejad (2011) has conducted a study among 107 hospital nurses in Iran. The internal consistency reliability was quite high for workload with $\alpha=0.81$.

3.4.2.2 Physical Demand

Physical demand is a way of describing the physical activities that a job requires (Hernandez, 2006), and are actually stressors associated with a job’s physical setting, such as seating and position, movement during work, lighting, noise, temperature, etc. Physical demand was measured by three items adapted from JCQ (Karasek, 1985) to evaluate the physical demand of nursing job. A four–point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the extent of agreement about the job requires strenuous movements like bending, physical strength, lifting, or carrying objects. For example “My job requires lots of physical effort”, “I am often required to move or lift very heavy loads on my job” (Table 3.2). A study using similar items was conducted by Araujo and Karasek (2008) on 1,311 urban residents in Brazil. The internal consistency reliability for physical demand was 0.76.

3.4.2.3 Emotional Demand

Emotional demands refer to the “extent to which employees are confronted in their job with things or persons that touch them personally” (Demerouti & Geurts, 2004). Emotional demand deals with emotional requirements of the job, which employee confronted from the job for instance dealing with patient problem (Hartel, Zerbe & Ashkanasy, 2005). Emotional demand was measured by five items adapted from JCQ (Karasek, 1985) to evaluate the emotional demand of nursing job. A four–point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the extent of agreement when they are confronted in their job with things or persons that touch them personally. For example “My job requires working very fast”, “My job requires working very hard” (Table 3.2). A study using similar items was conducted by Araujo and Karasek (2008) on 1,311 urban residents in Brazil. The internal consistency reliability for emotional demand was 0.66.

3.4.2.4 Job Scope

Job scope refers to the number of different activities that a specific job requires and the frequency with which each activity is performed (Lewis, Goodman, Fandt & Michlitsch, 2007). Job scope was measured with nine items adapted from Job Diagnostic Survey (JDS) (Hackman & Oldham, 1980). This measure specifically examines the perception of nurses on their skill variety, skill identity and task significance. A four–point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the extent of

agreement about a specific job requires them to do different activities and the frequency with which each activity is performed. For example “My work requires me to do many different things, using a variety of my skills and talents”, “My work requires me to use a number of complex and high-level skills” (Table 3.2). A similar measure was used in a study on 188 employees in the information technology industry in Singapore and the internal reliability coefficient was high with 0.92 (Lim & Cheng, 1999).

3.4.2.5 Role Conflict

Role conflict refers to the degree to which role expectations are incompatible or incongruent with the requirements of the role where compatibility is judged relative to a set of standards which impinge on role performance (Rizzo, House & Lirtzman, 1970). Role conflict was measured by eight items adapted from Rizzo *et al.* (1970). A four–point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the extent of agreement on whether their role expectations are incompatible or incongruent with the requirements of the role. For example “I have to do things that should be done differently”, “I receive incompatible requests from two or more people” (Table 3.2). Idris (2011) conducted a study among 310 university academics in Malaysia using the same scale and the internal consistency reliability was quite high with $\alpha=0.86$.

3.4.2.6 Role Ambiguity

Role ambiguity is the degree to which role expectations are unclear (Rizzo *et al.*, 1970). Role ambiguity was measured by six items adapted from Rizzo *et al.* (1970). This scales asking for nurses' perception on aspects of role ambiguity in their work. A four-point Likert scale, ranging from "1" "strongly disagree" to "4" "strongly agree" was employed. Participants were asked to indicate the extent of agreement when their role expectations are unclear. For example "I feel certain about how much authority I have", "I have clear, planned goals and objectives for my job" (Table 3.2). A similar study conducted by Idris (2011) among 310 university academics in Malaysia using the same scale and the internal consistency reliability was quite high with $\alpha=0.88$.

3.4.2.7 Job Complexity

Job complexity is defined as the degree of uncertainty and low divisibility of work process in a job given (Kivimaki *et al.*, 1997b). Job complexity was measured with two items adapted from Karasek (1985) and Hackman and Oldham (1980). A four-point Likert scale, ranging from "1" "strongly disagree" to "4" "strongly agree" was employed. Participants were asked to indicate the extent of agreement about the complexity issue of the job. For example "My work is monotonous", "My work requires thinking and weighing decision" (Table 3.2). Baer, Oldham and Cummings (2003) conducted a study on 171 employees from manufacturing organisations using job complexity scale and the reliability coefficient was high with $\alpha= 0.82$

3.4.3 Job Resources

Job resources refer to those physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals (Demerouti, Bakker, Nachreiner & Schaufeli, 2001b; Bakker *et al.*, 2003a). In the present study, job resources consist of six constructs namely: supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy.

3.4.3.1 Supervisor Support

Supervisor support is defined as assistance and protection provided to individual by supervisors (Langford, Bowsher, Maloney & Lillis, 1997). Supervisor support was measured by four items adapted from JCQ (Karasek, 1985). A four-point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of agreement or disagreement on supervisor support such as “My supervisor is concerned about the welfare of those under him”, “My supervisor pays attention to what I am saying” (Table 3.2). The similar scale was used in a study conducted on 1,199 factory workers in Taiwan, and the internal consistency reliability was reported to be $\alpha = 0.86$ (Cheng, Luh & Guo, 2003). Another study conducted in Kelantan, Malaysia on 68 secondary school teachers, and the internal consistency reliability for supervisor support was high with $\alpha = 0.84$ (Abdul Hadi, Naing, Daud & Nordin, 2006). Karasek *et al.* (1998) reported that the international comparative assessment on JCQ across studies conducted in US, Canada, Netherlands and Japan found the average internal reliability coefficients for supervisor support was 0.838.

3.4.3.2 Co-worker Support

Co-worker support is defined as assistance and protection provided to individual by coworkers or colleagues (Langford, Bowsher, Maloney & Lillis, 1997). Co-worker support was measured by four items adapted from JCQ (Karasek, 1985). A four-point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of agreement or disagreement on co-worker support such as “People I work with take a personal interest in me”, “People I work with are friendly” (Table 3.2). The similar items were used in a study conducted on 1,199 factory workers in Taiwan, and the internal consistency reliability was reported with $\alpha=0.82$ (Cheng, Luh & Guo, 2003). Another study conducted in Kelantan, Malaysia on 68 secondary school teachers, and the internal consistency reliability for co-worker support was reported with $\alpha=0.84$ (Abdul Hadi *et al.*, 2006). Karasek *et al.* (1998) reported that the international comparative assessment on JCQ across studies conducted in US, Canada, Netherlands and Japan found the average internal reliability coefficients for co-worker support was 0.752.

3.4.3.3 Autonomy

Autonomy is defined as the extent to which the job enables an individual to experience freedom, independence, and discretion, in both scheduling and determining the procedures used in completing the job (Hackman & Oldham, 1976). Autonomy was measured with three items adapted from JDS (Hackman and Oldham, 1980). A four-point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of

agreement or disagreement on job autonomy such as “My work permits me to decide on my own how to go about doing the work”, “My work denies me any chance to use my personal initiative or judgement in carrying out the work” (Table 3.2). Scott, Swartzel and Taylor (2005) conducted a study on 195 agents in USA using similar scale and the reliability coefficients for job autonomy was 0.66.

3.4.3.4 Job Feedback

Job feedback is defined as the extent to which an individual receives direct and clear information about how effectively he or she is performing the job (Hackman & Oldham, 1976). Job feedback was measured by three items adapted from JDS (Hackman and Oldham, 1980). A four–point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of agreement or disagreement on job feedback such as “My work activities provide information about my work performance”, My work provides many chances for me to figure out how well I am doing” (Table 3.2). Scott, Swartzel and Taylor (2005) conducted a study on 195 agents in USA using the same scale and the reliability coefficients for job feedback was 0.71. Another study conducted using job feedback scale on 232 private sector workers in Nigeria and the reliability coefficient for job feedback was 0.68 (Nwosu, Chiamaka & Tochukwu, 2013).

3.4.3.5 Task/Time Control

Task/Time control is defined as the extent to which workers are able to exercise discretion in dealing with heavy workload and work pressure (Smith, 1998).

Task/Time control was measured with nine items adapted from JCQ (Karasek, 1985). A four-point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of agreement or disagreement on aspects of task/time control in job such as “My job requires that I learn new thing”, “My job involves a lot of repetitive work”, “My job requires me to be creative”, “My job requires a high level of skill” (Table 3.2). In a study conducted by Cheng, Luh and Guo (2003) in Taiwan using similar scale and the internal consistency reliability was 0.80.

3.4.3.6 Self-Efficacy

Self-efficacy is defined as a person’s belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully (McShane & Glinow, 2008). Self-efficacy was measured by ten items adapted from Schwarzer and Jerusalem (1995). A four-point Likert scale, ranging from “1” “strongly disagree” to “4” “strongly agree” was employed. Participants were asked to indicate the level of agreement or disagreement on aspects of self-efficacy in job such as “I can always manage to solve difficult problems if I try hard enough”, “I am confident that I could deal efficiently with unexpected events”, “Thanks to my resourcefulness, I know how to handle unforeseen situations” (Table 3.2). Scholz *et al.* (2002 cited in Scherbaum, Cohen-Charash & Kem, 2006) reported the internal consistency coefficients for a variety of samples conducted in studies across many countries using similar scale have a range from 0.75 to 0.91.

3.4.4 Job Stress

Job stress is defined as “a pattern of emotional, cognitive, behavioural and physiological reactions to adverse and harmful aspects of work content, work organisation and the working environment” (European Agency for Safety and Health at Work, 2002, p. 3). Job stress acts as mediator in the preseng study consists of four constructs namely: physical, emotional, psychological and behavioral stress. Job stress was measured with a total of twenty eight items adapted from General Health Questionnaire (GHQ) developed by Goldberg and Hillier (1979). GHQ-28 are widely used in many studies related to occupational wellbeing. The reliability coefficients documented in many studies range from 0.78 to 0.95 (Jackson, 2007).

3.4.4.1 Physical Stress

Physical stress is defined as the physiological responses by body to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000). Physical stress can be manifested by individuals through illness of the physical body such as increased or irregular heart rate, increased blood pressure. Physical stress was measured by seven items adapted from GHQ-28 (Goldberg & Hillier, 1979). A four–point itemized rating scale, ranging from “1” “never” to “4” “always” was employed. Participants were asked to indicate the degree of frequency they experienced about the symptoms of physical stress. For example such as “been getting any pains in your head?”, “been getting a feeling of tightness or pressure in your head?”, “been having hot or cold spells” (Table 3.2). A study conducted by Nagyova *et al.* (2000) using

GHQ-28 in Slovakia reported internal consistency coefficient for physical stress to be 0.83.

3.4.4.2 Emotional Stress

Emotional stress is defined as the emotional responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000). Emotional stress can be manifested by symptoms which affect their mood and feeling for instance anxiety, depression and restlessness. Emotional stress was measured by seven items adapted from GHQ-28 (Goldberg & Hillier, 1979). A four-point itemized rating scale, ranging from “1” “never” to “4” “always” was employed. Participants were asked to indicate the degree of frequency they experienced about the symptoms of emotional stress. For example such as “felt on the whole you were doing things well?”, “felt that you are playing a useful part in things?” “felt capable of making decisions about things?” (Table 3.2). A study conducted by Nagyova *et al.* (2000) using GHQ-28 in Slovakia reported internal consistency coefficient for emotional stress to be 0.87.

3.4.4.3 Psychological Stress

Psychological stress is defined as cognitive and mental responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000). Psychological stress can be manifested by symptoms that affect cognitive and mental health state for example inability to concentrate and memory problem. Psychological stress was measured by seven items adapted from GHQ-28 (Goldberg & Hillier,

1979). A four–point itemized rating scale, ranging from “1” “never” to “4” “always” was employed. Participants were asked to indicate the degree of frequency they experienced about the symptoms of psychological stress. For example such as “been thinking of yourself as a worthless person?” “felt that life is entirely hopeless?”, “felt that life isn’t worth living?” (Table 3.2). A study conducted by Nagyova *et al.* (2000) using GHQ-28 in Slovakia reported internal consistency coefficient for psychological stress to be 0.76.

3.4.4.4 Behavioral Stress

Behavioral stress is defined as behavioral responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000). Behavioral stress is the action taken or behaviours exhibited by individuals to confront a stressful situation for example eatng more or less, sleeping too much or too little, isolate oneself, using drug or alcohol to relax. Behavioral stress was measured by seven items adapted from GHQ-28 (Goldberg & Hillier, 1979). A four–point itemized rating scale, ranging from “1” “never” to “4” “always” was employed. Participants were asked to indicate the degree of frequency they experienced about the symptoms of behavioural stress. For example such as “lost much sleep over worry?”, “been getting nervous and bad-tempered?”, “been getting scared or panicky for no good reason?” (Table 3.2). Nagyova *et al.* (2000) used GHQ-28 to conduct a survey study on 148 patients to see the impact of chronic diseases on their daily life in Slovakia. The reliability figures for all scales were satisfactory. Total scale has Cronbach’s alpha coefficient of 0.92, whereas for behavioural stress the Cronbach’s alpha coefficient was 0.83. In sum, the

following table depicts all constructs and measures with number of items adapted from previous researchers:

Table 3.1
Constructs and Measures

Constructs	No. of Items
<u>Job Demands:</u>	
Workload; Physical demand; Emotional demand. Developed by Karasek (1985).	Workload (3) Physical demand (3) Emotional demand (5)
Job scope. Developed by Hackman & Oldham (1980)	Job scope (9)
Role conflict and Role ambiguity. Developed by Rizzo, House & Lirtzman (1970).	Role conflict (8) Role ambiguity (6)
Job complexity. Developed by Hackman & Oldman (1980) and Karasek (1985)	Job complexity (2)
<u>Job Resources:</u>	
Supervisor support and co-worker support. Developed by Karasek (1985).	Supervisor support (4) Co-worker support (4)
Autonomy and Job feedback. Developed by Hackman & Oldham (1980).	Autonomy (3) Job feedback (3)
Task/Time control. Developed by Karasek (1985).	Task/Time control (9)
Self-efficacy. Developed by Schwarzer & Jerusalem (1995).	Self-efficacy (10)
<u>Job Stress:</u>	
General Health Questionnaire (GHQ) Developed by Goldberg & Hillier (1979). Consists of physical, emotional, psychological and behavioural stress.	Physical stress (7) Emotional stress (7) Behavioural stress (7) Psychological stress (7)
<u>Sickness absence</u>	
Sick leave; Scheduled worked day;	Total monthly scheduled worked days for 4 consecutive months Total monthly recorded sick leave verified from medical certificate for 4 consecutive months

3.4.5 Summary of Conceptual and Operational Definition of Variables

The following is the summary table of conceptual definitions and operational items of the study variables:

Table 3.2
Summary Table for List of Operational Items of the Main Variables

Variables	Conceptional definitions	Operational items/measurement	Source
Sickness absence	Involuntary absence by an employee attributed to illness or injury when attendance is scheduled or clearly expected by the employer (Searle, 1997).	Total duration of certified sick leave taken by individual nurses within a period of study (February 2011- May 2011)	NHS (2012)
<u>Job demands</u>			
Workload	Work overload or work pressure or too much to do in too little time or work too many hours on the job (Schnall, Landsbergis & Baker, 1994).	1. My job is very hectic. 2. My job requires long periods of intense concentration on the task. 3. My tasks are often interrupted before they can be completed, requiring attention at a later time	Karasek (1985)
Physical demand	The extent the job requires strenuous movements like bending, physical strength, lifting, or carrying objects (Hernandez, 2006).	1. My job requires lots of physical effort. 2. I am often required to move or lift very heavy loads on my job. 3. My work requires rapid and continuous physical activity.	Karasek (1985)
Emotional demand	The extent to which employees are confronted in their job with things or persons that touch them personally (Demerouti & Geurts, 2004).	1. My job requires working very fast. 2. My job requires working very hard. 3. I am not asked to do an excessive amount of work. 4. I have enough time to get the job done. 5. I am free from conflicting demands that other make.	Karasek (1985)
Job scope	The extent of different activities that a specific job requires and the frequency with which each activity is performed (Lewis, Goodman, Fandt & Michlitsch, 2007).	1. My work requires me to do many different things, using a variety of my skills and talents. 2. My work requires me to use a number of complex and high-level skills. 3. The work I do is quite simple and repetitive. 4. My work involves doing a whole or identifiable piece of work, rather than a small portion of the overall work process. 5. My work is arranged so that I do not have the chance to do an entire piece of work from beginning to end. 6. My work provides me the chance to completely finish the piece of work I begin. 7. The results of my work as a nurse likely to significantly affect the lives and well being of other people (within my hospital, family or society). 8. The work of a nurse is one where a lot of other people can be affected by how well the work gets done.	Hackman and Oldham (1980)

Table 3.2 (Continued)

Role conflict	The degree to which role expectations are incompatible or incongruent with the requirements of the role (Rizzo <i>et al.</i> , 1970).	<p>9. The work I perform as a nurse is not very significant or important in the broader scheme of things.</p> <ol style="list-style-type: none"> 1. I have to do things that should be done differently. 2. I receive an assignment without the manpower to complete it. 3. I have to buck a rule or policy in order to carry out an assignment. 4. I work with two or more groups who operate quite differently. 5. I receive incompatible requests from two or more people. 6. I do things that are likely to be accepted by one person and not accepted by others. 7. I receive an assignment without adequate resources and materials to execute it. 8. I work on unnecessary things. 	Rizzo <i>et al.</i> (1970)
Role ambiguity	The degree to which role expectations are unclear (Rizzo <i>et al.</i> , 1970).	<ol style="list-style-type: none"> 1. I feel certain about how much authority I have. 2. I have clear, planned goals and objectives for my job. 3. I know that I have divided my time properly. 4. I know what my responsibilities are. 5. I know exactly what is expected of me. 6. I get clear explanations of what has to be done. 	Rizzo <i>et al.</i> (1970)
Job complexity	The degree of uncertainty and low divisibility of work process in a job given. (Kivimaki <i>et al.</i> , 1997b).	<ol style="list-style-type: none"> 1. My work is monotonous. 2. My work requires thinking and weighing decision. 	Hackman and Oldham (1980) and Karasek (1985)
<u>Job resources</u>			
Autonomy	The extent to which the job enables an individual to experience freedom, independence, and discretion, in both scheduling and determining the procedures used in completing the job (Hackman & Oldham, 1976).	<ol style="list-style-type: none"> 1. My work permits me to decide on my own how to go about doing the work. 2. My work denies me any chance to use my personal initiative or judgement in carrying out the work. 3. As a nurse, I have considerable opportunity for independence and freedom in how I do the work. 	Hackman and Oldham (1980)
Job feedback	The extent to which an individual receives direct and clear information about how effectively he or she is performing the job (Hackman & Oldham, 1976).	<ol style="list-style-type: none"> 1. My work activities provide information about my work performance. 2. My work provides many chances for me to figure out how well I am doing. 3. Doing work by myself, provides very few clues about whether or not I am performing well. 	Hackman and Oldham (1980)
Supervisor support	Assistance and protection given to individual by supervisors (Langford, Bowsher, Maloney & Lillis,	<ol style="list-style-type: none"> 1. My supervisor is concerned about the welfare of those under him. 2. My supervisor pays attention to what I am saying. 	Karasek (1985)

Table 3.2 (Continued)

	1997).	3. My supervisor is helpful in getting the job done. 4. My supervisor is successful in getting people to work together.	
Co-worker support	Assistance and protection given to individual by coworkers or colleagues (Langford, Bowsher, Maloney & Lillis, 1997).	1. People I work with are competent in doing their jobs. 2. People I work with take a personal interest in me. 3. People I work with are friendly. 4. People I work with are helpful in getting the job done.	Karasek (1985)
Task/time control	The extent to which workers are able to exercise discretion in dealing with heavy workload and work pressure (Smith, 1998).	1. My job requires that I learn new thing. 2. My job involves a lot of repetitive work. 3. My job requires me to be creative. 4. My job requires a high level of skill. 5. I get to do a variety of different things on my job. 6. I have an opportunity to develop my own special abilities. 7. My job allows me to make a lot of decisions on my own. 8. On my job, I have very little freedom to decide how i do my work. 9. I have a lot of say about what happens on my job.	Karasek (1985)
Self-efficacy	A person's belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully (McShane & Glinow, 2008).	1. I can always manage to solve difficult problems if I try hard enough. 2. If someone opposes me, I can find the means and ways to get what I want. 3. It is easy for me to stick to my aims and accomplish my goals. 4. I am confident that I could deal efficiently with unexpected events. 5. Thanks to my resourcefulness, I know how to handle unforeseen situations. 6. I can solve most problems if I invest the necessary effort. 7. I can remain calm when facing difficulties because I can rely on my coping abilities. 8. When I am confronted with a problem, I can usually find several solutions. 9. If I am in trouble, I can usually think of a solution. 10. I can usually handle whatever comes my way.	Schwarzer and Jerusalem (1995)
Job stress			
Physical stress	Physiological responses by body to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000).	1. been feeling perfectly well and in good health. 2. been feeling in need of a good tonic. 3. been feeling exhausted and irritable. 4. felt that you are ill. 5. been getting any pains in your head. 6. been getting a feeling of tightness or pressure in your head.	Goldberg and Hillier (1979)

Table 3.2 (Continued)

Emotional stress	Emotional responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000).	<p>7. been having hot or cold spells.</p> <ol style="list-style-type: none"> 1. been managing to keep yourself busy and occupied. 2. been taking longer over the things you do. 3. felt on the whole you were doing things well. 4. been satisfied with the way you've carried out your task. 5. felt that you are playing a useful part in things. 6. felt capable of making decisions about things. 7. been able to enjoy your normal day-to-day activities. 	Goldberg and Hillier (1979)
Psychological stress	Cognitive and mental responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000).	<ol style="list-style-type: none"> 1. been thinking of yourself as a worthless person. 2. felt that life is entirely hopeless. 3. felt that life isn't worth living. 4. thought of the possibility that you might make away with yourself. 5. found at times you couldn't do anything because you are too worry. 6. found yourself wishing you were dead and away from it all. 7. found that the idea of taking your own life kept coming into your mind. 	Goldberg and Hillier (1979)
Behavioural stress	Behavioral responses to stress (European Commission's Directorate-General for Employment and Social Affairs, 2000).	<ol style="list-style-type: none"> 1. lost much sleep over worry. 2. had difficulty in staying asleep once you are off. 3. felt constantly under strain. 4. been getting nervous and bad-tempered. 5. been getting scared or panicky for no good reason. 6. found everything getting difficult for you. 7. been feeling nervous and tense up all the time. 	Goldberg and Hillier (1979)

3.5 Questionnaire Design

A questionnaire is a prepared set of questions or measures used by respondents or interviewers to record answers (Hair, Money, Samourel & Page, 2007). Sekaran and Bougie (2009) pointed out that questionnaires are an efficient data collection method, provided the researchers understand exactly what is required and how to measure the

variables of interest. Questionnaire is the most frequently used method in social sciences research to collect data for describing a population too large to observe directly because the same set of questionnaires could be distributed to a large number of respondents (Wong, 2002). This means, questionnaires are used: (i) when the research involves a large number of respondents; (ii) to ask respondents a series of predetermined questions; and (iii) when the research objective requires data that is attitudinal, behavioural and factual (Wong, 2002). Therefore, questionnaire was considered the most appropriate data collection method to achieve the objective of this study since it permits the researcher to obtain quantitative data on respondents' behaviour in a large sample and generalise the findings of this study to the entire population. Besides targeting a large sample, the questionnaire method allows the anonymity of respondents to answer the questions, which could encourage targeted respondents to participate in the study.

The main decision to be made in questionnaire design is related to the type of questions to be included and the overall format of the questionnaire (Robson, 1993). The strengths of closed questions are that it is easy to complete and analyse; however, the data obtained may be superficial. As such, to ensure that the questions are clear, it is important to avoid any technical jargon, specialist language or personal questions, and leading questions which suggest indirectly what the right answer might be (Smith, Thorpe & Lowe, 1996; Sekaran, 2000). A structured formatted questionnaire helps to process and undertake analysis easily (Gill & Johnson, 1991; Robson, 1993). The use of Likert scale and itemised scale provided for each item allow the respondent to circle the relevant number against each item more easily (Lee & Fielding, 1991; Sekaran, 2000). Research indicates that a four or five-point scale is just as good as other scale and the increase to seven or nine points on rating scale does not improve

the reliability of the instrument (Elmore & Beggs, 1975). Hence a decision was made to use the 4-point balanced Likert and itemised scale in this study.

In this study, one set of questionnaire was prepared to be answered by all respondents, regardless of their job grades in the nursing positions. The covering letter on the first page of questionnaire stressed that the survey is solely for scientific purposes and help is always available, if needed, for purposes of clarification. The subjects were also informed that their responses would be confidential and participation is voluntary. This self-administered questionnaire consisted of four sections:

Section A: related to perceptions of job demands, with thirty six questions set to measure job demands which consist of workload, physical demand, mental demand, job scope, role conflict, role ambiguity and job complexity.

Section B: related to perceptions of respondents towards job resources. For job resources dimensions, there were thirty three questions to measure supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy.

Section C: has twenty eight questions relating to job stress - seven questions each measuring physical, emotional, behavioural and psychological symptoms manifested by job stress.

Section D: consists of twelve questions relating to demographic information - gender, race, age, marital status, level of education, current position, current unit/discipline (type of ward/unit), hospital; tenure in hospital, length of employment as a nurse (seniority), income and working schedule (whether respondent is on divided duty or shift duty). The majority items in this section were close-ended, except tenure in hospital, length of employment, and gross income, whereby respondents were required to write it down.

For sick leave recording form, few questions were included to track sick leave taken by respondents within the study period. The first question is the record of total scheduled work days every month consecutively for a period of four months. The scheduled working days has to take into consideration the weekend off, the approved annual or emergency leave, and the public and bank holidays declared by the government. This is actually the total working days scheduled by the department to work in a month for a period of four months; second question is the record of total sick leave taken by a respondent for every month consecutively for a period of four months; and third question - record of any leave taken impromptu and approved by department head, such as emergency leave due to family matters, bereavement, sick children, ill parents, transportation problem, unplanned leave instructed by department head or management, and this leave must be deducted from total scheduled work days as laid out in the monthly duty roster. This type of adhoc approved leave has to take into account the total scheduled work days to avoid unnecessary contamination of the data obtained later. In terms of the sick leave to be recorded, maternity leave and long term sick leave due to existing chronic diseases, such as Pulmonary Tuberculosis (PTB), Advanced Carcinoma, Chronic Heart Diseases, Chronic Renal Failure and other previously medical certified diseases were excluded from the sick leave definition category. All the sick leave must be verified by a medical certificate issued by medical officer from government hospitals or clinics. Any medical certificate issued by medical doctors from private hospitals, medical centres and clinic must be endorsed by government doctors to prevent medical certificate frauds. The section on sick leave recording was coordinated by the researcher with the assistance from Nursing Department of all designated hospitals. The researcher was in close contact

and discussion with Nursing Department to ensure the criteria of sick leave recording was strongly complied with.

In relation to questionnaire preparation, the ethical consideration was well taken care of in terms of the adaptation and the utilisation of the instrument. As the Job Content Questionnaire (JCQ) was developed by Professor Dr Robert Karasek from University of Massachusetts, Lowell, Massachusetts, USA, permission was obtained from the author for using this instrument in this study (please see the permission and contract letter in Appendix A). After getting the approval from the author to use the instrument, questions were prepared in dual language, English and Bahasa Malaysia, as all the nurses are not native English speakers. Back-to-back translation was done by a language expert to guarantee the accuracy and correctness, in terms of syntax, language and grammatical flow. This questionnaire takes about 10 - 15 minutes for each respondent to complete. The Table 3.3 below shows the distribution of items in the questionnaire.

Table 3.3
Distribution of Items in Questionnaire

Variables	Number of items	Number for Adapted Items
Section A		
Job demands:	36	
• Workload	3	1,2,3
• Physical demand	3	4,5,6
• Emotional demand	5	7,8,9,10,11
• Job scope	9	12,13,14,15,16,17,18,19,20
• Role ambiguity	8	21,22,23,24,25,26,27,28
• Role conflict	6	29,30,31,32,33,34
• Job complexity	2	35,36
Section B		
Job resources:	33	
• Supervisor support	4	1,2, 3,4
• Co-worker support	4	5, 6,7,8
• Autonomy	3	9,10,11
• Job feedback	3	12,13,14
• Task/Time control	9	15,16,17,18,19,20,21,22,23
• Self-efficacy	10	24,25,26,27,28,29,30,31,32,33

Table 3.3 (Continued)

		Section C
Job stress:	28	
• Physical stress	7	1,2,3,4,5,6,7
• Emotional stress	7	8,9,10,11,12,13,14
• Behavioural stress	7	15,16,17,18,19,20,21
• Psychological stress	7	22,23,24,25,26,27,28
		Section D
Demography	12	1,2,3,4,5,6,7,8,9,10,11,12
Total	109	
Employee sick leave record	2	1,2

Since the questionnaire was more than three pages in length, a booklet format was used. The booklet format has several advantages. It is physically more attractive, easier for the respondent to turn the pages, and prevents the problems of lost pages (O'Rourke, 2001). A provision was made for special code number for identification purposes, placed in the upper right corner of the questionnaire. The code number serves several purposes. It allows the researcher to keep track of which questionnaires have been returned and to identify non-respondents for subsequent follow-up (O'Rourke, 2001). It also allowed the researcher to match the questionnaire with the sick leave record. The introductory letter printed in the first page of questionnaire included the identification of the researcher, purpose of the survey, how the respondent was selected, how the data will be used, the approximate time to complete the survey, assurance of confidentiality, contact number of researcher and supervisor, benefits of participation to the respondents' employer and expression of appreciation for participating and responding promptly. In addition, the introductory letter used hand written signature to stimulate response (Ashton & Hylas, 1981)

3.5.1 Response Format

Items for job demands, job resources and job stress in the questionnaire used a Likert scale and itemised rating scale (Please see Table 3.4), except for items tapping

demographic information. However sickness absence data was obtained by sick leave tracking form which recorded total scheduled work days per month and sick leave taken per month for four consecutive months.

For job demands, a 4-point Likert scale with uniform descriptive anchors (1 – strongly disagree, 2-disagree, 3- agree, and 4- strongly agree) was used for workload, physical demand, emotional demand, job scope, role ambiguity, role conflict and job complexity dimensions. Likewise, a 4-point Likert scale with uniform descriptive anchors (1 –strongly disagree, 2-disagree, 3- agree, and 4- strongly agree) was used for job resources dimensions: supervisor support, co-worker support, autonomy, job feedback, task/time control and self-efficacy. For job stress items, a 4-point itemised rating scale with anchors, was provided for each item, and labelled: 1-Never, 2-Sometimes, 3-Often and 4-Always, as a balanced rating scale. Cavana, Delahaye and Sekaran (2001) believed that there is flexibility allows researchers to use as many points in the scale as considered necessary (four, five, seven, nine, etc.), and it is also possible to use different anchors (for instance: very unsatisfied to very satisfied; extremely low to extremely high). Literature indicates that a 5-point scale is a reasonable rating; any increase from five to seven or higher point on rating scale does not improve the reliability of the ratings (Elmore & Beggs, 1975). However, this research used a 4-point balanced Likert scale because of few reasons. The first argument is to avoid acquiescent response bias. The second reason is to avert the problem of social desirability response bias and the third reason is that this scale is content specific and the measurement would not affect the stability and accuracy of the response data. Following what Ray (1980, 1990) suggested, the use of balanced Likert scale is a good alternative to forced-choice scales to overcome problem of

acquiescent response bias (Toner, 1987) and social desirability responding bias (Orvik, 1972).

In supporting this, Garland (1991) provided evidence to minimise social desirability bias arising from respondents' desires to please the interviewer or researcher by eliminating the mid-point in Likert scale, for example: neither...nor, uncertain, etc. Garland (1991) further advocated that in many of the research conducted in social science and marketing, researchers allow respondents to make a definite choice in responding to the scale in the questionnaire survey. A scale without a mid-point would be preferable, provided it does not affect the validity or reliability of the responses.

It is believed that the optimal number of scale categories required is dependent on specific content and the conditions of measurement (Friedman, Wilamowsky & Friedman 1981; Cox 1980; Wildt & Mazis 1978; Matell & Jacoby, 1971; Komorita, 1963). However, the decision to adopt the balanced Likert or rating scale without a mid-point is all depend on the level of 'uncertain' responses the researcher is willing to tolerate (Matell & Jacoby, 1972).

Table 3.4
Response Format for Items in the Questionnaire

Constructs	Scale	Response format
<u>Job Demands:</u> Workload, Physical demand, Emotional demand, Job scope, Role conflict, Role ambiguity and Job complexity.	4-point Likert scale	1 –strongly disagree, 2-disagree, 3- agree and 4- strongly agree
<u>Job Resources:</u> Ssupervisor support, co-worker support, Autonomy, Job feedback, Task/Time control and Self-efficacy.	4-point Likert scale	1 –strongly disagree, 2-disagree, 3- agree and 4- strongly agree
<u>Job Stress</u> Physical stress Emotional stress Psychological stress Behavioural stress	4-point itemised rating scale	1-Never, 2-Sometimes, 3-Often, 4-Always

3.5.2 Translation of Questionnaire

The original instrument was in English, but the study used dual languages, i.e., English and Bahasa Malaysia. This is because some of the nurses are basically trained in local nursing schools and had their secondary and tertiary education using Bahasa Malaysia as the medium of instruction; the majority of senior nurses were trained in schools using English as the main language. In order to avoid the problems inherent in translation, this study used a combination of Brislin's (1970) model for translating and back-translating instruments, and expert panel. One bilingual expert translated the instruments from English to Malay and a second bilingual expert back-translated from Malay to English. A panel of three experts in the area of healthcare and nursing examined the face validity of the translated questionnaire. In addition, emphasis has to be given on these translated questionnaires in regards to cross-language measurement equivalence because some of these instruments for example Job Content Questionnaire (JCQ) (Karasek, 1985) and GHQ (Goldberg & Hillier, 1979) have been translated into several languages (Choi *et al.*, 2009).

3.6 Population

The population frame consisted of all nurses in the nation, totalling 54,340 (MoH, 2007a). Nurses in Malaysia consist of few categories, i.e., Registered Nurse (RN), Community Nurse (CN), Midwife and Assistant Nurse (AN). RNs in Malaysia are mostly staff nurses (SNs) with diploma holders, as they have to attend three years' pre-registration course before they are registered with the Malaysian Nursing Board (MNB) and deemed fit to practice in the clinical area. The total number of RNs is

34,598, which is about 63.7% of the nursing population in the government sector (Table 3.5). In terms of RNs population in Malaysia, the proportion of RNs in the government sector is 72.6% compared to 26.3% in the private sector (Table 3.6). This category of nurses has opportunity to be promoted to Nursing Sister or Nurse Manager, Nursing Supervisor or Matron. Currently, only four public universities and a few private institutions of higher learning in Malaysia conduct four years' degree course plus two years' top-up post-registration courses.

According to the Planning and Development Unit, MoH (2007a), the total number of nurses in the Northern zone of Malaysia (Perlis, Kedah, Pulau Pinang and Perak) is 12,903, with Perak recording 4,981, Penang 3,165, and Kedah and Perlis with 3,948 and 809, respectively (Table 3.5). The 1990s saw the inception of the training of community nurses, as the government felt the dire need for this category of nurses in hospitals and community clinics. There are about 15,222 community nurses in Malaysia, which is about 28% of the nursing population in the government sector (MoH, 2007a).

Table 3.5
Categories of Nurses by States in Government Hospitals, Malaysia 2006

States	RN (Registered Nurse)	CN (Community Nurse)	Midwife (Division II)	AN (Assistant Nurse)	Total
Perlis	571	210	0	28	809
Kedah	2,755	1,116	15	62	3,948
Penang	2,165	685	111	204	3,165
Perak	3,363	1,382	40	196	4,981
Federal Territory Kuala Lumpur	3,652	337	7	1,077	5,073
Federal Territory Labuan	120	2,062	27	15	2,224
Selangor	3,954	1,551	100	499	6,104
Pahang	2,325	1,303	17	290	3,935
Negeri Sembilan	1,403	47	2	212	1,664
Malacca	1,115	514	61	218	1,908
Johor	4,110	436	55	58	4,659

Table 3.5 (Continued)

Terengganu	1,726	1,204	133	229	3,292
Kelantan	2,041	861	68	131	3,101
Sabah	2,498	1,159	74	156	3,887
Sarawak	2,800	2,355	156	277	5,588
Total Number	34,598	15,222	868	3,652	54,340
(Percentage)	(63.7)	(28)	(1.6)	(6.7)	(100)
Nurse: Population Ratio	1: 770	1:1,598		1:4,505	

Source: Planning and Development Division, MoH (2007a)

Table 3.6

Total Number of Registered Nurses in Government and Private Hospitals Malaysia 2006

Hospital	Government	Private	Grand Total
Total Number	34,598	13,044	47,642
(Percentage)	(72.6)	(27.4)	(100)

Source: Planning and Development Division, MoH (2007a)

There are about 868 midwives and 3,652 ANs in Malaysia. ANs are slowly phasing out in Malaysia, as the majority of ANs have been absorbed into the RN scheme after undergoing the conversion course for about two years in the 1990s. The current figure represents those ANs who have chosen not to undergo conversion course and remain as ANs. Similarly, the midwives are also slowly phasing out, as their job functions have been taken over by CNs.

In this study, due to the constraints of time, costs and manpower, the researcher decided to obtain the target population in the hospitals located in the northern region of Malaysia (states of Kedah, Perlis and Pulau Pinang). There are a total of 15 hospitals in these three states. The breakdown figure is shown in Table 3.7. Out of 15 hospitals, six hospitals were chosen in accordance to geographic cluster by area sampling. This is because in Malaysia, nurses in hospitals are nearly homogenous in terms of job descriptions and working disciplines. Hence, the selection and focus on nurses in northern states will not affect the representativeness of the population.

Table 3.7
Number of Hospitals in the States of Kedah, Perlis and Pulau Pinang

States	Number of Hospital
Kedah	8
1. Hospital Sultanah Bahiyah, Alor Star	
2. Hospital Sultan Abdul Halim, Sungai Petani	
3. Hospital Kulim	
4. Hospital Baling	
5. Hospital Yan	
6. Hospital Sik	
7. Hospital Jitra	
8. Hospital Baling	
Perlis	1
1. Hospital Tunku Fauziah, Kangar	
Pulau Pinang	6
1. Hospital Pulau Pinang	
2. Hospital Bukit Mertajam	
3. Hospital Kepala Batas	
4. Hospital Seberang Jaya	
5. Hospital Balik Pulau	
6. Hospital Sungai Bakap	

Source: Planning and Development Division, MoH (2007a)

In terms of the number of hospitals in Malaysia, there are a total of 128 government hospitals (Table 3.8). Currently there are eight hospitals in the state of Kedah, located in Alor Star, Jitra, Kuala Nerang, Yan, Sik, Sungai Petani, Baling and Kulim; in the state of Perlis, only one located in Kangar; whereas for Pulau Pinang, there are a total of six hospitals, located in George Town, Seberang Jaya, Sungai Bakap, Kepala Batas, Bukit Mertajam and Balik Pulau.

Table 3.8
Hospital and Healthcare Facilities Year 2006

Type of Facilities	Total Number
MoH Hospitals	128
Non-MoH Government Hospitals	6
Special Medical Institutions	6
Private Hospital, Maternity/Nursing Homes	233
MoH Health Clinics	807
MoH Rural Clinics	1,919
MoH Dental Clinics	2,117
MoH Mobile Clinics	151

Source: Planning and Development Division, MoH (2007a)

3.7 Sampling Technique and Sample Size

Sampling is the process of selecting a sufficient number of elements from the population. By studying and understanding the sample characteristics, researchers are able to generalise these characteristics to population elements (Neuman, 2006). The reason for using sampling is fairly obvious. In real research, it is impossible to collect data of the entire population as it involves a huge number of elements. Therefore, it is very important to select the right samples that are representative of the true properties of the population because the more representative the sample is of the population, the more generalisable are the findings of the research. According to Cooper and Schindler (2006), a good sample means the sample must be valid on the aspects of accuracy and precision. They asserted that accuracy is the degree to which bias is absent from the sample; this bias is due to systematic variance because of known or unknown influences that can affect the measures of the samples. The other important criterion for good sample design is the precision of the estimate, which is measured by the standard error of estimate. The smaller the standard error, the higher is the precision.

In this study, a stratified random sampling was used to obtain samples from all six general hospitals located in Kedah, Perlis and Pulau Pinang. This sampling technique involved a process of stratification or segregation, followed by random selection of subjects from each stratum. The reasons for choosing this sampling method were two fold: the first was to increase the sample's statistical efficiency, and the second was to provide adequate data for analysing the various strata (Cooper & Schindler, 2006). Neuman (2006) claimed that in general, stratified sampling produces samples that are more representative of the population than simple random sampling if the stratum information is accurate. The six hospitals randomly selected

from three states, were one hospital in Perlis, three hospitals in Kedah and two hospitals in Pulau Pinang. Since most of the hospitals in Malaysia are homogenous in terms of the nursing workforce, only the major hospitals located in all these states were selected. In addition, the selection was based on the geographical location in each state by area sampling technique. These hospitals were Hospital Sultanah Bahiyah, Alor Star, Hospital Sultan Abdul Halim, Sungai Petani and Hospital Kulim in the state of Kedah; Hospital Tunku Fauziah, Kangar in Perlis; and Hospital Pulau Pinang and Hospital Seberang Jaya in Pulau Pinang. The technique of stratified sampling used in this study required the following seven steps:

1. Define the target population. Here the target population is 7,922 of hospital nurses.
2. Choose the relevant stratification variables, usually the relevant stratification variables are the one that meet the purpose of the study and to be used for sub-group estimates. This study used nurses' job grade as the stratification.
3. List the population. Obtain the sampling frame of all hospital nurses.
4. List the population according to the chosen stratification. There was 6 categories of nurses namely, matron, sister, staff nurse, community nurse, assistant nurse and midwife. The percentage of each category was calculated. Matron: 0.7%; sister:8.6%; staff nurse:77.9%; community nurse:11.2%; assistant nurse:1.2% and midwife:0.4%.
5. Choose your sample size. The sample size of 1,300 was determined accordingly.
6. Calculate a proportionate stratification. Each category of nurses was calculated based on the proportion in the population.
7. Use a simple random to select the sample. Simple random was used to choose from six selected hospitals. 9 matrons, 112 sisters, 1,013 staff nurses, 145 community nurses, 16 assistant nurses and 5 midwives.

The unit of analysis was the individual nurse selected as a sample from the population in these six government hospitals from the MoH. The unit of analysis refers to the level at which data are aggregated for analysis (Sekaran & Bougie, 2009). It is important to decide the unit of analysis as we formulate the research questions because the data collection methods, sample size and even the variables included in the framework are guided by the level to which data are aggregated for analysis.

In this study, six general hospitals were randomly selected from 15 hospitals in Kedah, Perlis and Pulau Pinang. The rest are district hospitals. The differences between general and district hospitals are in terms of hospital beds, services, facilities provided and number of employees. A general hospital has all specialist services (internal medicine, surgery, orthopedic, pediatrics, obstetrics and gynecology, ophthalmology, otorhinolaryngology, psychiatry and dentistry). Some also have sub-specialist services, such as cardiology, cardiothoracic, nephrology, urology, plastic and reconstruction, nuclear medicine, neurology, neuro-surgery, colo-rectal surgery, spinal, geriatric, and paediatric surgery, and many others. In terms of facilities and medical technology, most general hospitals have CT (computerized tomography) and MRI (Magnetic Resonance Imaging) services. Generally, district hospitals only have general services and specialists are not stationed there. The specialist services are provided by visiting specialists or consultants from the general hospitals. Hence, to ensure a good coverage of all respondents working in various disciplines, it is only appropriate to select the general hospitals as this study's sampling frame.

Selection of sample size is important to consider whether statistical significance is more relevant than practical significance (Cavana *et al.*, 2001). Another point to consider in multivariate research (including multiple regression) is that sample size should be several times (preferably 10 times or more) as large as the

number of variables in the study (Roscoe, 1975). Krejcie and Morgan (1970) provided a simple scientific guideline for sample size decision. Based on this guideline, in this study, as the population of nurses in Kedah, Perlis and Pulau Pinang is around 7,922, hence the appropriate sample size should be in a range of 364 to 367. The sample size should have more observations than variables. The minimum is to have at least five times and the best is to aim for more than 10 for each variable (Hairk, Black, Babin, Anderson & Tatham, 2006). To add to these criteria and guidelines recommended by Hair *et al.* (2006); Roscoe (1975), Cohen (1969) and Krejcie and Morgan (1970), Neuman (2006) suggested the sample size to be based on sampling ratio; for a moderately large population about 7,922 in this study, a smaller sampling ratio of about 10% is needed to be accurate. However, practical limitations, especially cost, also play a role in a researcher's decision.

The sample for the research is guided by Roscoe (1975) that any response rate from 30 to 500 should be acceptable. The expected response is about 200 respondents (45%), which is considered acceptable based on previous research performance, where any response rate below 10% is considered a weak sample (Roscoe, 1975; Sekaran, 2003).

Besides the reasons explained in Chapter 1 (Section 1.6 - scope of research), the selection of the northern region of Peninsular Malaysia is because the nursing employees within government hospitals are generally homogenous under the nursing practices governed by the nursing registration board. The population of 7,922 nurses is considered sufficient to produce reasonable findings.

Sample size can be affected by the type of data analysis used. This study employed multivariate data analysis, which includes the analysis of sub-groups in the population. Adequate sample size is important for sub-group analysis in the

interpretation of results. As the sample size provides a basis for estimating sampling error, researchers should decide the best sample size based on the degree of accuracy required by the study, the degree of variability or diversity in the population and the number of different variables examined simultaneously in data analysis (Neuman, 2006). The rule of thumb to determine the right sample size is, everything being equal, larger samples are needed if the researcher wants accuracy, if the population has a great deal of variability or heterogeneity, or if the researcher wants to examine many variables in the data analysis simultaneously. On the other hand, smaller samples are sufficient when less accuracy is acceptable, and when the population is homogeneous or when only a few variables are examined at a time.

Based on several reasons as mentioned above, the sample size taken in this study was 1,300 which is 16.4% of total nurse population in northern region (7,922). This has met the minimum sample of 10% for the population as suggested by Neuman (2006). There are a total of 18 variables in this study, to meet the criteria as stated by Hair *et al.* (2006) and Roscoe (1975) which is 10 observations for each variable, i.e. a total of 180 was the adequate sample size. However, based on item to subject ratio, Flynn and Peacy (2001) and Nunnaly (1978) suggest a rule of thumb of ten subjects to each item. Since there are 109 items in this study, a total 1,090 is the appropriate sample size. Nevertheless to consider the non-response bias that would be encountered during the sampling process, an extra 10% to 20% of samples was taken, i.e. a total of 1,300 was finally decided for the sample size in this study.

3.7.1 Inclusion Criteria

This study employed some criteria for selection of target samples. The participants

included all categories of nurses working in the medical ward, surgical ward, orthopedic ward, pediatric ward, obstetrics and gynecology ward, psychiatric ward, critical care and high dependency unit, multidisciplinary ward and specialist clinics. The nurses selected consisted of those who are working on divided duty as well as on shift duty. Male nurses were included in the sample, although they form a small number of the nursing population in the hospitals.

3.7.2 Exclusion Criteria

Nurses who were on long leave for example study leave, maternity leave and any other leave approved by the organisation at the time of the study were exempted. The sample excluded nurse aids and attendants as they are not frequently involved in direct patient care. Newly graduated nurses who just joined the current hospital for less than six months are excluded and nurses working in community clinics and health office were also not included in this study.

3.8 Pilot Study

One approach that researchers can take to address some of the limitations related to measures and methods is to implement a pilot study. A pilot study is a small-scale study that aims to demonstrate the effectiveness of the selected measures and methods (Macnee & McCabe, 2008). Pre-testing a questionnaire through interviewing significant individuals in the hospitals permits the researchers to instantly detect flaws or confusion of items, if any. Conducting pilot study prior to the data collection has many significant advantages that contribute to the study's success, as it gives the researchers the opportunity to look back on some areas that are ambiguous (Brymann,

2004). According to Stommel and Wills (2004), pilot study is an essential building block to larger studies. Precisely, the goal of pre-testing is to refine the research instrument to ensure it has measurement items that cover all aspects of the variables being measured, and the wording of items are clear and understandable (Cavana *et al.*, 2001). Besides, costly mistakes can be avoided as feasibility of research can be decided from pilot study; for instance, if the main study involved huge resources and financial expenditure (Polit & Hungler, 1997).

Group interviews were conducted with 30 respondents in order to improve the quality of the questionnaire, in terms of both face validity and content validity. Several points were raised and discussed in the interview session. These included the following:

- a) The legibility of the questionnaire particularly with regards to the structure and general appearance.
- b) The clarity of the instructions given in each section.
- c) The ambiguity of certain words, statements and questions.
- d) The comprehensiveness of the measurement items.

The feedback and comments generated from pre-testing questionnaire were as follows:

- a) The measurement items were found to be satisfactory and comprehensible to the respondents.
- b) The measurement items of job demands, job resources and job stress were well covered with dimensions pertinent to nursing job.
- c) Unclear wording of “significant” in section A (18 and 20) of the questionnaire. Respondents felt that “important” was the more suitable word in these items instead of “significant”. In Bahasa Malaysia, ‘signifikan’ was altered to “penting”.

- d) Unclear phrase “broader scheme of things” in section A (question 20) was translated from “skema yang luas” to “dalam keseluruhan kerja yang dilakukan” in Bahasa Malaysia.
- e) Section C originally contained 28 items for measurement of job stress. However, some words in section C (question 27 and 28) were found to contain intrusive and sensitive phrases that could be antagonistic to the religious and cultural beliefs of respondents and may affect their responses to these items. Therefore, these two items were deleted from the questionnaire (Item 27: “have found yourself wishing you were dead and away from it all”, and item 28: “found that the idea of taking your own life kept coming into your mind”).
- f) All the respondents agreed that the questionnaire should be translated into Bahasa Malaysia as most of junior nurses are more comfortable with Bahasa Malaysia than English, even though senior nurses have no problem with English. Nevertheless, it has been planned that the questionnaires were to be prepared in both languages.

Based on the respondents’ answers, minor changes were made to increase the clarity of items. The altered items are shown in Table 3.9.

Table 3.9
Description of Altered Items after Pilot Study

Section/Question Number	Old Question	Descriptions	New Question
Section A Question 20	The work I perform as a nurse is NOT very significant in the broader scheme of things.	Unclear word: “significant” and “broader scheme of things”	The work I perform as a nurse is NOT very important in the overall work to be done.
Section C Question 27	have found yourself wishing you were dead and away from it all.	Intrusive and sensitive words.	This item was deleted.
Section C Question 28	found that the idea of taking your own life kept coming into your mind.	Intrusive and religious sensitive words.	This item was deleted.

The data from this pre-testing were analysed with Statistical Package for the Social Sciences (SPSS) version 16 for reliability tests. The internal consistency reliability of each measure was examined using Cronbach's alpha. Cronbach's alpha is a reliability coefficient that indicates how well the items in the measure are correlated to one another. The reliability results for each instrument obtained ranged from 0.62 to 0.93 (Table 3.10), which are generally considered acceptable for research purposes. Sekaran (2003) reiterated that the minimum acceptable reliability is 0.60; therefore, the reliability scale for each instrument can be considered as relatively reliable. The final version of the questionnaire in English and Malay language is exhibited in Appendix 2 and Appendix 3.

Table 3.10
Results of Reliability Analysis (Pilot Study)

Variables and Dimensions	Number of items	Cronbach's alpha
Independent Variables		
<u>Job Demands</u>	36	0.86
Workload	3	0.84
Physical demand	3	0.77
Emotional demand	5	0.67
Job scope	9	0.62
Job complexity	2	0.64
Job conflict	8	0.79
Job ambiguity	6	0.73
<u>Job Resources</u>	33	0.93
Social support	8	0.90
Autonomy	3	0.63
Job feedback	3	0.74
Task/Time control	9	0.64
Self-efficacy	10	0.91
Mediating variable		
<u>Job Stress</u>	26	0.87
Physical stress	7	0.82
Emotional stress	7	0.90
Psychological stress	5	0.83
Behavioural stress	7	0.79

3.9 Data Collection Procedure

This study was carried out in two phases. The first phase was the administration of questionnaire survey. A total of six regional hospitals in northern states were selected by area sampling, 1 from Perlis, 3 from Kedah and 2 from Pulau Pinang. The targeted sample from different job grades was randomly selected from the sampling frame obtained from nursing department of each hospital. In the second phase, sickness absence data was obtained from hospital registry for a period of four consecutive months from February to May 2011, and the period of collection was two months before and two months after the survey questionnaire was distributed. The study used four months data because hospital authority did not permit long duration of study as it might disrupt nursing task and affect patient care. The sick leave obtained excluded maternity leave, emergency leave and study leave. Since all regional hospitals do not have dedicated computerized sickness registry system to record all sickness absence, the sickness absence data collected was gathered from multiple recording sources in the ward or department such as duty roster and sick leave recording book. To ensure the data can be collected more systematically, a customized tracking form (Appendix 12) was created by the researcher. The collection and recording of sickness absence data was coordinated by the researchers with the help from the nursing departments. The process of data collection included the checking of the duration of sick leave from sick leave record and the verification of sick leave from the evidence of medical certificate endorsed by medical officers. In Malaysia, government service personnel have to submit their Medical Certificate (MC) as the evidence of sickness absence regardless of the duration or reason of sickness absence. Under the provision of government General Order chapter C in Malaysia, a civil servant is entitled for a

maximum of 90 days paid sick leave per year (Public Service Department of Malaysia, 2011). In this study, other than sick leave data, the number of scheduled worked day and other approved leave were also procured for the study. This information was obtained from weekly and monthly duty rota schedule, leave approval records which are kept in the ward or unit by the managers.

Consent was also obtained from hospital directors to access the sickness absence record from the participating hospitals. Matrons, sister and nurses were briefed about the detail of the study and subsequently informed consents were obtained from them as well. A total of 1,300 questionnaires were administered to all participating nurses. Each participating nurse was given a specific code and was written on questionnaire in order to help in matching with the sickness absence data obtained from nursing department. Participants were requested to return their completed questionnaires within three days in a sealed envelope to the ward sister. Once the survey was completed, sickness absence data were obtained from respective hospitals. The specific code that was written on questionnaire was used to match with sickness absence data obtained from personal records of each participating nurse from the respective hospital.

3.9.1 Ethical Consideration

Before data collection stage was initiated, approval has been obtained from directors of all six hospitals concerned, by providing them information about the research to be carried out (see Appendix 10). They were notified that this research has obtained approval from the National Institute of Health (NIH) (see Appendix 8) and Medical Research and Ethics Committee (MREC), MoH (see Appendix 9). Besides, this

research had been registered with the National Medical Research Registry (NMRR)(refer Appendix 6).

It is the requirement for medical and health staff in MoH who will be involved in research to register with the National Medical Research Registry (NMRR) Secretariat, and for the researcher to submit the research proposal online (<http://www.nmrr.gov.my>) to the NIH and MREC (refer Appendix 6 for acknowledgement of research submission). The completed agreement form (Investigator's Agreement, Head of Department's and Institutional Approval) was submitted online together with the research proposal (refer Appendix 5). This application was facilitated by the state Clinical Research Centre (CRC) located at Hospital Sultanah Bahiyah, Alor Star. The NMRR registered number for this research was 08-1531-3175 and investigator ID was 3175 (refer Appendix 6 for email reply dated 21 December 2008). To reinforce and strengthen the knowledge of medical and health researchers in conducting research in clinical setting, the MoH requires researchers to attend the Good Clinical Practice (GCP) workshop to be certified as GCP researcher. Thus, in compliance with this requirement, the researcher had obtained the GCP certification in 2008 (see Appendix 7) which helped to facilitate the approval and implementation of the research project.

After obtaining the approval from the three state Director of Health from Kedah, Perlis and Pulau Pinang. Researcher has met up with hospital matrons and ward sisters to brief them and discuss the process in administration of questionnaire survey and accessing to employee sick leave records. Cooperation and coordination from hospital matrons were good and the process was smooth in terms of questionnaire survey and accessing of employee sick leave data. Informed and written consent was obtained from each individual nurse who participated (Appendix 11);

they were given a formal letter to explain the researcher's obligation, the purpose of the study and promised confidentiality and anonymity of the information they provided according to the Helsinki Treaty. Further, they were informed that their participation is voluntary and they can withdraw from the study at any point of time if they felt like doing so because they have no obligation or liability whatsoever to participate. Thus, in carrying out this research, the respondents' right to self-determination, the right to full disclosure and the principle of beneficence (minimize risk and maximize benefit) and justice were maintained in accordance to ethical principles as laid out in medical research ethics (Polit & Beck, 2001).

3.10 Data Analysis

The data collected through questionnaire survey and hospital sick leave record was analysed using SPSS version 16.0 and Microsoft Excel version 2003. For the purpose of data analysis and hypothesis testing, several statistical tests were conducted, and these are explained in the following sections.

3.10.1 Validity Testing

At the beginning of the study, the validity of the instrument was tested. Validity refers to the degree of accurateness of a measurement in carrying out its measuring function. Validity tests how well an instrument measures the particular concept it is supposed to measure. In other words, validity is concerned with whether we measure the right concept (Cavana *et al.*, 2001). An instrument is considered to have high validity when it produces measurement results that are consistent with its purpose. Construct

validity is to identify the structure which the instrument was able to tap the concept as theorized (Cavana *et al.*, 2001). Convergent validity is indicated by scores of questionnaire items measuring the same concept that have correlation index greater than 0.4 (Hair *et al.*, 2006). Discriminant validity is established when two variables are predicted to be uncorrelated in theory, and the empirical measure is found to be so.

This study used factor analysis, a multivariate statistical method to summarise or reduce the number of data or variables required to be analysed. The use of factor analysis takes into consideration every variable as an independent variable, as a function of another unobservable dimension or factor or latent variable. Factor analysis in SPSS programme is able to test convergent validity, as well as discriminant validity.

3.10.2 Reliability Testing

Reliability of a measure indicates the extent to which it is without bias and ensures consistent measurement across time and across the various items in the instrument (Sekaran & Bougie, 2009). Reliability testing is done to measure the reliability or consistency of the research instrument. The stability of measures means the ability of a measure to remain the same over time despite uncontrollable conditions of the state of the respondents themselves. This is measured by using Cronbach's alpha coefficient. Sekaran (2003) stated that testing an instrument is considered reliable when the alpha is greater than 0.7. However, many researchers believe that alpha coefficient of 0.6 and above is considered acceptable in most research (Nunnally,

1978; Hair *et al.*, 2006), and any alpha coefficient less than 0.6 is considered as unsatisfactory (Malhotra & Birks, 2007).

The goodness of measures is established through different kinds of validity and reliability. The results of the any research can only be as good as the measures that tap the concepts in the theoretical framework (Sekaran & Bougie, 2009).

3.10.3 Factor Analysis

Factor analysis is a data reduction technique used to reduce a large number of variables to a smaller set. One important step in data analysis is to understand the dimensionality of variables in the proposed relationship in empirical research (Hair, Anderson, Tatham & Black, 1998). Therefore, factor analysis is carried out to establish the interrelationships of variables that belong together. More frequently factor analysis is used as an exploratory technique when the researcher intends to summarize the structure of a set of a variables. However, for testing a theory about the structure of a particular domain, confirmatory factor analysis is appropriate (Coakes & Ong, 2011). In conducting factor analysis, several assumption tests have to be examined to ensure no violation of criteria (Hair *et al.*, 2006). These include a strong theoretical foundation is needed to support the underlying structure of the study; Measure of Sampling Adequacy (MSA) for the individual items should be above 0.50 (Hair *et al.*, 2006) and the Kaiser-Meyer-Olkin (KMO) values must be greater than 0.60 (Blaikie, 2003) to be considered adequate criteria for factorability; and lastly Barlett's Test of Sphericity should be significant at $p < 0.05$ to provide reasonable basis for factor analysis (Ho, 2006). Principle component analysis (PCA) with oblimin rotation was utilized in this study for the identification of the underlying dimensions

of every construct under study. The utilization of factor analysis allows the development of descriptive summaries of data matrices, which may help to evaluate the collected data are in line with theoretically expected pattern or structure of the target construct (Matsunaga, 2010). PCA is the most widely used factor extraction method (Cooper & Schindler, 2006). The oblimin rotation, on the other hand is a method that provides a clear pattern of factor loading when factors are allowed to be correlated (Costello & Osborne, 2005). Further, to determine the appropriate number of factors to be extracted in factor analysis, criteria used included Kaiser's criterion, which consider factors with an eigenvalue greater than one (Nunnally, 1978); Cattell's (1966) scree plot which provides interpretation from the plot graph on the number of factors to be extracted; proportion of variance accounted for factors extracted; and lastly criteria used for interpretation on factor loading, in which items with significant high loadings are retained and item with cross loading and violate the guidelines will be removed (Igarria, Livari & Maragahh, 1995; Igarria, Parasuraman & Baroudi, 1996; Hair *et al.*, 2006; Kim & Muller, 1978).

Factor analysis under the extraction method of principle component factoring with the rotation of oblimin with Kaiser Normalisation was used to analyse the scale of job demands, job resources and job stress. Subsequently, reliability of each factor was computed.

3.10.4 Descriptive Statistics

Descriptive statistics was conducted by computing the frequency, percentage, mean scores, and standard deviation of each dimension of the variables. The purpose of this

analysis was to acquire a good feel of the gathered data and present the responses of major variables under study.

3.10.5 Multiple Regression Analysis

Hierarchical or sequential regression analysis was used to examine the hypotheses presented in this study. Four sets of hierarchical regression analysis were carried out: the first set examined the relationship between independent variables and mediating variable; the second set analysed the relationship between independent variables and dependent variable; the third set investigated the relationship between mediating variable and dependent variable; and the last set examined the mediating effect of job stress on the relationship between independent variables and dependent variable.

Several assumptions have to be tested before performing regression analysis. As suggested by Coakes and Ong (2011); Tabachnick and Fidell (1997); Berry and Feldman (1985) and Cohen, Cohen, West and Aiken (2003), these assumptions are normality, linearity, homoscedasticity, independence of residuals and multicollinearity. All these assumptions, except independence of residuals and multicollinearity, are tested by residual scatter plot and the Normal Probability Plot of regression standardised residual (Tabachnik & Fidell, 2007; Cohen *et al.*, 2003). Residual plots are the plots of the standardised residuals as a function of standardised predicted values. It is essential to examine for non-linearity because if the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will under-estimate the true relationship and increase chances of a Type II error for that independent variable. In the case of multiple regression, the

non-linearity increases risk of Type I error for other independent variables that share variance with that independent variable (Osborne & Waters, 2002).

Through the examination of the scatter plots of the standardised residuals against predicted values, if there is no clear relationship between the residuals and the predicted values, and the plots of residuals did not indicate curvilinearity, then linearity assumption is met (Coakes & Ong, 2011; Tabachnik & Fidell, 2007). In addition, the normal plot of regression standardised residuals for the independent variables should showed a relatively normal distribution.

The assumption of homoscedasticity can be tested by examining the plots of standardised residuals against predicted values, if the residuals are equally scattered for all the predicted dependent variables' scores; this indicates the variance of errors are the same or constant for all levels of the independent variables and the assumption of homoscedasticity is met (Tabachnick & Fidell, 1997). According to Berry and Feldman (1985); and Tabachnick and Fidell (1997), slight heteroscedasticity has little effect on significance tests; however, if the heteroscedasticity is marked, it can lead to serious distortion of findings and weaken the analysis, thus increasing the possibility of a Type I error.

To examine the assumption of independence of residuals or autocorrelation of errors, the Durbin-Watson test is used to investigate whether the residuals from a linear or multiple regression are independent or otherwise (Montgomery, Peck & Vining, 2001). The normal value is between 0 and 4. The value approaching 0 indicates positive autocorrelation and value toward 4 indicates negative autocorrelation. If the Durbin-Watson values are within this range, then the assumption of independence of residuals is met (Hair, Black, Babin, Anderson, & Tatham, 2006).

The other assumption of multiple regression analysis to be tested is multicollinearity. It refers to high correlations among independent variables; however, if perfect correlations exist among independent variables, then singularity is said to occur. The problem of multicollinearity is that it could affect the relationship between predictors and dependent variable and influence the significance of regression coefficient (Coake & Ong, 2011; Cohen *et al.*, 2003). To detect multicollinearity, it is essential to check for values of tolerance and variance inflation factor (VIF). The rule of thumb for normal values of tolerance and VIF is tolerance values should be more than 0.10, whereas for VIF, the values should be less than 10 (Hair *et al.*, 2006; Cohen *et al.*, 2003). Hence, tolerance of less than 0.10 and VIF of more than 10 indicate violation of assumption of multicollinearity. Allison (1999) suggested few strategies to solve the problems of multicollinearity, mostly when dealing with research design; researchers should use individual-level data and not aggregate data; obtain a good sample size and cross-sectional data instead of time-series data; and lastly, use stratified sampling on the independent variables, as was utilised in this study, to reduce the multicollinearity problem.

3.10.6 Calculation of Sickness Absence

There are many approaches to measuring sickness absence that can provide sets of different information and series of indices to help detect trend, identify variations from the norm and diagnose causes. The followings discuss two common methods used to report the sickness absence level used in this study:

3.10.6.1 Time Lost Measures

The most commonly used method of expressing the level of sickness absence used by many organisations is the crude absence rate, or sometimes referred to as the inactivity or time lost measure. This is calculated as the time lost due to or ascribed to sickness absence as percentage of contracted working time in a defined period.

The absence rate can be measured in days or more accurately in hours. However, the rate is expressed in percentage. The formula of calculation is expressed as the total duration of sick leave in the study period (numerator) divided by the total number of scheduled working days in the study period (denominator) and multiply 100 (Figure 3.2).

Formula:
$\frac{\text{Total duration of sick leave (MC) in study period} \times 100}{\text{Total number of scheduled working day in study period}}$
e.g. = $\frac{2,813.00 \text{ (day)}}{87,917.00 \text{ (day)}} \times 100\% = 3.2\%$

Figure 3.2
Calculation of Sickness Absence Rate

3.10.6.2 Duration Measures

This measure is to calculate the average duration of sickness absence per employee within the study period. The measure took into account the total time lost in the period and the number of staff employed within the stipulated period, and is expressed in days (Figure 3.3).

<p>Formula:</p> $\frac{\text{Total sick leave in study period}}{\text{Total number of staff employed in study period}}$ <p>e.g. = $\frac{2,813.00}{1,114}$ = 2.53 days</p>
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Figure 3.3
Calculation of Average Duration of Sick Leave per Employee within Study Period

3.11 Summary

This chapter discusses the methodology of this study, which comprised research philosophy and design of the study, operationisation of variables and measurements, questionnaire design, population and sampling method, pilot study, data collection and data analysis techniques. The study employed quantitative approach to obtain data in two phases. The sick leave data was accessed from employer’s registry record, while questionnaire survey tool was used to measure all the operationised variables. The sampling and data collection were carried out in systematic manner and in compliance with ethical considerations. The approach for calculation of sickness absence level was provided. The model in this study was further tested with several statistical tests, including multiple regressions. SPSS version 16 was used for data cleaning and preliminary factor analysis and the goodness of measures was further enhanced with multivariate data analysis to explain the model under study. The results of the analyses are presented in the next chapter.

CHAPTER FOUR

FINDINGS

4.1 Introduction

This chapter consists of three main sections: the first section begins with the discussion of response rate from the questionnaire survey, followed by the report of the status of completion of the sickness absence data obtained from hospital records. This section also highlights respondents' profiles based on their demographic characteristics of gender, age, marital status, educational level, length of service, job position, hospital tenure and average monthly income. In the second section, the instruments used in the study are tested for their goodness of measures, specifically focusing on the issue of construct validity and internal consistency tests using factor analysis and reliability analyses. In the third section, statistical tests using descriptive analysis and multivariate analysis, i.e. multiple regression analysis are presented to demonstrate the relationship between independent variables, the dependent variable and the mediating variable under study.

4.2 Response Rate

As mentioned in the previous chapter, the sample size for the current study is 1,300 nurses drawn from six general hospitals in the northern region of Peninsular Malaysia, namely Kedah, Perlis and Pulau Pinang. The data for independent variables were obtained through a questionnaire distributed to randomly selected respondents from these hospitals; while the dependent data were derived from secondary data made available through hospital registry records kept in the ward or unit where the

respondents work. The questionnaires were administered in mid-March 2011 for a period of two weeks. The response rate of each participating hospital was very encouraging. From a total of 1,300 questionnaires that were distributed, 1,273 were returned, constituting a 97.8% response rate (see Table 4.1 below). The high response rate was due to good coordination and the assistance provided by the nursing department; in addition, the respondents complied with the instructions from the nursing department. From the 1,273 questionnaires returned, 159 were found with incomplete data, thus only 1,114 (87.5%) were usable; these raw data were coded and used for further analyses.

Table 4.1
Response Rate of Six General Hospitals

Hospital	Questionnaire Distributed	Questionnaire Returned	Response Rate (%)	Total Response rate (%)
HTF	162	156	12.0	12.3
HSB	330	319	24.5	25.1
HSAH	211	210	16.2	16.5
HK	94	92	7.0	7.2
HPP	368	367	28.2	28.8
HSJ	135	129	9.9	10.1
Total	1300	1273	97.8	100

Note: HTF- Perlis; HSB, HSAH, HK- Kedah; HPP, HSJ-Pulau Pinang

4.3 Sickness Records

The sick leave data were obtained from hospital registry records. The sick leave records included Medical Certificate (MC) certified by government medical officers and MC issued by private general practitioners (GP) and endorsed by government medical officers. This sick leave was accessed from sick leave record book, while other approved leave, such as emergency leave, study leave and work schedule were obtained from leave record book and monthly and weekly schedule and roster record

book located in the wards and units where respondents work. The identities of respondents were matched from respondent numbers allocated to each respondent in their survey form. A total of 1,300 respondents were targeted to obtain their information about the number of sick leave taken monthly from February 2011 to May 2011. A duration of four months was taken for sick leave record instead of six months as planned earlier because of the complexity of data to be accessed from different disciplines in the six general hospitals (for instance, one hospital in Pulau Pinang has more than 30 disciplines where nurses are located). The other reason was that the questionnaires were distributed in mid-March and return of questionnaires from all hospitals are roughly given a month to complete the collection process. Four months is an adequate window period for respondents to remember events related to their job within this four months' duration, respondents would be able to reflect the true or nearly true picture of the effects of the job demands, job resources and job stress on sickness absenteeism.

The criteria of sick leave taken into consideration excluded maternity leave, emergency leave, study leave, paternity leave, compassionate leave or any other leave approved by the department. The sick leave records were verified with evidence of medical certificate issued by government medical officers or specialists. The data of total monthly scheduled worked days from February 2011 to May 2011 were recorded. All the information were entered into sick leave tracking form developed by the researcher (refer Appendix 12). Tabel 4.2 below illustrates the status of completion of sick leave data obtained in comparison with questionnaires returned from the six general hospitals.

Table 4.2
 Status of Completion of Sick Leave Data Obtained from Six General Hospitals

Hospital/Location	Total Respondents Identified	Questionnaire Returned	Completed Sick Leave Data
HTF	162	156	160
HSB	330	319	326
HSAH	211	210	210
HK	94	92	93
HPP	368	367	365
HSJ	135	129	127
Total	1300	1273	1281

Note: HTF- Perlis; HSB,HSAH,HK- Kedah; HPP,HSJ-Pulau Pinang

From a total 1,300 respondents identified for sick leave records, 1,281 respondents were found to have a complete sick leave record. This means a total of 19 respondents' sick leave records were incomplete. This incomplete sick leave record was mainly due to respondents having been transferred to other locations or hospitals. In short, a total of 1,281 respondents had complete sick leave records, while a total of 1,273 respondents returned their questionnaires. The difference between the completed sick leave record and the returned questionnaire was eight (1,281-1,273). The researcher conducted the check on the questionnaires and found that these eight respondents with completed sick leave data failed to return their questionnaires. Hence, only 1,273 respondents had completed sick leave records that matched their returned questionnaires, and therefore were used for further analysis after undergoing thorough data screening and cleaning.

4.4 Data Screening and Cleaning

After data were obtained from questionnaires and sick leave tracking forms, they were examined to ensure completeness and validity. Real data sets often contain errors, inconsistencies in responses or measurements, outliers and missing values (Warner,

2008). Therefore, researchers should conduct thorough preliminary data screening and cleaning to identify and remedy potential problem with the data prior to running the data analysis.

The first stage in data preparation is data coding. Data coding involves assigning a number to the participant's responses, so that it can be entered into the database. Raw data were entered into SPSS data editor. The data were then edited. This means the data was inspected for completeness and consistency (Hair *et al.*, 2007). Blank response or missing data, were handled appropriately. Missing data can impact the validity of the researcher's findings and therefore must be identified and resolved. This study used the approach recommended by Hair *et al.* (2006, 2007), that respondents and variables that have data missing more than the proportion of missing data point (e.g., 20% to 30%) were eliminated from the analysis.

Data editing deals with detecting and correcting illogical, inconsistent or illegal data in the information returned by the participants. Outlier is an example of illogical responses. It is an observation that is substantially different from the other observations.

Illegal codes are values that are not specified in the coding instruction. These codes were identified in about 10 respondents in which data were wrongly entered, for example, code of 40 was entered instead of 4, code of 6 was entered instead of 4. After verification was done with the original questionnaire form, these wrong codes were changed appropriately.

Data transformation is the process of changing the original numerical representation of a quantitative value to another value. Data transformation was carried out for reverse coding for items 9, 10, 11, 14, 17, 20, 21, 31 to 36 in section A, items 10, 14, 16 and 22 in section B, and items 1, 17 to 21 in section C.

4.5 Detecting Outliers

Prior to data analysis, the data set was cleaned and tested thoroughly in order to detect univariate and multivariate outliers. To detect univariate outliers, inspection through extreme cases in boxplot analyses was carried out (Tabachnick & Fidell, 2007). However, no major univariate outlier cases were detected in the data set. The data set was then screened for multivariate outliers through SPSS regression by Mahalanobis distance value. This was done through a procedure suggested by Tabachnick and Fidell (2007). The presence of multivariate outliers suggest that the individual is responding differently compared to other participants across multiple dimensions (Cruz, 2007).

The criterion for multivariate outliers is Mahalanobis distance at $p < 0.001$ for the Chi-square (χ^2) value and degree of freedom (df) equal to the number of items (Tabachnick & Fidell, 2007). This is in sync with Garrett (1989) who used the chi-square plot by plotting the squared Mahalanobis against the quantiles of χ^2_p ; the most extreme points are deleted until the remaining points follow a straight line. Based on criteria suggested by Hair *et al.* (2006); Weisberg (1985) and Steven (1984), Mahalanobis distance (D^2) was calculated as $(n-1)h_{ii}$ whereby n is the number of sample and h_{ii} is the centred leverage value. A value of D^2/df greater than 3.5 (for large sample in this study) was considered as outlier. After taking into account the suggestions by Hair *et al.* (2006) and Tabachnick and Fidell (2007) that potential outliers should be retained to ensure the generalisation of population, unless there is enough proof that such outliers are truly different from other cases or not representative of the population, a total of 19 cases (case no.3, 10, 95, 191, 194, 198, 255, 268, 309, 361, 403, 486, 512, 888, 915, 1003, 1017, 1026 & 1030) with Mahalanobis distance value much greater than χ^2 value of 155.54 were omitted from

the data set. This meant that 1,095 cases were retained and used for subsequent analyses.

4.6 Goodness of Measure

Prior to factor analysis, the validity of the measurement was first tested and this included face validity and content validity, which were attended to as early as during the pilot testing stage. According to Nunnally (1978), face validity and content validity is a non-statistical type of validity that involves systematic examination of the test content to determine whether it covers all the items to be measured. Then the data is submitted for factor analysis.

4.6.1 Construct Validity

Validity is the degree to which a test measures what it claims, or purports to be measuring (Brown, 1996). It is the extent to which an operationalisation measures the concept it is supposed to measure (Cook & Campbell, 1979). According to Campbell and Fiske (1959), convergent and discriminate validity are two aspects of construct validity that researchers use to support the validity of measures in organisational research. Convergent validity is the degree to which multiple attempts to measure the same concept are in agreement. The idea is that two or more measures of the same thing should co-vary highly if they are valid measures of the concept. On the other hand, discriminant validity is the degree to which measures of different concepts are distinct. The notion is that if two or more concepts are unique, then valid measures of each should not correlate too highly.

Factor analysis is one of the established tools used to determine the construct adequacy of measuring device (Cooper & Schindler, 2006). It should be performed with all the items tapping the independent and dependent variables included in the study before conducting the main analysis.

Factor analysis was conducted with data collected for measures obtained from questionnaires survey. There were seven constructs in job demands, six constructs in job resources and four constructs in job stress, whose validity and reliability were tested. The following section reports and discusses the construct validity for this study's variables,

4.6.2 Factor Analyses

Factor analysis is a collection of methods used to examine how underlying constructs influence the responses on a number of measured variables. The objective in factor analysis is usually "data reduction" or "dimension reduction" (Warner, 2008). Several statistical assumptions have to be met before conducting factor analysis on the study variables (Hair *et al.*, 2006). First, a strong theoretical foundation needs to support the underlying structure of the study; second, the value of Measure of Sampling Adequacy (MSA) for the individual items preferably should be above 0.50 to be considered adequate criteria for factorability (Hair *et al.*, 2006); third, the Kaiser-Meyer-Olkin (KMO) values must be greater than 0.60 (Blaikie, 2003) to be considered adequate criteria for factorability; and finally, Barlett's Test of Sphericity should be significant at $p < .05$ to support the adequacy of the correlation among variables and thus provide a reasonable basis for factor analysis (Ho, 2006).

Basically there are two common extraction methods used in conducting factor

analysis (Hair *et al.*, 2006): principle component analysis (PCA) and principal axis factoring (PAF). PCA is the appropriate choice if data reduction is the main concern, whereas PAF is the right option if the primary objective is to identify the latent dimensions of the study variables. After the extractions, rotations have to be done in factor analysis procedure to achieve the optimal factor loading for the items under analysis. Orthogonal rotations are used when factors are restricted to be correlated; oblique rotations are considered when factors are allowed to be correlated. Oblique rotation output is slightly complex than orthogonal rotation output (Costello & Osborne, 2005), because the rotated factor matrix is interpreted after orthogonal rotation; whereas for oblique rotation, the pattern matrix is examined for factor loadings but the substantive interpretations for both methods are essentially the same.

PCA with oblimin rotation was carried out in this study to simplify a large number of items to a few representative factors or dimensions, in order to test the patterns of correlations among the items of variables and to establish the goodness of measures for testing the hypotheses (Hair *et al.*, 1998; Hair *et al.*, 2006; Tabachnick & Fidell, 2007). Oblimin rotation with the default delta (0) or kappa (4) values was used in the SPSS analysis, as Fabrigar *et al.* (1999) suggested to use the default values to avoid unnecessary complexity in the interpretation of results.

To determine the number of factors to be extracted in factor analysis, few criteria are usually followed: (i) Kaiser's criterion, which consider factors with an eigenvalue greater than one (Nunnally, 1978); (ii) Cattell's (1966) scree plot which provides interpretation from the plot graph on the number of factors to be extracted; (iii) proportion of variance accounted for factors extracted; (iv) interpretation on factor loading, items with significant high loadings are retained according to criteria used, for example clean loading on one factor with no cross loading on other factors.

In this study, three factor analyses were carried out for independent variables (job demands and job resources) and mediating variable (job stress). Dependent variable (sickness absence) was not subjected to factor analysis as it is an objective measure. To ensure the number of factors to be extracted is correct and reflects the theoretical significance, methods suggested by Hair *et al.* (1998, 2006) and Tabachnick and Fidell (2007) were considered. First, the eigenvalue of factors must be greater than 1. Thus, all factors having eigenvalue less than 1 were considered insignificant and excluded from the analysis. The second method is through the inspection of the shape of scree test plot. A cut-off point at which the pattern of the curve changes to nearly horizontal line was determined and used as guideline to find out the optimum number of factors to be extracted (Hair *et al.*, 1998; 2006; Tabachnick & Fidell, 2007). The scree test from the initial PCA in this study suggested number of factors to be retained for interpretation, which together accounted for the variance in the item pool. As most components were possibly correlated, these were initially rotated to approximate a simple structure using both oblique (direct oblimin) and orthogonal (varimax) procedures. However, the results from varimax rotation indicated overlapping between components. On the other hand, the results from direct oblimin showed less overlapping between components. Moreover, the oblique rotation method was recommended to suit the goal of obtaining several theoretical meaningful factors or constructs that are correlated (Hair *et al.*, 2006). Hence, the direct oblimin rotation was used in this study for factor analysis.

Hair *et al.* (2006) concurred with Comrey and Lee (1992) that factor loading of 0.30 to 0.40 are minimally acceptable, values greater than 0.50 are considered necessary for practical significance. However, a small loading, for instance, 0.3, is needed if there is large sample size or a larger number of variables (Hair *et al.*, 2006).

The greater the loading, the more the item is a pure measure of the factor (Tabachnick & Fidell, 2007). Therefore, in interpreting the factors in this study, items with loading of above 0.35 and not cross-loaded in other factors were considered. To deal with cross loading and to decide on the elimination of items that leaked and cross-loaded, the criteria suggested by Igbaria, Livari and Maragahh (1995); Igbaria, Parasuraman and Baroudi (1996); Hair *et al.* (2006) and Kim and Muller (1978) were taken into account. The first two researchers stated that the loading of >0.50 in one single factor and cross-loading of <0.35 on other factors are considered acceptable. The latter two researchers proposed the loading of below 0.50 in one factor and cross-loaded at a difference of <0.10 on other factors is the potential item to be deleted.

In interpreting factors, a decision has to be made regarding factor loadings in factor matrix. A factor loading represents the correlation between an original variable and its factor. The researchers need to assess the significance of factor loading; whether to ensure practical significance or statistical significance. If practical significance is used as the criteria, factor loadings in the range of ± 0.30 to ± 0.40 are considered to meet the minimal level for interpretation of structure. Loadings ± 0.50 or greater are considered as practically significant. Loadings exceeding $+0.70$ are considered indicative of well-defined structure and are the goal of any factor structure. The decision on practical significance is applicable if the sample size is 100 or above and the emphasis is on practical and not on statistical significance.

4.6.2.1 Factor Analysis on Job Demands

A total of 36 items were used to measure job demands. Initial results of the Exploratory Factor Analysis (EFA) on the thirty six items came out with eight

components. Since only items with loading of 0.50 and above and not cross-loaded in other factors are acceptable, six items (two items from job scope, two items from workloads, one item each from emotional demand and role ambiguity) were dropped. The remaining 30 items were re-analysed. The subsequent results produced seven components. The criterion of 0.50 was used to determine loadings that should be retained for interpretation. On the basis of this criterion, most of the items loaded uniquely on one of the seven components. In cases where items were cross-loaded, the criteria suggested by Igbaria *et al.* (1995); Igbaria *et al.* (1996); Hair *et al.* (2006) and Kim and Muller (1978) were used. Three items from role conflict with loading of less than 0.5 in one factor and cross-loaded with >0.35 on another factor, or at a difference of <0.10 on other factors were deleted. The results of PCA with oblique rotation are presented in Table 4.3.

In Table 4.3, the Kaiser-Meyer-Oikin Measure (KMO) for the items was 0.861, which was more than 0.6; indicating that the items were correlated and they shared common factors. The MSA values for individual items ranged from 0.739 to 0.937 in anti-image correlation which indicated that the data matrix was appropriate for factor analysis. Barlett's test of Sphericity was found to be significant at $p < 0.001$ with the approximate Chi-Square value of 8819.618, indicating the significance of the correlation matrix, thus providing a reasonable basis for factor analysis.

The factor analysis resulted in seven components with eigenvalue greater than 1 that explained 57.789% of variance in the data. The results of scree plot also provided support for the construction of the seven components. The first component explained 20.873% of the total variance, with an eigenvalue of 5.636. Factor loading for items in component 1 ranged from 0.555 to 0.839. Component 1 consisted of six items related to physical demand of the nursing job. The attributes in this factor

reflected the demand of job that required more physical effort. Thus, the original label of 'physical demand' was retained. For component 2, it explained 12.167% of the total variance with an eigenvalue of 3.285. Factor loading for this component ranged from 0.561 to 0.835. It contained five items related to role ambiguity of nursing job; thus, the original label of 'role ambiguity' was maintained. Component 3 accounted for 6.681% of the total variance with an eigenvalue of 1.804. The factor loading for this component ranged from 0.501 to 0.768. This component had four items related to workload. The attributes of this component reflected the workloads in nursing job. Hence, the original label of 'workload' was maintained. Component 4 explained 5.901% of the total variance with an eigenvalue of 1.593. The factor loading for this component ranged from 0.523 to 0.765. This component consisted of four items related to job scope of nursing job. The four items reflected the attributes of job scope which made nursing a demanding job. Component 5 accounted for 4.557% of the total variance with eigenvalue of 1.230. This component was defined by three items with factor loading ranging from 0.574 to 0.703. As these items related to emotional demand, thus, the original label of 'emotional demand' was retained. Component 6 accounted for 3.894% of the total variance with eigenvalue of 1.051. This component was defined by two items with factor loading 0.767 and 0.907 respectively. As these items were related to role conflict, thus, the original label of 'role conflict' was retained. Component 7 accounted for 3.716% of the total variance with eigenvalue of 1.003. This component was defined by three items with factor loading ranging from 0.452 to 0.842. The attributes of these items reflected the characteristics of complexity of nursing job; thus, the original label of 'job complexity' was retained.

Table 4.3
Results of Factor Analysis for Job Demands

Items	Component						
	1	2	3	4	5	6	7
Factor 1- Physical demand							
My work requires rapid and continuous physical activity.	<u>.839</u>	.029	.054	.056	.005	-.008	-.025
My job requires lots of physical effort.	<u>.776</u>	.002	.023	.078	-.046	.038	-.014
My job requires working very fast.	<u>.767</u>	-.060	.060	.091	-.011	-.042	.006
My job requires working very hard.	<u>.736</u>	-.050	.053	-.071	.011	-.042	.085
I am often required to move or lift very heavy loads on my job.	<u>.619</u>	-.007	-.067	-.115	-.162	.015	.086
My job is very hectic.	<u>.555</u>	-.094	-.128	.001	-.073	-.016	.083
Factor 2- Role ambiguity							
I know that I have divided my time properly. ®	.037	<u>.835</u>	.026	.038	.019	-.018	.027
I have clear, planned goals and objectives for my job. ®	-.054	<u>.780</u>	.001	-.062	.073	.075	.072
I know what my responsibilities are. ®	-.011	<u>.732</u>	.067	-.167	.122	-.037	.048
I know exactly what is expected of me. ®	-.026	<u>.665</u>	.051	.040	-.114	.005	-.129
I get clear explanations of what has to be done. ®	-.129	<u>.561</u>	-.191	.078	-.275	-.005	-.016
Factor 3- Workloads							
I receive an assignment without adequate resources and materials to execute it.	-.007	.003	<u>-.768</u>	.028	-.143	-.037	.016
I work on unnecessary things.	-.072	-.044	<u>-.714</u>	-.190	-.080	.101	.188
I do things that are likely to be accepted by one person and not accepted by others.	-.014	-.005	<u>-.622</u>	.032	-.024	-.221	-.064
My work is arranged so that I do not have the chance to do an entire piece of work from beginning to end.	.119	.058	<u>-.501</u>	.111	.321	-.032	-.118
Factor 4- Job scope							
The work of a nurse is one where a lot of other people can be affected by how well the work gets done.	.166	-.034	-.108	<u>.765</u>	.145	-.004	.054
The results of my work as a nurse likely to significantly affect the lives and well being of other people.	.159	.026	-.073	<u>.751</u>	.104	-.066	.127
The work I perform as a nurse is not very significant or important in the broader scheme of things. ®	.005	-.065	.084	<u>.602</u>	-.292	.081	.019
My work is monotonous. ®	-.235	-.119	.188	<u>.523</u>	-.050	.018	-.025
Factor 5- Emotional demand							
My work provides me the chance to completely finish the piece of work I begin. ®	.096	.015	-.038	.044	<u>-.703</u>	.104	-.076
I am free from conflicting demands that other make. ®	.168	.034	-.022	.062	<u>-.616</u>	-.186	-.042
I have enough time to get the job done. ®	.104	.083	-.054	-.076	<u>-.574</u>	-.079	.219
Factor 6- Role conflict							
I work with two or more groups who operate quite differently.	-.008	-.020	.078	-.035	.048	<u>-.907</u>	-.035
I receive incompatible requests from two or more people.	-.002	.011	-.134	-.020	-.094	<u>-.767</u>	.081
Factor 7- Job complexity							
My work requires me to use a number of complex and high-level skills.	.038	.001	-.021	-.013	-.019	.007	<u>.842</u>
My work requires me to do many different things, using a variety of my skills and talents.	.157	.041	.028	.145	.104	-.044	<u>.731</u>
My work requires thinking and weighing decision.	-.039	-.206	-.037	.292	-.107	-.145	<u>.452</u>

Table 4.3 (Continued)

Eigenvalue	5.636	3.285	1.804	1.593	1.230	1.051	1.003
Percentage of variance explained (%)	20.873	12.167	6.681	5.901	4.557	3.894	3.716
Total variance explained (%)	57.789						
Kaiser-Meyer-Oikin (KMO)	.861						
Barlett's test of sphericity. Approx. Chi Square	8819.618***						
Df	351.000						

Note: n=1095; ® = Reversed coded statement; Underlined loadings indicate the inclusion of that item in the factor; ***p<0.001

4.6.2.2 Factor Analysis on Job Resources

In the initial stage, a total of 33 items were used to measure five dimensions of job resources; eight items relating to social support, three items measuring job autonomy, three items reflecting job feedback, nine items concerning task/time control and ten items measuring self-efficacy. However, after factor analysis, one item from task/time control dimension was dropped and the components increased to six dimensions. The results of PCA with oblique rotation are presented in Table 4.4,

From the results in Table 4.4, the Kaiser-Meyer-Oikin Measure (KMO) for the items was 0.888, which was more than 0.6; indicating that the items were correlated and they shared common factors. The MSA values for individual items ranged from 0.601 to 0.944 in anti-image correlation which indicated that the data was suitable for factor analysis. Barlett's test of Sphericity was found to be significant (df=496, approx. Chi-Square value=13108.777, p<0.001), which indicated the significance of the correlation matrix, and consequently, the appropriateness for factor analysis. The factor analysis produced six components with eigenvalue greater than 1. The results of scree plot provided support for the construction of six components.

From the results presented in Table 4.4, Component 1 explained 22.851% of the total variance with an eigenvalue of 7.312. Factor loading for this component ranged from 0.434 to 0.867. This component consisted of eight items reflecting

respondents who believed in their capabilities to organise and execute the courses of action required to manage prospective situations or belief in their ability to succeed in a particular situation. Thus, the original label of ‘self-efficacy’ was retained.

Component 2 accounted for 11.217% of the total variance with eigenvalue of 3.589. Factor loading ranged from 0.540 to 0.917. This component comprised four items related to the social support provided by supervisor in the work setting. The original label ‘social support’ was divided into two dimensions: supervisor support and co-worker support. Since the four items in this component were related to support provided by supervisor, a new label ‘supervisor support’ was created. Co-worker support is discussed in component 4.

Component 3 explained about 5.921% of the total variance with eigenvalue of 1.895. Factor loading ranged from 0.527 to 0.732. This component comprised seven items related to the extent to which respondents were able to exercise discretion in dealing with heavy workload and work pressure. The original label of ‘task/time control’ was retained.

Component 4 accounted for 5.520% of the total variance with eigenvalue of 1.766. Factor loading ranged from 0.761 to 0.774. This component consisted of four items which reflected the social support provided by co-workers or colleagues in the work setting. Since the original label of social support was split into supervisor support and co-worker support, and the items here reflected the support provided by co-workers, thus, a new label of ‘co-worker support’ was created.

Component 5 explained about 4.457% of the total variance with eigenvalue of 1.426. Factor loading ranged from 0.357 to 0.751. This component comprised six items related to job autonomy, which referred to the extent the job enabled respondents to experience freedom, independence, and discretion in both scheduling

and determining the procedures used in completing the job. The original label of ‘job autonomy’ was appropriate and retained since the items were related to job autonomy.

Component 6 accounted for 4.17% of the total variance with eigenvalue of 1.334. Factor loading ranged from 0.606 to 0.657. This component comprised three items related to job feedback. The items also reflected the extent to which respondents received direct and clear information about how effectively they are performing the job. Since the original label contained items that were related to job feedback, thus the label of ‘job feedback’ was retained.

Table 4.4
Results of Factor Analysis for Job Resources

Items	Component					
	1	2	3	4	5	6
Factor 1- Self efficacy						
If I am in trouble, I can usually think of a solution.	<u>.867</u>	-.007	.066	-.026	.076	.028
When I am confronted with a problem, I can usually find several solutions.	<u>.839</u>	.062	.033	.015	.058	.048
I can remain calm when facing difficulties because I can rely on my coping abilities.	<u>.790</u>	.033	.007	.022	.038	.064
I can solve most problems if I invest the necessary effort.	<u>.683</u>	.017	-.173	.120	.121	-.027
I can usually handle whatever comes my way.	<u>.670</u>	-.076	.057	-.102	-.095	.029
Thanks to my resourcefulness, I know how to handle unforeseen situations.	<u>.616</u>	-.046	-.091	-.106	-.066	-.058
I am confident that I could deal efficiently with unexpected events.	<u>.528</u>	-.045	-.028	-.004	-.194	-.048
I can always manage to solve difficult problems if I try hard enough.	<u>.434</u>	.064	-.126	.133	-.228	-.063
Factor 2- Supervisor support						
My supervisor is concerned about the welfare of those under him.	-.034	<u>.917</u>	-.035	.071	-.007	.023
My supervisor pays attention to what I am saying.	-.020	<u>.909</u>	.006	.070	-.042	.028
My supervisor is helpful in getting the job done.	.021	<u>.751</u>	-.008	-.198	.014	-.049
My supervisor is successful in getting people to work together.	.042	<u>.540</u>	-.025	-.355	.019	-.039
Factor 3- Task/time control						
My job requires me to be creative.	-.018	-.044	<u>-.732</u>	.025	-.067	-.107
My job requires that I learn new thing.	.085	-.026	<u>-.705</u>	-.100	.207	-.154
I get to do a variety of different things on my job.	.001	.096	<u>-.701</u>	.060	-.076	.104
My job requires a high level of skill.	.028	-.013	<u>-.698</u>	-.070	.088	-.206
I have an opportunity to develop my own special abilities.	.049	.172	<u>-.597</u>	.104	-.177	.135
My work provides many chances for me to figure out how well I am doing.	.124	.037	<u>-.548</u>	-.141	.012	.141
My work activities provide information about my work performance.	.109	.028	<u>-.527</u>	-.054	-.079	.185
Factor 4- Co-worker support						
People I work with take a personal interest in me.	-.056	.079	.090	<u>-.774</u>	-.130	.032
People I work with are friendly.	-.064	.064	-.031	<u>-.772</u>	.009	-.049
People I work with are helpful in getting the job done.	.036	.044	-.072	<u>-.764</u>	.066	-.024
People I work with are competent in doing their jobs.	.069	-.037	-.023	<u>-.761</u>	.022	.049

Table 4.4 (Continued)

Factor 5- Autonomy						
I have a lot of say about what happens on my job.	-0.069	.069	.037	.015	<u>-.751</u>	-.002
If someone opposes me, I can find the means and ways to get what I want.	.125	-.036	.023	-.014	<u>-.592</u>	-.228
It is easy for me to stick to my aims and accomplish my goals.	.262	.088	.071	-.049	<u>-.563</u>	-.074
My job allows me to make a lot of decisions on my own.	-.036	-.008	-.377	.048	<u>-.492</u>	.149
My work permits me to decide on my own how to go about doing the work.	.051	-.062	-.177	-.133	<u>-.361</u>	.175
As a nurse, I have considerable opportunity for independence and freedom in how I do the work.	.057	.084	-.145	-.146	<u>-.357</u>	.168
Factor 6- Job feedback						
My work denies me any chance to know how I use my personal initiative or judgment in carrying out the work. ®	.027	.082	-.116	-.103	.131	<u>.657</u>
Doing work by myself, provides very few clues about whether or not I am performing well.	-.011	-.110	.036	.043	.006	<u>.630</u>
On my job, I have little freedom to know how I do my work. ®	.030	.152	.141	.005	.020	<u>.606</u>
Eigenvalue	7.312	3.589	1.895	1.766	1.426	1.334
Percentage of variance explained (%)	22.851	11.217	5.921	5.520	4.457	4.170
Total variance explained (%)	54.136					
Kaiser-Meyer-Oikin (KMO)	.888					
Barlett's test of sphericity. Approx. Chi Square	13108.777***					
Df	496.000					

Note: n=1095; ® = Reversed coded statement; Underlined loadings indicate the inclusion of that item in the factor; ***p<0.001

4.6.2.3 Factor Analysis on Job Stress

To examine the validity of job stress measures, the PCA with oblimin rotation was carried out. There were initially 26 items for job stress contained in four dimensions: physical, emotional, behavioural and psychological responses. Physical, emotional and behavioural response each had seven items, while psychological response had five items. However, after factor analysis was performed, the results revealed all these items were extracted into four dimensions. In the process of factor analysis, only items with loading of 0.30 and above and not cross-loaded in other factors were considered clean items and accepted. Hence, six items (two items from physiological response and four items from behavioural response) were dropped because of low loading and cross-loading with other components. Table 4.5 below presents the results of factor analysis.

As shown in Table 4.5, the Kaiser-Meyer-Oikin Measure (KMO) for the items was 0.887 which was more than 0.6; indicating that these items were correlated and shared common components. The MSA values for individual items ranged from 0.806 to 0.957 in anti-image correlation which indicated that the data was suitable for factor analysis. Barlett's test of Sphericity was found to be significant (df=190, approx. Chi-Square value=10317.832, $p < 0.001$), which indicated the significance of the correlation matrix, and the appropriateness of data for factor analysis. The factor analysis produced four components with eigenvalue greater than 1. The results of scree plot also provided support for the construction of four components.

From the results of factor analysis in Table 4.5, Component 1 accounted for 30.553% of the total variance with an eigenvalue of 6.111. Factor loading for this component ranged from 0.522 to 0.932. This component contained five items that described physical symptoms of job stress of respondents. Therefore, the original label of 'physical responses' was changed to 'physical stress' which was more appropriate for this dimension.

Component 2 accounted for 13.927% of the total variance with eigenvalue of 2.785. Factor loading ranged from 0.575 to 0.844. This component comprised of five items related to the emotional symptoms elicited from respondents with job stress. A new label was created as 'emotional stress' to represent a more appropriate stressful response in this dimension.

Component 3 explained about 11.618% of the total variance with eigenvalue of 2.324. Factor loading ranged from 0.593 to 0.910. This component comprised of five items related to the psychological symptoms manifested by respondents in dealing with job stress. Thus, the new label 'psychological stress' was added to represent the stressful responses in this dimension.

Component 4 accounted for 6.745% of the total variance with eigenvalue of 1.349. Factor loading for this component ranged from -0.548 to -0.845. This component consisted of five of items which reflected the behavioural symptoms manifested by the respondents with job stress. Thus, a new label ‘behavioural stress’ was added to represent the appropriate stressful responses in this dimension.

The results of the factor analysis on job stress variable successfully extracted four components that underpinned the structure of job stress. Hence, factor analyses for independent variables: job demands and job resources, and mediating variable: job stress, were completed. The next important step was to carry out reliability test for all these variables and dimensions.

Table 4.5
Results of Factor Analysis for Job Stress

Items	Component			
	1	2	3	4
Factor 1- Physical stress				
been getting any pains in your head.	<u>.932</u>	.021	.055	.171
been getting a feeling of tightness or pressure in your head.	<u>.925</u>	-.006	.078	.136
felt that you are ill.	<u>.636</u>	.047	.001	-.143
been feeling exhausted and irritable.	<u>.598</u>	.033	-.060	-.200
been having hot or cold spells.	<u>.522</u>	-.039	.033	-.193
Factor 2- Emotional stress				
felt capable of making decisions about things. ®	-.039	<u>.844</u>	-.011	-.031
felt that you are playing a useful part in things. ®	-.047	<u>.839</u>	-.052	-.005
been satisfied with the way you’ve carried out your task.®	.004	<u>.809</u>	.074	.002
felt on the whole you were doing things well. ®	.000	<u>.741</u>	-.007	.135
been able to enjoy your normal day-to-day activities. ®	.115	<u>.575</u>	.007	-.146
Factor 3- Psychological stress				
felt that life is entirely hopeless.	-.028	-.002	<u>.910</u>	.039
felt that life isn’t worth living.	-.019	-.014	<u>.873</u>	.032
thought of the possibility that you might make away with yourself.	.075	-.005	<u>.804</u>	.084
been thinking of yourself as a worthless person.	.004	.010	<u>.716</u>	-.114
found at times you couldn’t do anything because you are too worry.	.019	.028	<u>.593</u>	-.197
Factor 4- Behavioural stress				
been feeling nervous and tense up all the time.	-.069	.021	.077	<u>-.845</u>
been getting scared or panicky for no good reason.	-.024	.037	.060	<u>-.822</u>
found everything getting difficult for you.	-.019	.040	.121	<u>-.776</u>
been getting nervous and bad-tempered.	.293	-.037	-.011	<u>-.609</u>
felt constantly under strain.	.268	-.015	-.055	<u>-.548</u>
Eigenvalue	6.111	2.785	2.324	1.349
Percentage of variance explained (%)	30.553	13.927	11.618	6.745
Total variance explained (%)	62.843			

Table 4.5 (Continued)

Kaiser-Meyer-Oikin (KMO)	.887
Barlett's test of sphericity. Approx. Chi Square	10317.832***
Df	190.000

Note: n=1,095; @ = Reversed coded statement; Underlined loadings indicate the inclusion of that item in the factor; ***p<0.001

4.7 Reliability Analysis

Reliability refers to the accuracy and precision of a measurement procedure (Thorndike, Cunningham, Thorndike, & Hagen, 1991). Reliability may be viewed as an instrument's relative lack of error. In addition, reliability is a function of properties of the underlying construct being measured, or the test being assessed. Reliability answers the question, 'how well the instrument measures what it purports to measure'.

Reliability of a measure is established by testing for both consistency and stability. Consistency indicates how well the items measuring a concept hang together as a set (Cavana *et al.*, 2001). Nevertheless, the researcher has to decide the quality of outcome and the degree of risk he or she is willing to take. However, some degree of inconsistency is present in all measurement procedures. The variability in a set of item scores is due to the actual variation across individuals in the phenomenon that the scale measures, made up of true score and error. Therefore, each observation of a measurement is equal to true score plus measurement error.

The internal consistency for each component was estimated using Cronbach's coefficient alpha. Before factor analysis, the computed values of Cronbach's coefficient alpha for the total items pool ($n = 95$), job demands subscale ($n = 36$), job resources subscale ($n = 33$) and the job stress subscale ($n = 26$) were 0.84, 0.85 and 0.82 respectively.

After factor analysis, the obtained variables and dimensions were subjected to reliability test. The reliability of each measure was examined by computing its

Cronbach's alpha. Generally, alpha coefficient of 0.8 or higher is good (Bryman & Cramer, 1990). According to DeVaus (1991), a scale with a Cronbach's alpha greater than 0.70 is considered to have an acceptable level of internal consistency. However, some authors (e.g. Hair *et al.*, 2006; Nunnally, 1978; Sekaran, 2003), suggested that the minimum acceptable reliability of 0.6 and above is reasonable. Hence, the value was recommended in this study as indicators of internal consistency of the scale. Table 4.6 summarises the reliability coefficients of the measures.

As shown in Table 4.6, the Cronbach's alpha for the dimensions of independent variables: job demands and job resources, was in the range from 0.60 to 0.84 and 0.60 to 0.85 respectively. This met the criteria as suggested by Hair *et al.* (2006); Sekaran (2003) and Nunnally (1978), that the minimum acceptable reliability value of 0.60 is reasonable. The Cronbach's alpha for mediating variable: job stress, was in the range from 0.82 to 0.86, and all values in the dimensions exceeded 0.60, thus fulfilling the criteria as suggested by Hair *et al.* (2006); Sekaran (2003) and Nunnally (1978) in our study. The Cronbach's alpha for overall job demands that consisted of 27 items was 0.77; for overall job resources; it contained 32 items and the Cronbach's alpha was 0.88; while the overall job stress consisted of 20 items, and the Cronbach's alpha was 0.86. Hence, the results of reliability analysis for all these study variables showed strong internal consistency and stability of the instruments used in this study.

Table 4.6
Reliability Analysis of Job Demands, Job Resources and Job Stress Dimensions

Items	Variables	α	Items	Dimensions	α
27	Independent Variable - Job demands	0.77	6	Physical demand	0.84
			5	Role ambiguity	0.78
			2	Role conflict	0.67
			4	Job scope	0.66
			3	Emotional demand	0.60
			3	Job complexity	0.63
32	Independent Variable - Job resources	0.88	4	Workload	0.62
			8	Self efficacy	0.85
			4	Supervisor support	0.85
			7	Task/Time control	0.82
			4	Co-worker support	0.81
			6	Autonomy	0.68
20	Mediating Variable - Job stress	0.86	3	Job feedback	0.60
			5	Physical stress	0.82
			5	Emotional stress	0.82
			5	Psychological stress	0.84
			5	Behavioral stress	0.86

4.8 Description of Study Sample

The descriptive analysis was performed on the sample. The results of the analysis are presented in Tables 4.7 and 4.8. The respondents' demographic characteristics revealed that 1,074 respondents were female, while 21 respondents were male. Most of them were married (78.9%), and majority of the respondents were in the age bracket of 21 to 30 years old (42.9%). In terms of academic achievement, 208 respondents (19%) possessed nursing certificate, 867 respondents (79.2%) were diploma holders, 18 respondents (1.6%) had bachelor's degree, and only two respondents (0.2%) had master's degree.

Table 4.7
 Respondents' Demographic Characteristics – Personal Detail

Demographic Variables	Frequency	Percentage (%)
<u>Gender</u>		
Male	21	1.9
Female	1074	98.1
<u>Age</u>		
21 – 30	470	42.9
31 – 40	358	32.7
41 – 50	120	11.0
51 – 60	147	13.4
<u>Marital status</u>		
Single	204	18.6
Married	864	78.9
Widowed	20	1.8
Divorced	4	0.4
Others	3	0.3
<u>Ethnicity</u>		
Malay	984	89.9
Chinese	32	2.9
Indian	71	6.5
Others	8	0.7
<u>Academic level</u>		
Certificate	208	19.0
Diploma	867	79.2
Bachelor's degree	18	1.6
Master's	2	0.2

More demographic information about respondents' job detail is exhibited in Table 4.8. Majority of respondents, about 18.5% (203) work in Obstetric & Gynaecology (O & G) ward followed by critical, High Dependency Unit (HDU) and Intensive Care Unit (ICU), constituting about 13.9% (152), and the least is 12 respondents (1.1%) working in Otorhinolaryngology (ORL) unit. Of the total six hospitals, HPP had the highest number of respondents (30.4%), while HK had the least with 76 respondents which constituted 6.9% of the total. In terms of job position or grade, 882 respondents (80.5%) are staff nurses, while 116 (10.6%) are CNs, and the remaining 97 respondents (9%) are sisters, matrons, ANs and midwives. With regards to working schedule, 83.4% (913 respondents) were on shift work, while the rest of the 182 respondents (16.6%) were on normal office hours. In terms of length of nursing experiences or seniority, the maximum length of service was 40 years, whilst

the most junior respondents had only half a year in service. The average length of service was 11.2 years. With respect to hospital tenure, the maximum tenure was 36 years working in the current hospital, and the minimum was only half year, while the average hospital tenure was 7.5 years. Each participant had an average of 19.75 scheduled work days per month, while the maximum scheduled work days per month was 25.75, and the least work days per month was 8.25. In terms of monthly income, the average monthly income was RM2,413.37, with monthly gross salary ranging from RM1,000.00 to RM5,000.00. Sick leave taken by nurses ranged from 0 to 16 days. Each nurse has taken an average of 2.04 days sick leave throughout the four months study period.

Table 4.8
Respondents' Demographic Characteristics – Job Detail

Demographic Variables	Frequency	Percentage (%)
<u>Discipline/unit of work</u>		
Medical	151	13.8
Surgical	77	7.0
Orthopedic	58	5.3
Pediatric	118	10.8
Obstetric & Gynecology	203	18.5
Emergency	26	2.4
Critical care/ICU	152	13.9
Operation theatre	83	7.6
Specialist clinic	5	4.8
Psychiatric	13	1.2
Ophthalmology	19	1.7
ORL	12	1.1
Others (multidisciplinary unit)	130	11.9
<u>Hospital</u>		
HTF	123	11.2
HSB	257	23.5
HSAH	186	17.0
HK	76	6.9
HPP	333	30.4
HSJ	120	11.0
<u>Position</u>		
Matron	11	1.0
Sister	75	6.8
Staff nurse	882	80.5
Assistant nurse	9	0.8
Community nurse	116	10.6
Midwife	2	0.2
<u>Work schedule</u>		

Table 4.8 (Continued)

Office hours	182		16.6	
Shift hours	913		83.4	
<u>Length of service in nursing</u>				
0.5 - 5	380		34.7	
6 - 10	268		24.5	
11 - 15	178		16.3	
16 - 20	71		6.5	
21 - 25	60		5.5	
26 - 30	88		8.0	
>30	50		4.6	
<u>Tenure in hospital</u>				
0.5 - 5	602		55.0	
6 - 10	223		20.4	
11 - 15	132		12.1	
16 - 20	53		4.8	
21 - 25	41		3.7	
26 - 30	36		3.3	
>30	8		0.7	
<u>Monthly income</u>				
RM1,000 – RM2,000	463		42.3	
RM2,001 – RM3,000	471		43.0	
RM3,001 – RM4,000	137		12.5	
RM4,001 – RM5,000	24		2.2	
	Min	Max	Mean	SD
Length of service in nursing	0.5	40	11.2	9.2
Tenure in hospital	0.5	36	7.5	7.2
Scheduled work days per month	8.25	27.75	19.75	2.16
Monthly income	RM1,000.00	RM5,000.00	RM2,413.37	RM736.83
Sick leave	0	16	2.04	2.13

4.9 Descriptive Analysis of Study Variables

To describe the major variables in the research study, descriptive statistics, such as maximum, minimum, mean, and standard deviation were obtained for the independent, mediating and dependent variables. This analysis provided the overall picture about the magnitude or strength of the measures on the study's variables. Table 4.11 shows the mean, standard deviation, maximum and minimum of this study's variables. Responses to this study, except demographic variables and dependent variable, were measured on a 4-point Likert scale (1- strongly disagree to 4- strongly agree) for job demands and job resources variables and 4-point rating

scale (1-never to 4-always) for job stress variable.

In Table 4.11, among the dimensions of independent variables, job scope (mean=3.56, SD=0.48) was highly perceived by the respondents as the most demanding dimension of the nursing job. Since the job scope of respondents was very wide, diversified and challenging, perhaps this contributed to job stress and sickness absence. Role ambiguity was perceived as the least demanding aspect of the job content (mean=1.74, SD=0.39). For job resources, task/time control was perceived as the most resourceful dimension (mean=3.15, SD=0.37), as it provided opportunity for respondents to participate in decision making with regards to the task and respondents had control over the time allocated for the job. All the means of job resources variables scored on the higher side, ranging from 2.68 to 3.15. The lowest mean was job feedback (mean=2.68, SD=0.42). For the mediating variable, i.e., job stress, emotional stress was the most highly perceived component (mean=2.06, SD=0.58) by the respondents in response to job stressors even though the mean was slightly above 2.0, while psychological stress was the least perceived response (mean=1.16, SD=0.34), in reaction to job demands. For sickness absence which served as dependent variable, the average sickness absence for the total four months duration was 2.04 days (as with the usual trend of sickness absence data, the majority of the respondents did not take any sick day, while some respondents had taken sick leave to the maximum of 16 days).

Likewise, for the control variable, the seniority of respondents in this study was highlighted in the section of descriptive statistics of study sample. Seniority is the years of accumulated nursing experience by respondents. In this study, the average length of nursing experience for respondents was 11.2 years with some respondents having served to the maximum of 40 years, since the government recently announced

the extension of the retirement age to 60 years.

Table 4.9
Mean and Standard Deviation, Minimum and Maximum of Variables

Variables	Mean	SD	Min	Max
Control Variable:				
Years of nursing experience (seniority)	11.16	9.18	0.5	40
Independent Variable				
Job demands:				
Workload	2.34	0.56	1.00	4.00
Physical demand	3.16	0.50	1.00	4.00
Emotional demand	2.61	0.51	1.00	4.00
Job scope	3.56	0.48	1.00	4.00
Role conflict	2.87	0.61	1.00	4.00
Role ambiguity	1.74	0.39	1.00	4.00
Job complexity	3.10	0.45	1.00	4.00
Job resources:				
Supervisor support	2.90	0.48	1.00	4.00
Autonomy	2.73	0.38	1.00	4.00
Task/Time control	3.15	0.37	1.00	4.00
Co-worker support	3.03	0.39	1.00	4.00
Job feedback	2.68	0.42	1.00	4.00
Self efficacy	3.04	0.33	1.00	4.00
Mediating Variable				
Job stress				
Physical stress	1.98	0.50	1.00	4.00
Emotional stress	2.06	0.58	1.00	4.00
Psychological stress	1.16	0.34	1.00	4.00
Behavioural stress	1.65	0.52	1.00	4.00
Dependent Variables				
Scheduled working hours	19.75	2.16	8.25	27.75
Duration of sickness absence (time lost in day)	2.04	2.13	0	16

4.10 Hypotheses Testing: Test for Relationship

To test for relationship between variables and to examine the hypotheses in this study, hierarchical or sequential multiple regression analysis was employed as a method of choice. This type of analysis is also known as user-determined regression because the order of entry of predictor variables is determined by the data analyst (Warner, 2008), based on theoretical knowledge (Coakes & Ong, 2011). This approach was used to estimate how a set of variables explained the proportion of variance in the dependent

variables, as well as to examine the relative predictive importance of each independent variable (Hair *et al.*, 2006; Polit & Beck, 2005). The results of this analysis were reported through regression statistics, such as R^2 , adjusted R^2 ; regression coefficient (B); and standardised beta coefficient (β). R^2 is used to explain the extent to which independent variables uniquely or jointly explain the variation in a dependent variable. Through assessing the changes of R^2 when adding new independent variables to a regression equation, the R^2 change reflects the extent to which the new independent variables increase the power of prediction. Adjusted R^2 is used to provide a better estimation of overall prediction. The statistical significance of R^2 increment and adjusted R^2 are assessed by the F statistics. The regression coefficient (B) indicates the average amount the dependent variable increases by when the independent variable increases by one unit. The standardised beta (β) coefficient is the B coefficient for standardised data, which helps to assess the relative importance of the independent variables using different measuring units.

Before the use of multiple regression analysis, several assumptions have to be tested to meet its requirement. Pedhazur (1997) emphasised that understanding of these assumptions is important for researchers to avoid estimates bias, and making the statistical results more trustworthy and valid. Osborne and Waters (2002) asserted that checking for assumptions violation helps to avoid committing type I and type II errors which can benefit statistical test and estimates.

Several assumptions that underpin the regression analysis as suggested by Coakes and Ong (2011); Tabachnick and Fidell (1997); Berry and Feldman (1985) and Cohen, Cohen, West and Aiken (2003) are normality, linearity, homoscedasticity, independence of residuals and multicollinearity. All these assumptions, except independence of residuals and multicollinearity, are tested by residual scatter plot and

the Normal Probability Plot of regression standardised residual (Tabachnik & Fidell, 2007; Cohen *et al.*, 2003). Residual plots are the plots of the standardised residuals as a function of standardised predicted values. It is essential to examine for non-linearity because if the relationship between independent variables and the dependent variable is not linear, the results of the regression analysis will under-estimate the true relationship and increase chances of a Type II error for that independent variable. In the case of multiple regression, the non-linearity increases risk of Type I error for other independent variables that share variance with that independent variable (Osborne & Waters, 2002).

Through the examination of the scatter plots of the standardised residuals against predicted values, it was found that there was no clear relationship between the residuals and the predicted values, as all the plots of residuals did not indicate curvilinearity, and therefore met linearity assumption (Coakes & Ong, 2011; Tabachnik & Fidell, 2007). In addition, the normal plot of regression standardised residuals for the independent variables also showed a relatively normal distribution.

By examining further the plots of standardised residuals against predicted values, the residuals were almost equally scattered for all the predicted dependent variables' scores; in other words, the variance of errors was the same or constant for all levels of the independent variables. Hence, the assumption of homoscedasticity was met (Tabachnick & Fidell, 1997). According to Berry and Feldman (1985); and Tabachnick and Fidell (1997), slight heteroscedasticity has little effect on significance tests; however, if the heteroscedasticity is marked, it can lead to serious distortion of findings and weaken the analysis, thus increasing the possibility of a Type I error.

To examine the independence of residuals or autocorrelation of errors, the Durbin-Watson statistic was used. Durbin-Watson test is used to investigate whether

the residuals which from a linear or multiple regression are independent or otherwise (Montgomery, Peck & Vining, 2001). The value is between 0 and 4. Values approaching 0 indicates positive autocorrelation and values toward 4 indicate negative autocorrelation. From the results, all the Durbin-Watson values ranged from 1.5 to 2.0, and thus met the assumption of independence of residuals.

The other assumption that was examined was multicollinearity. It refers to high correlations among independent variables; however, if perfect correlations exist among independent variables, then singularity is said to occur. The problem of multicollinearity is that it could affect the relationship between predictors and dependent variable and influence the significance of regression coefficient (Coake & Ong, 2011; Cohen *et al.*, 2003). To detect multicollinearity, it is essential to check for values of tolerance and variance inflation factor (VIF). The rule of thumb for normal values of tolerance and VIF is tolerance values should be more than 0.10, whereas for VIF, the values should be less than 10 (Hair *et al.*, 2006; Cohen *et al.*, 2003). Hence, tolerance of less than 0.10 and VIF of more than 10 indicate violation of assumption of multicollinearity. Allison (1999) suggested few strategies to solve the problems of multicollinearity, mostly when dealing with research design; researchers should use individual-level data and not aggregate data; obtain a good sample size and cross-sectional data instead of time-series data; and lastly, use stratified sampling on the independent variables, as was utilised in this study, to reduce the multicollinearity problem. From the results of regression analyses showed all the values of tolerance and VIF were greater than 0.10 and less than 10 respectively, thus meeting the assumption of multicollinearity. As all the assumptions for multiple regression were met, thus the process of testing hypotheses were carried out subsequently.

Several past studies (Shapira-Lishchinsky & Even-Zohar, 2011; Schreuder, Roelen, Koopmans, Moen & Groothoff, 2010; Liu & Meyer, 2005; Ingersoll, 2004; Siu, 2002; Peiro, Gonzalez-Roma, Lloret, Bravo & Zurriaga, 1999; Clegg, 1983; Garrison & Muchinsky, 1977; Nicholson, Brown & Chadwick-Jones, 1977; Taylor & Weiss, 1972) had either used or supported the use of some of the pertinent demographic variables, such as age, gender, marital status, tenure, occupational type and years of service (seniority), as control variables. Clegg (1983) argued that the majority of previous empirical studies showed not much effect; however, controlling of variables is important to exclude any possible factors that may exert some relationship to the variables under study. Control may still be necessary because there are some evidences that true effects can be suppressed or augmented by the presence of third variables (Nicholson *et al.*, 1977). Controls are commonly included when partial correlation and multiple regression techniques are employed (Garrison & Muchinsky, 1977; Taylor & Weiss, 1972). Hence, for the purpose of this study, two pertinent demographic variables (years of service and work schedule) were identified and incorporated in the multiple regression analysis. The rationale of selecting the years of service as control was that several previous studies (particularly Shapira-Lishchinsky & Even-Zohar, 2011; Liu & Meyer, 2005; Ingersoll, 2004) supported the link between this variable and voluntary absence. For work schedule, the shift work was assumed to be linked with sickness absence even though the findings from recent empirical studies (Tuchsen *et al.*, 2008; Admi, Tzischinsky, Epstein, Herer & Lavie, 2008) were inconclusive. The very recent systematic review on nine quality empirical studies by Merkus *et al.* (2012) found the evidence was inconclusive for rotating shifts, but there was a strong evidence for a positive association between fixed evening work and sickness absence among female healthcare workers. A recent

longitudinal study (De Bacquer *et al.*, 2009; Pietroiusti *et al.*, 2010) found significantly increased risks for metabolic syndrome among shift and night duty healthcare workers; this risk would definitely give rise to more sickness absence.

4.10.1 Normality Issues with Sickness Absence Data

Absence data can be measured by frequency and time-lost methods. Both frequency and time-lost absence data are generally truncated on the low end and positively skewed (Blau, 1985b; Hammer & Landau, 1981). Previous researchers (e.g., Adler & Golan, 1981; Hackett & Guion, 1985; Martocchio, 1989) highlighted the importance of separating absence into voluntary and involuntary indices, and further asserted that frequency measures are typically utilised to measure voluntary absence; time-lost measures seem to be a better indicator of involuntary absence (Blau, 1985a). In this study, sickness absence was operationalised with time-lost measures, which assessed the duration of absence due to sickness (Chadwick-Jones *et al.*, 1982; Hackett & Guion, 1985).

Many studies suggested that the non-normality distribution of absence data can be tackled with transformation (Conte & Jacobs, 2003), or using different methods of analysis, for instance, survival analysis (O'Reilly, 1991), and Tobit analysis (Baba, 1990). Hammer and Landau (1981) emphasised that in normality testing, it is the magnitude of the deviation, rather than indication of significant differences, that is of concern. Kendau and Stuart (1958) suggested that only values of skewness above 2 and kurtosis above 5 should be of concern. Conte and Jacobs (2003) used several transformations, such as logarithmic and square root transformations, to assess the normality of the absence data, but they did not reduce the skewness or

kurtosis much. Further, there were no differences in the results from the analysis of absence data between the transformed and untransformed absence data. Thus, the researcher decided to use the raw untransformed data in this study. From the results, the normality test for sickness absence data showed the distribution was positively skewed with skewness value of 2.5 and kurtosis of 10.8. This was in concurrence with Blau (1985a) and Hammer and Landau's (1981) findings that time-lost data is generally skewed. The researcher attempted log and square root transformation but the output of the normality tests after transformation showed not much improvement. Hence, the raw time-lost absence data was maintained as the results showed similar findings (Conte & Jacobs, 2003).

4.10.2 Job Demands and Sickness Absence

To test the relationship between job demands and sickness absence as postulated in hypothesis 1, a set of two-step hierarchical multiple regression analysis was conducted. Demographic variables, i.e., length of nursing experience (seniority) and work schedule (shift duty) were statistically controlled (Shapira-Lishchinsky & Even-Zohar, 2011; Liu & Meyer, 2005; Ingersoll, 2004; Tuchsén *et al.*, 2008; Admi *et al.*, 2008), to avoid confounding the results. In the first step, the control variables were entered into prediction equation, followed by the second step, whereby seven dimensions of job demands were entered into the multiple regression analysis. The results of the hierarchical multiple regression analysis are summarised below in Table 4.10.

From the results in Table 4.10, the control variables accounted for 1% (R^2 change=0.009, F-change=4.722, $p<0.01$) of the observed variation in sickness

absence. Of the two demographic variables, only length of nursing experience (seniority) was related to sickness absence ($\beta=-0.099$, $p<0.01$). By adding seven dimensions of job demands, the R^2 value increased to 0.018. This indicated that job demands dimensions were able to explain an additional 1% (R^2 change=0.010, $F=2.227$, $p<0.05$) of the variance in sickness absence.

Table 4.10
Results of Hierarchical Multiple Regressions of Job Demands and Sickness Absence

Predictors	Criterion Variables	
	Model 1 Std. β	Model 2 Std. β
Step 1: Control Variables		
Length of nursing experience (seniority)	-.099**	-.094**
Work schedule (shift duty)	-.052	-.054
Step 2: Job Demands		
Physical demand		.075*
Role ambiguity		-.028
Role conflict		.032
Job scope		.016
Emotional demand		-.040
Job complexity		-.084*
Workload		-.031
R^2	.009	.018
Adjusted R^2	.007	.010
R^2 change	.009	.010
F	4.722**	2.227*
F-change	4.722**	1.509*

Note: * $p<0.05$, ** $p<0.01$; Dependent variable = Sickness absence.

The results also indicated that job complexity ($\beta=-0.084$, $p<0.05$) was the most influential dimension in explaining sickness absence, followed by physical demand ($\beta=0.075$, $p<0.05$). The remaining job demands dimensions were not significantly related to sickness absence. Since only two dimensions; physical demand and job complexity out of seven dimensions of job demands were related to sickness absence, hence, hypothesis 1 was partially supported.

4.10.3 Job Resources and Sickness Absence

To test for hypothesis 2, a two-step hierarchical multiple regression analysis was conducted to examine the relationship between job resources and sickness absence. To prevent the confounding effect of demographic variables, length of nursing experience (seniority) and work schedule (shift duty) were statistically controlled as discussed in previous section. Thus, in the first step, the controlled variables were entered in the prediction equation, while the six dimensions of job resources were entered in the second step of multiple regression model. The results of the hierarchical multiple regression analysis are summarised in Table 4.11.

As shown in Table 4.11, the control variables collectively explained 1% (R^2 change=0.009, F -change=4.772, $p < 0.01$) of the variance in sickness absence. Of the two demographic variables, length of nursing experience (seniority) was significantly correlated with sickness absence ($\beta = -0.099$, $p < 0.01$), while working schedule (shift duty) was not significantly related to sickness absence. On adding six dimensions of job resources to the regression model, the R^2 value increased to 0.015. This indicated that the six dimensions of job resources were able to explain an additional 1% (R^2 change=0.007, $F=2.114$, $p < 0.05$) towards the observed variations in sickness absence. Of the six dimensions of job resources, only job feedback was significantly and positively related to sickness absence. The remaining job resources dimensions were not related to sickness absence. Since only one dimension of job resources was related to sickness absence, it can be said that hypothesis 2 was partially supported.

Table 4.11
Results of Hierarchical Multiple Regressions of Job Resources and Sickness Absence

Predictors	Criterion Variables	
	Model 1 Std. β	Model 2 Std. β
Step 1: Control Variables		
Length of nursing experience (seniority)	-.099**	-.105**
Work schedule (shift duty)	-.052	-.048
Step 2: Job Resources		
Self efficacy		.048
Supervisor support		-.028
Task/Time control		.005
Co-worker support		-.048
Autonomy		-.017
Job feedback		.052*
R ²	.009	.015
Adjusted R ²	.007	.008
R ² change	.009	.007
F	4.722**	2.114*
F-change	4.722**	1.243*

Note: * $p < .05$, ** $p < .01$; Dependent variable = Sickness absence.

4.10.4 Job Demands and Job Stress

To examine the relationship between job demands and job stress, two-steps hierarchical multiple regression analysis was performed to examine the relationship between job demands and job stress. For the analysis, this study specifically looked into which dimension of job demands had the stronger relationship with job stress dimensions. The predictors consisted of seven dimensions of job demands, i.e., physical demand, role ambiguity, role conflict, job scope, emotional demand, job complexity and workload, while the criterion variable was job stress, which comprised four dimensions of job stress, namely physical stress, emotional stress, psychological stress and behavioural stress. In addition, two demographic variables, length of nursing experience (seniority) and work schedule (shift duty) were taken as

control variables based on suggestions by several researchers as mentioned in previous section. These two demographic variables were entered into the prediction equation in the first step, followed by seven dimensions of job demands which acted as independent variables, with each dimension of job stress acting as dependent variable. A total of four sets of hierarchical regression analyses were performed with each dimension of job stress acting as dependent variable. The summary results of hierarchical multiple regression analysis are showed in Table 4.12.

The results of hierarchical multiple regressions is shown (Table 4.12) after taking into account the entry of control variables. All seven dimensions of job demands were able to explain an additional 11% of the observed variations on emotional stress (R^2 change=0.109, F-change=20.184, $p<0.01$), followed by 9% on behavioural stress (R^2 change=0.088, F-change=15.083, $p<0.01$), 8% on physical stress (R^2 change=0.077, F-change=13.087, $p<0.01$), and 6% on psychological stress (R^2 change=0.055, F-change=9.077, $p<0.01$).

The hierarchical regression analyses results also found that workload was correlated to all the dimensions of job stress, namely with psychological stress ($\beta=0.197$, $p<0.01$), with behavioural stress ($\beta=0.119$, $p<0.01$), with physical stress ($\beta=-0.094$, $p<0.01$) and with emotional stress ($\beta=0.066$, $p<0.01$). However, role ambiguity was only correlated with three dimensions of job stress, specifically with emotional stress ($\beta=0.294$, $p<0.01$), with behavioural stress ($\beta=0.137$, $p<0.01$), and with physical stress ($\beta=0.084$, $p<0.01$). Physical demand was correlated with only two dimensions of job stress, specifically with behavioural stress ($\beta=0.111$, $p<0.01$), and physical stress ($\beta=0.096$, $p<0.01$). Emotional demand was only correlated to one dimension of job stress, i.e., physical stress ($\beta=0.097$, $p<0.01$). Similarly, job scope was also correlated to only one dimension of job stress, namely, physical stress

($\beta=0.096$, $p<0.01$). Job complexity was correlated with only one dimension of job stress, specifically behavioural stress ($\beta=0.085$, $p<0.05$). Lastly, role conflict was the only job demand dimension that did not correlate to any dimension of job stress. Since some of the job demands dimensions were not associated with all job stress dimensions, hence hypothesis 3 was partially supported.

Table 4.12
Results of Hierarchical Multiple Regressions of Job Demands and Job Stress

Predictors	Criterion Variables			
	Phy Str Std. β	Emot Str Std. β	Psych Str Std. β	Behav Str Std. β
Step 1: Control Variables				
Length of nursing experience (seniority)	-.087**	-.233**	-.048	-.052
Work schedule (shift duty)	.038	-.024	.014	.050
Step 2: Job Demands				
Physical demand	.096**	.040	.002	.111**
Role ambiguity	.084*	.294**	.000	.137**
Role conflict	.013	-.003	.037	.051
Job scope	.096**	-.046	-.024	.059
Emotional demand	.097**	.024	.038	.030
Job complexity	.056	-.026	.038	.085*
Workload	.094**	.066*	.197**	.119**
R ²	.088	.160	.058	.095
Adjusted R ²	.081	.153	.050	.088
R ² change	.077	.109	.055	.088
F	11.704**	22.981**	7.444**	12.680**
F-change	13.087**	20.184**	9.077**	15.083**

Note: * $p<.05$, ** $p<.01$; Dependent variable = Job Stress. Phy Str = physical stress; Emot str = emotional stress; Psych str = psychological stress; Behav str = behavioural stress.

4.10.5 Job Resources and Job Stress

To examine the relationship between job resources and job stress dimensions, another set of hierarchical multiple regression analysis was performed specifically to test for hypothesis 4. Similar to previous test for hypothesis 3, two demographic variables,

i.e., length of nursing experience (seniority) and work schedule (shift duty) were statistically controlled as suggested by previous researchers as mentioned in previous section.

The results in Table 4.13 were derived from four sets of hierarchical multiple regression analyses that were performed separately with each dimension of job stress acting as the dependent variable. The results clearly showed that the six dimensions of job resources were able to explain an additional 15% (R^2 change=0.150, F -change=33.867, $p<0.01$), 8% (R^2 change=0.079, F -change=15.596, $p<0.01$), 6% (R^2 change=0.060, F -change=11.540, $p<0.01$), and 5% (R^2 change=0.045, F -change=8.710, $p<0.01$) of the observed variations in emotional stress, behavioural stress, psychological stress and physical stress respectively, after taking into consideration the control demographic variables.

The summarised hierarchical multiple regression analysis results also revealed that job feedback and co-worker support were the two dimensions of job resources that correlated to all dimensions of job stress. Job feedback was found to be correlated to all dimensions of job stress, specifically with behavioural stress ($\beta=-0.188$, $p<0.01$), psychological stress ($\beta=-0.169$, $p<0.01$), physical stress ($\beta=-0.121$, $p<0.01$) and emotional stress ($\beta=-0.110$, $p<0.01$). For co-worker support, it was found to be related specifically to behavioural stress ($\beta=-0.157$, $p<0.01$), physical stress ($\beta=-0.128$, $p<0.01$), psychological stress ($\beta=-0.071$, $p<0.05$) and emotional stress ($\beta=-0.062$, $p<0.05$). Autonomy was related to only two dimensions of job stress, namely, psychological stress ($\beta=0.163$, $p<0.01$) and behavioural stress ($\beta=0.086$, $p<0.05$). Self-efficacy was related to only one dimension of job stress, i.e., emotional stress ($\beta=-0.310$, $p<0.01$). Supervisor support and task/time control were not related to any

dimensions of job stress. Since some of the dimensions of job resources were not associated with dimensions of job stress, thus, hypothesis 4 was partially supported.

Table 4.13
Results of Hierarchical Multiple Regressions of Job Resources and Job Stress

Predictors	Criterion Variables			
	Phy Str Std. β	Emot Str Std. β	Psych Str Std. β	Behav Str Std. β
Step 1: Control Variables				
Length of nursing experience (seniority)	-.087**	-.215**	-.048	-.052
Work schedule (shift duty)	.038	-.046	.014	.050
Step 2: Job Resources				
Self efficacy	-.008	-.310**	-.017	-.069
Supervisor support	-.056	.016	-.057	-.048
Task/Time control	.037	-.055	-.068	.026
Co-worker support	-.128**	-.062*	-.071*	-.157**
Autonomy	.010	-.028	.163**	.086*
Job feedback	-.121**	-.110**	-.169**	-.188**
R ²	.057	.200	.063	.086
Adjusted R ²	.050	.194	.056	.079
R ² change	.045	.150	.060	.079
F	8.192**	34.014**	9.090**	12.754**
F-change	8.710**	33.867**	11.540**	15.596**

Note: *p<.05, **p<.01; Dependent variable = Job Stress. Phy Str = physical stress; Emot str = emotional stress; Psych str = psychological stress; Behav str = behavioural stress.

4.10.6 Job Stress and Sickness Absence

To test for hypothesis 5, the relationship between job stress and sickness absence was examined by performing hierarchical multiple regression analysis. The predictor variables were job stress dimensions and the criterion variable was sickness absence. Respondents' demographic variables of length of nursing experience (seniority) and working schedule (shift duty) were statistically controlled as suggested by several researchers as mentioned previously. The summary of the hierarchical multiple regression analysis results are displayed in Table 4.14.

From the results in Table 4.14, control variables accounted for only 1% ($R^2=0.09$, $F\text{-change}=4.722$, $p<0.01$) of the variance in sickness absence. Of the two demographic variables, only length of nursing experience (seniority) was significantly related to sickness absence ($\beta=-0.099$, $p<0.01$), while work schedule (shift duty) was not related to sickness absence. After adding job stress dimensions, the R^2 value increased to 0.024. This indicated that the four dimensions of job stress were able to explain an additional 2% (R^2 change=0.015, $F\text{-change}=4.273$, $p<0.01$) of the observed variations in sickness absence. Behavioural stress exerted the most influence on the prediction of sickness absence ($\beta=-0.163$, $p<0.01$), followed by physical stress ($\beta=0.102$, $p<0.01$). The other job stress dimensions, emotional stress and psychological stress, did not significantly predict sickness absence. Since not all job stress dimensions were associated with sickness absence, hence hypothesis 7 was partially supported.

Table 4.14
Results of Hierarchical Multiple Regressions of Job Stress and Sickness Absence

Predictors	Criterion Variables	
	Model 1 Std. β	Model 2 Std. β
Step 1: Control Variables		
Length of nursing experience (seniority)	-.099**	-.096**
Work schedule (shift duty)	-.052	-.048
Step 2: Job Stress		
Physical stress		.102**
Emotional stress		.003
Psychological stress		.035
Behavioural stress		-.163**
R^2	.009	.024
Adjusted R^2	.007	.019
R^2 change	.009	.015
F	4.722**	4.442**
F-change	4.722**	4.273**

Note: * $p<.05$, ** $p<.01$; Dependent variable = Sickness Absence.

4.11 Hypotheses Testing: Test for Mediation Effects

There are three major statistical approaches to mediation analysis: (i) causal steps; (ii) difference in coefficients; and (iii) product of coefficients (MacKinnon 2000). However, this study used the causal steps approach suggested by Baron and Kenny (1986), and Judd and Kenny (1981); the concept and notion from other authors like MacKinnon (2008); MacKinnon, Fairchild and Fritz (2007) and Holmbeck (1997) were also taken into consideration to determine feasibility of conducting mediating analyses and the significance of mediation model. According to Baron and Kenny (1986), the causal-step approach requires some criteria to be fulfilled before mediation analysis can be conducted. In fact, there are four conditions that must be met for a variable to be considered as a mediator: (i) the independent variable (X) must be significantly associated with the hypothesised mediator (M); (ii) the independent variable (X) must be significantly associated with dependent variable (Y); (iii) the mediator (M) must be significantly associated with dependent variable (Y); and (iv) the impact of independent variable (X) on dependent variable (Y) must become less significant or insignificant when the mediator intervenes. This suggests either full mediation or partial mediation will occur. Conversely, if the impact of independent variable (X) on dependent variable (Y) becomes larger after the mediator sets in, the mediation will not happen.

Figure 4.1 shows the mediation model, whereby A is the significant effect of X on M; and there is also significant effect (B) of M on Y. C is the significant effect of X on Y (Figure 4.1.b). The mediation will happen, once the M intervenes, the effect C will shrink or become insignificant (C') (Figure 4.1.a).

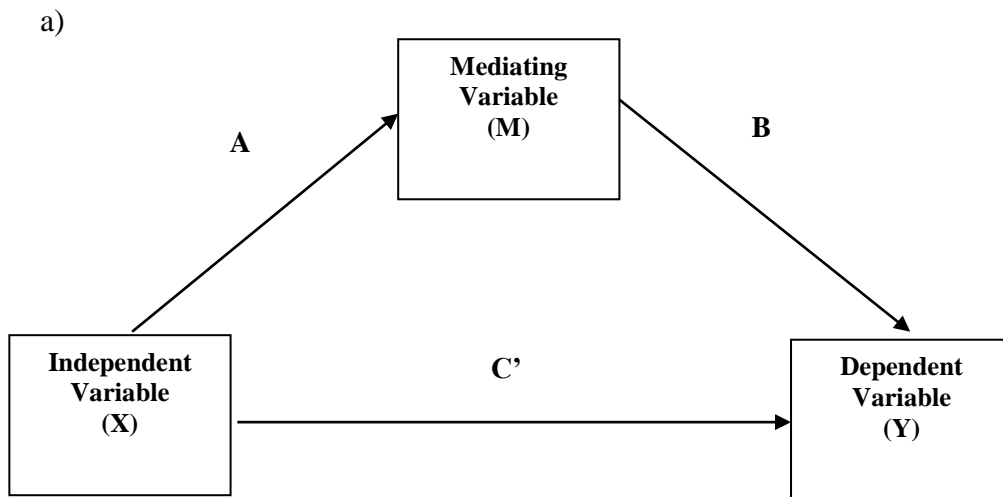


Figure 4.1
Mediation Model

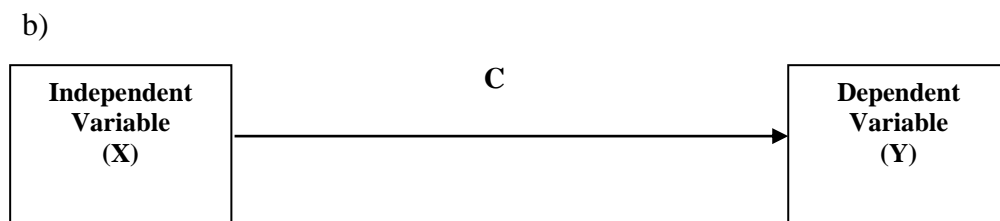


Figure 4.1
Mediation Model

Source: Baron and Kenny (1986); MacKinnon (2008); MacKinnon *et al.* (2007)

MacKinnon (2000) claimed that whichever statistical approach is used, all the information has to be derived from the following three regression equations:

$$M = i_1 + aX + e_1 \quad \text{Equation 1}$$

$$Y = i_2 + cX + e_2 \quad \text{Equation 2}$$

$$Y = i_3 + c'X + bM + e_3 \quad \text{Equation 3}$$

The first equation is obtained by regressing the mediator on the independent

variable. The second equation is formed by regressing the dependent variable on the independent variable; and the third equation is derived by regressing the dependent variable on both the independent variable and the mediator (Baron & Kenny, 1986; McKinnon & Fairchild, 2009).

From the equations as shown above, Y is the dependent variable, X is the independent variable and M is the mediating variable. The intercepts in each equation representing the average score of each variable are i_1 , i_2 and i_3 , respectively, and e_1 , e_2 and e_3 represent the model fit errors or residuals or part of the relation that cannot be predicted by the model. The a, b, c and c' terms are the regression coefficients capturing the relationships between the three focal variables. The term a is the coefficient representing the strength of the relationship between X and M. The b is the coefficient for the strength of relationship between M and Y, with the strength of the X-Y relation removed. The coefficient c represents how strongly X predicts Y; and c' represents the strength of prediction of Y from X, with the strength of M-to-Y relation removed (MacKinnon & Fairchild, 2009). Evidence for mediation is said to be likely if: (i) the term a in equation 1 is significant; there is evidence of a linear relationship between the independent variable (X) and the mediator (M); (ii) the regression coefficient c in equation 2 is significant; there is a linear relationship between the independent variable and dependent variable (Y). The term b in equation 3 is significant, indicating that the mediator (M) helps predict the dependent variable (Y); and (iii) for c' - the effect of the independent variable (X) on the dependent variable (Y) becomes significantly smaller in size relative to equation 2 or becomes insignificant.

In this study, regression coefficients for each equation were estimated by multiple regression analyses performed according to criteria suggested by Baron and

Kenny (1986). To reiterate whether mediation effects occurred in this study, four conditions must be met as discussed in the earlier section: (i) the independent variable (job demands and job resources) must predict the dependent variable (sickness absence); (ii) the independent variable (job demands and job resources) must predict the mediator variable (job stress); (iii) the mediator (job stress) must predict dependent variable (sickness absence); and (iv) the predictive utility of the independent variable (job demands and job resources) must be reduced, in comparison to condition 1, when the independent variable (job demands and job resources) and the mediator (job stress) are used simultaneously to predict the dependent variable (sickness absence).

4.11.1 The Mediation Effects of Job Stress on the Relationship between Job Demands and Sickness Absence

The mediating effects of job stress on the relationship between job demands and sickness absence as postulated in hypothesis 6 were examined by hierarchical multiple regression analyses. From the previous regression analysis carried out as discussed in the previous section (refer Table 4.10 to Table 4.14), the results showed that only physical stress and behavioural stress (job stress's dimensions) were correlated significantly with sickness absence, job demands and job resources, and thus met the conditions to be mediators as suggested by Baron and Kenny (1986) for mediation analysis. Since these two dimensions of job stress acted as mediators, further examination was necessary to see which dimensions of job demands and job resources would be the key variables in the mediation analysis. From the Table 4.15 showing the tabulated results of checking for eligibility of job stress dimensions for mediation analysis between job demands dimensions and sickness absence, physical

demand was found to be the key dimension in the job demands that not only related significantly to physical stress, but also related significantly to sickness absence. On the other hand, the results in Table 4.15 also showed that when behavioural stress was a mediator, two dimensions of job demands (physical demand and job complexity) had fulfilled the criteria to be the independent variables in the mediation analysis, because both dimensions related significantly to behavioral stress and sickness absence. The following table (Table 4.15) summarises the checking for eligibility of job stress dimensions for mediation test between the job demands and sickness absence.

Table 4.15
Checking for Eligibility of Job Stress Dimensions for Mediation Test between Job Demands Dimensions and Sickness Absence

IV- Job Demands	M- Job Stress	DV- Sickness Absence	IV→M Beta	M→DV Beta	IV→DV Beta	IV→M→DV Beta	Remarks
pd ra rc js ed jc wl	Phy str	SA	.096**	.102**	.075*	pd→phystr →SA Test for mediation	Qualify for mediation test
			.084*	.	-.028		
			.013		.032		
			.096**		.016		
			.097**		-.040		
			.056		-.084*		
			.094**		-.031		
pd ra rc js ed jc wl	Emot str	SA	.040	.003	.075*	Did not qualify for mediation test	M-DV=ns
			.294**		-.028		
			-.003		.032		
			-.046		.016		
			.024		-.040		
			-.026		-.084*		
			.066*		-.031		
pd ra rc js ed jc wl	Psych str	SA	.002	.035	.075*	Did not qualify for mediation test	M-DV=ns
			.000		-.028		
			.037		.032		
			-.024		.016		
			.038		-.040		
			.038		-.084*		
			.197**		-.031		
pd ra rc js	Behav str	SA	.111**	-.163**	.075*	pd→behavst →SA jc→behavstr →SA	Qualify for mediation test
			.137**		-.028		
			.051		.032		
			.059		.016		

Table 4.15 (Continued)

ed	.030	-.040	Test for
jc	.085*	-.084*	mediation
wl	.119**	-.031	

*p<0.05, **p<0.01, IV=independent variable; M=mediator; DV=dependent variable; pd = physical demands; ra=role ambiguity; rc=role conflict; js=job scope; ed=emotional demand; jc=job complexity; wl=workload; phy str=physical stress; emot str=emotional stress; psych str=psychological stress; behav str=behavioural stress; SA=Sickness Absence; ns=no significant.

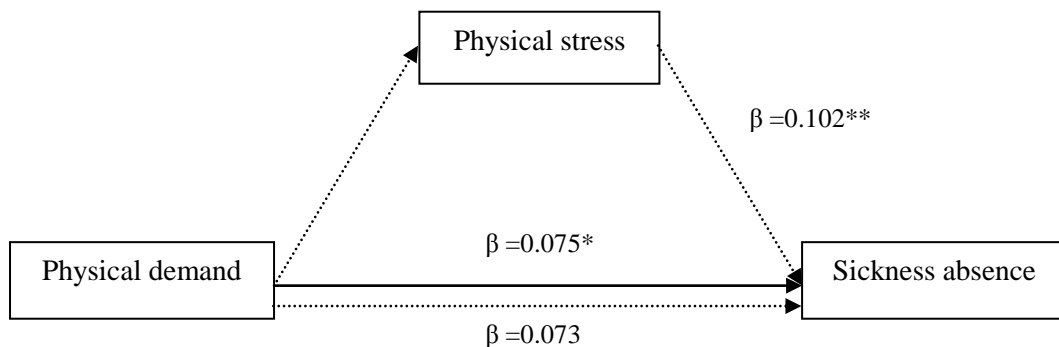
The results in Table 4.16 indicate that physical demand was significantly related to physical stress ($\beta=0.096$, $p<0.01$) and sickness absence ($\beta=0.075$, $p<0.05$); and physical stress was also significantly related to sickness absence ($\beta=0.102$, $p<0.01$). However, when the physical stress intervened, the relationship between physical demand and sickness absence became insignificant. This showed that physical stress fully mediated the relationship between physical demand and sickness absence. In addition, Figure 4.2 demonstrates that the beta coefficient (0.073) between physical demand and sickness absence reduced in absolute size in the presence of physical stress. This beta coefficient was not only smaller than the total effect between physical demand and sickness absence, but also became insignificant; this suggested full mediation of physical stress on the relationship between job demands and sickness absence.

One important point to note is about the opposing mediated effects and more complicated models of mediation. In the mediation analysis results as shown in Table 4.16, for the overall model observed from F, F-change for physical demand to physical stress (X-M), and physical stress to sickness absence (M-Y) were significant. For direct effect of physical demand to sickness absence, the overall model observed from F was significant but the F-change was not significant. MacKinnon *et al.* (2007) argued that overall relations may not be statistically significant, yet mediation may still exist in a research study because the opposing mediated effects could counteract each other resulting in a non-significant X to Y relation in mediation analysis.

Table 4.16
Multiple Regression Results Using Physical Stress as Mediator on the Relationship between Job Demands and Sickness Absence

Predictor	Std. β X \rightarrow M	Std. β M \rightarrow Y	Std. β X \rightarrow Y	Std. β X \rightarrow M \rightarrow Y
X = Job demands				
Physical demand	.096**	.102**	.075*	.073
Role ambiguity	.084*		-.028	-.030
Role conflict	.013		.032	.032
Job scope	.096**		.016	.013
Emotional demand	.097**		-.040	-.042
Job complexity	.056		-.084*	-.085*
Workload	.094**		-.031	-.034
M = Physical stress				
				.024
R ²	.088	.024	.018	.019
Adjusted R ²	.081	.019	.010	.010
R ² change	.077	.015	.010	.010
F	11.704**	4.442**	2.227*	2.062*
F-change	13.087**	4.273**	1.509*	1.393

Note: *p<.05, **p<.01; X = Job demands; M = Physical stress; Y= Sickness absence



Note: **p<0.01; —————> direct effect;> mediating effect

Figure 4.2
Mediating Effect of Physical Stress on the Relationship between Physical Demand and Sickness Absence

To further confirm the mediation effect of the research model, MacKinnon, Lockwood, Hoffman, West & Sheets (2002) suggested the use of Sobel test. This test was first proposed by Sobel (1982), which uses standard errors and unstandardised regression coefficients of path A and path B as input parameter estimates. MacKinnon, Warsi and Dwyer (1995) claimed that Sobel test is a conservative

method and it works well for large sample (Preacher & Hayes, 2004). The use of the Sobel test in this study was adopted from interaction calculation tool taken from Preacher and Leonardelli's (2003) online website for mediation test. In Table 4.17, the calculation results showed three versions of Sobel test as suggested by Baron and Kenny (1986); MacKinnon *et al.* (1995); Sobel (1982) and Goodman (1960). The test statistics for mediating effect of physical stress on the relationship between physical demand and sickness absence reported from Sobel test (2.02973673, $p < 0.05$), Aroian test (1.9719393, $p < 0.05$) and Goodman test (2.09293362, $p < 0.05$) (Table 4.17), were all found to be significant, thus providing evidence for mediation.

Table 4.17
The Sobel, Aroian and Goodman Test of Physical Stress as a Mediator on the Relationship between Physical Demand and Sickness Absence

Parameter	Input	Tests	Test Statistics	p-value
A	0.096	Sobel Test	2.02973673	0.042
B	0.430	Aroian Test	1.9719393	0.049
S _A	0.031	Goodman Test	2.09293362	0.036
S _B	0.160			

Note: A=unstandardized regression coefficient (IV- M); B= unstandardized regression coefficient (M-DV)
S_A= standard error of A; S_B= standard error of B

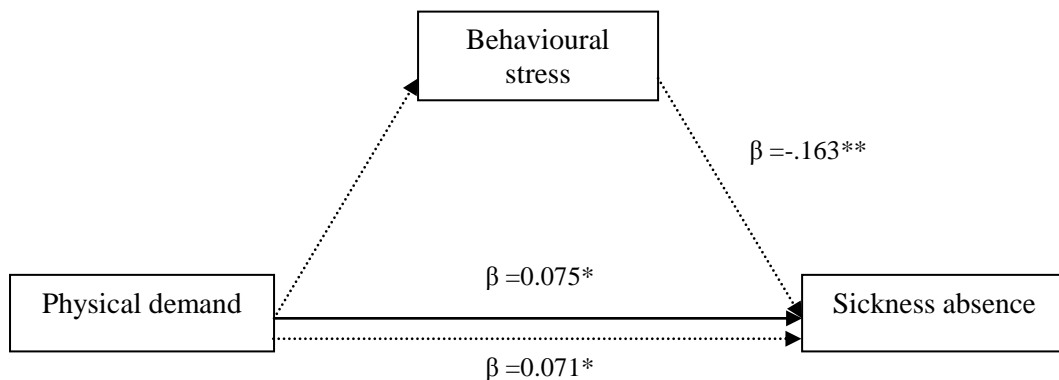
From the regression results as shown in Table 4.18, there was a significant relationship between physical demand and behavioural stress ($\beta = 0.111$, $p < 0.01$) and sickness absence ($\beta = 0.075$, $p < 0.05$); there was also a significant relationship between behavioural stress and sickness absence ($\beta = -.163$, $p < 0.01$). However, in the presence of behavioural stress, the relationship between physical demand and sickness absence became significant ($\beta = 0.071$, $p < 0.05$); thus implying partial mediation. Besides the

beta coefficient value (as showed in Figure 4.3) between physical demand and sickness absence in the presence of behavioural stress was significant and, became smaller in comparison with the beta coefficient between physical demand and sickness absence. This suggests behavioural stress partially mediated the relationship between physical demand and sickness absence.

Table 4.18
Multiple Regression Results Using Behavioural Stress as Mediator on the Relationship between Job Demands and Sickness Absence

Predictor	Std. β X→M	Std. β M→Y	Std. β X→Y	Std. β X→M→Y
X = Job demands				
Physical demand	.111**	-.163**	.075*	.071*
Role ambiguity	.137**		-.028	-.016
Role conflict	.051		.032	.036
Job scope	.059		.016	.021
Emotional demand	.030		-.040	-.038
Job complexity	.085*		-.084*	-.076*
Workload	.119**		-.031	-.021
M = Behavioural stress				
				-.086**
R ²	.095	.024	.018	.025
Adjusted R ²	.088	.019	.010	.016
R ² change	.088	.015	.010	.016
F	12.680**	4.442**	2.227*	2.757**
F-change	15.083**	4.273**	1.509*	2.254*

Note: *p<.05, **p<.01; X = Physical demand; M = Behavioural stress; Y= Sickness absence



Note: **p<0.01; —————> direct effect;> mediating effect

Figure 4.3
Mediating Effect of Behavioural Stress on the Relationship between Physical Demand and Sickness Absence

To further support the mediation results from multiple regression analysis, three types of Sobel test were carried out; the results of the tests as shown in Table 4.19 reported that the test statistics for Sobel test (-2.43267485, $p < 0.05$); Aroain test (-2.38595328, $p < 0.05$) and Goodman test (-2.38595328, $p < 0.05$), were all significant and hence provided evidence for mediation effect of behavioural stress on the relationship between physical demand and sickness absence.

Table 4.19
The Sobel, Aroian and Goodman Test of Behavioural Stress as a Mediator on the Relationship between Physical Demand and Sickness Absence

Parameter	Input	Tests	Test Statistics	p-value
A	0.115	Sobel Test	-2.43167485	0.015
B	-0.674	Aroian Test	-2.38595328	0.017
S _A	0.038	Goodman Test	-2.38595328	0.013
S _B	0.165			

Note: A=unstandardized regression coefficient (IV- M); B= unstandardized regression coefficient (M-DV)
S_A= standard error of A; S_B= standard error of B

The results of hierarchical regression analysis as shown in Table 4.18 also demonstrated mediating effect of behavioural stress on the relationship between job complexity and sickness absence. The results depicted that job complexity was significantly related to behavioural stress ($\beta = .085$, $p < 0.01$) and sickness absence ($\beta = -.084$, $p < 0.05$). Behavioural stress was also significantly related to sickness absence ($\beta = -.163$, $p < 0.01$). However, in the presence of behavioural stress as mediator, the relationship between job complexity and sickness absence became significant ($\beta = .076$, $p < 0.05$); thus implying partial mediation. In addition, Figure 4.4 shows the negative significant relationship between job complexity and sickness absence, with beta coefficient of $-.084$. However, the beta coefficient value became smaller and

significant with beta coefficient value of -0.076, once behavioural stress intervened. Therefore, this denotes that behavioural stress partially mediated the relationship between job complexity and sickness absence.

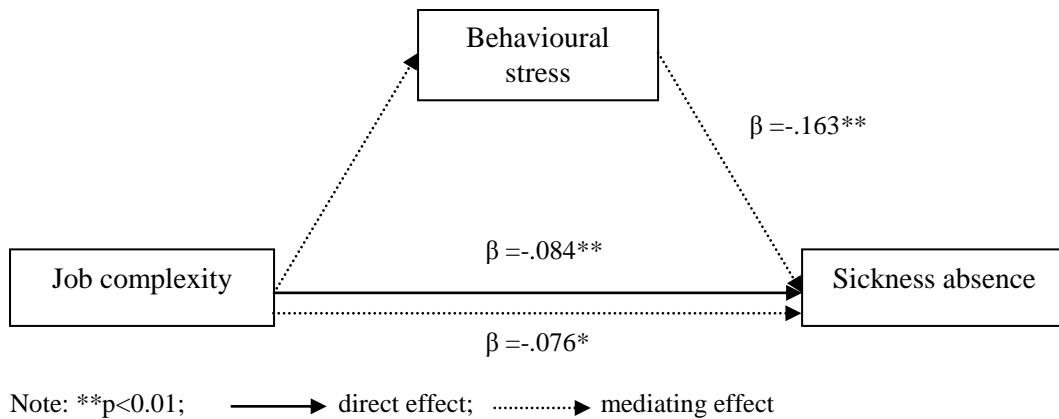


Figure 4.4
Mediating Effect of Behavioural Stress on the Relationship between Job Complexity and Sickness Absence

To further reinforce the presence of mediation from multiple regression analysis results, three types of Sobel test were conducted. From the results as in Table 4.20 below, the test statistics reported for Sobel test (-1.99025381, $p < 0.05$); Aroian test (-1.94627487, $p < 0.05$) and Goodman test (-2.03735545, $p < 0.05$) were all significant and hence supported the evidence of mediation of behavioural stress on the relationship between job complexity and sickness absence.

Table 4.20

The Sobel, Aroian and Goodman Test of Behavioural Stress as a Mediator on the Relationship between Job Complexity and Sickness Absence

Parameter	Input	Tests	Test Statistics	p-value
A	0.098	Sobel Test	-1.99025381	0.046
B	-0.674	Aroian Test	-1.94627487	0.042
S _A	0.043	Goodman Test	-2.03735545	0.042
S _B	0.165			

Note: A=unstandardized regression coefficient (IV- M); B= unstandardized regression coefficient (M-DV)

S_A= standard error of A; S_B= standard error of B

4.11.2 The Mediation Effects of Job Stress on the Relationship between Job Resources and Sickness Absence

The mediating effect of job stress on the relationship between job resources and sickness absence as postulated in hypothesis 7 was examined using criteria and steps as suggested by Baron and Kenny (1986). From the previous section, whereby the hierarchical regression analysis was performed, the results (Table 4.11, Table 4.13 and Table 4.14) found that only physical stress and behavioural stress emerged from job stress as the key dimensions to be considered as mediator, thus fulfilling the criteria of the causal step approach by Baron and Kenny (2006). Since these two dimensions of job stress acted as mediators, further examination was necessary to see which dimensions of job resources would be the key independent variables in the mediation analysis. Table 4.21 showed the tabulated results of checking for eligibility of job stress dimensions for mediation analysis between job resources dimensions and sickness absence, and the results revealed that job feedback was the only dimension of job resources that related significantly to physical stress ($\beta=-.121$, $p<0.01$) and

sickness absence ($\beta=.052$, $p<0.05$). Therefore, job feedback was included as key dimension of job resources in the mediation analysis, in which physical stress acted as mediator. Co-worker support was excluded from mediation analysis because, even though it was related significantly with physical stress ($\beta=-.128$, $p<0.01$), however its relationship with sickness absence was not significant. Further examination of the results (Table 4.21) also revealed that when behavioural stress was a mediator, job feedback was the only job resources dimension that met the criteria to be the independent variable in the mediation analysis, because job feedback related significantly to behavioural stress ($\beta=-.188$, $p<0.01$) and sickness absence ($\beta=.052$, $p<0.05$). Hence, job feedback was included again in the mediation analysis, which allowed behavioural stress to act as mediator on the relationship between job feedback and sickness absence. The mediation analysis results are further discussed in the subsequent section.

Table 4.21
Checking for Eligibility of Job Stress Dimensions for Mediation Test between Job Resources Dimensions and Sickness Absence

IV- Job Resources	Mediator- Job Stress	DV- Sickness Absence	IV→M Beta	M→DV Beta	IV→DV Beta	IV→M→DV Beta	Remarks
se	Phy str	SA	-0.008	.102**	.048	jf→phystr→ SA	Qualify for mediation test
ss			-0.056	.	-0.028		
tc			.037		.005		
cws			-.128**		-0.048		
aut			.010		-0.017		
jf			-.121**		.052*	Test for mediation	
se	Emot str	SA	-.310**	.003	.048	Did not qualify for mediation test	M-DV-ns
ss			.016		-0.028		
tc			-0.055		.005		
cws			-.062*		-0.048		
aut			-0.028		-0.017		
jf			-.110**		.052*		
se	Psych str	SA	-0.017	.035	.048	Did not qualify for mediation test	M-DV-ns
ss			-0.057		-0.028		
tc			-0.068		.005		
cws			-.071*		-0.048		
aut			.163**		-0.017		

Table 4.21 (Continued)

jf			-.169**		.052*			
se	Behav str	SA	-.069	-.163**	.048	jf→behav	Qualify	for
ss			-.048		-.028	st→SA	mediation	
tc			.026		.005	Test for	test	
cws			-.157**		-.048	mediation		
aut			.086*		-.017			
jf			-.188**		.052*			

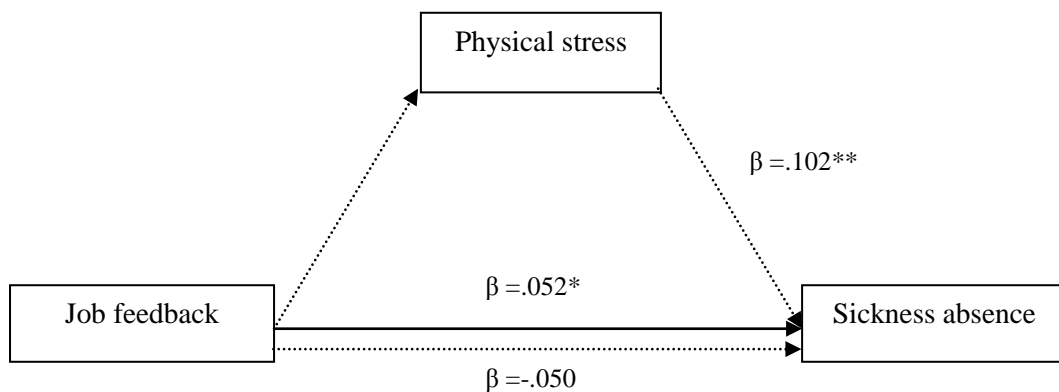
*p<0.05, **p<0.01; IV=independent variable; M=mediator; DV=dependent variable; se=self efficacy; ss= supervisor support; tc=task/time control; cws= co-worker support; aut= autonomy; jf= job feedback; phy str=physical stress; emot str=emotional stress; psych str=psychological stress; behav str=behavioural stress; SA=Sickness Absence; ns=no significant.

Two sets of hierarchical regression analysis were performed using physical stress and behavioural stress as mediators. The regression results which used physical stress as mediator is shown in Table 4.22 as follows: Job feedback was significantly related to physical stress ($\beta=-.121$, $p<0.01$) and sickness absence ($\beta=.052$, $p<0.05$). Physical stress was also related significantly to sickness absence ($\beta=.102$, $p<0.01$). With all these significant relationships between independent variable and mediator; between independent variable and dependent variable; and between mediator and dependent variable, the conditions of causal step approach, as suggested by Baron and Kenny (1986), were fulfilled. Therefore, mediation analysis was performed using physical stress as mediator on the relationship between job feedback and sickness absence. As shown in Table 4.22 below, in the presence of physical stress as mediator, the beta coefficient shrunk from 0.052 to 0.050 and became insignificant. To reinforce the explanation, Figure 4.5 depicts clearly that the beta coefficient value had decreased by 0.02 and rendered the relationship between job feedback and sickness absence insignificant, thus implying full mediation. Therefore, from this set of hierarchical regression analysis results, physical stress was found to fully mediate the relationship between job feedback and sickness absence.

Table 4.22
Multiple Regression Results Using Physical Stress as Mediator on the Relationship between Job Resources and Sickness Absence

Predictor	Std. β X→M	Std. β M→Y	Std. β X→Y	Std. β X→M→Y
X = Job Resources				
Self efficacy	-.008	.102**	.048	.048
Supervisor support	-.056		-.028	-.027
Task/Time control	.037		.005	.005
Co-worker support	-.128**		-.048	-.046
Autonomy	.010		-.017	-.017
Job feedback	-.121**		.052*	.050
M = Physical stress				
				.012
R ²	.057	.024	.015	.015
Adjusted R ²	.050	.019	.008	.007
R ² change	.045	.015	.007	.007
F	8.192**	4.442**	2.114*	1.895*
F-change	8.710**	4.273**	1.243	1.086

Note: *p<.05, **p<.01; X = Job resources; M = Physical stress; Y= Sickness absence



Note: **p<0.01; *p<0.05 \longrightarrow direct effect; $\cdots\cdots\longrightarrow$ mediating effect

Figure 4.5
Mediating Effect of Physical Stress on the Relationship between Job Feedback and Sickness Absence

To further affirm the presence of mediation from the results of multiple regression analysis, three types of Sobel test were performed. From the results in Table 4.23 as shown below, the test statistics for Sobel test (-2.23789142, p<0.05); Aroain test (-2.19134117, p<0.05) and Goodman test (-2.28754013, p<0.05) were all

found to be significant, thus providing evidence of mediating effect of physical stress on the relationship between job feedback and sickness absence.

Table 4.23
The Sobel, Aroian and Goodman Test of Physical Stress as a Mediator on the Relationship between Job Feedback and Sickness Absence

Parameter	Input	Tests	Test Statistics	p-value
A	-0.144	Sobel Test	-2.23789142	0.025
B	0.432	Aroian Test	-2.19134117	0.028
S _A	0.036	Goodman Test	-2.28754013	0.022
S _B	0.160			

Note: A=unstandardized regression coefficient (IV- M); B= unstandardized regression coefficient (M-DV)
S_A= standard error of A; S_B= standard error of B

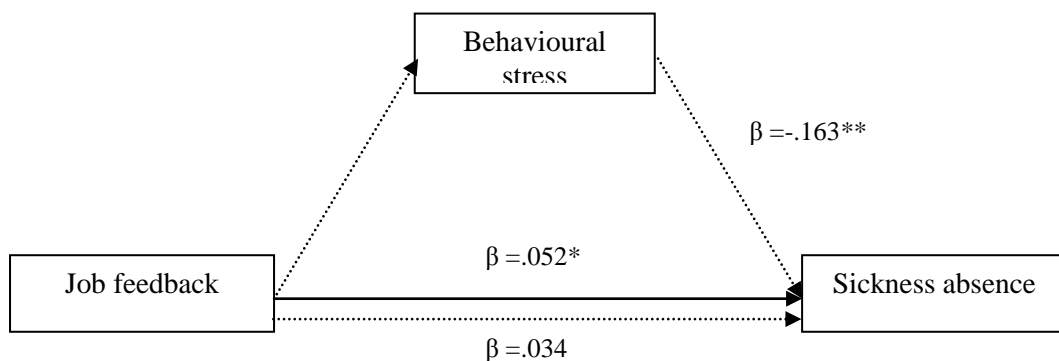
The last set of hierarchical regression analysis was performed using behavioural stress as mediator on the relationship between job feedback and sickness absence. As shown in Table 4.24, job feedback was significantly related to behavioural stress ($\beta=-0.188$, $p<0.01$) and sickness absence ($\beta=0.052$, $p<0.05$). Behavioural stress was related significantly to sickness absence ($\beta=-0.163$, $p<0.01$). These significant relationships, as mentioned above, met the criteria in causal step approach as suggested as Baron and Kenny (1986) to perform mediation analysis. The results of multiple regression in mediation analysis as depicted in Table 4.24 show that the value of beta coefficient had shrunk when behavioural stress set in as mediator in the relationship between job feedback and sickness absence. To substantiate further the evidence of mediation, Figure 4.6 shows the beta coefficient had decreased by 0.018 from 0.052 to 0.034, rendering the relationship between job feedback and sickness absence insignificant. Therefore, from this hierarchical

regression analysis results, it is clearly shown that behavioural stress fully mediated the relationship between job feedback and sickness absence.

Table 4.24
Multiple Regression Results Using Behavioural Stress as Mediator on the Relationship between Job Resources and Sickness Absence

Predictor	Std. β X \rightarrow M	Std. β M \rightarrow Y	Std. β X \rightarrow Y	Std. β X \rightarrow M \rightarrow Y
X = Job Resources				
Self efficacy	-.069	-.163**	.048	.042
Supervisor support	-.048		-.028	-.032
Task/Time control	.026		.005	.007
Co-worker support	-.157**		-.048	-.063
Autonomy	.086*		-.017	-.009
Job feedback	-.188**		.052*	.034
M = Behavioral stress				-.094**
R ²	.086	.024	.015	.023
Adjusted R ²	.079	.019	.008	.015
R ² change	.079	.015	.007	.015
F	12.754**	4.442**	2.114*	2.880**
F-change	15.596**	4.273**	1.243	2.342*

Note: *p<.05, **p<.01; X = Job resources; M = Behavioural stress; Y= Sickness absence



Note: **p<0.01; *p<0.05 \longrightarrow direct effect; $\cdots\cdots\cdots\longrightarrow$ mediating effect

Figure 4.6
Mediating Effect of Behavioural Stress on the Relationship between Job Feedback and Sickness Absence

To further provide support for mediation of behavioural stress on the relationship between job feedback and sickness absence from the results of multiple

regression analysis carried out, three types of Sobel test were conducted. The results of the test analysis are shown in Table 4.25 below, with test statistics for Sobel test (3.43717682, $p < 0.01$); Aroain test (3.40749411, $p < 0.01$) and Goodman test (3.46764899, $p < 0.01$) all found significant, thus providing evidence of mediation by behavioural stress on the relationship between job feedback and sickness absence.

Table 4.25

The Sobel, Aroian and Goodman Test of Behavioural Stress as a Mediator on the Relationship between Job Feedback and Sickness Absence

Parameter	Input Value	Tests	Test Statistics	p-value
A	-0.229	Sobel Test	3.43717682	0.000
B	-0.674	Aroian Test	3.40749411	0.000
S _A	0.036	Goodman Test	3.46764899	0.000
S _B	0.165			

Note: A=unstandardized regression coefficient (IV- M); B= unstandardized regression coefficient (M-DV)

S_A= standard error of A; S_B= standard error of B

4.12 A Summary Results of Hypotheses Testing

4.12.1 Job Demands and Sickness Absence

The following Table 4.26a depicts a summary of the hypotheses testing on the relationship between job demands and sickness absence. The results indicated some hypotheses were supported while some found no empirical support.

Table 4.26a
Summary of Hypotheses Testing for Job Demands and Sickness Absence

Hypothesis	Statement	Finding
H1	Job demands is positively related to sickness absence	Partially supported
H1a	Workload is positively related to sickness absence	Not supported
H1b	Physical demand is positively related to sickness absence	Supported
H1c	Emotional demand is positively related to sickness absence	Not supported
H1d	Job scope is positively related to sickness absence	Not supported
H1e	Role ambiguity is positively related to sickness absence	Not supported
H1f	Role conflict is positively related to sickness absence	Not supported
H1g	Job complexity is positively related to sickness absence	Supported but in opposite direction

4.12.2 Job Resources and Sickness Absence

The Table 4.26b below summarises the hypotheses testing on the relationship between job resources and sickness absence. The results provided partial support to job resources-sickness absence relationship.

Table 4.26b
Summary of Hypotheses Testing for Job Resources and Sickness Absence

Hypothesis	Statement	Finding
H2	Job resources is negatively related to sickness absence	Partially supported
H2a	Supervisor support is negatively related to sickness absence	Not supported
H2b	Co-worker support is negatively related to sickness absence	Not supported
H2c	Autonomy is negatively related to sickness absence	Not supported
H2d	Job feedback is negatively related to sickness absence	Supported but in opposite direction
H2e	Task/Time control is negatively related to sickness absence	Not supported
H2f	Self efficacy is negatively related to sickness absence	Not supported

4.12.3 Job Demands and Job Stress

The results of the hypotheses testing on the relationship between job demands and job stress are summarised in Table 4.26c below. Some of the hypotheses were supported while other hypotheses indicated no significant relationship.

Table 4.26c
Summary of Hypotheses Testing for Job Demands and Job Stress

Hypothesis	Statement	Finding
H3	Job demands is positively related to job stress	Partially Supported
H3a	Workload is positively related to job stress.	Supported
H3a(i)	Workload is positively related to physical stress	Supported
H3a(ii)	Workload is positively related to emotional stress	Supported
H3a(iii)	Workload is positively related to psychological stress	Supported
H3a(iv)	Workload is positively related to behavioral stress	Supported
H3b	Physical demand is positively related to job stress	Partially Supported
H3b(i)	Physical demand is positively related to physical stress	Supported
H3b(ii)	Physical demand is positively related to emotional stress	Not supported
H3b(iii)	Physical demand is positively related to psychological stress	Not supported
H3b(iv)	Physical demand is positively related to behavioral stress	Supported
H3c	Emotional demand is positively related to job stress	Partially Supported
H3c(i)	Emotional demand is positively related to physical stress	Supported
H3c(ii)	Emotional demand is positively related to emotional stress	Not supported
H3c(iii)	Emotional demand is positively related to psychological stress	Not supported
H3c(iv)	Emotional demand is positively related to behavioral stress	Not supported
H3d	Job scope is positively related to job stress	Partially Supported
H3d(i)	Job scope is positively related to physical stress	Supported
H3d(ii)	Job scope is positively related to emotional stress	Not supported
H3d(iii)	Job scope is positively related to psychological stress	Not supported
H3d(iv)	Job scope is positively related to behavioral stress	Not supported
H3e	Role ambiguity is positively related to job stress	Supported

Table 4.26c (Continued)

H3e(i)	Role ambiguity is positively related to physical stress	Supported
H3e(ii)	Role ambiguity is positively related to emotional stress	Supported
H3e(iii)	Role ambiguity is positively related to psychological stress	Not supported
H3e(iv)	Role ambiguity is positively related to behavioral stress	Supported
H3f	Role conflict is positively related to job stress	Not supported
H3f(i)	Role conflict is positively related to physical stress	Not supported
H3f(ii)	Role conflict is positively related to emotional stress	Not supported
H3f(iii)	Role conflict is positively related to psychological stress	Not supported
H3f(iv)	Role conflict is positively related to behavioral stress	Not supported
H3g	Job complexity is positively related to job stress	Partially Supported
H3g(i)	Job complexity is positively related to physical stress	Not supported
H3g(ii)	Job complexity is positively related to emotional stress	Not supported
H3g(iii)	Job complexity is positively related to psychological stress	Not supported
H3g(iv)	Job complexity is positively related to behavioral stress	Supported

4.12.4 Job Resources and Job Stress

Table 4.26d below provides summary of hypotheses testing on the relationship between job resources and job stress. The findings indicated some hypotheses were supported while some found no significant relationship.

Table 4.26d
Summary of Hypotheses Testing for Job Resources and Job Stress

Hypothesis	Statement	Finding
H4	Job resources is negatively related to job stress	Partially Supported
H4a	Supervisor support is negatively related to job stress	Not supported
H4a(i)	Supervisor support is negatively related to physical stress	Not supported
H4a(ii)	Supervisor support is negatively related to emotional stress	Not supported
H4a(iii)	Supervisor support is negatively related to psychological stress	Not supported
H4a(iv)	Supervisor support is negatively related to behavioral stress	Not supported

Table 4.26d (Continued)

H4b	Co-worker support is negatively related to job stress	Supported
H4b(i)	Co-worker support is negatively related to physical stress	Supported
H4b(ii)	Co-worker support is negatively related to emotional stress	Supported
H4b(iii)	Co-worker support is negatively related to psychological stress	Supported
H4b(iv)	Co-worker support is negatively related to behavioral stress	Supported
H4c	Autonomy is negatively related to job stress	Partially Supported
H4c(i)	Autonomy is negatively related to physical stress	Not supported
H4c(ii)	Autonomy is negatively related to emotional stress	Not supported
H4c(iii)	Autonomy is negatively related to psychological stress	Supported but in opposite direction
H4c(iv)	Autonomy is negatively related to behavioral stress	Supported but in opposite direction
H4d	Job feedback is negatively related to job stress	Supported
H4d(i)	Job feedback is negatively related to physical stress	Supported
H4d(ii)	Job feedback is negatively related to emotional stress	Supported
H4d(iii)	Job feedback is negatively related to psychological stress	Supported
H4d(iv)	Job feedback is negatively related to behavioral stress	Supported
H4e	Task/Time control is negatively related to job stress	Not supported
H4e(i)	Task/Time control is negatively related to physical stress	Not supported
H4e(ii)	Task/Time control is negatively related to emotional stress	Not supported
H4e(iii)	Task/Time control is negatively related to psychological stress	Not supported
H4e(iv)	Task/Time control is negatively related to behavioral stress	Not supported
H4f	Self efficacy is negatively related to job stress	Partially Supported
H4f(i)	Self efficacy is negatively related to physical stress	Supported
H4f(ii)	Self efficacy is negatively related to emotional stress	Not supported
H4f(iii)	Self efficacy is negatively related to psychological stress	Not supported
H4f(iv)	Self efficacy is negatively related to behavioral stress	Supported

4.12.5 Job Stress and Sickness Absence

The results of the hypotheses testing on the relationship between job stress and sickness absence were tabulated as in Table 4.26e. The findings revealed that some hypotheses were supported while some showed insignificant relationship.

Table 4.26e
Summary of Hypotheses Testing for Job Stress and Sickness Absence

Hypothesis	Statement	Finding
H5	Job stress is positively related to sickness absence	Partially Supported
H5a	Physical stress is positively related to sickness absence	Supported
H5b	Emotional stress is positively related to sickness absence	Not supported
H5c	Psychological stress is positively related to sickness absence	Not supported
H5d	Behavioral stress is positively related to sickness absence	Supported but in opposite direction

4.12.6 Mediating Effect of Job Stress on Job Demands-Sickness Absence Relationship

The following Table 4.26f shows the results of hypothesis testing on the mediating effect of job stress on the relationship between job demands and sickness absence. Overall, the findings provided partial support to the mediating effect of job stress on job demands-sickness absence relationship. The results revealed that some hypotheses were supported and some reported no significant relationship.

Table 4.26f
Summary of Hypotheses Testing for the Mediating Effect of Job Stress on Job Demands-Sickness Absence Relationship

Hypothesis	Statement	Finding
H6	Job stress mediates the relationship between job demands and sickness absence	Partially supported
H6a	Physical stress mediates the relationship between job demands and sickness absence	Partially supported
H6a(i)	Physical stress mediates the relationship between workload and sickness absence	Not supported
H6a(ii)	Physical stress mediates the relationship between physical demand and sickness absence	Supported
H6a(iii)	Physical stress mediates the relationship between emotional demand and sickness absence	Not supported
H6a(iv)	Physical stress mediates the relationship between job scope and sickness absence	Not supported

Table 4.26f (Continue)

H6a(v)	Physical stress mediates the relationship between role ambiguity and sickness absence	Not supported
H6a(vi)	Physical stress mediates the relationship between role conflict and sickness absence	Not supported
H6a(vii)	Physical stress mediates the relationship between job complexity and sickness absence	Not supported
H6b	Emotional stress mediates the relationship between job demands and sickness absence	Not supported
H6b(i)	Emotional stress mediates the relationship between workload and sickness absence	Not supported
H6b(ii)	Emotional stress mediates the relationship between physical demand and sickness absence	Not supported
H6b(iii)	Emotional stress mediates the relationship between emotional demand and sickness absence	Not supported
H6b(iv)	Emotional stress mediates the relationship between job scope and sickness absence	Not supported
H6b(v)	Emotional stress mediates the relationship between role ambiguity and sickness absence	Not supported
H6b(vi)	Emotional stress mediates the relationship between role conflict and sickness absence	Not supported
H6b(vii)	Emotional stress mediates the relationship between job complexity and sickness absence	Not supported
H6c	Psychological stress mediates the relationship between job demands and sickness absence	Not supported
H6c(i)	Psychological stress mediates the relationship between workload and sickness absence	Not supported
H6c(ii)	Psychological stress mediates the relationship between physical demand and sickness absence	Not supported
H6c(iii)	Psychological stress mediates the relationship between emotional demand and sickness absence	Not supported
H6c(iv)	Psychological stress mediates the relationship between job scope and sickness absence	Not supported
H6c(v)	Psychological stress mediates the relationship between role ambiguity and sickness absence	Not supported
H6c(vi)	Psychological stress mediates the relationship between role conflict and sickness absence	Not supported
H6c(vii)	Psychological stress mediates the relationship between job complexity and sickness absence	Not supported
H6d	Behavioural stress mediates the relationship between job demands and sickness absence	Partially supported
H6d(i)	Behavioural stress mediates the relationship between workload and sickness absence	Not supported
H6d(ii)	Behavioural stress mediates the relationship between physical demand and sickness absence	Supported
H6d(iii)	Behavioural stress mediates the relationship between emotional demand and sickness absence	Not supported
H6d(iv)	Behavioural stress mediates the relationship between job scope and sickness absence	Not supported
H6d(v)	Behavioural stress mediates the relationship between role ambiguity and sickness absence	Not supported
H6d(vi)	Behavioural stress mediates the relationship between role conflict and sickness absence	Not supported
H6d(vii)	Behavioural stress mediates the relationship between job complexity and sickness absence	Supported

4.12.7 Mediating Effect of Job Stress on Job Resources-Sickness Absence Relationship

The following Table 4.26g summarises the hypothesis testing on the mediating effect of job stress on the relationship between job resources and sickness absence. Overall, the results provided partial support to the mediating effect of job stress on job resources-sickness absence relationship. The results indicated some hypotheses were supported and for some hypotheses, the findings were not significant.

Table 4.26g
Summary of Hypotheses Testing for the Mediating Effect of Job Stress on Job Resources-Sickness Absence Relationship

Hypothesis	Statement	Finding
H7	Job stress mediates the relationship between job resources and sickness absence	Partially supported
H7a	Physical stress mediates the relationship between job resources and sickness absence	Partially supported
H7a(i)	Physical stress mediates the relationship between supervisor support and sickness absence	Not supported
H7a(ii)	Physical stress mediates the relationship between co-worker support and sickness absence	Not supported
H7a(iii)	Physical stress mediates the relationship between autonomy and sickness absence	Not supported
H7a(iv)	Physical stress mediates the relationship between job feedback and sickness absence	Supported
H7a(v)	Physical stress mediates the relationship between task/time control and sickness absence	Not supported
H7a(vi)	Physical stress mediates the relationship between self-efficacy and sickness absence	Not supported
H7b	Emotional stress mediates the relationship between job resources and sickness absence	Not supported
H7b(i)	Emotional stress mediates the relationship between supervisor support and sickness absence	Not supported
H7b(ii)	Emotional stress mediates the relationship between co-worker support and sickness absence	Not supported
H7b(iii)	Emotional stress mediates the relationship between autonomy and sickness absence	Not supported
H7b(iv)	Emotional stress mediates the relationship between job feedback and sickness absence	Not supported
H7b(v)	Emotional stress mediates the relationship between task/time control and sickness absence	Not supported
H7b(vi)	Emotional stress mediates the relationship between self-efficacy and sickness absence	Not supported

Table 4.26g (Continued)

H7c	Psychological stress mediates the relationship between job resources and sickness absence	Not supported
H7c(i)	Psychological stress mediates the relationship between supervisor support and sickness absence	Not supported
H7c(ii)	Psychological stress mediates the relationship between co-worker support and sickness absence	Not supported
H7c(iii)	Psychological stress mediates the relationship between autonomy and sickness absence	Not supported
H7c(iv)	Psychological stress mediates the relationship between job feedback and sickness absence	Not supported
H7c(v)	Psychological stress mediates the relationship between task/time control and sickness absence	Not supported
H7c(vi)	Psychological stress mediates the relationship between self-efficacy and sickness absence	Not supported
H7d	Behavioural stress mediates the relationship between job resources and sickness absence	Partially supported
H7d(i)	Behavioural stress mediates the relationship between supervisor support and sickness absence	Not supported
H7d(ii)	Behavioural stress mediates the relationship between co-worker support and sickness absence	Not supported
H7d(iii)	Behavioural stress mediates the relationship between autonomy and sickness absence	Not supported
H7d(iv)	Behavioural stress mediates the relationship between job feedback and sickness absence	Supported
H7d(v)	Behavioural stress mediates the relationship between task/time control and sickness absence	Not supported
H7d(vi)	Behavioural stress mediates the relationship between self-efficacy and sickness absence	Not supported

4.13 Summary

Generally, this chapter presents in detail the results of all the statistical analyses that were conducted in this study. The analyses used include frequency, descriptive statistics, factor analysis and hierarchical multiple regression analyses. As noted from the results of factors analysis of job demands, job resources and job stress, the dimensions extracted are consistent with previous studies in other international contexts. The general picture is that the sickness absence levels and sickness absence costs estimated in this study are moderate as compared to local and international context. The results revealed that physical demand and job complexity dimensions of job demands exhibit significant influence on sickness absence. In a similar vein, job

feedback is the only job resources dimension that is related to sickness absence. The results revealed that workload and role ambiguity are the main job stressors, while co-worker support and job feedback are significant buffers for job stress. It was also found that job stress, specifically physical stress and behavioural stress, exerted more significant effects on sickness absence. The mediation analyses provided support to the mediating role of job stress on the relationship between job demands and job resources on sickness absence. Overall, the findings indicated that most of the hypotheses were partially supported. The discussions related to the research findings are presented in the next chapter.

CHAPTER FIVE

DISCUSSIONS AND CONCLUSION

5.1 Introduction

This chapter recapitulates in an orderly manner the findings presented in chapter four. Attempts are made to discuss the results of hypothesis testing based on the research objectives. Subsequently, this chapter discusses the implications of the study from theoretical and managerial perspectives. Lastly, the limitations of the study and the recommendations for the future research are presented followed by the conclusion.

5.2 Discussions

The gist of discussions in this chapter is based on the research objectives stated in Chapter one. These objectives are reemphasized here to link them with the findings of the study in the discussion proper. Generally, this study examines the relationship of job demands, job resources and job stress and how these impact on sickness absence among nursing professionals in the healthcare industry. Specifically, seven sections of discussions are included in this chapter. In the first section, the focus of discussion is to examine the relationship between job demands and sickness absence. The second section touches on the relationship between job resources and sickness absence. The third section is on the relationship between job demands and job stress. The fourth section explains the relationship between job resources and job stress. The fifth section debates the relationship between job stress and sickness absence. The last

section articulates the mediating effect of job stress on the relationship between job demands, job resources and sickness absence.

5.2.1 Relationship between Job Demands and Sickness Absence

As expected, the physical demand was found to be positively related to sickness absence, while job complexity was found to be negatively associated with sickness absence. The results implied that nurses who have high job demands from physical factors, such as performing physically demanding or heavy-duty activities, overly strenuous work like lifting, handling equipment or technological devices, etc., were more prone to suffer from job stress and MSD, thus resulting in sickness absence. In terms of job complexity, the nurses engaged with demands of high job complexity were able to experience diversity, variety and challenges in the job itself, which allowed them opportunity to be competent, creative and satisfied with task assigned. The satisfied nurses had less job stress and consequently, low sickness absence.

In terms of physical demand, the results of this study corroborated the findings by Eshoj *et al.* (2001), Voss *et al.* (2001a), Roelen *et al.* (2008), van der Molen and Delleman (2006), Ariens *et al.* (2002), Frings-Dresen and Sluiter (2003), that found physical work demands contributed to MSD. This is manifested by physical and behavioural symptoms of job stress, often resulting in employee disability sick leave and sickness-related absenteeism in the workplace. Nevertheless, one study by Roelen *et al.* (2006), found the opposite that physical job demand was not significantly associated with sickness absence.

In terms of job complexity, this study was in congruence with Vaananen *et al.*'s (2003) findings that low job complexity predicted long sickness absence. In addition, the study conducted by Tummers *et al.* (2002), discovered that nurses who

worked in intensive care or critical care setting reported significantly higher job complexity and decision authority compared to their colleagues who worked in other passive units; their studies reported higher job stress. Nevertheless, they found no significant relationship between job complexity and absenteeism, which contradicted the results obtained in this study.

Surprisingly, many job demands dimensions, namely emotional demand, role ambiguity, role conflict, job scope, workload obtained in this study did not relate significantly to sickness absence. All these factors explained only 2% of the variance of sickness absence; nevertheless the model was significant. This denotes that other than the psycho-social factors, there are other factors that may influence sickness absence. In terms of emotional demand, the results of this study are contrary to previous studies (Schaufeli *et al.*, 2009; Grandey, 2000; Singh *et al.*, 1994; Cordes & Dougherty, 1993; Maslach & Pines, 1977) that supported the relationship between emotional demand and sickness absence. The insignificant relationship between emotional demand and sickness absence in this study can be explained by nurses in this study were able to cope well even nursing job has placed emotional demand on them. This emotional demand require them to work fast or to do excessive amount of work in short time frame. However it seemed that nurses have accustomed to this demanding task and treat them as a routine task for them. These hectic activities may even exceeded the normal working hours. The other aspect of mental demand is when nurses are facing conflicting demand from staff or patients, which may place pressure on nurses to decide the best option in implementation of care activities. The activities which cause emotional demand on nurses have become the norm for nurses to deal with them as part of their job responsibility, thus there will not be any much influence of mental demand on sickness absence, if nurses are able to cope and learn to grow

with demand on their tasks, unless one is really down with illness or health problem which lead them to take sick leave and stay away from workplace. In the similar vein, escalating workload in nursing did not seem to exert any influence on sickness absence. The workload has become part and parcel of job responsibilities for nurses to accomplish, whether they like it or not. The routine nursing task still has to be carried on to meet the client expectation, thus increase or decrease workload for nurses did not produce any significant relationship with sickness absence.

With regards to role ambiguity, the results of this study did not congruent with Rizzo *et al.* (1970); Jackson (1983) that found role ambiguity was related to sickness absence. In addition, the results in this study are not in agreement with previous studies (Chung & Schneider, 2002; Jackson, 1983; Rizzo *et al.*, 1970) that support the relationship between role conflict and sickness absence. The plausible reasons for the insignificant relationship between role conflict, role ambiguity and sickness absence might point to the indirect relationship that exist between role problem and sickness absence. Since both role problems arise from incongruence between expectation and requirement or unclear expectation, the nurses who encounter role conflict and role ambiguity might lead to stressful reaction and if nurses are able to cope well, they would not resort to withdrawal behaviour by absence from work. To deal with these role problems, nurses might have sought possible solution with superiors for discussion. The conflicting request from two or more people in medical and nursing field especially in dealing with patient care, nurses need to seek clarification to avoid committing any errors that may detrimental to patient health and wellbeing. Thus through this channel, nurses are able to avert from job stress and subsequently avoid from sickness absence.

In terms of job scope, the results of this study found no association between job scope and sickness absence and the findings were different from previous studies by Singh (1998), Hirschfeld *et al.* (2002), Mowday and Spencer (1981), who found a positive relationship between job scope and absenteeism. It is pertinent to point out in this study that the measurement for job scope employed only skill variety, task identity and task significance dimensions. The other dimensions, job autonomy and job feedback, were omitted because they were included as an independent job resources dimensions. The omission of these dimensions could partly explain the insignificant relationship between job scope and sickness absence. On the issue of workload, the results of this study corroborated past studies by researchers such as Tellnes *et al.* (1990), Bekker *et al.* (2005), Vingard *et al.* (2005), Voss *et al.* (2004), Rauhalaa *et al.* (2007), that found workload was positively related to sickness absence. It was also mentioned in several studies (Hegney *et al.*, 2003; McVicar, 2003; Bryant *et al.*, 2000; Cavanagh & Coffin, 1992) that workload from work overload has been the main culprit affecting the levels of employees' well-being. It is also interesting to note that some of these factors, for instance, an increase in the number of patients warded, their increased needs for care, an increase in patient acuity rates with a decrease in the length of hospital stay, relative lack of economic resources to cope with the increase in nursing workload, demands for better work productivity and increased work competition in healthcare industry, might contribute to work overloads. However, to identify more specifically which factors perhaps cause more work overload, Rauhalaa *et al.* (2007) advocated the use of RAFAELA system that could enable the monitoring of nurses-patient associated workload in relation to provision of optimum level of patient care.

5.2.2 Relationship between Job Resources and Sickness Absence

The statistical results as exhibited in Table 4.11 partially supported hypothesis 2. This study discovered that only one job resources dimension, i.e., job feedback was positively related to sickness absence. Surprisingly, the results revealed that majority of the job resources dimensions, namely supervisor support, co-worker support, task/time control, autonomy and self-efficacy were not correlated with sickness absence. These results indicated that nurses who received more job feedback were perceived to be constantly under close observation by superiors. Since nursing job involves hand-on procedures and skills to be performed on patients, constant job feedback would create job dissatisfaction as they are always being told what to do, and this affects their smooth delivery of patient care. The dissatisfaction among nurses can lead to sickness absenteeism (Harrison, Newman & Roth, 2006; Hanisch & Hulin, 1991; Steers & Rhodes, 1978).

The results in this study (see Table 4.11) did not provide any evidence of association between social support and sickness absence as demonstrated in several past studies (Rael *et al.*, 1995; Unden, 1996; Niedhammer *et al.*, 1998; Hemingway & Smith, 1999; Verhaeghe *et al.*, 2003; Melchior *et al.*, 2003; Stansfeld *et al.*, 1997; Cropanzano, Rupp, & Byrne, 2003) that found low social support resulted in higher rates of sickness absence, and in contrast, good social support helped to mitigate the effects of chronic stressors, thereby resulting in lower sickness absence rates. However the findings from this study clearly showed neither supervisor nor co-worker support helped to improve work attendance. The insignificant relationship of this finding in this study corroborated few previous studies (Bourbonnais & Mondor, 2001; Kivimaki *et al.*, 1997a). The possible reasons could be that nurses in this study

who have high physical demand and low complexity in their nursing job tend to take more sick leave. These two job demands dimensions were mitigated by the availability of job resources particularly job feedback which showed significant relationship with sickness absence. However because of the influence of physical demands was more as the nursing task involved a lot of physical movement, positioning, lifting and carrying which contribute to physical fatigue and MSD and further lead to sickness absence.

Eventhough support was provided by supervisors and co-workers, nurses perceived this assistance does help them to tie over the work stress in the short term basis. The positive encouragement and guidance also help them to learn and grow to confront the difficulty. Once nurses have build up their confidence, they gain more knowledge and experiences through more exposure to clinical skills and procedures. They will be competent in performing their nursing tasks. Thus though the stress encountered by nurses may be more, they would not resort to absent from work because of the supportive culture being inculcated in work environment to prevent them from withdrawal behaviors (Eriksen, Bruusgaard & Knardahl, 2003). Since supervisors and co-workers are also nursing professionals who are always on the toes with their daily tasks to be accomplished. Their busy schedules and hectic work activities might deter nurses who encounter work stressors from seeking helps. Hence nurses have to get adjusted to the work stressors and cope well because they should understand the importance and quality of patient care should not be compromised regardless of any situation. The other plausible reason for the insignificant relationship between social support and sickness absence might be due to continual nurse education providing to nurses through seminars and clinical discussions. This continual professional development activities are being organized regularly to keep

nurses updates in regards to clinical conditions, skills, knowledge in managing cases in different disciplines. The cumulative effort equips nurses to manage patients more effectively particularly in performing nursing procedure and might possibly dilute the supervisor and co-worker support sought by nurses. For example the use of body mechanic while moving and transferring patient to prevent from inflicting backache and muscle fatigue. The practice of standard universal precautions while nursing patients or performing nursing procedures is utmost essential to prevent nosocomial infection toward patients and nurses. This noble effort of continual professional development activities is usually conducted by doctors and nursing professionals to instil sense of responsibilities during clinical practice and thereby prevent them from falling sick and be absent form work. However, if the nurses encountered stress, the supervisors and co-workers were there to provide support, but the nurses are not motivated to learn and gain more experience and skill to keep up with the pace of the job, then the support provided will not any significant effect to improve their work performance (Vaananen *et al.*, 2003) and they might exhibit absent behaviors to cope with stress in workplace.

On the other aspect supervisor support and co-worker support provided to individuals would be effective if the individuals were motivated and able to cope and deal with the problems. If the individuals did not want to make an attempt to learn to cope and grow to achieve the work goal, the effect of supervisor and co-worker support would not be able to bring any impact. Since nursing tasks required human touch, caring attitude and tacit hand skills from individual nurses who can provide holistic care to patients, therefore the support from external parties may only help to certain extent through motivation and encouragement. However performing and providing nursing care to patients is individualised and very much dependent on

knowledge, professional skills and attitude of nurses, who have acquired them through clinical practice and work experience. In addition, supervisor support can increase employees' coping ability to deal with job stress and thus improve the job performance (Vaananen *et al.*, 2003). Whereas co-worker support enhance peer relationship and increase job satisfaction, thereby reducing sickness absence (Vaananen *et al.*, 2003). The justification provided as in previous section about supervisor and co-worker support are basically help to provide assistance to employees, however was the effect of support provided augers well for employees to acheive working goal and avert from absence from work was still dependent on individuals who want to change and and make an attempt to improve performance and work attendance.

The statistical findings from this study also showed that task/time control did not correlate with sickness absence. The results are not in agreement with previous studies (Ala-Mursula *et al.*, 2005; Ala-Mursula *et al.*, 2002; Hammar *et al.*, 1994) that found good task/time control was associated with lower absence rate. The plausible reason for this disagreement was that in nursing profession, the work process and workflow is not as flexible as other occupations, because it is under the control of supervisors. The latitude to exercise discretion in dealing with workload and work pressure are limited as the work/time schedule is always being assigned. In addition, nurses are instructed to work extra hours or cover staff shortage. Since nurses basically lack control over time and schedule allocation of tasks, it seems that nurses are quite comfortable and compliant with instructions. In addition, this action of lack of time/task control among nurses provides avenue for managers to optimally deployed staff accordingly, thus ensuring quality of care given to patients is not jeopardised.

The results in this study showed no significant effect of job autonomy on sickness absence. This result is inconsistent with previous researchers (Baard *et al.*, 2004; Vaananen *et al.*, 2003; Bond & Bunce, 2003; Spector, 1986), who found low job autonomy was associated with high sickness absence rate. The insignificant results could be that nurses resorted to taking sick leave when they are unable to work (ability to attend) and not because they are not given adequate job autonomy. In fact, nurses in hospital setting are less empowered and autonomous in terms of decision making because the patient care is strongly dictated by medical doctors (McParland, Scott, Arndt, Dassen, Gasull, & Lemonidou, 2000; Fulton, 1997). The less job autonomy by nurses will not lead them to absence from work because nurses are important member of healthcare team. Their tasks are considered pertinent and complement to a successful patient care.

In terms of self-efficacy, the findings from this study showed insignificant relationship between self-efficacy and sickness absence. This means employee with low self-efficacy did not link to his absence behavior. The findings failed to concur with past researchers (Saragih, 2011; Andrew, 1998; Chacko & Huba, 1991), who revealed relationship between self-efficacy and organizational outcome, while Bandura (1977), emphasised on the relationship between perceived self-efficacy and behavioural changes; Harvey and McMurray's (1994) study on nursing students indicated that students with a low academic self-efficacy were more likely to withdraw from a nursing course. The insignificant relationship between self-efficacy and sickness absence could be due to the fact that nurses took sick leave because they were unable to work (involuntary absence) due to ill health caused by job stress. Even though their self-efficacy was high, their belief that they have the ability or motivation

to complete a task successfully did not play an important part in influencing their decision to take sick leave in this situation.

5.2.3 Relationship between Job Demands and Job Stress

The multiple regression results (Table 4.12) partially supported hypothesis 3 (there is relationship between job demands and job stress). As expected, workload was found to be positively correlated to all the dimensions of job stress, i.e., physical stress, emotional stress, psychological stress and behavioural stress. Role ambiguity was positively correlated with three dimensions of job stress, specifically with emotional stress, behavioural stress and physical stress. Physical demand was positively correlated with two dimensions of job stress, specifically behavioural stress and physical stress. Emotional demand and job scope were positively correlated to one dimension of job stress, i.e., physical stress. Job complexity was also positively correlated with one dimension of job stress, i.e., behavioural stress. Surprisingly, role conflict was not correlated to any dimensions of job stress.

The results further indicated that nurses who have higher job demands are more likely to be predisposed to job stress, especially emotional stress, followed by physical stress, behavioural stress and psychological stress, which may ultimately lead them to taking more sick leave. Workload was the most important dimension of job demands that was significantly related to job stress. Hence, in order to reduce sickness absence because of job stress, workload should be given emphasis in work setting by management to help reduce job stress among nursing staff.

The findings of this study supported previous researchers (Leiter, 1993; Demerouti *et al.*, 2000a; Bakker & Demerouti, 2007; Bryant *et al.*, 2000; McVicar,

2003; Karasek, 1979; Armstrong *et al.*, 1996; Greenglass *et al.*, 2001; Bekker *et al.*, 2005; Leiter, 1991; Greenglass *et al.*, 2003; Greenglass *et al.*, 1998; Lee & Ashforth, 1996; Gray-Toft & Anderson, 1983; Kaufman & Beehr, 1986; Moore *et al.*, 1996; Armstrong-Stassen, 1994), on the relationship between job demands, specifically workload and job stress. Nursing task is characterised by its demanding nature, coupled with its variety, intense pacing and timing of the job, this has created job stress among nurses (Caplan *et al.*, 1975). Besides, other factors, such as high patient to nurse ratios, overtime work because of the staff shortage, and increasing patient acuity especially in high dependency and intensive wards which need close patient observation and monitoring, were highlighted by previous researchers (Aiken *et al.*, 2002; Demerouti *et al.*, 2000b; Janssen *et al.*, 1999; O'Brien-Pallas *et al.*, 2001), as important perceived workload that causes job stress.

The findings of this study are also in congruence with previous researchers (Fineman & Payne, 1981; Jackson & Schuler, 1985; Jackson, 1983), who found that employees' role ambiguity can provoke job stress when the goals of one's job or the methods of performing the job are ambiguous. Such a lack of clear direction in job engagement can be very stressful, particularly for employees who are low in their tolerance for such ambiguity; and can indirectly affect attendance at work or their intention to leave the organisation.

In terms of the effect of physical demand on job stress, the results of this study are also in agreement with several previous researchers (Holtermann *et al.*, 2010; van der Molen & Delleman, 2006; Trinkoff *et al.*, 2003; Trinkoff *et al.*, 2001; Kant *et al.*, 1992), who found physical demand from nursing job was associated with job stress because nursing job involved physical activities, such as patient lifting, maintaining working posture, position and repetitive movement during nursing work. The physical

demand from these patient handling activities can pose physical stress and contribute to MSD, as cited by several researchers (e.g. Lagerstrom *et al.*, 1998; Pope *et al.*, 2001; Engels *et al.*, 1996; Nabe-Nielsen *et al.*, 2008).

This study also showed emotional demand was related to job stress, specifically physical stress. The findings are in concurrence with previous studies (e.g. Schaufeli *et al.*, 2009; Fillon *et al.*, 2007; Lewig & Dollard, 2003; Grandey, 2000; Maslach, 1993; Van Sell *et al.*, 1981), that found jobs which needed high levels of emotional demand may result in physically stressful symptoms, and over the long run, may lead to withdrawal behaviours, such as absenteeism. Emotional demand is prevalent among HCW, especially among nurses because they have to face patient-related stressors, for instance interaction with difficult patients, frequent contact with chronically or terminally ill patients or confrontation with death and the dying. It is believed that this type of patient-related stressors may warrant increased emotional demand, and a person may experience high blood pressure and other job stress symptoms.

In terms of correlation between role conflict and job stress, quite surprisingly, the findings of this study did not seem to support the evidence provided by previous researchers (McSahne & Glinow, 2008; Barnett & Gareis, 2006; Margolis, Kroes & Quinn, 1974; French & Caplan, 1970; Kahn *et al.*, 1964), that employees who are exposed to role conflict situations may suffer from job stress. The reason could be that majority of nurses in this study were staff nurses and nursing support groups, and they were not in the organisational boundary roles that involved supervisory or managerial duties. Further, it was also argued in previous studies (Cooper & Marshall, 1978; Margolis *et al.*, 1974), that employees in supervisory or middle management category were more exposed to role conflict because of their boundary roles and therefore,

most likely to suffer from job stress. Moreover role conflict defined in this study, specifically referred to inter-role and intra-role conflict which occurs when nurses received contradictory instruction from supervisors as in performing a task or nurses were given multiple roles to carry out their tasks (Johns, 2007; Rizzo *et al.*, 1970).

The findings from this study showed job scope was positively correlated to physical stress, but not related significantly with other dimensions of job stress. The results were in agreement with two previous studies (Singh, 1998; French *et al.*, 1982) that found positively significant relationship between job scope and job stress, but not in line with Jackson and Schuler (1985) that found inverse relationship between job scope and job stress. Several previous studies had inconsistent findings regarding the relationship between job scope and job stress; thus the results from this study also differ from these previous researchers. The other reason for the inconsistencies could be that the measurements of job scope dimensions only consisted of three dimensions (i.e., skill variety, task identity and task significance) instead of five dimensions as suggested by Hackman and Oldham (1980). The other two dimensions, i.e., autonomy and feedback, were excluded in job scope measurements because they were considered as job resources dimensions and not job demands dimensions in the context of this study. Since the three dimensions used in job scope were basically job demands related to job skills, identity and significance, it is not surprising that the higher the job scope experienced by employees, the more job stress they encountered. It is recognised that the nursing job requires hand-on skills and dexterity. Hence, the mastery of clinical skill is important and significant for quality patient care. It is more demanding for nurses working in high intensive and complex units, especially in intensive care and high dependency units which demand high level of skills and

experiences. The nurses working in these areas are exposed to more job stress because of higher job scope in their tasks.

The results from this study found that job complexity was correlated with behavioural stress, and not related significantly with the other three dimensions of job stress. The results are in agreement with Tummers, Van Merode and Landeweerd (2002), who found nurses with high job complexity reported higher job stress. This was noted particularly for nurses working in intensive and high dependency wards, which required complex job variety and specific task identity. On the other hand, the results of this study are different from London and Klimoski (1975), who found job complexity was negatively related to job stress. London and Klimoski (1975) argued that job complexity has its links with job enrichment (e.g., Argyris, 1964; Katz & Kahn, 1978; Herzberg, 1966), and job complexity provides job variety and challenges and brings about motivation and job satisfaction, and hence less job stress.

In summary, the seven job demands dimensions were able to predict variance better on emotional stress and behavioural stress than physical stress and psychological stress. This clearly showed that all these job demands factors were able to provoke nurses to manifest more on emotional and behavioural symptoms of job stress and less on physical and psychological symptoms. Hence, the management should aim to provide interventional measures, such as proper job redesign, resources optimisation, social support network, occupational and rehabilitative interventional measures, etc., to help ameliorate burnout and mental exhaustion symptoms of job stress and restore well-being of the nurses.

5.2.4 Relationship between Job Resources and Job Stress

The statistical results as exhibited in Table 4.13 partially supported hypothesis 4. This study discovered that three job resources dimensions, i.e., job feedback, co-worker support and self-efficacy were negatively related to job stress. Another one dimension of job resources, i.e., autonomy was found to be positively related to job stress. Surprisingly, the results revealed that supervisor support and task/time control were not correlated to job stress. In addition, job feedback was found to be the strongest predictor of job stress, followed by co-worker support. These results further indicated that nurses who have higher job resources, particularly, job feedback, co-worker support and self-efficacy, seemed to experience less job stress than those who had lower job resources. The findings further reinforced that nurses who have higher autonomy and decision latitude in their work tended to have higher job stress.

The results of this study showed that job feedback was the strongest predictor among the job resources dimensions on job stress. In fact, job feedback correlated significantly with all dimensions of job stress, namely behavioural stress, psychological stress, physical stress and emotional stress. Out of the four dimensions of job stress, behavioural stress was the most potent dimension demonstrated by nurses on job stress. The negative correlation between job feedback and job stress indicated that nurses who received high levels of job feedback from superiors or immediate supervisors may experience less stressful symptoms. Constructive job feedback helps employees to improve their job performance and enhance interpersonal communication. In addition, it boosts their work morale and motivation to continue to keep up with the good work, and stay healthy by averting job stress (Hackman & Oldham, 1980; Kahn & Byosserie, 1992; Bakker & Demerouti, 2007).

With regards to the relationship between social support and job stress, the results of this study are consistent with past empirical researches (Kaufman & Beehr, 1986; Johnson *et al.*, 1989; Karasek & Theorell, 1990; North *et al.*, 1996), that found association between social support and job stress.

Obviously, the low social support from colleagues and supervisors contributed to higher levels of job stress. Conversely, good support from colleagues and supervisors helped to mitigate the effects of job stress, thereby resulting in less sickness absence. This study found co-worker support was significantly correlated with all dimensions of job stress, namely behavioural stress, physical stress, psychological stress and emotional stress. Out of the four dimensions of job stress, behavioural stress was the most important dimension of job stress that nurses manifested in response to social support. This signifies that the lesser the co-worker support received by nurses, the higher the behavioural responses of job stress they experienced.

The co-workers or colleagues in the work place are the closest confidantes that nurses are able to share their work-related grievances with, seek attention and instrumental support (Fillion *et al.*, 2007), and be able to make a helpful social interaction on the job concerned (Johnson *et al.*, 1989). Co-workers are peers of same rank and position who are willing to share and work together in the work setting without feelings of intimidation, compared to the support from nurse managers or supervisors. The nursing field is characterised by high mental pressure (Verhaeghe *et al.*, 2003), because working with patients causes additional work pressure, for example giving psychological support or handling possible complaints. Such types of work circumstances require social support, especially from co-workers.

From the results of this study, supervisor support was not significantly correlated with all dimensions of job stress. The possible reason was that nurses perceived that supervisors were not able to provide necessary support they need (Bradley & Cartwright, 2002). In addition for nurses that encountered difficult situation during work for instance dealing with difficult patient in the odd hour, and this situation at times required decision making. Nurses perceived supervisors were not the first to seek help on issues regarding patient care. Moreover supervisors were not always round the clock in the ward as they mostly worked on normal duty hours. Since most nurses worked shift or odd hours, they were not there for immediate assistance. Nurses perceived supervisors were not the first resource person to get help in regards to jobs unless the problem involved administrative issue for instance application for relocation or courses. Usually in most of the hospital practice, there is only one supervisor take charge of the ward and if she has to manage many staff under her control, the individual attention given to each staff will be limited. On top of that supervisors did not intend to provide special treatment to particular staff, and at times leadership style and communication skill hamper effective communication and this may seem not to work well with many staff. Thus nurses who afflicted with job stress would not seek advice or assistance from supervisors but rather to her colleagues who are always in the vicinity to offer help.

The statistical results from this study found self-efficacy was negatively correlated to only one dimension of job stress, i.e., psychological stress. This showed that nurses with high levels of self-efficacy were able to avert stressful situations and manifest less psychological symptoms. Conversely, those with low self-efficacy would experienced more stressful symptoms. It is interesting to note that self-efficacy was not related to physical, emotional and behavioural stress because self-efficacy is

the person's belief that he or she has the ability, motivation, and situational contingencies to complete a task successfully (McShane & Glinow, 2008), and it does not cause more serious impact till a person is down with physical, emotional or behavioural stress symptoms. The findings of this study are in line with previous researchers (Xanthopoulou *et al.*, 2007; Schwarzer & Hallum, 2008), but contradict to the findings by Saragih (2011), who found no significant relationship between self-efficacy and job stress.

From the statistical findings of this study, job autonomy was significantly associated with two dimensions of job stress, i.e., psychological stress, and behavioural stress. It is quite surprising to note that job autonomy was positively correlated to psychological stress and behavioural stress. Nevertheless, the positive link between autonomy and behavioural stress was not in line with previous researchers (Elsass & Veiga, 1997; Karasek, 1979; Spector, 1986; Thompson & Prottas, 2005), who found a negative link between job autonomy and job stress. These past studies postulated that job autonomy allows employees to carry out their jobs the way they wish to and this leads to reducing feelings of threat. This condition creates a comfortable and non-threatening work environment, thereby reducing job stress. Besides, job autonomy also allows employees to limit their exposure to stressors and be able to choose their task, or allow them to limit the more stressful tasks, thereby reducing feelings of threat and encouraging positive coping behaviours (Elsass & Veiga, 1997). Employees with high job autonomy have reduced job stress because the presence of control may encourage individuals to believe positive outcomes are possible, thereby reducing feelings of threat (Spector, 1986; Elsass & Veiga, 1997).

This inconsistent finding occurred in this study possibly due to several explanations. First, there are many job stressors which nurses might be exposed to.

They may experience different stress levels or different stress symptoms because of individual differences or they may have different thresholds of resistance to a stressor and different ways to cope with stressors. Second, job experience of nurses may affect the level of nurses' job stress. Based on respondents' demographic variables in this research, About 43% of nurses were in the age group of 19 to 30 year-old and 55% of them have been working as nurses for less than five years. Thus, giving more opportunity to share and make decisions in the work process may create more job stress because these nurses are not yet ready to take the responsibility and empowerment to stand on their own feet when facing tough or difficult situations.

The task/time control was another job resources dimension that did not correlate significantly with all dimensions of job stress. The results are inconsistent with past studies (Elsass & Veiga, 1997; Marmot *et al.*, 1997; Sargent & Terry, 1998; Smith, 1998; Vahtera *et al.*, 2000b), that found significant relationship between task/time control and job stress. The insignificant results in this study is possibly because nurses in this study were able to exert control over how and when they perform their tasks, especially in dealing with work schedule (Arnetz, 1997; Karasek & Theorell, 1990). Although nurses in this study were mostly on shift schedule, they have the liberty to request for any shift duty they like or to mutually change shift duty with colleagues without any hassle from the sister-in-charge. Their request for vacation or emergency leave or leave for other purposes, is also not a problem, as supervisors are usually flexible and able to accommodate their wish within the availability of existing resources. Therefore to ensure nurses are working in conducive work environment, Daniels and Guppy (1994) suggested that managers, as reasonable as possible, give employees sufficient control over the way in which they perform their duties.

5.2.5 Relationship between Job Stress and Sickness Absence

The statistical results as depicted in Table 4.14 in this study partially supported hypothesis 5. Of the four dimensions of job stress, two dimensions, namely physical stress and behavioural stress were significantly related to sickness absence. The other two dimensions of job stress, i.e., emotional stress and psychological stress, were not related significantly to sickness absence. Out of two job stress dimensions that were significantly related to sickness absence as mentioned, behavioural stress exerted the most influence on sickness absence. Obviously, behavioural stress was the strongest predictor of sickness absence. There was a negative link between these two variables which denoted that the higher the behavioural stress nurses experienced, the less sickness absence they had. The plausible reason was that nurses perceive the stressors from job demands as the work challenges for them, for instance, physical demand of the nursing task which requires long standing posture while assisting during surgery in the operation theatre (OT) would be seen as job responsibility to accomplish. The task has to done with care considering the aspects of patient monitoring, safety precautions taken and anticipation of upcoming patient problems at any time that may arise. The other example is the job complexity of certain nursing skills and procedures, such as performing resuscitation skills for cardiac arrest patients during emergency. All these job demands can create job stress, however some of the stress reactions are perceived as positive (eustress) because nurses are strongly motivated to do it and feel satisfied with the task performed, thus they would not absent themselves from these job assigned,

On the other hand, physical stress was positively correlated to sickness absence. The probable reason was that nurses who are carrying out nursing tasks require physical strength (Van der Molen & Delleman, 2006), such as lifting, carrying and transferring patients and moving medical machines or devices. These nursing actions need to be undertaken with safe body mechanic and ergonomic posture to prevent stress and MSD, such as neck pain, backache and other muscular strain (Trinkoff *et al.*, 2003). The perceived physical demand of nursing tasks are associated with reported MSD (Harrison & Nixon, 2002), and can lead to physical stress, thereby affecting the ability to attend work, and contributing to involuntary absence (Steers & Rhodes, 1978). To reinforce this argument, Van der Molen and Delleman (2006), claimed that physical work demands are the most important cause of absenteeism and disability in many industries.

The results in this study which showed significant association between job stress and sickness absence corroborated previous researches (Frankenhaeuser & Gardell, 1976; Spector *et al.*, 1988; Kristensen, 1991; Parker & Kulik, 1995; Vasse *et al.*, 1998; Aronson *et al.*, 2000; Tennant, 2001; Nielsen *et al.*, 2002; Bakker *et al.*, 2003b; Verhaeghe *et al.*, 2003; Kedem, 2005; Bultmann *et al.*, 2005; Borritz *et al.*, 2006). The association between job stress, specifically physical stress and behavioural stress and sickness absence in this study concurred with Kahn and Byosiere's (1992) findings that revealed job stress related to physical and behavioural responses may lead to work outcomes, such as health complaints, burnout and absenteeism.

In this study, emotional stress and psychological stress were not related significantly to sickness absence, for the simple reason that the work stressors from job demands could have been buffered by job resources, particularly social support, job feedback, autonomy and self-efficacy that helped to avert job stress and reduce

incidence of sickness absence. The non-significant correlation between emotional stress, psychological stress and sickness absence coincided with studies by Parkes (1982) and Houtman *et al.* (1994).

On the other hand, the practice of standard precautions and aseptic techniques by HCW, especially nurses, are the basic and important nursing practices for disease prevention and infection control. These practical guidelines have to be complied with by all HCW in the clinical setting to prevent cross transmission and risk of nosocomial infection (NCI) or hospital acquired infection (HAI), for example, hepatitis, HIV infection and other communicable diseases (WHO, 2006). This infection control practice helps nurses to stay healthy and avoid sickness absence while providing continued care to the patients.

5.2.6 Mediating Effects of Job Stress on the Relationship between Job Demands, Job Resources and Sickness Absence

The eighth research objective deals with the mediating role of job stress. First, the discussion in this section focuses on the mediating effects of job stress on the relationship between job demands and sickness absence, more specifically, by examining the mediating influence of physical stress and behavioural stress on the relationship between physical demand and sickness absence, as well as the mediating role of behavioural stress on the relationship between job complexity and sickness absence. The second section elucidates the mediation role of job stress on the relationship between job resources and sickness absence. The discussion focuses specifically on the mediating effect of physical and behavioural stress on the relationship between job feedback and sickness absence.

The statistical results (refer Table 4.15 to Table 4.25) obtained in this study partially supported hypothesis 6 and hypothesis 7. Based on the findings of this study, physical stress fully mediated the relationship between physical demand and sickness absence. The results indicated that physical demand of nursing job directly and indirectly affected sickness absence through physical stress. The findings confirmed Demerouti *et al.* (2001b) and Bakker *et al.*'s (2003a) JD-R model which asserts that job demands could trigger job strain and burnout and employees can resort to sickness absenteeism to cope with the consequences of job strain. It appears that nurses with high level of job demands in performing nursing tasks, must exert physical effort, such as moving, lifting, maintaining working posture and repetitive movement and other nursing activities to meet these physical demands. This can contribute to job stress manifested by physical symptoms, i.e., physical stress. The burden of job stress can lead nurses to suffer from ill health, for instance, MSD, headache, common cold, general malaise and other medical conditions. Hence, the attendance motivation is very much involuntary as the ill health or sickness compelled nurses to stay away from work place by taking sick leave.

Besides, the results of this study (see Table 4.18) also indicated that behavioural stress partially mediated the relationship between physical demand and sickness absence. Hence, physical demand had indirect relationship with sickness absence through the behavioural response of job stress, implying nursing is a stressful profession (Maria *et al.*, 2010; Healy & McKay, 2000; Yeh *et al.*, 2007; Shader *et al.*, 2001; Schmitz *et al.*, 2000; Stordeur *et al.*, 2001; Bratt *et al.*, 2000; Griffiths, 2000; Fresco & Norfolk, 2000; Demerouti *et al.*, 2000b), which can directly affect them with physical and behavioural symptoms (Foxall *et al.*, 1990; Lindsey & Attridge, 1989). The statistical results (see Table 4.14 & Table 4.18) indicated the negative

relationship between behavioural stress and sickness absence; and also physical demand was significantly related to behavioural stress. It can be argued that the physical demand from nursing task can also contribute to behavioural symptoms of job stress which do not cause any physical incapacity to be manifested by physical symptoms. The reason for this paradox is the behavioural symptoms manifested by job stress were more psychological in nature; therefore, the decision for attendance behaviour was very much dependent on pressure to attend and not ability to attend (Steers & Rhodes, 1978). Nursing jobs basically involve dealing and interacting with human life and suffering; the attendance at work is seen as an important personal ethic to be observed in nursing profession. Thus, it is not surprising that nurses inflicted with job stress due to physical demand of the job are still able to cope and present themselves in the workplace to serve the sick, unless they are really down with medical and health problems which affect their ability to attend. In such cases, they stay away from work by taking sick leave.

On the other hand, the results of this study (see Table 4.18) indicated that behavioural stress fully mediated the relationship between job complexity and sickness absence. This implied that job complexity directly and indirectly influenced sickness absence through behavioural response of job stress. The positive relationship between job complexity and job stress concurred with Tummers *et al.* (2002), who found job complexity is positively related to job stress. This is in fact true for nurses working in high intensity areas that require sub-speciality knowledge and skills, for instance cardiothoracic and neurology specialities. The results also showed job complexity was negatively related to sickness absence. It can be argued that a nurse who perceives her/his job to be of low complexity will become frustrated and less satisfied (Scott, 1966, London & Klimoski, 1975), and report high sickness absence.

However, job complexity has job enrichment advantages which permit variety, challenge and competitiveness of the job and bring about job satisfaction by allowing the employee to express his or her own ability and carry out his or her own decisions (Katz & Kahn, 1978; Thompson, 1967; London & Klimoski, 1975). Thus, nurses working in areas with high job complexity were more satisfied and reported low sickness absence. However, care must be taken not to overburden the worker with overly complex tasks; otherwise, he/she cannot fulfill the job requirements.

The statistical results (refer Table 4.22 to Table 4.25) obtained in this study partially supported hypothesis 7. Based on the findings (see Table 4.22) of this study, physical stress fully mediated the relationship between job feedback and sickness absence. The results indicated that job feedback directly and indirectly affected sickness absence through physical stress. The findings confirmed Demerouti *et al.* (2001b) and Bakker *et al.*'s (2003a) JD-R model which highlights that job resources could mitigate job strain and burnout, and employees can resort to sickness absenteeism to cope with the consequences of job strain. More regular job feedback provided by superiors to nurses could help them to carry out nursing tasks more systematically with less job stress (physical stress) (Kahn & Byosserie, 1992). This is because activities which need more physical movement and manual handling with patients can be planned and nurses can work in teams with colleagues to accomplish the task. Once employees experience lower level of job stress, they would not take more sick leave. However, the statistical findings (see Table 4.11) revealed a positive relationship between job feedback and sickness absence. It could be argued that too regular and frequent job feedback provided to nurses may give rise to deleterious effect instead of benefits. The nurses felt they are not respected and trusted to perform the task assigned. Instead of engaging in completing the task, they try to evade and

reduce interface with superiors by taking sick leave and staying away from work. The results on the positive link between job feedback and sickness absence differed from previous studies (Bakker & Demerouti, 2007; Kahn & Byosserie, 1992; Hackman & Oldham, 1980) that found constructive feedback may help reduce the level of job stress and provide employees with the information necessary to maintain their performance and improve organisational outcomes.

The next statistical results of this study (Table 4.24) indicated that behavioural stress fully mediated the relationship between job feedback and sickness absence. It implied that job feedback directly and indirectly affected sickness absence through behavioural stress. As expected, the more regular the job feedback provided to employees, the less job stress (behavioural stress) they would experience and perform better in their work (Bakker & Demerouti, 2007), indirectly improving their work attendance and reducing sickness absence. It was found from the results that there was a direct positive relationship between job feedback and sickness absence. This could be explained by the fact that excessive job feedback would not benefit the employees, because they would view it as threatening to their job control, trust and autonomy towards tasks assigned. Hence, overly providing job feedback may cause repercussions on employees' motivation to work, and most probably to stay away from workplace by taking sick leave.

The overall results of this study (refer Table 4.15 & Table 4.21) showed that emotional stress and psychological stress did not qualify as mediators on the relationship between job demands, job resources and sickness absence. From the statistical findings, emotional stress and psychological stress were not related significantly to sickness absence. Nurses who manifested emotional and psychological symptoms of job stress still had the ability to attend work and not be

under pressure to be absent. The plausible reason is because the emotional and psychological stress experienced by nurses was still within their coping threshold and ability. Combined with the availability of job resources in the work place, such as social support provided by supervisor and peers, job autonomy, self-efficacy of individual nurses, and especially job feedback from immediate superiors, could at least help nurses to mitigate the stress caused by job demands on nursing task, thereby reducing the incidence of sick leave taken by nurses.

The statistical results (Table 4.15 & Table 4.21) revealed that emotional stress did not mediate between job demands and sickness absence. The results also indicated that role ambiguity was not related to job stress and sickness absence. In terms of job resources, co-worker support, self-efficacy and job feedback were negatively significant related to emotional stress but only job feedback positively related to sickness absence. From these results, it denotes that nurses who has more role ambiguity in their task tend to inflict with emotional stress characterised by anxiety, irritability, agitation, inability to relax and moodiness (European Commission's Directorate-General for Employment and Social Affairs, 2000). Nevertheless nurses with emotional stress were able to cope well because of their good self-efficacy and they believe they have the ability and motivation to perform their tasks successfully (McShane & Glinow, 2008). Moreover, these nurses were proactive and able to seek job feedback from superiors to ensure their tasks can be accomplished without conflicting to their role and able to meet work expectation. Furthermore, the emotional stressed nurses could also seek assistance and guide from competent colleagues in their tasks and thus able to reduce stress. Hence with good self-efficacy, the utilization of job feedback and co-worker support, these nurses would not resort to taking sick leave.

The results also found psychological stress did not mediate on the relationship between job demands, job resources and sickness absence. In addition the results also indicated that workload was positively significant related to psychological stress but not related to sickness absence. On the aspect of job resources, job feedback, autonomy and co-worker support were significantly related to psychological stress, but only job feedback found positively significant related to sickness absence. From the analysis, it signifies that nurses who has psychological stress would manifest with symptoms of inability to concentrate, forgetfulness, low satisfaction and frequent negative thought (European Commission's Directorate-General for Employment and Social Affairs, 2000). Nurses with heavy workload tend to suffer from psychological stress, however they are able to withstand the stressful reaction if their jobs enable them to experience independence and discretion especially in determining the procedure in completing the job (Hackman & Oldham, 1976). If they were able to access to useful job resources particularly job feedback, co-worker support, then they would not taking sick leave and stay away from work. The results indicate that job feedback was more effective in averting nurses from taking sick leave, because timely job feedback would provide nurses clear information about how effectively they are performing the job (Hackman & Oldham, 1976). However co-worker support did not provide much advantages since increase in workload of nurses did not make colleagues to share workload or shoulder some of the job responsibility of nurses. Likewise, the opportunity of autonomy to nurses did not enable nurses with heavy workload to resort to absence behaviour because autonomy only offer nurse the independence to determine the procedure and scheduling but not reduction in workload. Therefore nurses perceived that they are able to cope with workloads and

they have tried to utilise various job resources available to mitigate the impact of job stress and thereby avert from taking sick leave.

Overall, the mediating effect of job stress, specifically physical stress and behavioural stress on the relationship between job demands (particularly physical demand and job complexity), job resources (particularly job feedback) and sickness absence had consistent findings with previous researchers (Chen & Lien, 2008; Bakker *et al.*, 2004; Jex *et al.*, 1991), that job strain is a potent mediator between job-related factors and organisational outcomes. In addition, the results of this study further extended and supported the JD-R model (Demerouti *et al.*, 2001b; Bakker *et al.*, 2003a), which highlights the relationship between job demands, job resources, job strain and organisational outcome, specifically sickness absenteeism.

5.3 Implications

From the outcome of the study, several important implications from theoretical and practical perspectives have emanated. The initial section focuses on the theoretical implications while the subsequent section elaborates on the practical implications for managers who are striving to manage and control absenteeism in their work setting, followed by the limitations of the study, future research direction and lastly conclusion that recapitulates the recommendations for management and control of sickness absence.

5.3.1 Theoretical Implications

The purpose of this study was to examine the relationship between job demands, job resources, job stress and sickness absence. In addition, this study also depicted the

mediating role of job stress on the relationships between job demands, job resources and sickness absence.

The outcomes of this study empirically supported the theoretical relationships showed in the research framework (Figure 2.1). This study also specifically confirmed the association between job demands, job resources, job stress dimensions and sickness absenteeism. Hence, this study advances further knowledge on the importance of job demands, job resources and job stress, as predictors of sickness absence. In addition, the results of the study also provide empirical support for the JD-R model proposed by Demerouti *et al.*, (2000b, 2001b), pertaining to the relationship between job demands, job resources, job strain and employee well-being. Demerouti *et al.* (2000b, 2001b) suggested that every occupation has its own specific risk factors associated with job stress. These risk factors are grouped under job demands and job resources categories. The job demands which constitute the physical, psychological, social, or organisational aspects of the job, require sustained physical and/or psychological effort or skills, and are therefore associated with physical, psychological, emotional and behavioural stressful reaction, and consequently sickness absence. Likewise, job resources which can be available at task, personal and organizational levels, may exert a reciprocal and functional role in counteracting the stressor reaction from job demands, to achieve work goals and reduce sickness absence. In other words, job demands and job resources are correlated with job stress and sickness absence. This study adds further knowledge to the previous studies (Jex *et al.*, 1991; Chen & Lien, 2008; Roelen *et al.*, 2006; Eshoj *et al.*, 2001; Voss *et al.*, 2001a) by finding that physical demand, job complexity and job feedback are the important predictors for job stress and sickness absence in the nursing profession. The results indicate that employees engaged in physical demands and complex tasks are

more likely to be inflicted with job stress symptoms, leading them to taking more sick leave. Likewise, employees who use job feedback as resources in the performance of task are less likely to suffer from stressful strain reaction and eventually reduced absenteeism from work due to sickness.

Additionally, this study also enhances the activation theory of job stress, especially when job-related stimuli cause a job holder to experience activation level to deviate substantially from one's characteristic level of activation. At this stage, individuals use performance-protection strategies under the influence of environmental demands. These performance-protection strategies are achieved through mobilisation of sympathetic activation, as exhibited by physical, emotional, psychological and behavioural stressful responses of an individual, and the use of subjective effort, for instance, job feedback, autonomy, social support and others to control the stress. Thus, the greater the activation effort, the greater the physiological cost; the effect of energy depletion will result in job stress and eventually individuals may take more sick leave to cope with job stress.

This study also reinforces the COR theory which state that when individuals are confronted with high job demands and under stress, individuals can gain their motivational potential with job resources. The availability of resources influences the ability and the motivation for change. Hence, individuals can draw on social resources at their workplace provided by the organisation or other individuals. Fundamentally, people seek to obtain, retain, protect, and restore resources in their own right. In dealing with job stress, the main motivational process is preventing the loss of resources by individuals. However, by losing resources, it creates strain, and coping responses are enacted by individuals with the goal of protecting and restoring

resources. Therefore, in facing the loss of resources, individuals may strive to develop surplus resources, which are the source of higher levels of well-being.

This study extends beyond previous research (Bakker *et al.*, 2003a; Bakker & Demerouti, 2007), by investigating job demands and job resources as predictors of sickness absence. The determination of which variables in job demands and job resources dimensions, are related and how they are related to job stress and sickness absence, provides valuable insights into the job characteristics of nursing and sickness absence reported by nurses. This study also concurs in the same principle with the Karasek (1979) DCM model that emphasises the influence of job demands and job control towards the development of physical and health problems, because when jobs are simultaneously high in demands and low in control, this will produce a state of arousal in the worker that would normally be reflected in such physiological responses, as increase in heart rate or adrenaline excretion. When there is a constraint on the responses of the worker, as would occur under conditions of low control, the arousal cannot be appropriately channelled into a coping response, thus producing a larger physiological reaction that persists, eventually leading to health problem and illness.

From another perspective, this study further enhances researchers' knowledge on the mediating role of job stress, especially on the relationship between job demands, job resources and sickness absenteeism, since very scarce research (e.g. Chen & Lien, 2008; Jex *et al.*, 1991) has used job stress as mediator. By demonstrating the existence of significant direct and indirect effects of job demands and job resources on sickness absenteeism through the mediating role of job stress, this research has provided clear evidence that the mediating role of job stress is empirically substantiated.

With very limited sickness absenteeism studies on individuals related to the healthcare industry in the Malaysian context, this study has in fact, to some extent, contributed to knowledge in this domain, especially the influence of job demands, job resources and job stress on sickness absenteeism among hospital nurses. Most importantly, this study has successfully filled the research gap pertaining to the issue of managing and controlling sickness absenteeism in the workplace, particularly in the Malaysian healthcare industry. From the results of the study, one can understand more about the job content or work-related factors, especially those related to job demands and job resources, that exert substantive influences to the development of job stress reactions which may lead to sickness absence behaviours.

5.3.2 Managerial Implications

The results of this study also provide some useful guidelines to the present and future healthcare managers in the application of organisational behaviour concepts in the healthcare industry to improve the development of employees' well-being and performance among HCW in public healthcare institutions. This is critical because many organisations with sickness absenteeism problem which are perceived to be superficial, can end up suffering significant ill effects on organisational productivity and business performance. The issue of this counterproductive work behaviour allows managers to relook different arrays of job content and job context factors that may result in job stress and absence behaviour. From the present study, some of the job demands and job resources factors can be deduced as important predictors of job stress and sickness absence. Findings from this study indicated that nurses performing physically demanding and complex tasks are more likely to have job stress, leading to

sickness absence. On the other hand, nurses who obtain or can access job feedback as resources, are less likely to be inflicted by job stress and thereby have less sickness absence. Hence, this finding offers several indications to healthcare managers regarding the potential factors that may influence job stress and sickness absenteeism among employees. With this knowledge and information, healthcare managers can plan and manage the issue through appropriate human resources actions and strategies. In short, the findings of this study would benefit the healthcare industry in the management and control of absenteeism. It would also serve as a basis for future policy decisions, and at the same time, as a template of reference for the managers and other HCWs. It is envisaged that the findings would make them realise the importance of balancing job demands and job resources to ameliorate the impact of job stress upon sickness absence.

Managing employee absence is important in management practice, in order to secure quality improvement and cost reduction through effective and considerate action. Knowledge acquired from the present study provides terms of reference for healthcare and nursing managers to plan and devise strategies to reduce employee sickness absence, making the workplace more conducive for employees. Appropriate methods can be adopted by management, including a proactive approach to absence by identifying what the root causes of absence are, and taking action to prevent absence where there is scope for positive intervention.

This findings of this study have posted an important message to healthcare institutions to play a greater role in coordinating and supporting any health, occupational or rehabilitation interventions or services in the workplace, for instance, ensuring appropriate occupational health assessment, promotion and support facilities to be in place in work areas; suggesting return-to-work plan for absentees; adopting

employment practices that are flexible and supportive to employees with domestic commitments, to assist in limiting absence. It is believed that a punitive approach to managing absence is less likely to be effective in the long run, therefore, it is recommended that a systematic approach based on written and agreed procedures, and maintaining of good recording on absences and actions taken be by line managers and are appropriately laid out in absenteeism policy documents. In order to ensure these guidelines are carried out accordingly, the role of first line managers, such as ward sister or senior charge nurse is crucial to developing good practice in managing absence. Where necessary, they will have to receive training in appropriate procedures.

To cultivate conducive and healthy environment in workplace, managers should aim to limit their employees' exposure to sources of pressure and job stress, however difficult or challenging their task may be, because of the negative consequences of stress. The statistical results obtained in this study revealed that other than physical work demands and job complexity that were mentioned previously, role ambiguity, emotional demands, workload and job scope are important stressors in work setting. Hence, managers, as far as is reasonably possible, need to implement measures such as job redesign, well planned and clear job duties, team work, flexible job schedule, etc., to give employees sufficient control over these stressors, besides accessibility to resources, especially job feedback, co-worker support and job autonomy, for the performance of their duties (Daniels & Guppy, 1994). The findings of the study also provide evidence for employees to use self-efficacy as personal resources to boost their motivation potential to deal with job stress. In addition, managers need to ensure that employees who have a low tolerance of job demands have a clear understanding of what they are responsible for (Frone, 1990), which can

be achieved through well-formulated job descriptions. Further, managers should attempt to ensure that their employees do not feel isolated or undervalued, and that they have the opportunity to attain an appropriate balance between the demands from their job and availability of job resources to accomplish tasks (Anderson, Coffey, & Byerly, 2002).

The results of this research, with regards to job stress as mediator of the relationships between job demands and job resources and sickness absenteeism, provide insight and understanding of potential job stressors, measures and prevention of job stress and control of sickness absence. From a managerial perspective, controlling of job stress and encouraging job satisfaction is an essential part of retaining employees. As a means to alleviate sickness absenteeism, managers of healthcare institutions can improve aspects of their employees' jobs. The extent to which employees feel that their job is pleasant and enjoyable is important. On the other hand, management may consider job enrichment strategies to provide more challenges with a greater sense of achievement, thus ensuring that interesting jobs are created (Johnson *et al.*, 2003). Harmonious and supportive relationships with co-workers and supervisors are also important to employees; so managers must look to facilitate the development of a harmonious and supportive culture at the workplace.

From another viewpoint, the results of the study provide learning curve to organisations to increase job resources as a means of potentially reducing and even preventing sickness absenteeism associated with job stress. This can be achieved through the implementation of principles that have the potential to increase job resources. For example, organisations must project to employees that senior management support is available, by indicating that senior management values and cares about their employees' well-being (Eisenberger, Huntington, Hutchison & Sowa,

1986). This may be communicated by public displays of management's concern for their employees' welfare. Similarly, supervisors must also show their support to employees and interact with employees on a continual basis. It is also noteworthy that of the variables examined in this study, job feedback, co-worker support and job autonomy have the potential to alleviate the impact of job stress. Attention to being supportive of employees is thus vital to reduce sickness absence for employees who are working in stressful conditions, while increasing employees' job resources to a greater extent. Besides measures and interventions used by managers at organisational level to deal with job stress and sickness absence, other person-directed interventions that include a cognitive-behavioural approach, for instance coping skills training, combined with relaxation techniques, can be effective in reducing burnout, anxiety, stress and general symptoms among HCWs.

Overall, the findings of the present study provide good evidence and impetus for organisations to facilitate the creation of conditions that will be more conducive for individuals who work under intense job challenges, so that they will experience less stress and thereby avoid absence due to sickness. HCW, especially nurses suffer from work-related or occupational stress often resulting from high expectations coupled with insufficient time, skills and social support at work. This can lead to severe distress, burnout or physical illness, and finally to a decrease in quality of life and service provision. At the same time, the exorbitant costs of sickness absence due to job stress could have negative impact on the organisational effectiveness and management outcome of the organisation (Benson & Leona, 2000).

Finally, the outcome of the study contributes to the development of more effective preventive and promotional strategies of stress management for nurses in the clinical areas. This will allow practitioners to practice and function in safe

environment, when providing high quality care to their clients. The understanding into the knowledge of job stress and sickness absence has provided them a better insight of certain dimensions of nursing job demands and job resources as the important determinants of job stress and sickness absence. Besides, it adds professional value to nursing profession, whereby nurse practitioners are able to carry out the noble nursing task in spite of facing many challenges of job stress and sickness absence behaviour in the workplace. Overall, the findings provide useful insight for managers to facilitate the creation of conditions that will be more conducive for individuals who work under intense job challenges to experience less stress, thereby avoiding absence due to sickness.

5.4 Limitations and Future Research Directions

Undeniably, this study has its limitations. Several limitations are identified. First, this study only used nursing professionals in hospital setting as the research subjects, and it precluded employees in other industries, such as manufacturing, trade, finance, education, etc. Different results might be obtained if the study targeted employees' sickness absenteeism in other industries. Moreover, the study setting was in public hospitals; the results might be different for private hospitals. Therefore, the results of this study could not be generalised to employees in other industries as they might have different work cultures, human resources practices and absenteeism policy that would affect their sick leave usage. It is recommended that future researchers could widen their scope of investigation by incorporating employees from other industries and carry out a comparative study across different industries.

Second, this study focused on nursing professionals in the hospitals located in the northern region of Malaysia. As the duties and job responsibilities of nurses, the scope of practice, the nature of work in ward and clinic settings, the measures to estimate the sickness absence, are similar for nurses across Malaysia, hence, it is suggested that similar research could be duplicated with a larger sample which may include nursing professionals from all regions of Malaysia, including East Malaysia. The use of larger sample would help to generalise the results of the study.

Third, part of the data of this study was obtained through questionnaire. Thus, the feedback or responses depended on the voluntary participation of the individuals. The responses may not be consistent and accurately reflect their true perception or experiences towards the job demands, job resources and the job stress. The respondents may not be sincere in answering the questions in order to please someone by answering what is morally right; thus response bias may creep into the data. If the respondents choose not to respond to many items, non-response bias may occur. Therefore, to enhance the precision of findings, it is suggested that combined qualitative and quantitative methods should be incorporated to examine the issue of job demands, job resources and job stress.

Fourth, survey data was gathered through cross-sectional method, which did not allow the drawing of any conclusion in terms of causality (Sekaran, 2003; Winship & Morgan, 1999). To avoid the issue of common method variance and causal inference, it would be appropriate to collect longitudinal data because it might help future researchers to validate the findings gathered from cross-sectional data, since individuals' behaviours, cognition, perception and feeling might change over time (Rindfleisch, Malter, Ganesan & Moorman, 2008). Besides, several previous studies using longitudinal cohort studies have revealed the predictive associations

between psycho-social work factors and the days of sickness absence (Kivimaki *et al.*, 2005; Kondo *et al.*, 2006).

Fifth, since sickness absence data was collected for only a short term of four months period, it would not be very accurate to determine the trend and pattern of the sickness absence because of systemic variation over very short time periods (Harrison & Hulin, 1989). It would be more useful to collect data over longer period, typically over a year, to allow the trend of sickness data to be more discernable and convincing (Mitra, Jenkins & Gupta, 1992). The epidemiological survey about the causes of ill health and sickness can also be carried out using medical records in future research.

Sixth, although the response rate was relatively high (97%), the non-participants in the study might be a population who had more sickness absence than the participants, or who were not available at the time of study. Since those workers who had serious health impairments or who were chronically absent from work might not have been able to answer the questionnaire, it should not be presumed that all their absences are due to illness. Therefore, it is suggested that respondents from these categories might be able to add worthwhile information with respect to the issues under study (and it is recommended that an attempt is made to find such respondents for future research). The conclusions in this study are therefore limited to those respondents who actually participated.

Seventh, the study only sampled nurses from public healthcare institutions in hospitals and omitted nurses in community setting form a large proportion of the nursing population. The validity of the responses depended upon honesty of the respondents in answering items on the questionnaire, and hence the findings of the study were limited to the useful responses on questionnaires returned by the respondents. The sample population consisted of only 21 males. This represents only

1.9% of the sampled population and may not be adequate to compare the differences in sickness absence based on gender.

Eighth, the absence measure used in this study was a time lost index and no frequency measure was taken. The sickness absences might also have the voluntary component. This may allow researchers not to miss significant amount of useful data through examine the voluntary absence data and make the comparison between these two measures.

Finally, this study is limited to two independent variables, i.e., job demands, job resources, and one mediating variable, i.e., job stress. The low R^2 (see Table 4.10 to Table 4.14) of the model suggests that there are other factors that could influence sickness absenteeism. Previous researchers (Higgins, O'Halloran & Porter, 2012; Nyberg, 2009; Camp & Lambert, 2005; Vaananen *et al.*, 2008; Wrzesniewski & Dutton, 2001), had identified that the size of work group, leadership and supervisory style, incentive and reward system, work group norms, work-family interference and job crafting (employee shaping their jobs) are predictors of sickness absenteeism. Therefore, it is strongly recommended that future researchers could widen the scope of study by incorporating other variables to extend the framework of the present study.

There has been some evidence that psychological vulnerability factors, such as hostility or low sense of coherence, predicts sickness absence, especially with women (Kivimaki *et al.*, 1997a; Kivimaki, Vahtera, Koskenvuo, Uutela & Pentti, 1998). Similarly, bullying and low organisational fairness also have been found to be good predictors of sickness absences (Kivimaki *et al.*, 2000a; Elovainio, Kivimaki & Vahtera, 2002) that merit further investigation in future studies.

Future studies should also look into the impact of nurse sickness absenteeism on quality of patient care, as there is a dearth of information on the effects of absenteeism on the workplace, workforce, patient care, patient outcomes and financial performance (Unruh, Joseph & Strickland, 2007). It is suggested that research on any of these areas would contribute immensely to our understanding of the impacts of sickness absenteeism. Lastly, study on return to work also seems worthwhile in the future research since it will be a better measure of sickness absence and incapacity.

5.5 Conclusion

As stated in the first chapter, the purpose of this study was to investigate the relationship between job demands, job resources, job stress and sickness absenteeism. In addition, this study also presented the mediating role of job stress. From the results presented, this study has met all six research objectives. The first two objectives were to determine the relationship between job demands, job resources and sickness absence. The third and fourth objective sought to examine the relationship between job demands, job resources and job stress. The fifth objective identified the relationship between job stress and sickness absence whereas the last (sixth) objective dealt with mediating effects of job stress on the relationship between job demands, job resources and sickness absence. The findings of the study either fully or partially supported the tested hypotheses as outlined in Table 4.26a to Table 4.26h.

This study confirmed the Activation theory (Hockey, 1993) which suggests that the individuals use performance-protection strategies under the influence of environmental demands. The performance protection is achieved through the mobilisation of sympathetic activation and increased subjective effort. The effect of

such compensatory strategy may drain individual's energy, eventually resulting in job stress and breakdown. This study also argued that resources gain their motivational potential particularly when individuals are confronted with high job demands. This indicates that under stressful conditions, individuals will be more likely to use resources as a coping mechanism or stress-reducing action. This study also affirmed the COR theory which proposes that people seek to obtain, retain and protect the resources which they value and individuals with greater pool of resources are less susceptible to resources loss and job stress. Nevertheless if they experience increased loss of resources (loss spiral), they may seek opportunities to risk resources for increased resources gains (gain spiral) to attain higher levels of well-being (Hobfoll, 2001).

In addition, this study also provides support to the JD-R model, which indicates that jobs with chronic job demands (e.g., work overload, emotional demand, physical demand, role ambiguity) exhaust employees' mental and physical resources, and may lead to depletion of energy and to health problems (Bakker *et al.*, 2003a; Demerouti *et al.*, 2000a; Leiter, 1993). To deal with job demands, job resources are important and necessary to achieve and protect other valued resources. The job resources have motivational potential and they foster employees' growth, learning and development, through the role of intrinsic motivation. Job resources may also play extrinsic motivation role as work environment offers many resources that foster the willingness to dedicate one's effort and abilities to the work task. As such, it is likely that the task will be completed successfully and that the work goal will be attained. Further, this study not only provides evidence of significant relationship between job demands, job resources, job stress and sickness absence, but it also fills the research gap by examining the mediating role of job stress which has received little attention

from previous researchers. This study has provided evidence that job stress, specifically physical stress and behavioural stress, mediates the relationship between job demands (physical demands and job complexity), job resources (job feedback) and sickness absenteeism.

The study also found that physical demands, job complexity, job feedback, physical stress and behavioural stress are the important predictors of sickness absenteeism. Thus, in order to control sickness absenteeism, the healthcare manager must consider job redesign with more effective and optimised human resources allocation of nursing staff to deal with physical demands and job complexity of nursing tasks. At the same time, management should look into right mechanisms to provide performance feedback to employees and institute measures to reduce stress in nursing work. Thus, from the findings obtained, the proposed framework has been substantially validated and the six research questions successfully answered.

This study also noted several limitations and shortcomings and provided useful references for future studies. It is expected that the future researchers will widen their scope of study, especially with regards to the use of the JD-R model in organisational research, to enhance and extend the knowledge of the present and future managers and professionals to plan and tackle the issue of absenteeism, systematically and tactfully.

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