THE INFLUENCE OF SAFETY CLIMATE ON SAFETY PERFORMANCE AMONG ASSISTANT MEDICAL OFFICER AT GOVERNMENT HEALTH FACILITIES IN KUANTAN PAHANG DARUL MAKMUR.

By

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ABSTRAK

Tujuan tesis ini untuk membuat kajian berkenaan hubungan dan pengaruh antara iklim keselamatan dengan prestasi keselamatan penolong pegawai perubatan yang bertugas di kemudahan kesihatan di seluruh Kuantan Pahang. Iklim keselamatan yang di pilih terdiri daripada beberapa dimensi iaitu, komitmen pengurusan, penglibatan pekerja dan kepuasan pekerja. Untuk mendapatkan kesahihan berkenaan objektif kajian, 94 set borang soal selidik telah di edarkan kepada penolong pegawai perubatan di ke semua kemudahan kesihatan di daerah Kuantan Pahang dan hanya sebanyak 84 borang telah berjaya di kumpulkan balik, walaupun begitu, ianya masih menepati sasaran yang telah di sarankan oleh pengkaji Krejcie and Morgan pada tahun 1970. Data yang dikumpulkan telah diproses menggunakan sistem perisian SPSS versi 23. Ujian analisis korelasi Pearson mendapati bahawa terdapat hubungan yang kuat dan positif antara iklim keselamatan (penglibatan pekerja dan kepuasan kerja) dengan prestasi keselamatan. Hanya ada satu dimensi dari iklim keselamatan, iaitu komitmen pengurusan, yang tidak mempunyai hubungan yang signifikan dengan prestasi keselamatan. Walau bagaimanapun, bagi pelbagai ujian analisis regresi, terdapat pengaruh terhadap prestasi keselamatan oleh semua dimensi iklim keselamatan. Untuk kesimpulannya, walaupun semua iklim keselamatan pemboleh ubah kecuali komitmen pengurusan, mempunyai pengaruh positif dan signifikan terhadap prestasi keselamatan, namun kesannya akan lebih besar jika komitmen pengurusan memainkan peranan penting dalam isu berkaitan keselamatan dan kesihatan dalam organisasi. Pada akhir kajian, implikasi kajian telah ditemui dan akhirnya, pendapat dan cadangan untuk meningkatkan prestasi keselamatan digariskan untuk kajian masa depan.

Kata kunci: Iklim keselamatan, prestasi keselamatan, penolong pegawai perubatan.

ABSTRACT

The purpose of this thesis is to study the relationship and influence of the safety climate and the safety performance of assistant medical officers in health facilities throughout Kuantan Pahang. The chosen safety climate consists of several dimensions, namely, management commitment, employee involvement, and worker satisfaction. To obtain the validity of the study objectives, 94 sets of questionnaires were distributed to the assistant medical assistant at all health facilities in the Kuantan Pahang district and only 84 forms were successfully collected. However, they still met the targets suggested by the researchers-Krejcie and Morgan in 1970. Collected data were processed using SPSS software system version 23. Pearson's correlation analysis test found that there was a strong and positive relationship between the safety climate (worker involvement and job satisfaction) with safety performance. There is only one dimension of the safety climate, which is the management commitment, who has no significant relationship with safety performance. Nevertheless, for multiple regression analysis tests, there is an influence on safety performance by all dimensions of safety climate. For conclusion, although all variables safety climate except management commitment, have positive and significant corelated toward safety performance, however the impact will more larger if management commitment is playing more important part in safety and health related issues in an organization. At the end of the study, the implications of the study is need were uncovered and finally, opinions and recommendations for improving safety performance were outlined for future studies.

Keywords: Safety climate, safety performance, medical assistants.

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AIDS	Acquired Immune Deficiency Syndrome
BBS	Behavior-based safety
CDC	Centre for Disease Control and Prevention
DOSH	Department Occupational safety and Health
EH&S	Environment, Health and Safety
FMA	Factory Machinery Act
HCW	Health Care Workforce
HIV	Human Immunodeficiency Virus
IOM	Institute of Medicine
MOH	Ministry of Health
MPSG	Malaysia Patient Safety Goals
OCSFs	Organizational Climate Safety Factors
OSHA	Occupational Safety and Health Act
OSH	Occupational Safety and Health
PPE	Personel Protective Equipment

PSCHO	Patient Safety Climate in Healthcare Organization
SAQ	Safety Analysis Question
SARS	Severe Acute Respiratory Syndrome
SAS	Statistical Analysis System
SOP	Standard Operation Procedure
SPM	Safety Performance Measurement
SPSS	Statistical Package for the Social Science
TIS	Total Involvement Safety
UTC	Urban Transformation Centre
VHA	Veterans Health Administration
WHO	World Health Organization
WRMD	Work Related Musculoskeletal Disorder

CHAPTER 1 INTRODUCTION

1.1 Research background

The judgement of accident amount at the workplace has been enforced in several industries to set the safety performance, and this is to identify the frequency of occurrences of accidents and injuries (Wu, Lee, Shu & Shu, 2010). Providing a pleasant safety work environment is crucial, provide safety for workers also essential to prevent any accident happen but almost all the organizations in the world experience an accident in the workplace (Abdul Wahab, Mad Shah & Idrus, 2010; Hee & Ping, 2014). The occupational accident will cause the company to lose money because of compensation, ill-affected medical efficiency, and competitiveness of an organization (Fernandez-Muniz, Montes-Peon, & Vazquez-Ordas, 2009).

The most crucial element in manufacturing industries is a safety concern (Casio, 1996). Furthermore, mostly in an organization's safety is an important factor. The outcomes lack of safety concern can be divided into two-element, either direct or indirect cost (Kundu, Yadav & Yadav, 2015). Direct costs can be defined when the worker gets an injury and covered by compensation from an insurance company. The indirect cost was carried by the contractor and mostly from negligence contractor. For example, decline in productivity, project delays, supervision cost, rescheduling project, transportation cost, and worker salary include those were injuries in the workplace (Hinze, 1997). Safety promotion and safety accidents had been extensively researched on several theoretical methods but unfortunately, many workers take slight consideration of safety at the workplace, the

worker mainly was not proactive in involving a role in safety (Curcuruto, Conchie, Mariani & Violante, 2015). In an organization setting, majority of the workers were not interesting participating in safety concern at the workplace, this happens in years and years ago (Hollnagel, 2014). Currently, the World Health Organization (WHO) was introduce healthy workplace model in which employee and managers work together for the same objective for a better outcome in safety and health in the workplace. There are a few element influences safety and also health in work environments such as physical work environment influences on health and safety. Secondly, the health, safety, and feel comfortable are related to a few factors such as psychosocial in work environment, work organization and workplace culture. Healthy lifestyle by worker and also encouragement and support by employer is essential to promote health resources in the workplace is the third element and the last one is the encouragement of employer to worker for participation into community to promote healthy lifestyle (WHO, 2011). Valid studies showed that well-being is associated with workplace health, worker engagement, pliability, and productivity (MacLeod & Clarke, 2009).

When every worker are knowledgeable in safety awareness and have good health will show the effectiveness in work performance and prevent an accident at the workplace and also increase work efficiency and professionalism (Ali, Yusof, & Adam, 2017). 98,000 of deaths are reported annually in the United States caused by medical error by the Institute of Medicine's (IOM), in their report on 'Err Is Human' (IOM, 2000). Department of Health (2000) reported that in 1999 indicated that related to medical carelessness was documented 400 death and people affected caused by negligence outcomes is 10,000, and the consequences are people had a mental and physical complication. Harvard University has

been conducted studies related to medical injuries and medical negligence in 1991 and reported that medical negligence had 28%, the patient had hospitalized due to medical injuries, and about 76% of the cases can be avoidable (Brennan, Leape, Laird, Hebert, Localio, Lawthers, Newhouse, Weiler & Hiatt, 1991). According to reported by Australian state, from all patient were hospitalized, 17% were indicated cases can be avoidable (Wilson, Runciman, Gibberd, Harrison, Newby & Hamilton, 1995).

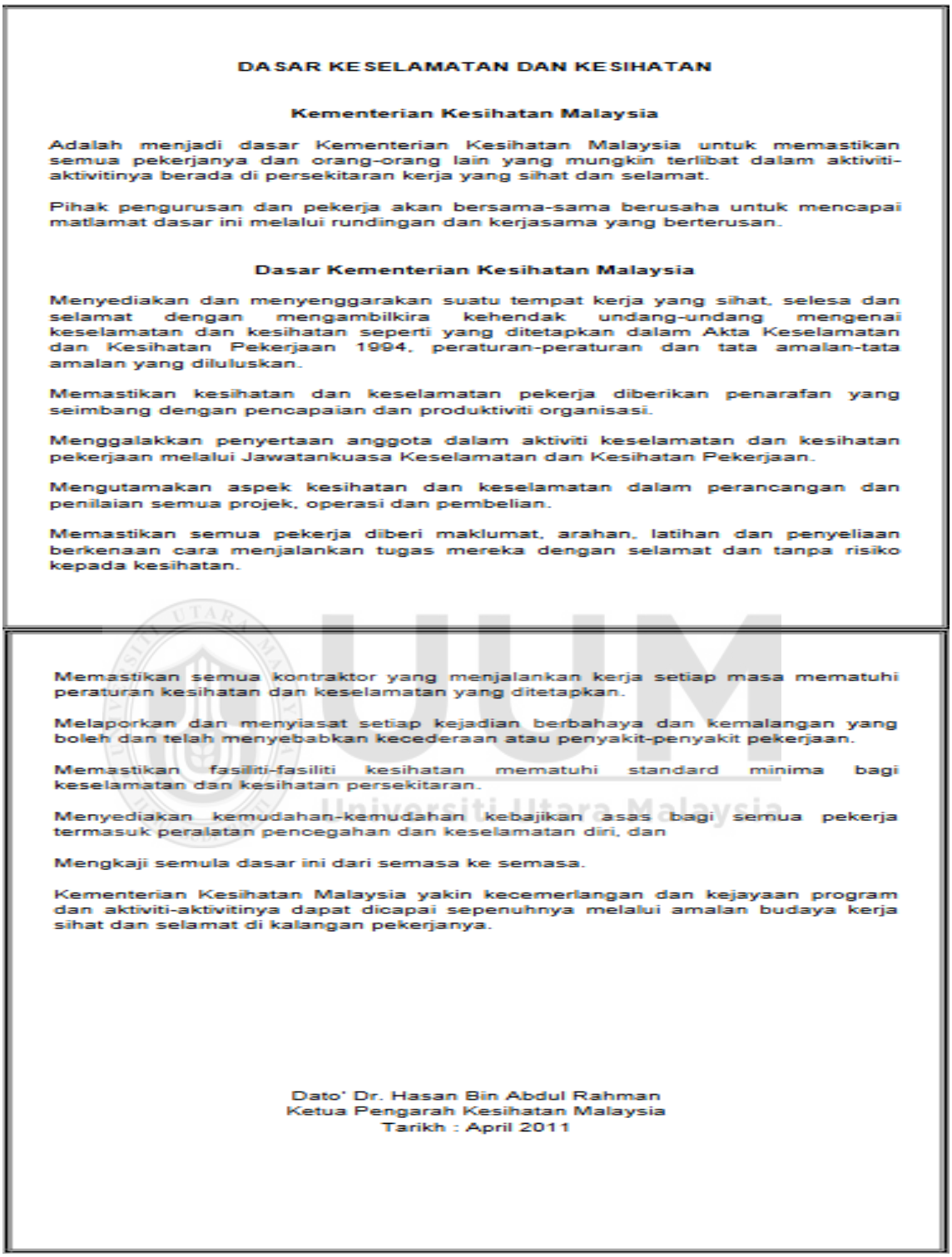
In the United States, research showed that 83% of cases could be prevented from occurrence rate of adverse events 3.7 per 100,000 clinic visits (Fischer, Fetters, Munro & Goldman, 1997). Baker, Norton, Flintoft, Blais, Brown, Cox, Etchells, Ghali, Hebert, Majumdar, Beirne, Derflingher, Reid, Sheps and Tamblyn (2004) suggested that 3% ~16% of patients were hospitalized, and 28% ~ 51% due to medical error or medical negligence and this situation is can be avoided. WHO was appraised, there is about 35 million health care workforce (HCW) and estimated about 12% working population worldwide. Contaminated needle, lancet, scalpels, broken glass, or anything sharp medical equipment were highly exposed to healthcare workers (Goniewicz, Włoszczak-Szubzda, Niemcewicz, Witt, Marciniak-Niemcewicz & Jarosz, 2012). Healthcare industries are not industries are "clean" or zero hazard, many people have a misconception about zero hazards in healthcare facilities, but in reality healthcare facilities are highly exposed to chemical and blood-borne, and encountered can be dangerous in term of health and psychological on healthcare worker (Susan & Eijkemans, 2004). Healthcare facilities are highly exposed to various airborne such as severe acute respiratory syndrome (SARS), tuberculosis and blood-borne such as hepatitis and human immunodeficiency virus (HIV) / acquired immunodeficiency syndrome (AIDS) (Susan & Eijkemans, 2004). Chemical hazard subjected exposures on

healthcare worker such as disinfectant chemical agent and sterilizing chemical agent that can cause various side effects such as dermatitis and asthma. In another cause healthcare worker were exposed to ergonomic hazard such as lifting patient and manual handling of patient, work overload, shift rotation, and also exposed to physical hazard such as noise and radiation (Susan & Eijkemans, 2004). Related to the risk of injuries and also an accident in the workplace is related to a few behaviour elements such as being rushing, absent-mindedness, nervousness, and various attempts at performing the same procedure (Goniewicz *et al*., 2012).

Patient safety is included prevention of patient fall at healthcare facilities, and patient fall can occurred injuries. Consequences, inpatient falls can occur in substantial injuries, a prolonged stay at health facilities, add treatment for injuries, add cost for injuries treatment, and the worst scenario is death (Hagland, 2014). Falls can contribute 25% significant injuries, such as a bone fracture or severe head injuries (Centers for Disease Control and Prevention [CDC], 2012). In a training hospital in Kuala Lumpur, there is a study has been conducted, shown that the cancer patients feel unsatisfied in health care quality, which causes by lack of communication between staff and patients (Ezat, Fuad, Hayati, Zafar, & Kiyah, 2014). Analysis has been made on 11 studies on a medical error at primary health care facilities and found that in per 100,000 visits, there is a 5 to 80 error (Sandars & Esmail, 2003). According to Khoo, Lee, Sararaks, Samad, Liew, Cheong, Mohd Ibrahim, Su, Hanafiah, Ismail and Hamid (2012) revealed that there are two common errors in a primary healthcare clinic, such as missed diagnoses and treatment errors. The likelihood of occurrences of medical fault is significant at the high-risk level in primary care, and it can cause significant harm to health, but on the other hand, it can be

preventable, instant reduction of error can manage and focus on complete documentation and correct prescription (Khoo *et al*., 2012). Malaysia is now towards excellence for providing the best healthcare system in the world that aligns with WHO and DOSH (department occupational safety and health). To create safer work environment Ministry of Health Malaysia (MOH) is to established policies that related to occupational safety and health refer to Figure 1.1 for details policies. Furthermore, it is to create Malaysian Patient Safety Goal (MPSG) and it was introduced since July 2013 to provide an exceptional standard in patient safety status in Malaysia (Ministry of Health Malaysia, 2017).

MPSG involves every type of facility, either government or private and they must submit the e-safety goal through an online website in every each year. The indication showed that MPSG e-safety goals mostly increased each year. The MPSG reporting submitted by the government healthcare facilities in excellence level and by private sector needed more commitment because only 40.64% summited their MPSG and only 1% private clinic summited their MPSG. For further percentage, MPSG reporting can be referred to in Figure 1.2, Figure 1.3, Figure 1.4 and Figure 1.5 is for medication error (actual) and (near-miss) done by hospital and clinic and can see figure from clinic have significant increasing on cases for near-miss from 2016 to 2018 and decrease cases for actual from 2016 to 2018 and Figure 1.6, 1.7, and 1.8 is related to an incident of patient fall in healthcare facilities, and can see the increasing patient fall for adult in 2017 to 2018 in-clinic healthcare facilities is 98 cases and increasing pediatric fall in 2017 to 2018 is increasing 83 cases, and in Figure 1.9 is analysis of patient fall and prove that significant increasing cases yearly of pediatric and adult fall from 2014 to 2017 and involving cases from Ministry of Health clinics that adult 113 cases and pediatric is 34 cases.



DASAR KESELAMATAN DAN KESIHATAN

Kementerian Kesihatan Malaysia

Adalah menjadi dasar Kementerian Kesihatan Malaysia untuk memastikan semua pekerjanya dan orang-orang lain yang mungkin terlibat dalam aktiviti-aktivitinya berada di persekitaran kerja yang sihat dan selamat.

Pihak pengurusan dan pekerja akan bersama-sama berusaha untuk mencapai matlamat dasar ini melalui rundingan dan kerjasama yang berterusan.

Dasar Kementerian Kesihatan Malaysia

Menyediakan dan menyenggarakan suatu tempat kerja yang sihat, selesa dan selamat dengan mengambilkira kehendak undang-undang mengenai keselamatan dan kesihatan seperti yang ditetapkan dalam Akta Keselamatan dan Kesihatan Pekerjaan 1994, peraturan-peraturan dan tata amalan-tata amalan yang diluluskan.

Memastikan kesihatan dan keselamatan pekerja diberikan penarafan yang seimbang dengan pencapaian dan produktiviti organisasi.

Menggalakkan penyertaan anggota dalam aktiviti keselamatan dan kesihatan pekerjaan melalui Jawatankuasa Keselamatan dan Kesihatan Pekerjaan.

Mengutamakan aspek kesihatan dan keselamatan dalam perancangan dan penilaian semua projek, operasi dan pembelian.

Memastikan semua pekerja diberi maklumat, arahan, latihan dan penyeliaan berkenaan cara menjalankan tugas mereka dengan selamat dan tanpa risiko kepada kesihatan.

Memastikan semua kontraktor yang menjalankan kerja setiap masa mematuhi peraturan kesihatan dan keselamatan yang ditetapkan.

Melaporkan dan menyiasat setiap kejadian berbahaya dan kemalangan yang boleh dan telah menyebabkan kecederaan atau penyakit-penyakit pekerjaan.

Memastikan fasiliti-fasiliti kesihatan mematuhi standard minima bagi keselamatan dan kesihatan persekitaran.

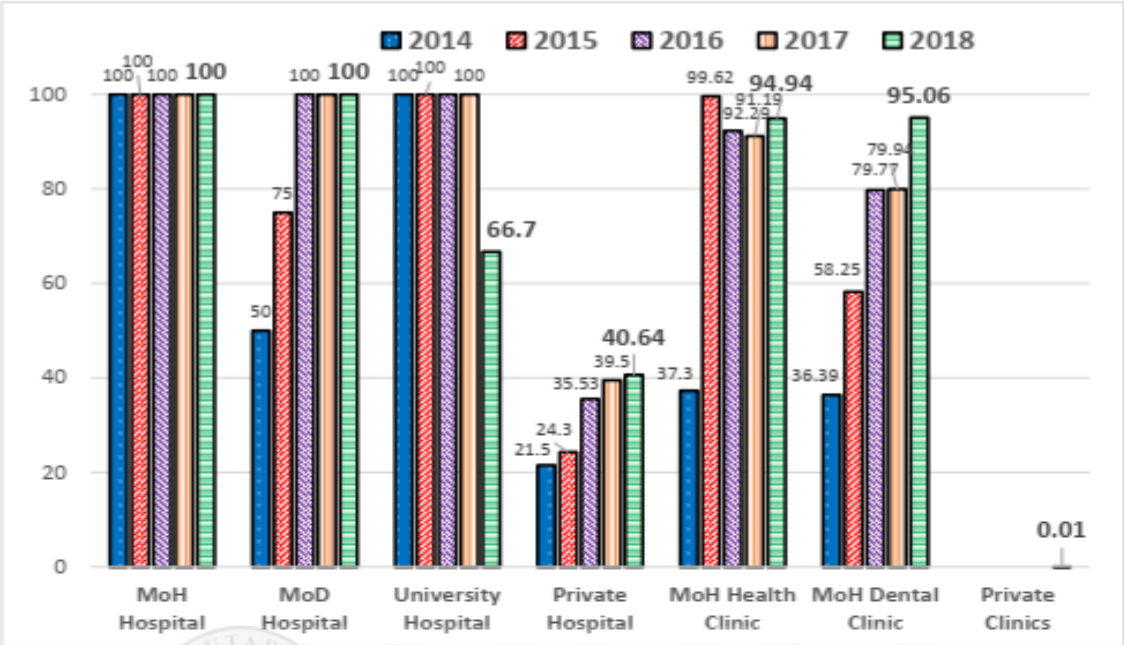
Menyediakan kemudahan-kemudahan kebajikan asas bagi semua pekerja termasuk peralatan pencegahan dan keselamatan diri, dan

Mengkaji semula dasar ini dari semasa ke semasa.

Kementerian Kesihatan Malaysia yakin kecemerlangan dan kejayaan program dan aktiviti-aktivitinya dapat dicapai sepenuhnya melalui amalan budaya kerja sihat dan selamat di kalangan pekerjanya.

Dato' Dr. Hasan Bin Abdul Rahman
Ketua Pengarah Kesihatan Malaysia
Tarikh : April 2011

Figure 1.1
Dasar keselamatan dan kesihatan
Source: Ministry of Health Malaysia (2011)



MPSG REPORTING FOR 2018:

- **100% of Ministry of Health Malaysia Hospitals, Ministry of Defence Hospitals** had submitted their Malaysian Patient Safety Goals Performance.
- **66.7% University Hospitals (2/3 Hospital)** submitted their Malaysian Patient Safety Goals Performance.
- **40.64% of Private Hospitals (76/187 Hospital) submitted their Malaysian Patient Safety Goals performance for 2018.** Compared to 2017, there is an increase of 1% Malaysian Patient Safety Goals performance submitted.
- **94.94% of Ministry of Health Malaysia Health Clinic** (1,013 / 1,067 Clinics) submitted their performance for 2018.
- **95.06% of Ministry of Health Malaysia Dental Clinic** (616/688 Clinics) submitted their performance for 2018.
- 1 private clinic submitted their Malaysian Patient Safety Goals performance.

Figure 1.2
Percentage of MPSG Reporting by type of facilities 2014 – 2018
Source: Ministry of Health Malaysia (2018)

GOALS	Overall 2016 Performance	Hospital	Clinic
GOAL 7 : TO ENSURE MEDICATION SAFETY			
Numbers of medication error (actual)	2016 : 3,104 Cases	2016 : 1,884 Cases	2016 : 1,220 Cases
Numbers of medication error (near miss)	2016 : 162,771 Cases	2016 : 124,294 Cases	2016 : 27,548 Cases

Figure 1.3
Medication error 2016
Source: Ministry of Health Malaysia (2016)

GOALS	Overall 2017 Performance	Hospital	Clinic
GOAL 7 : TO ENSURE MEDICATION SAFETY			
Numbers of medication error (actual)	2017 : 3,847 Cases	2017 : 2,330 Cases	2017 : 1,517 Cases
Numbers of medication error (near miss)	2017 : 141,480 Cases	2017 : 116,906 Cases	2017 : 24,574 Cases

Figure 1.4
Medication error 2017
Source: Ministry of Health Malaysia (2017)

GOALS	Overall 2018 Performance	Hospital	Clinic
GOAL 7 : TO ENSURE MEDICATION SAFETY			
Numbers of medication error (actual)	2018 : 3,438 Cases	2018 : 2,617Cases	2018 : 821 Cases
Numbers of medication error (near miss)	2018 : 148,177 Cases	2018 : 113,769 Cases	2018 : 34,408 Cases

Figure 1.5
Medication error 2018
Source: Ministry of Health Malaysia (2018)

GOALS	Overall 2016 Performance	Hospital	Clinic
GOAL 9 : TO REDUCE PATIENT FALLS			
Adult patient fall (>12 years old)	2016 : 2,374 Cases	2016 : 2,269 Cases	2016 : 105 Cases
Peadiatric patient fall (≤12 years old)	2016 : 441 Cases	2016 : 383 Cases	2016 : 58 Cases

Figure 1.6
Patient falls 2016
Source: Ministry of Health Malaysia (2016)

GOALS	Overall 2017 Performance	Hospital	Clinic
GOAL 9 : TO REDUCE PATIENT FALLS			
Adult patient fall (>12 years old)	2017 : 2,934 Cases	2017 : 2,815 Cases	2017 : 119 Cases
Peadiatric patient fall (≤12 years old)	2017 : 486 Cases	2017 : 451 Cases	2017 : 35 Cases

Figure 1.7
Patient fall 2017
Source: Ministry of Health Malaysia (2017)

GOALS	Overall 2018 Performance	Hospital	Clinic
GOAL 9 : TO REDUCE PATIENT FALLS			
Adult patient fall (>12 years old)	2018 : 3,547 Cases	2018 : 3,330 Cases	2018 : 217 Cases
Peadiatric patient fall (≤12 years old)	2018 : 696 Cases	2018 : 578 Cases	2018 : 118 Cases

Figure 1.8
Patient fall 2018
Source: Ministry of Health Malaysia (2018)

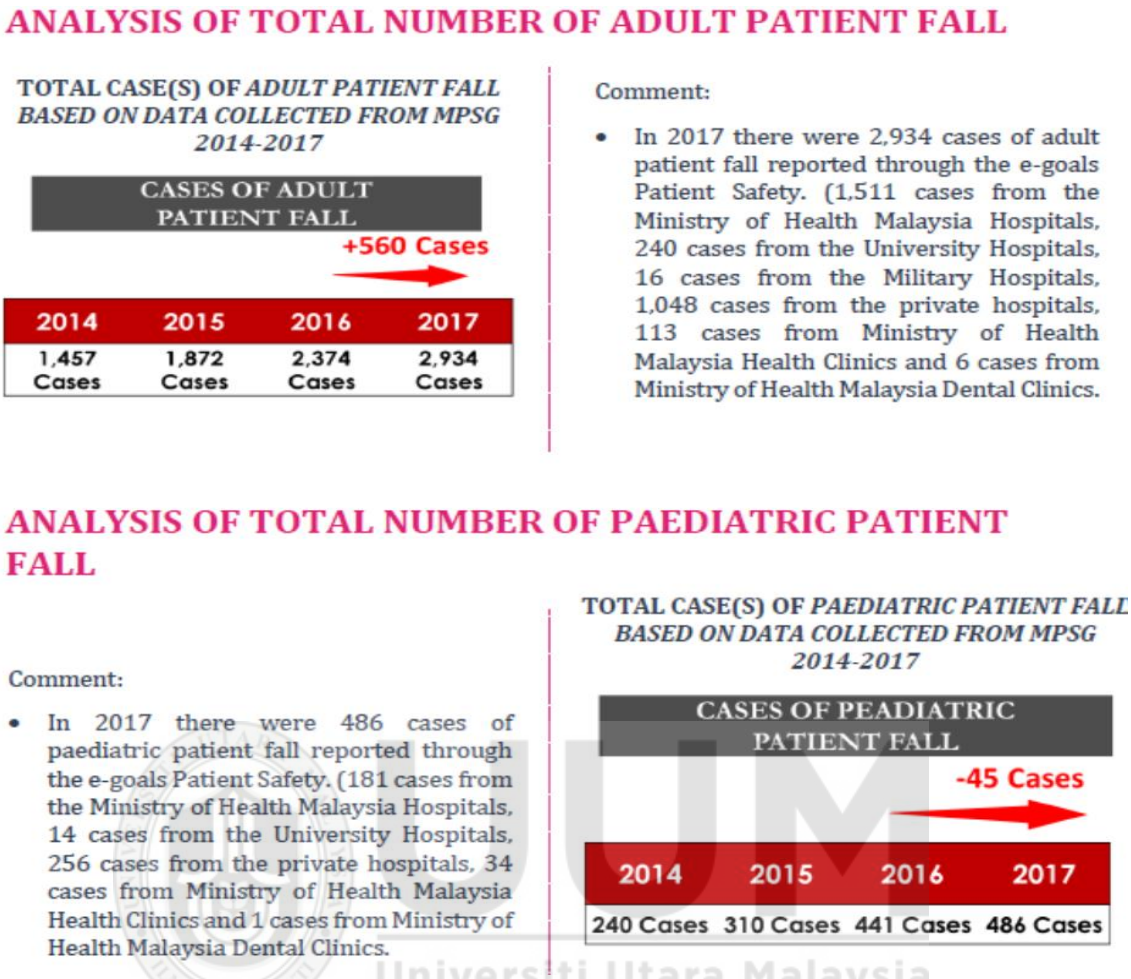


Figure 1.9
Analysis of the total cases of adult and pediatric patient fall from 2014 to 2017
Source: Ministry of Health Malaysia (2017)

1.2 **Problem statement**

Malaysia is a developing country and moving toward a high-income nation. Healthcare facilities and professionalism of a healthcare worker must be aligned with the development of the nation. In 2012, government primary health care clinics in Malaysia had 806 clinics, East Malaysia has 270 clinics, and west Malaysia has 536 clinics (Nadia, Sivasampu, Lim & Hisham, 2011). Currently, in Malaysia, there is 53 community clinic

(formerly known as 1 Malaysia Clinic), and government health clinic had 2840 (Ministry of Health Malaysia, 2019). Khoo *et al*. (2012) reveal that government health clinic mostly managed by medical assistance (now known as assistant medical officer), and their qualifying is diploma in medical assistance which needs three years to qualify. Due to three years completed of training programmed in theory and practical, medical assistance was capable of managing patient treatment in government health clinic, in other situations. There are several numbers of clinic mange by medical officer who just qualified from training with no specialized training especially from senior medical officer or by family medical specialist (Khoo *et al*., 2012). Khoo *et al*., (2012) state that research has been done in 12 government clinic all over Malaysia for detected the frequency of medical error. This studied were conducted in cross-sectional study, the sampling on 1753 medical record card and found in documentation error is 98.0%, medication error 41.1%, investigation error 21.7%, decision error 41.1%, investigation error 21.7%, decision-making error 14.5% and diagnostic error was 3.6%, and the majority patient was seen and managed by Medical Assistance (now known as assistant medical officer). For further view refer to Figure 1.10.

Lack of or limited resources compare with high demand from people can threaten the healthcare system in Malaysia, in terms of delivering the best healthcare to the people (Ministry of Health Malaysia, 2011). Healthcare industries are high pressure with danger from patients and employees itself (Yassi & Hancock, 2005). The cause of patient treatment error is occurs when healthcare worker not following standard operation procedure, improper medical management, also equipment failure dues to lack of training handling the equipment by staff or due to lack of maintenance, failure to present an action plan for example surgical event, none or lack of patient protection and care, and blurred or

confusion on objective and goal about patient safety (Gaba, 2000; Leape, 2002). The United State has capitalized in training, technology, and system for healthcare industries to reduce human error but still failing in a healthcare setting. There is no single training tool or assessment equipment that enough to safeguard patient health in a recent situation that full with challenging in healthcare industries (Arramchuk, 2018).

A medical error harms healthcare workers, families and patients. The patient is threatening by medical error and each year consequences related to medical error are statistically involving 44,000 to 98,000 people was death (Kohn, Corrigan, & Donaldson, 1999). Currently, reported that 400,000 adverse procedures and indicated that 210,000 deaths yearly and had been related to preventable harm in the US hospital (James, 2013). This documentation was remarking the level of patient maltreatment from healthcare, and this documentation also suggests increasing patient safety in hospital (Wilson, Runciman, Gibberd, Harrison, Newby & Hamilton., 1995). The increasing case of patient harm from healthcare needed a concrete measure to improve patient safety (Wilson *et al*. 1995).

Any procedures or services are carried to patient or customer are usually high risk because any defect or improper handling the procedure or services can cause harmful and the effect can be irreversible in some situation, such as scarring, organ failure, permanent loss of mobility and death. All of this will cause catastrophic to organization or company that mostly face with lawsuit, worst impression and loss of customer. The role of managers and their commitment are vital to increasing the quality of patient care in terms of good and quality hospital clinical strategies, ensuring that all stakeholders in the organization have the same objectives, vision, and mission. (Robbins, Judge, Millett & Boyle, 2003). Work-related musculoskeletal disorder (WRMD) is a common issue or problem that

healthcare staff has to face is related to their job (United States Department of Labor: Occupational Safety and Health Administration, 2013). Common injuries due to their tasks are mostly patient lifting, material or equipment lifting, repositioning, patient handling, and patient transfer (Mark, Hughes, Belyea, Chang, Hofmann, Jones & Bacon, 2007). Organizational climate is essential to decrease healthcare worker injuries, lack of organizational climate and the excessive task related to accidents and injuries, commonly is needlestick injuries and near-missed to nurses in the hospital setting (Clarke, Rockett, Sloane & Aiken, 2002; Gershon, Karkashian, Grosch, Murphy, Escamilla-Cejudo, Flanagan, Bernacki, Kasting & Martin, 2000).

To avoid any medical error and to increase patient safety, the healthcare organization needs to deliver quality healthcare such as the organization in healthcare needs transformational and quality leadership to create interdisciplinary teamwork, worker involvement in quality and patient safety (Ferguson, Calvert, Davie, Fallon, Ferd, Gerbach & Sinclair, 2007).

	N	Error rate		Inconclusive rate	
		%	95% CI (%)	%	95% CI (%)
Overall documentation errors	1753	98.0	97.0 – 99.1	-	-
No/Inadequate History	1753	46.5	29.7 – 63.2	-	-
No/Inadequate Physical examination	1753	51.2	36.3 – 66.1	-	-
No/Inadequate Diagnosis	1753	42.5	24.7 – 60.2	-	-
Overall management errors	1753	53.2	46.3 – 60.2	13.9	9.0 – 18.8
Medication errors	1753	41.1	35.8 – 46.4	27.9	20.3 – 35.4
Wrong dosage/frequency prescribed		48.5	41.5 – 55.6		
Inappropriate medication prescribed		47.2	39.0 – 55.4		
Drug interaction/adverse reactions		9.8	5.1 – 14.4		
Investigation errors	1753	21.7	16.5 – 26.8	22.3	14.8 – 29.7
No investigation done		72.6	68.1 – 77.1		
Unnecessary investigation done		8.6	4.7 – 12.6		
Decision making errors	1753	14.5	10.8 – 18.2	40.2	30.4 – 49.9
Inappropriate follow up		48.4	37.7 – 59.1		
Inappropriate care plan		8.1	4.0 - 12.2		
Referral not made when it should		6.3	3.1 – 9.4		
Referral for admission not done		3.6	0 - 7.7		
Diagnostic errors	1753	3.6	2.2 – 5.0	61.9	53.2 – 70.6

Figure 1.10
Error detected in the medical record
Source: Khoo *et al*. (2012)

1.3 Research question

Based on the preceding discussion, this research seeks to provide insight into the following questions:

i. What are the relationships between the dimensions of safety climate (employee involvement, management commitment, and job satisfaction) and safety performance of assistant medical officers in Kuantan government health facilities?
ii. Which safety climate dimension (employee involvement, management commitment, and job satisfaction) provide the most important outcome on the safety performance of assistant medical officers in Kuantan government health facilities?

1.4 Research objectives

The aims of this research are:

I. To identify the relationship between employee involvement in safety performance.

II. To identify the relationship between management commitment to safety performance.

III. To identify the relationship between job satisfaction on safety performance.

IV. To analyze the influence of safety climate dimensions (job satisfaction, employee involvement, and management commitment) on the safety performance of assistant medical officers in Kuantan government health facilities.

1.5 Scope of the study

This research concentrates on two core variables (safety climate and safety performance). Safety climate is studied on three variables (employee involvement, management commitment, and job satisfaction). Meanwhile, the safety performance founded on two variables (safety participation and safety compliance). A respondent for this study was an assistant medical officer in government health facilities in Kuantan, Pahang only.

1.6 Significance of the study

Safety performance in an organization can be scale and evaluate using on safety climate. The safety performance founded on the safety climate indicates the effectiveness of the safety program of an organization. This research is delivering to evaluate all potential safety climates that are exposed to the assistant medical officer, which can influence safety performance. This study gives access to further view into work culture and safety behavior. The survey questionnaire believed to be able to analyze the work culture and safety behavior of the assistant medical officer at the same time validates the reliability of the gathered data via the survey. Based on the data gathered, it would enable the assistant medical officer to review and improvise patient safety and eliminate medical errors. At the same time, cultivate a better safe working condition at the government health clinic.

1.7 Limitations of the study

This research involves assistance medical officers in a government health facility in Kuantan, Pahang as the target group. Target group with a sample size of 94 people are chosen to fill up the questionnaire survey which contains questions that associates the dimensions of safety climate (employee involvement, management commitment and job satisfaction) and its influence on the safety performance.

In the survey measurement, consist of two basic expectations that made in the study are:

i. Respondents are voluntary to complete the questionnaire.
ii. Respondents who completed the questionnaire answered the questions with decently and correctly.

However, by using the survey questionnaire instruments, the study is likely to face some limitations as listed below:

i. A study was limited to self-reported data (type of survey questionnaire, or poll in which respondents read the question and able to choose by themselves without researcher interference). None observational follow up to verify the conditions as it reported.
ii. The study was limited to the assistant medical officer who works at government health facilities in Kuantan, Pahang which had to select all assistance medical officers to complete the survey.
iii. The respondents' answer is influenced by two factors such as the psychological and physical condition of the respondents at the point of finishing the survey.

Lastly, the scope of this research is concentrating on occupational safety and health policies by the Ministry of Health Malaysia as per the Occupational Safety and Health Act (OSHA) 1994 by the Department of Safety and Health. As per stated in Part 1(4), the main act objectives are:

i. "To secure the safety, health, and welfare of persons at work against risks to safety or health arising out of the activities of persons at work."
ii. "To protect persons at the workplace other than persons at work to risks to safety or health arising out of the activities of persons at the workplace."
iii. "To promote an occupational environment for persons at work this adapted to their physiological and psychological needs."
iv. "To provide the means whereby the associated occupational safety and health legislation may be progressively replaced by a system of regulations and approved

industry codes of practice operating in combination with the provisions of this Act designed to maintain or improve the standards of safety and health." (*Act 514 Occupational Safety and Health Act*, 1994).

1.8 **Arrangement of the research paper.**

Chapter 1 is based on research studied. There are a few core elements of the research studies obtainable in this chapter such as research background, problem statements, the scope of the study, research objectives the significance and limitations of the study. Chapter 2 concentrates on the literature review by numerous researchers for covering the same subject or related subject and also with their methodologies. Research studies by a few researchers in previous time were used to design the framework and scope of this research. A further study made on the dependent variable, safety performance (safety participation and safety compliance) and the independent variable, safety climates (employee involvement, management commitment and job satisfaction), was covered in this chapter. Chapter 3 contains the research methodology with a complete project structure with a one-by-one description of the data collection and analysis process to describe in this chapter. Discussion on conversation and argument on the citation by previous researchers are involved in amplifying further the reliability of the methodology used from the initial study phase to the data collection analysis. In chapter 4, the collected data from the survey tools or instruments were analyzed and presented. A few types of statistical analysis are contained such as descriptive analysis, normality analysis, correlation analysis, and multiple regression analysis. For a much better understanding and view will present on the table. Chapter 5 will present summarizes in chapter 4 for the data collection analysis and

interpretation. Furthermore, the result compares with another research form previous time. This chapter includes the limitation and recommendations to overcome the limitations and challenges by Assistance Medical Officer. Besides that, overall views and reflection upon retrospect on a research study.

1.9 Summary

The increased cost of a work-related accident, increase perspective on patient safety and prevention to medical error had driven the MOH to develop safety programs that allow the workers to be protected at the same time complying with the policy that established by MOH associated to occupational safety and health (OSH) and the important is the policies related to occupational safety and health Act (OSHA) 1994. The safety management system is quickly altering to encounter any an environment that exposed by hazard to workers. The healthcare industries are the crucial sectors to secure patient safety and to prevent medical error, limiting the risk of injuries and death to a patient that happening yearly. Other than that, to reduce the accident and injuries on worker itself such as needle prick injuries and also to prevent from making the medical error that highly can causes summonses from a patient and they're relative. MOH had several programs yearly to upgrade the skill and knowledge to prevent medical error and also courses such as infection control for awareness and correct technique to preventing infection from various angles. The safety climate study, being one of the most coveted areas of study, and thus the correlation to the safety performance is the best subject to study the Assistance Medical Officer in Kuantan Pahang.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter is mainly to elaborate understanding of a diversity of literature on studied safety performance (e.g., safety compliance and safety participation). For safety climate will see on the dimension that influencing around an assistant medical officer (e.g., management commitment to safety, worker involvement in safety, and job satisfaction). Safety performance and safety climate make significant influences or make a huge part in activities safety in a government health clinic in Kuantan. The main point in this research outlined in the safety climate that mainly available on published literature on the safety performance of the worker. Safety factors were so durable and established, and bonding with safety performance, and the result or outcome will boost safety activity in the workplace.

2.2 An overview of related legislation

Malaysia has developed and established the law that protects the worker. In term of their safety, health, their welfare and also protect the worker from any risk at a workplace. Law of Malaysia, Occupational Safety and Health (1994) is a comprehensive Act. The main objective is not just to protect the worker or their welfare, but also to promote safety at the workplace and reducing accidents at the workplace. This act has outlined the minimum requirements as a clear guideline in managing occupational safety and health issues. Physiological and psychological

factors have been taken into account in the existence of this Act, in providing a more secure working environment in safety and health (Nur Aqilah, 2010). This law is also boosting cooperation between management and employee and also to develop commitment management to produce safety at the work environment. It also gives high standard on safety and health at Malaysia working environment (Universiti Teknologi Malaysia, n.d). Enforcement of Occupational safety and health Act (OSHA) under section 39 is permitted by Occupational Safety and Health to examine into premises, for inspection, take a sample, to the investigation, and seize any susceptible equipment (Kamal, 2015). Under section 30 (1) of the 1994 Act has also outlined that it is necessary to establish a safety and health committee in the workplace organization, safety and health committee should establish when organization reached 40 or more workers. It serves as a communications platform and workers in safety and health issues as well as other stakeholders in evaluating the actions or steps previously taken for re-evaluation to ensure that they are in good standing with the latest situation. The committee also investigates any occupations that are deemed to contribute to safety and health risks.

Factory Machine Act (FMA) 1967 was introduced in earlier 1913 and known as Machinery Ordinance 1913. Soehod and Laxman (2003) revealed that it contained a provision to guarantee the safety of machinery including the boiler and the combustion engine. This provision is to ensure the risk were reduced and prevented the occurrence of accident and injuries. After some time, other legislation ratified known as the Machinery Ordinance 1953. This ordinance was replacement all preceding legislation that associated to safety industries and has been enforced at all-state in Malaya back then (now known as Malaysia) under the Jurisdiction of the Machinery Department, Ministry of Labor (Malaysia Trade Union Congress, 2000). In the early 60s, Malaysia was toward industrialization and many industries were existed and felt that the Machinery Ordinance not

suitable anymore due to managing in OSH problem. Later on the new legislation was introduced know as Factories Machinery Act 1967. Soehod and Laxman (2003) state that in early 1970, a few more regulations added to strengthen the FMA 1967. Also included Factories and Machinery (safety, health, and welfare) Regulation 1970 to provide safety for the workplace, guarantee the welfare of the employee, regardless of their country of origin (Department of Occupational Safety and Health, Ministry of Human Resources, 2019).

2.3 Safety performance

Safety performance in term conceptualization was demarcated with a variable dimension by the researcher (DeArmond, Smith, Wilson, Chen & Cigularov, 2011), but in early research safety performance used for indicator or benchmark in the amount of accident. After a few research, the conceptualization was a change and the researcher was narrow their point of view that they were added near-miss in an amount of accident in safety performance (Hon, Chan, & Yam, 2014). According to Vinodkumar and Bhasi (2010) state that the measurement for safety performance in an old-style method depends mainly on accident and injury data and safety participation and safety compliance is the part of safety performance. Safety performance as the indicator on near-miss is not included in fatality or injuries. It is a sign on potential of risk and early prevention with consistency in prevention is necessary taken by management to prevent before an accident occurs (Christian, Bradley, Wallace & Burke, 2009; Clarke, 2006; Shaheen, Bashir, Shahid, Yasin, Tariq & Qidwai, 2014). Safety performance (near miss, accident, and getting injuries and worst involving fatality) in the workplace depends on our safety participation and safety compliance in work behavior and this has been view by many researchers. Vinodkumar and Bhasi (2010) revealed that factors such as accident rate in the workplace, injuries level and

right attitude in the workplace are essential factors to recognize the degree of impact by safety performance toward the workplace and also to define level risk at the workplace. Huang, Smith, and Chen (2006) state that when involving occupational injuries, self-reported accident is essential and this included in safety performance. Point of view from Huang, Smith, and Chen (2006) and Vinodkumar and Bhasi (2010), there are similarities view that involving accident and injuries. It will be affected safety performance level at the organization and risk will become more significant and will affect the safety and health employees in all job sector. The main point is safety performance became an essential safety behavior. This safety behavior character will make employee more caution, alert and knowledgeable. For example, as an employee uses protective personnel equipment when handling chemical hazard, always follow standard of procedures, and good interact between management and worker about health and safety information also their right in term safety and health (Burke & Dunlap, 2002). The effected safety performance (safety participation and safety compliance) on safety climate among the assistant medical officer at a government health clinic in Kuantan, Pahang will be elaborate.

2.3.1 Definition safety performance

Safety performance can further understand when looking at the illustration in Figure 2.1 from Borman and Motowildo (1993) to elaborate on what is safety performance, Borman, and Motowidlo (1993), state that these two elements, task, and contextual performance are combined to make what is safety performance. From the illustration in Figure 2.1 from Borman and Motowildo (1993) in safety performance separate into two-element safety behavior. There are safety participation and safety compliance, same as, Griffin and Neal (2000) and Neal, Griffin and Hart (2000) has described in safety performance was separated into two-element. Firstly safety

compliance and secondly is safety participation. The worker itself as an individual in the organization was responsible for carrying out the activities that awarded to safety and health at the workplace such as follow standard operation procedure. It is defined as safety compliance, meanwhile safety participation about contributes to safety in the organization as a whole. It is including involving providing training to workers and attending a safety meeting. This safety compliance will create a safe environment in the workplace, in which a worker can contribute more productivity to the organization. Nowadays, existing models essential elements that must include the safety performance described into three fundamentals such as a component of performance, determination of performance and the antecedent of performance (Griffin & Neal, 2000). The present conceptualization of safety performance is nowadays and many researchers make assumptions and highlight (Burke, Sarpy, Tesluk, & Smith-Crowe, 2002). The antecedent performance divided into two components which is an organization level and individual level. In individual level could be able to perform the task which is reliant on the degree of ability, experiences and personality. The organization level is part of the climate of an organization, in which employee as individual was able to contribute effort to create value in term safety and healthy workplace in an organization.

They are three factors essential to determinants of performance such as knowledge, skill, and motivation. These behaviors were so crucial to determining the individual at the workplace. In term how the worker performed the responsibility at the workplace, allied within safety compliance and safety participation (Neal, Griffin & Hart, 2000). Burke *et al*. (2002) describe that safety performance can evaluate action on the attitude that a person or worker to show a characteristic of promoting health and safety to their colleague, the public, to the client and also to work environment. It is increasingly clear that in Burke *et al*. (2002) in safety performance should

be maintained to ensure that the work environment is much secure. Through the study from Crow, Burke and Landis (2003) Safety performance is divided into four elements such as using personal protective equipment (PPE), communication about work practice or standard operation procedure, communication information correlated to safety and health and finally the worker have knowledge associated to safety and health to increase the role and responsibility for safer work environment.

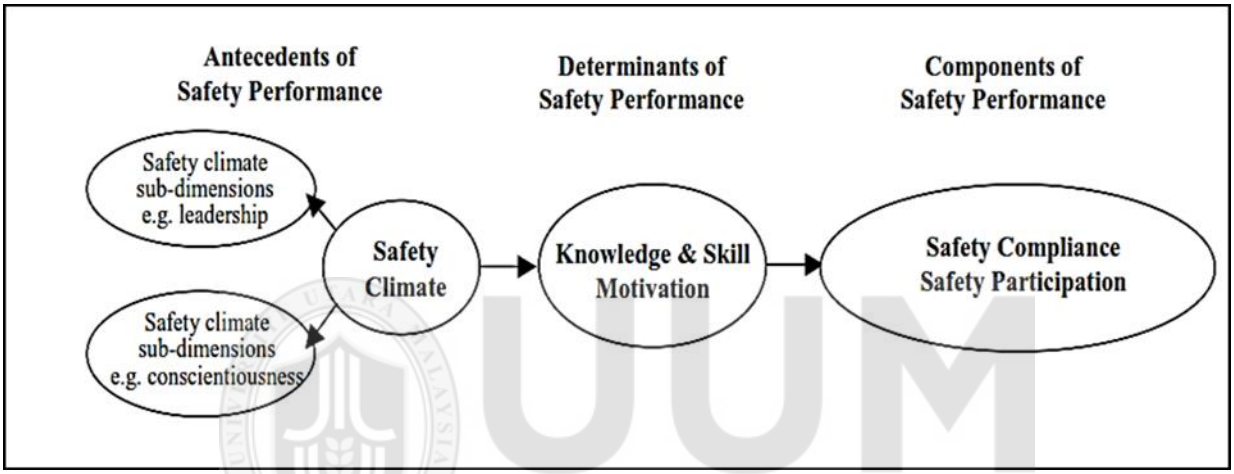


Figure 2.1
A model of relations among antecedents, determinants, and components of safety performance, Source: Borman and Motowidlo (1993)

2.3.2 Safety performance dimensions

To evaluate the effective management in an organization the most vital element is an effective safety performance in the organization. However, until now there is numerous definition of safety performance and became more challenge to the researcher to define safety performance assessment that contributes more on safety performance (Wu, 2000). Burke *et al*. (2002) define that general safety performance was an examination in systemically in dimensionality. Integrated between safety elements is became a concept in safety performance. Researcher Borman and

Motowildo, in 1993, were able to express views with quickly saw the differences between task performance and contextual performance. Burke *et al*. (2002) revealed that the safety performance dimension also associates strongly with safety knowledge and it became an essential factor contributing to safety performance. This revealed after analyses from two departments the US Department of Energy Contractor in the USA.

The researcher has produced past and current relevant literature associated with safety performance dimension and several dimensions were taken in an important part contributing to safety performance. Overview, the researcher was differently viewed on safety performance dimensionally and it is suitable for industries. For example, Kao, Steward, and Lee (2009) state that safety performance is separate into safety compliance, safety participation and accident investigation, the rate among crew member airline industries is a pointer for safety performance. Siu, Phillips and Leung (2004) self – reported accident in constructive industries became essential when dealing with an occupational accident at a construction site. Wu, Chang, Shu, Chen & Wang (2011) stated that when involving petrochemical industries, the dimensions are safety training, safety inspection and safety motivation. The different industry provides different approaches too dimensionally in safety performance, depending on the level of risk that available in the industry.

Many studied indicated the two essential behavioral factors contribute or consist of safety performance is safety compliance and safety participation (Neal, Griffin, & Hart, 2000). Job performance produced from work behavior that related to work safety concept (Campbell, Gasser, & Oswald, 1996). Consequently, the performance model is useful for distinguishing performance antecedent, performance component, and performance determinants (Campbell, Gasser, & Oswald, 1996). Borman and Motowildlo (1993) revealed that when the employee performs in work, it influences two essential elements into a component of performance which is task

performance and contextual performance, these called actual behavior performance. In the meantime, Campbell, McCloy, Oppler and Sager (1993) state that knowledge, motivation and skill were determinants of individual performance. In an organization level, organization climate is essential for the antecedent of performance, safety climates, and safety performance. These were facilitated and encouragement by motivation, and this has been proved by previous studies in the work performance literature. These two safety performance dimensions are chosen in safety performance dimensionally propose by Griffin and Neal (2000) which is safety compliance and safety participation. This research is to measure influences and affect safety climate on safety performance (safety compliance and safety participation) among assistance medical officer at a government clinic in Kuantan, Pahang.

2.3.2.1 Safety compliance.

Griffin and Neal (2000) state that safety compliance consists of the primary safety in the workplace that must deliver by every worker such as followed and understand the procedures and wearing personal protective equipment. Safety regulation is dimensional of safety compliance but still needs from safety participation to directly affected safety environmental. Griffin and Neal (2000) ascertained that occupational safety could be measured with two elements, knows as safety and initiative and can be concluded as safety compliance and safety performance. Safety compliance elements contribute influences into safety performance and it can show in many studies and also it can be found in many varieties of literature (Wong, Chan, & Lo, 1999). The significant variable between two dimensions, safety compliance and safety performance, follow or obedient on rules and regulation and also able to follow work procedures is safety compliance, safety participation is about the worker as an individual were willing voluntary contribute directly

or indirectly to safety in an organization (Griffin & Neal, 2000). According to Neal, Griffin and Hart (2000) showed an attitude for safety behavior at the workplace is the safety compliance. Obedient to procedures and policies when the worker performs safety behavior at the workplace defined as safety compliance and safety compliance can be accomplished. It is agreed upon by Podsakoff, MacKenzie, Paine and Bachrach (2000) state that employees who follow the rules of an organization and practice the standard operating procedure is safety behavior which requirements of safety compliance.

To preserve safety compliance at workplace, it needs essential activities that carry out by employees and this safety behavior are obey to standard operation procedure, wearing personal protective equipment, obey safety policies, this has been firm revealed by Neal *et al*. (2000) noted that essential events, for example, endorsing safety programmed at workplace and the meantime safety behavior must be included into safety performance for purpose to boost safety performance. Safety performance was hugely affected by safety compliance and this has been firmly noted by (Nahrgang, Morgeson & Hoffman 2008). In an organization, one of the ways to achieve the objective in safety compliance is to communicate the message on safety and ultimately will bring something positive to an organization (Kapp & Parboteeah, 2008).

In conclusion, even safety compliance had been applying to an organization, the accident and injuries are still occurring and happening. The organization should apply safety behavior continuously to all workers. To accomplished objective safety compliance should be considered the penalty to the worker as a way to maintain a safe work environment. Especially to high-risk industries to make safety compliance were relevant to an organization.

2.3.2.2 Safety participation

Behavior in communication between each worker to reduce hazards at the workplace can describe as safety participation and the worker also helps to improve safety within their workplace (Subramaniam, Shamsudin, Zin, Ramalu & Hassan, 2016). Griffin and Neal (2000) were agreed when workers involving voluntarily in safety behavior at the workplace that called safety participation. Vinodkumar and Bhasi (2010) state that safety participation has significant influences on safety performance. Participation in the organization is open more on participation communication between management and employee and drive organization much better managing in terms of prevention in an accident and injuries at the workplace. Vredenburgh (2002) describes that participation in safety behavior in an organization involves an individual worker or a group of employees.

Wu, Lin, and Shiau, (2010) state that employee and top management participation were considerable influences in safety and health, and it can be divided into three safety parts:

I. To guarantee liability for middle management in safety performance.

II. To maintained and increasing quality in safety management.

III. As individual employees were willing to take part in safety activities.

European Agency for Safety and Health at Work (2012), state that participation is involving all level workers in an organization when deciding a decision. It must be involved in all levels of the worker, it about a process of decision making at all levels of the worker. European Agency for Safety and Health at Work (2012) revealed that employee and employer have significant and vital roles in securing safety and health at the workplace, for those reasons, a few factors can influence safety participation such as:

a. The employee must alert to take their safety and their co-worker.

b. Employees and management must cooperate actively in terms of safety and health.
c. Able to participate in training in terms of safety in a job task.
d. Able to report any unsafe act or condition or inadequate safety measure to co-worker, supervisor, or to top management.

Occurred of an accident and injuries at the workplace, one of the reasons was deficient or non-safety participation in worker or management level (Nahrgang *et al*., 2008). When lacking in safety, participating in the injuries at the workplace will occur. Has been solid-state by Havlovic and McShane (2000) state that internal safety inspection and safety audit must an implement in periodic time. These two elements were playing important roles to ensure the case of an accident and injuries can be decline. Safety participation was management responsibility to deliver safety information to an employee with a various method such as either email, WhatsApp, notice board, or directly an announcement in the workplace, the objective is to improve safety organization and implement safety behavior.

2.4 Instrument & measurement safety performance

Studies in conceptualization in safety performance had several postulations from the researcher (Burke *et al*., 2002). Firstly, safety performance can be measured on safety outcomes such as accidents (Christian *et al*., 2009). Secondly, safety knowledge and skill can be measured in safety performance, and including regularity of occurrence employees engaged to safety activities (Griffin & Neal, 2000). Every organization is toward established good safety management, including strengthening occupational safety and health management system, quality management, and including an environmental management system. The measurement of each

system and its outcome is important to achieve excellence in quality management. According to Arezes and Miguel (2003) state that the important factor to safety performance measurement (SPM) is financial, production, and proper conduct by management. The goal and objective of SPM are to deliver important information, such as level of the quality system, mediation, or proper decision – making from the outcome of SPM and provide information to the organization (HSE, 2001). Arezes and Miguel (2003) state that in SPM, risk can be controlled within an organization by providing information such as progress and current status strategies, process, and activities within an organization.

In general, organization safety performance can be measured in negative perspectives such as measured in lost time caused by injuries, lost workday rate, and total injuries (Williams, 1999). Measurement in safety performance can use statistic accidents, injuries, and adverse health effects (Arezes & Miguel 2003). Instrument and measurement safety performance can see through past and current studies. According to Kao (2015), the worker's safety performance measurement using 8 items developed by Burke *et al.* (2002), this research is to find any connection employees on safety knowledge and safety performance. Siu, Phillips, and Leung (2003) researched related on age differences in safety attitudes and safety performance in Hong Kong construction workers, using questionnaire and also using 12 subscales of SAQ (Safety Attitude Questionnaire) to evaluate safety attitude, and only 2 questionnaires were used to measure safety performance (accident rates and occupation injuries).

Vinodkumar and Bhasi (2010) led the research in an industry in Kerala India that involving two-component, safety management practice and safety behavior, the question was divided into 3 categories, each category has questionnaire, such as to measure 6 safety management practice has 35 questions to measure perception of the worker, to measure level participation worker on safety

knowledge and safety motivation have 12 questions, and lastly 12 questions were prepared to measure safety participation and safety compliance. Otitolaiye (2016) conduct this research purposely to find and discover the mediating effect of safety management system on the relationship between safety culture and safety performance of F&B industries in Lagos, Nigeria, using self – reported questionnaire and data analysis were used on 126 head safety managers, total questionnaire had 46 items and divided into 4 core categories such as safety performance, safety management system, safety culture dan demographic information, this studied shown that safety performance was associated toward safety culture and safety management system.

Chen, Wang, Lu and Pan (2018) from research discover that, the interface of safety culture and firm safety performance in Taiwan's construction industries, Chen *et al.* (2018) used 316 valid questionnaires and using data analyzed, and found that in Taiwan's construction industries there is signification lead that ability of safety culture can affect safety performance. Mearns, Whitaker, and Flin (2003) were conduct studied in an offshore environment, and divided into 3 core categories named safety climate, safety performance, and management safety practice. The method questionnaire was using offshore safety questionnaire, and there are 2 type data were collected, namely, self – reported accident and safety management questionnaire statistic of an accident, and were found some safety climate has a significant relationship to official statistics of an accident, and some accident rated were related to some safety management practice.

Yang, Wang, Chang, Guo, and Huang (2009) using 350 questionnaires when studied relationship among leaders attitude, safety performance, and safety culture, using a cross-sectional study in healthcare industry, all questionnaire was mailed to hospital worker, final result this studies revealed that leadership attitude is playing vital part in pretentious safety performance and also safety culture. Wu, Chen, and Li (2008) were using self – administered questionnaire when

conducted a study on safety climate, safety leadership and safety performance, and this questionnaire was divided into 4 parts namely, general information, safety performance, safety leadership, and safety climate. Morrow, Koves and Barnes (2014) revealed that researched in safety performance and its relationship with safety culture and studied via the technique of questionnaire, consisted of 2 important elements, namely safety culture score and demographic questions. Hajmohammad and Vachon (2014) had conducted studied at 251 Canadian manufacturing plants and using method of a questionnaire to administer human resources managers. This study is to determine how safety culture can drive safety performance around the framework in an organization.

Singer, Lin, Falwell, Gaba, and Baker (2009) conducted a study in hospitals. This study related to safety performance, and using questionnaire surveys that consist questionnaires on demographic and safety climate. Furthermore, McFadden, Henagan, and Gowen, (2009) conducted studied in 200 hospitals on directors of nursing, quality officer, and risk officer. This studied was using an employed questionnaire to collected data, studied safety performance influences on an organization. Wu, Chang, Shu, Chen and Wang, (2011) researched a few petroleum plants in Taiwan using an administered questionnaire to 23 employees to each plant. This studied how safety leadership and safety climate can influence safety performance. In conclusion, there is numerous research conducted in a variety of industries on an instrument and measurement safety performance. Many researchers have used the questionnaire method to collect data, and this was proved in much research in the database.

2.5 Safety climate

Clark (2006) states that safety climate associated with concept or perception based on collective views in an organization and has been shared on the thought of safety behavior and safety practice, usually this was a practice within an organization. Safety climate seems had a close relationship to safety performance. Because when a safety climate is getting stronger, the value of safety performance will increase. It' support by multiple factors such as management commitment in safety, none absenteeism, regular feedbacks in communication-related safety issues, training, and also adequate tools and equipment in the workplace (Gershon *et al*., 2000). Safety knowledge and motivation became mediating parts between safety climate and safety behavior. Found that safety climate had a single factor comprehending management value, communication, training, and safety system (Neal *et al*., 2000). Individual assessment of the various perceptions and thoughts of the work environment is due to the creation and construction of a multidimensional organizational climate (James & James, 1989).

Safety climate is subject related to safety and risk at work environment that influences perception on the individual worker (Mearns & Flin, 1999). Schneider (1975) had conducted research related to organizational climate and conclude that the worker has a few opinions and points of view in terms of management, creativity, workgroup and position. Other factors such as work environment, procedures, and workplace practices also influence in different industries. Zohar (1980) had been conducting a study about measure safety climate in the industrial organization in Israel, and it believes the first researcher to publish at that time. General organizational climate influenced by employee participation. For example, attend for training which also contributes to knowledge and skills (Morrison, Upton & Cordery, 1997).

According to Donald and Canter (1994), revealed that in various industries or an organization. There will be various levels of risk or accident. This concept is closely related to the organizational climate, and meanwhile, according to Zontek (2006), through her published dissertation, within an organization, a safety climate played an important role because it can develop and will affect the feeling of stress and satisfaction of employees in an organization. Producing a safe environment in the organization, the organization climate playing a vital role, and with the condition, training must be center to develop skills and knowledge. One of the reasons need adequate training is because each industry had a different level of risk and type of risk. For the last decade, many researchers have produced studies about the concept of safety culture and safety climate in accident and safety literature (Diaz & Cabrera, 1997). Manageable in safety and adaptive safe behavior has become a perception to the worker and this perception can create the molar perception (people perception and share their view of their work settings or work culture) toward safety in the work environment (Zohar, 1980).

Neal *et al.* (2000) revealed that safety climate is when employees as an individual have expressed their feelings or their view related safety condition in their workplace. Numerous research successfully studies and create different safety climate into different industry, it can see study on industry health care services done by (Coyle, Sleeman & Adams, 1995), construction studies done by (Dedobbeleer & Beland, 1991; Siu, Phillips, & Leung, 2004), manufacturing studies were done by (Brown & Holmes, 1986), Energy industry studies done by (Ostrom, Wilhelmsen & Kaplan, 1993), road administration studies done by (Niskanen, 1994), and airport industries studies done by Diaz and Cabrera (1997), and Cabrera, Isla and Vilela (1997). In Table 2.1 safety climate model that has been produced by previous studies by researchers, and in Figure 2.2 can see a model safety climate presented by Christian *et al*. (2009), and lastly Figure 2.3 can

see a safety climate foundational. In 1935, Lewin theory has been introduced until from theory in 2017 done by Shen, Ju, Koh, Rowlinson and Bridge.

Table 2.1
A model that associated with safety climate

Researcher	**A greater safety climate dimension that recognizes from safety climate research**
Zohar (1980)	Firstly worker perception of management attitude about safety, and secondly related to their perceptions regarding the relevance of safety in the production processes, is two-element in safety climate model resolute from 20 industrial organizations in Israel.
Brown & Holmes (1986)	Failed to replicate Zohar's 1980, Firstly, employee perception of management's concern about they are well – being, secondly is management activity in responding to a problem with employee well-being and thirdly their own physical risk, is two-element safety climate model from American production worker.
Dedobbeleer & Beland (1991)	Verified by Brown & Holmes's 1986. Three-element climate model on a construction worker, the data two superior factor determines the sample, firstly management commitment to safety and secondly is the worker's involvement in safety support the model.
Seppala (1992)	The result founded into three elements, firstly organization responsible for safety, secondly is workers' concern about safety, and lastly, worker indifferences toward safety, the result is from investigating occupational safety at the system level and investigating the relationship between safety climate perception and occupational accidents occurring
Donald & Canter (1994)	Three-facet model developing on safety attitude, firstly people or organizational roles which make up the safety climate (supervisor, manager, workmates), secondly is attitude-behavior or aspect of an individual safety behavior (knowledge, satisfaction, actual behavior), and lastly is safety activity or type of safety behavior (passive, wearing safety clothing, active/attending safety meetings, this result from researching the chemical industry.
Cox & Cox (1991)	Five main elements of safety: firstly personal skepticism, secondly is an individual responsibility, thirdly is safeness of work environment, fourthly is the effectiveness of arrangements for safety, and lastly is personal immunity. These are the identified and important element is within a manufacturing company, operating around industrial gases.

Niskanen (1994)	Three-element safety climate model founded, firstly attitude to safety in the organization, secondly change in work demands and safety as part of productive work. The structure for each group included a comparable element describing, thirdly perception of the work labeled worker appreciation of work. The supervisor had a factor referencing, and fourth is value of the work. This research is led by Niskanen, an exploratory study with a questionnaire but it's not tested by reliability or validity, this research is taken sample from Finnish National Road Administration's five district of maintenance and construction worker
Kines et al. (2011)	Identified seven safety climate element's, firstly is management safety priority, secondly is management safety environment, thirdly is management safety justice, fourthly group safety commitment, fithly is group safety priority, sixthly is group safety learning, and lastly was safety system. This study was conducted by Det Nationale and the Nordic researcher review past empirical data, theories, and model.

Sources: Niskanen, (1994), Williamson, Feyer, Cairns, & Biancotti (1997), & Zohar (1980)

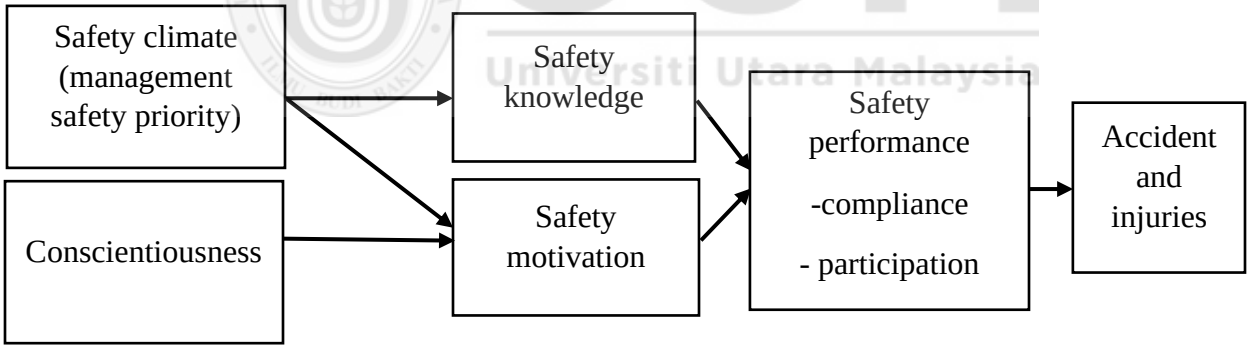


Figure 2.2
Model of safety climate
Source: Christian *et al*. (2009).

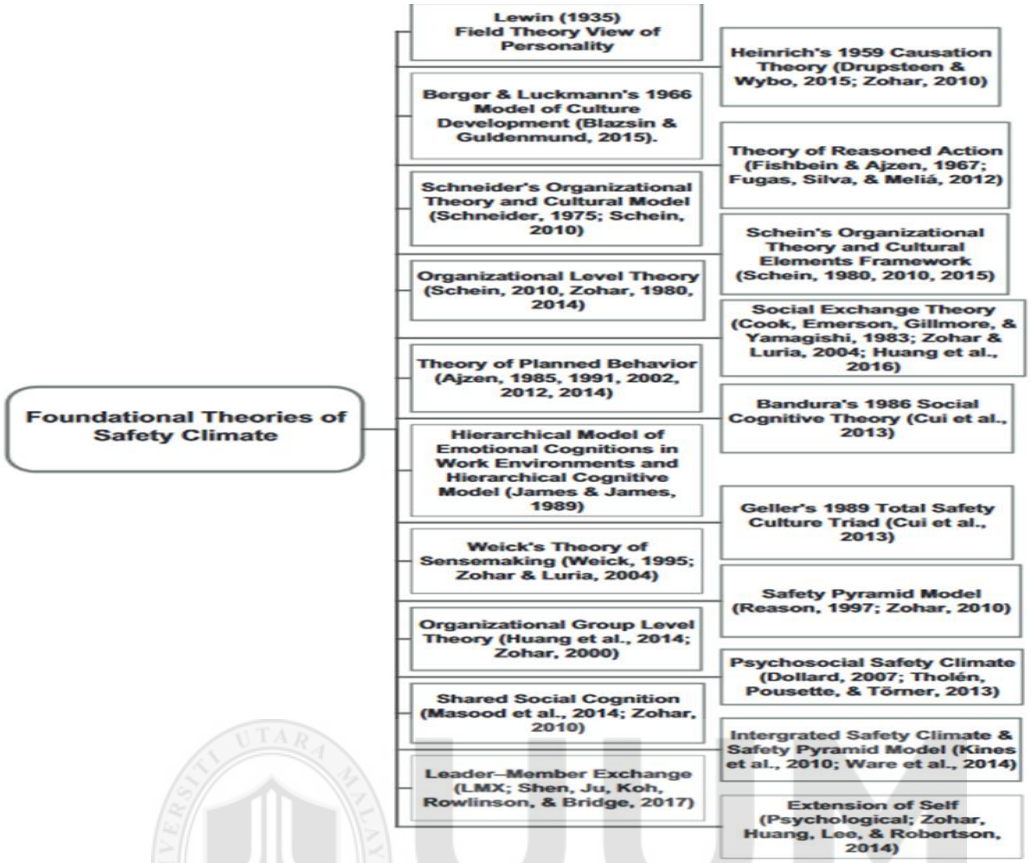


Figure 2.3
Safety climate foundational
Source: Cui *et al*. (2013), Kines *et al*. (2011) & Zohar (2010)

2.5.1.1 Safety climate dimension

Safety climate is a subsection from organizational climate and was divided into three components which are operator training, work style and work practices (Coyle, Sleeman & Adam, 1995). In the organization climate, there is a safety climate that gives employee perception of the level of safety in the workplace. It refers to the various elements of perception about safety at the workplace, and this includes the management's attention about the issues safety in the workplace,

employee welfare issues, adequate training for employees, organizations practices in quality management systems in terms of safety, and management practices an effective communication system with employees in occupational safety and health. In the general dimension in the organization, the environment had been describing as communication, roles, and leadership (James & McIntyre, 1996). Singer, Lin, Falwell, Gaba and Baker (2009) state that in a hospital organization, the management is belief and confidence that good practice in ethics and professionalism of hospital employees may cause safety values.

Safety climate is the attitude to implement the safety behavior toward our work environment. Human error when working can occur when personnel is taking disregard approach toward safety, one of the reasons is a lack of knowledge. Accidents and injuries can occur when the employee ignores the term safety at the workplace, and responsibility of the organization is to provide knowledge safety to an employee through training and various channels such as WhatsApp's, notice board, or announcement was associated with safety in the work environment. The objective is to sustain a safer workplace (Coyle, Sleeman, & Adams, 1995; Gillen, Baltz, Gassel, Kirsch & Vaccaro, 2002). In safety climate studies, the researcher have defined a critical factor in safety climate is management commitment (Flin *et al*., 2000; Marsh & Simpson, 1995). Two-factor influences decrease the rate of accidents in the organization is safety committees and safety training (Smith, Cohen, Cohen & Cleveland, 1978). Several types of research have been conducted related to safety climate, but unfortunately, the researcher was concluded that they have found no concrete and consistency factor in safety climate and the researcher were made decision that existence factor in safety climate is still unstable and inconsistency, still need further research and studies to prove the reliable factor for safety climate. (Coyle *et al*., 1995; Flin *et al*., 2000; Neal & Griffin, 2002; Mearns *et al*., 2003). About the instability of the factors affecting the safety

climate with the study done by (Cox & Flin, 1998; Merritt & Helmreich, 1995; Guldenmund, 2000; Glendon & Litherland, 2001) revealed that the safety climate dimension is influenced by the differential industrial and cultural of a country. According to Huang, Ho, Smith and Chen (2006) found that elements in safety climate such as safety training, management commitment to safety, return to work practice, and post-injury administration. These elements were analyzing as the intermediating the role of safety control on the association between safety climate and safety performance. Until today the world has seen numerous industries existed, this has seen numerous safety climate dimensions within each industry and this has been proving by previous studies. According to Glendon and Litherland (2001), safety guidelines, standard operation procedures, work pressure, personal protective equipment, relationships, and communication are a dimension safety climate in road construction.

In meanwhile Fang, Yang and Wong (2006) state that in construction industries, were acknowledge that 10 essential dimensions of safety climate, ethics in each employee, management commitment, safety training, supervisor responsibility, co-worker roles, safety consultation, lacking toward in safety procedure, risk-taking attitude, assessment in safety procedure, work risk, employee participation, and capability. Davenport, Henderson, Mosca, Khuri and Mentzer (2007) conduct the research from Veterans Affairs Medical Centers and Academic Medical Centers, and from the survey-based measures of organizational climate safety factors (OCSFs) found that, from multi-item safety climate measure of teamwork climate, safety climate, working condition, job satisfaction, recognition of stress effects, perception of management, and emotional exhaustion. The researcher found that safety analysis question (SAQ) indicated by Cronbach's α is more than 0.70 excepted perception of management, and revealed that job satisfaction is most higher in Cronbach's α indicated 0.83. Jacqueline (2015) was studied on Veterans Health Administration

(VHA) Safety Barometer employee perception survey, conducted studies among VHA workers in 2012, and propose on safety climate that dimensionally with six elements, such as safety support climate, supervision participation, safety support activities, organization climate, employee participation, and management participation and the result was significant that VHA work-related injury and illness rates were associated with worker perception of supervisor participation and safety support climate. In meanwhile, a few more dimension safety climate at Table 2.2, and Figure 2.4 were listed researchers with their safety climate dimensions.

Table 2.2
Dimension in the safety climate

Dimension	**Description of statement**
Management commitment	Words, action, organization, and control strategies that demonstrate management commitment to the environment, health, and safety (EH&S).
Expectations (a) Understanding	Understanding of standard work, health and safety responsibilities, and expectations.
(b) Training	The adequacy of training to effectively deal with EH&S aspects of their work.
(c) Accountability	Respondents accountability for EH&S performance.
Involvement (a) Supervisor involvement	Strategies that demonstrate supervisor involvement in EH&S such as planning, leading, organizing, and representing the employee.
Support activities (a) Rules and regulation (b) Standard work procedure (c) Communication and contact (d) Inspection (e) Accident investigation (f) Contractors (g) Emergency procedure (h)Technology (i) Maintenance (j) Award and recognition	No further information provided

Sources: Neal, Ridge, Ng, & Griffin (1997).

Studies	Climate Dimensions
Brown & Holmes (1986)	management concern, management activity, risk perception
Budworth (1997)	management commitment, supervisor support, safety systems, safety attitudes, safety reps
Cheyne et al. (2002)	communication, individual responsibility, safety standards and goals, personal involvement, workplace hazards, physical work environment
Cooper (1995)	management commitment, management actions, personal safety commitment, perceived risk levels, effects of work pace, belief about accident causation, effects of job induced stress, safety communication, emergency procedures, safety training, and role of safety representatives
Cox & Cheyne (2000)	management commitment, priority of safety, communication, safety rules, supportive environment, involvement in safety, personal priorities and need for safety, personal appreciation of risk, work environment
Cox & Cox (1991)	Personal skepticism, individual responsibility, work environment, safety arrangements, personal immunity
Dedobbeleer & Beland (1991)	management commitment, worker involvement
Salminen & Seppala (2005)	organizational responsibility, workers' concern about safety, workers' indifference in regards to safety, and the level of safety actions
Hsu et al. (2007)	organizational level: top management commitment, reward system, reporting system, and resource allocation; management level: safety training, safety activities, safety management; team level: communication, coordination, cooperation in a work team; individual level: safety performance such as safety awareness, safety attitude and safety behavior
Huang et al. (2006)	management commitment, return-to-work policies, post-injury administration, safety training
Williamson et al. (1997)	personal motivation for safe behavior, positive safety practice, risk justification, fatalism/optimism
Zohar (1980)	importance of safety training programs, management attitudes toward safety, effects of safe conduct on promotion, level of risk at workplace, effects of required work pace on safety, status of safety officer, effects of safe conduct on social status, status of safety committee

Figure 2.4
Previous research on safety climate dimension
Sources: Azimah *et al*. (2009)

2.5.1.2 Management commitment

Law of Malaysia (1994) revealed that occupational safety and health (Act 514) state that to provide and prepare a safe workplace to employees for reducing hazards in the workplace is the

responsibility of employers as highest management. This Act 514 clearly show management commitment to safety at the workplace is important to occupational safety and health management system. Top management essential committed to validated about employee safety and their well-being through positive safety attitudes (Sao, Hsieh & Chen, 2017). Reduced accidents and injuries at the workplace are essential in management practice (Cabrera, Fernaud, & Diaz, 2007), this also agrees by Ali, Abdullah and Subramaniam (2009) point out that, effective factors reduce accident and injuries at the workplace is management practice. According to Abudayyeh, Fredericks, Butt, and Shaar (2006) found that through their studies, there is a significant relationship between management commitment and regularity injuries and illness at the workplace.

Effectiveness manager roles in an organization are essential to creating a safe environment in the organization and already prove by the British shipping industry (Bhattacharya & Tang, 2013). According to Fernandez-Muniz, Montes-Peon and Vasquez-Ordas (2009) revealed that as managers, there was an important task to ensure safety in the workplace, managers also have two essential factors that influence toward the employee, firstly attitude and secondly is behavior, and also included in the safety management system. Management should change their style of leadership into transactional or transformational to create a positive work environment, and any occupational safety and health program will succeed (Crumbley, 2014). Human error and lack of development of management in an organization is the essential factor that contributes high in an accident and injuries at the workplace (Al-Moumen, 2009). In an organization, management has to create and implement policies, rules, and regulations for reducing accidents and injuries at the workplace. Crumbley (2014) revealed that successful occupational safety and health program needs developing, implementing, and sustaining and this only can get from management

commitment. Towards better objectives and goals, top management was responsible for creating policies (Khdair, Subramaniam & Shamsudin, 2011).

Many researchers have found management commitment toward safety and safety training is essential to view or perception to the worker because it became an indicator toward the safety level for the current and future (Crumbley, 2014). According to Vivodkumar and Bhasi (2010) found that Zohar (1980) is the pioneer and first researcher that study of safety climate and found that management commitment had huge influences successful on safety programmed in an organization. To the organization, the essential element is their production and product quality, and management commitment also should treat as equal or more to create quality in safety (Du Pont, 1989).

2.5.1.3 Worker involvement

Participation from employees also known worker involvement and it involves any program from an organization such as the welfare of employee, safety, and health, including cooperation between management and employee to solve the problem in an organization (Gibson, 1999). According to Vinodkumar and Bhasi (2010) state that worker involvement is part of the behavioral aspect of communication involving individuals or groups. The pattern communication is from below to above communication (the process of information flowing from the below levels of a hierarchy to the higher levels of the organization), this is also involvement all parties and stakeholders into the decision-making process within an organization. According to Tyler (1992) revealed that the objective Total Involvement Safety (TIS) is involving all levels of the worker, managers, and employees, participation in safety is essential to all workers, the worker should not

take care of their safety only but must view safety is for all the workers. Involvement employee for any program within an organization is valuable because the outcome will be effected on an organization, and the employee is suggested involving in the workshop, task force, particular project, meeting, target, and committees (Nurick, 1985). According to Tyler (1992) involving in safety programs also include participation in the audit team, Tyler has suggested that audit must come into two categories such as unsafe act audit and responsibilities safety audit. This audit is to inspect the plant in term of operating and maintenance in term of the management system. Excellent cooperation and involvement from employee toward safety can create a safety culture, the employee whom actively in safety program can generate employee with highly knowledgeable and skillful about safety within their organization (Williams, 2008).

All of the employees should actively contribute to safety within their organization and this condition can create a safety culture. A few researches have been proving that increase and sustain excellent safety in the workplace is dependent on two-element such as management commitment and worker involvement (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Flin, Mearns, O'Connor, & Bryden, 2000). Any employees highly involved with work processes and activities within their organization will bring onto employee engagement (Lockwood, 1997). An employee with knowledge about their organization is mostly will accountable at their workplace (US Department of Labor, 1994). Without worker involvement in safety programs, safety aspects will failure at their organization, every organization must make sure every worker involved in issues of the safety aspect and to ensure workers more understanding in theory and practically related to safety issues (Raines, 2011). The organization must act to find a way to increase worker in safety involvement such as worker whom active involving in safety program were given initiatives such as bonuses or another benefit. This will boost safety culture and also can reduce the injuries at the

workplace (William, 2008). Worker involvement in safety can increase by behavior-based safety (BBS), and workers can provide safety feedback from their co-worker or their group of the workplace (Williams, 2008).

Through study, any worker that involving in job involvement is related to the learning climate whether, in the public or private sector. It just needs the worker more on proactivity and be creative (Eldor & Harpaz, 2018). The employee was actively involved and committed to the safety program and was able to provide useful input or ideas related information about safety (OSHA, 2017). The responsible organization was always involved in the safety program and also was able to involve the worker in safety program and also be able to facilitate in safety program (Tsao, Hsieh, & Chen, 2017).

2.5.1.4 Job satisfaction

According to mbaskool (2009), a worker felt the satisfaction and pleased with their job, which can motivate their-self in work environment, and known as job satisfaction. Mbaskool (2009), also explains that employees that have a pleasant work environment, have good progress in their career as well as stability in their job and can create satisfaction to the workers. This factor also contributes to job satisfaction, and it is an indication of fulfilling the individual's needs and achievements. The worker feel satisfaction in their work will show happiness and easy to engaging and responding to their organization and this will add organizational value behavior such as safety compliance (Hofmann, Morgeson & Gerras, 2003). According to Sypniewska (2014), Maslow hierarchy of needs creator Abraham Harold Maslow found that people trying to climb step by step in the right hierarchical direction, from bottom to the top, where the physiological needs such as

of food, water, and shelter, secondly is safety needs such as security and health, the thirdly is to be loved either from family or friends, the fourthly is to be cherished or respected, and then lastly is to self-fulfillment needs in life.

According to Asare (2019), researchers have found that organizational effectiveness and well-being depend on teamwork, commitment, and job satisfaction (as cited in Amoatemaa & Kyeremeh 2016; Isac & Badshah, 2016). According to mbaskool (2009), employees feel that rewarded with the variety of facilities and incentives provided by the organization will indirectly employee will be shown the right level of dedication to work, revealed good work ethic, and always working hard. According to Clark (2006), employee compliance in work environment is related to compliance in work procedures or policies is related to job satisfaction, a study conducted on nurses, found that nurses generally when they felt positive about job satisfaction indirectly complied with work rules rather than with their coworkers who are dissatisfied with their work which will not comply with the rules. According to Abiri (2017) discovered that good relationship with management, good collaboration between physician-nurse, practice safety culture, able to control, feel responsible and feel self-rule or able to decide determined practice are the several work environment factor that influences nurse's into job satisfaction, this will stick with their organization, and if the factor were contradictory, the employees would seek other alternate organization or job (as cited in Djukic, Kovner, Brewer, Fatehi & Cline, 2013; Faller, Gates, Georges & Connelly, 2011; Hofmann & Mark, 2006; Sawatzky, Enns, & Legare, 2015; Van Bogaert, Kowalski, Weeks & Clarke, 2013). According to Jayasuriya, Whittaker, Halim and Matineau (2012) agreed that in recent research job satisfaction can conceptualized divided into three groups, firstly known as intra-personal factors, "those characteristics of the nurse," secondly known as Inter-personal factors, refer to people that associate interaction person to other person

and lastly extra-personal factors, is the further side of interaction, and mostly its influences by "institutions and government policies" (as cited in Hayes, Bonner & Pryor, 2010). According to Sexton, Helmreich, Neilands, Rowan, Vella, Boyden, Roberts and Thomas (2006) found that employees will show good ethics and positive vibes when they get job satisfaction from their experiences of working. According to Clark (2006), an employee who seeks the right job will bring job satisfaction, and this will create an obligation to the organization by adhering to organizational policies and regulations.

According to Zontek (2006), the job satisfaction factor is found to be opposite to the job stress factor (as cited in Gray-Toft & Anderson, 1981; Healy & McKay, 2000; Lee, 1998; Norbeck, 1985; Packard & Motowidlo, 1987) which is linked with factors of workplace injury and adverse physical and mental health. Lu, While and Barriball (2005) found that job dissatisfaction would have adverse effects such as job abandonment, a late entry to work, low quality of work, and intention to quit. Packard & Motowidlo (1987), in their study, found that job satisfaction and performance have a relationship, and obviously, workers with higher job satisfaction tend toward higher safety climate as well. According to Spector (1997) revealed that many factor or influences that can shape job satisfaction through work experiences, one of the indicators are the workers were an ability to negotiate to authority people or upper management because of their gain years of experiences in work.

2.6 Instrument and measurement safety climate

Safety climate is a partial state of safety, and it delivers a measurement for the safety culture of an organization, teamwork, or company (Flin *et al.*, 2000). Predicted on safety behavior must

consist of the ability to perform and evaluate measuring safety climate (Hon, Chan & Yam, 2014). People's behavior on safety influenced by safety climate and see-through expectation on behavior-outcome (Zohar, 2003). Safety climate is designed to specific tools to measurement related to safety attitude, and many industries are using a safety climate to measure, which obviously related to safety attitude (Brown, Willis & Prussia, 2000; Budworth, 1997; Carder & Ragan, 2003). According to Zohar (2003) state that the differences in actual practice and enforced informal policies, procedures, and practices can be determined by measuring safety climate. Ojanen (1988) and his colleague were proposing in measuring safety climate able to make vicissitudes safety behavior within the organization, and it is so valuable to assess the safety program within the organization (Glendon & Litherland, 2001).

Nowadays, to measure safety climate were using analytic measures for better condition observation and this is to ensure able to encounter problems and failure of the system and furthermore, find the solution and take necessary measures (Flin *et al*., 2000). There are seven key elements to be learned from the study on climate theory, and research is the basis of theoretical that used as a measurement to identify elements for climate measurement are co-workers' safety practices, leader safety commitments, security communications, safety training, security rewards, security involvement, security equipment, and housekeeping (Beus, Payne, Arthur & Muñoz, 2017). When referring to construction industries, the measurement is depending on industry environment, and three levels considered to reaching the objective. Firstly is problem identification, development of safety climate contextual indicator, and lastly, enrich safety climate measurement model (Niu, 2017). Through extensive and numerous studies on safety climate the researcher developed safety climate measurement consist 65 questionnaire surveys, and these surveys only used confirmatory factor analysis and expert evaluation. The researcher takes further

studies on safety climate that influences behavioral safety management, and determine descriptive statistic models that influence the organization (Pather, 2014). Many researchers were conduct a study in healthcare setting related to safety climate (Bagian, Lee, Gosbee, DeRosier, Stalhandske, Eldridge, Williams & Burkhardt, 2001; Ciavarelli & Crowson, 2004; Flin, Flecther, McGeorge, Sutherland & Patey, 2003; Flin *et al*., 2000; Itoh, Abe & Anderson, 2002; Kaissi, Johnson, & Kirschbaum, 2003; Nieva & Sorra, 2003; Sexton *et al*., 2006; Sexton, Thomas & Helmreich 2000; & Shortell, Rousseau, Gillies, Devers & Simons, 1991). The measurement diverged when researchers selected dimension on their studies, and in health care. The first instrument to measure safety climate was created by Gaba and colleagues, mostly the studies cover safety climate among anesthesiologists. Other than that, concentrate studies on "production pressure" (Gaba, Howard, & Jump 1994; Healzer, Howard, & Gaba, 1998).

In a healthcare setting, a safety climate survey can divide into several elements such as patient safety planning, infrastructure for perceiving errors, adequacy of crisis management, infrastructure for perceiving errors, risk-taking, and willingness to ask for help (Singla, Kitch, Weissman & Campbell, 2006). A famous questionnaire in the healthcare setting was SAQ (Safety Attitude Questionnaire), but Patient Safety Climate in Healthcare Organizations (PSCHO) survey was developed in 1999 and was revised in 2004 (Singer, 2007). O' Brien (2009) using a SAQ to measurement safety climate and consist dimension, stress recognition, teamwork, working condition, and job satisfaction. Konjin *et al*. (2015) using psychometrics (PSCHO) to measurement safety climate among Iranian nurses, the dimension of safety climates such as worker involvement in safety, accessibility to PPE and compliance to safety rules, safety training, risk perception, job pressure, safety communication, and difficulty of safe work. Furthermore, measuring in safety climate in healthcare by the researcher, see Figure 2.5 for more details.

Table 1 Studies measuring safety climate in health care

Authors	Instrument details and survey sample	Safety climate factors	Psychometric analyses	Outcome measures	Results
(1) DeJoy *et al*[36] See also DeJoy *et al*,[37 38] Gershon *et al*,[39] Guastello *et al*,[40] McGovern *et al*[41] for analyses based on parts of same data set	Safety climate scale 35 items (part of a longer questionnaire) 902 nurses, 322 physicians and 247 technicians (57% response rate) from 3 USA hospitals	Safety performance feedback Management commitment to safety Provision of PPE UP-related job hindrances Knowledge and information about UP Risk of infection Self-protective actions Work organisation	Exploratory factor analysis yielded 8 factors based on 23 items (some based on 3 items or less) α for the identified factors ranged from 0.39 (general work organisation) to 0.83 (management commitment) Regression analyses	Self-report scale on compliance; adherence to UP	Job hindrance was strongest predictor of compliance in nurses and physicians. Safety performance feedback was a strong predictor of compliance in nurses but more modest predictor for physicians
(2) Gershon *et al*[26]	46 item safety climate scale (part of longer questionnaire) 1240 employees from a large urban USA medical research centre (60% response rate) Only employees with the highest risk for blood and body fluid exposure were selected for participation	Senior management support Absence of job hindrances Cleanliness, orderliness Minimal conflict and good communication Safety-related feedback/training by supervisors PPE/engineering control equipment availability	Exploratory factor analysis yielded 6 factors based on 20 items (only 2 based on more than 3 items) $\alpha > 0.7$ for all 6 factors Regression analyses	Self-report scale on compliance with universal safety precautions Exposure incident history	"Cleanliness and orderliness", "senior management support" and "absence of job hindrances" associated with compliance with safety practices Higher "senior management support" and "feedback/training" related to lower exposure to incidents
(3) Neal *et al*[27]	16 items about safety climate (part of longer questionnaire) 525 employees from an Australian hospital (56% response)	Safety climate scale included items about: Management values Communication Training Safety systems	Safety climate defined by mean score from 16 items No factor analysis α =0.93 for 16 item safety climate scale Structural equation modelling	Self-report of safety practices and procedural compliance	Safety climate indirectly related to safety compliance
(4) Fellknor *et al*[28]	Safety climate 11 items based on Gershon *et al*.[26] (part of longer quesionnaire) 878 employees from 10 Costa Rican hospitals (96% response rate)	Management commitment to safety Work area Unsafe work practices Reporting safety violations	No FA[27] Regression analysis	Work injuries Self-report compliance with safety practices	Safety climate inverse relationship with workplace injuries Positive relationship between safety climate and safety practices
(5) McCoy *et al*[29]	21 item safety climate scale based on studies by Murphy *et al*[27] 149 infection control practitioners from 149 USA hospitals (62% response rate)	Management commitment Feedback Job demands Safety committee PPE availability	Exploratory FA α=0.62–0.93 Logistic regression analysis	Perceptions of adequacy of healthcare worker training to monitor co-workers' adherence to standard precautions	"Management commitment" and "feedback" positively related to training to observe co-workers' standard precautions compliance "Job demands" inversely related to training to observe co-workers' standard precautions compliance
(6) Vredenburgh[30]	18 item scale based on Ostrom *et al*[27] 62 risk managers from 62 USA hospitals (57% response rate)	Rewards Training Management commitment Communication and feedback Selection Participation	Exploratory factor analysis; 6 factor solution did not correspond to the hypothesised dimensions Multiple regression	Occupational injuries	Factor 1 (reactive measures) and factor 2 (proactive measures) predicted injury rates
(7) Carrico[31]	79 item questionnaire based on Offshore Safety Questionnaire[43] 93 nurses in Delaware, USA (31% response)	Communication Satisfaction safety Involvement Work pressure Safety attitudes Safety behaviours	Internal reliability analysis of proposed safety climate dimensions	None	Low mean scores indicated a somewhat poor safety climate for nurses

Table 1 Continued

Authors	Instrument details and survey sample	Safety climate factors	Psychometric analyses	Outcome measures	Results
(8) Singer *et al*[32]	Stanford/PSCI Culture Survey (82 items) 6312 employees including attending physicians, senior executives and a 10% random sample of other hospital personnel at 15 USA hospitals (47% response rate)	Organisation Department Production Reporting/seeking help Shame/self-awareness	Exploratory FA yielded 5 factors based on 30 items (shame/self-awareness factor only based on 3 items) α not given for identified factors	None	Problematic and neutral responses suggested "a lack of safety culture" in some hospitals
(9) Sorra and Nieva[33]	Hospital Survey on Patient Safety (79 items) 1437 staff at 21 USA hospitals (29% response rate)	Supervisor/manager expectations and actions promoting patient safety Organisational learning Teamwork within units Communication openness Feedback/communication about error Response to error Staffing Hospital management support for patient safety Teamwork across hospital units Hospital handoffs and transitions	Exploratory FA yielded 14 factors based on 66 items. Confirmatory FA yielded a 12 factor solution (2 factors that measured outcomes and 10 factors that measured safety climate) based on 42 items (6 factors only based on 3 items) $\alpha > 0.7$ for all factors except staffing ($\alpha = 0.63$) Correlations	Self-report of: Number of events reported Overall patient safety grade Overall perceptions of safety Frequency of event reporting	"Overall perceptions of safety" were correlated with "patient safety grade" and "hospital management support for patient safety" "Frequency of event reporting" was correlated with "feedback and communication about error"
ORMAQ studies[47,62]					
(10) Itoh *et al*[34]	Adapted Operating Team Resource Management Survey which included 57 items. 66 doctors, 486 nurses and 43 pharmacists from 5 Japanese hospitals (91% response rate)	Satisfaction with management Morale and motivation Communication Teamwork Power distance Own competence Recognition of stress Stress management Error	No factor structure emerged from FA (personal communication) α not given for proposed factors Correlation	Rates of incident reporting for nurses in one hospital	"Recognition of human error" and "power distance" were negatively correlated with rates of incident reporting
(11) Pronovost *et al*[35]	Total length of questionnaire not given but it included 10 item safety climate scale 395 staff at a large USA teaching hospital (64% response rate)	Supervisor and management commitment to safety Knowledge of how to report adverse events Understanding of systems as the cause of adverse events	No FA α not given for proposed factors	None	Participants perceived supervisors to have a greater commitment to safety than senior leaders
(12) Woods *et al*[36]	Total length of questionnaire not given but it was adapted from the 60 item version of the ORMAQ 802 healthcare workers from an Australian Health Service Area (26% response rate)	Organisational culture Communication Teamwork Assertiveness Performance shaping factors Error	No FA α not given for proposed factors	None	None related to outcomes

PPE, personal protective equipment (e.g. gloves, masks); UP, universal precautions; FA, factor analysis; ORMAQ, Operating Room Management Attitudes Questionnaire.

Figure 2.5
Measuring safety climate in health care
Sources: Flin *et al*. (2000)

CHAPTER 3 METHODOLOGY

3.1 Introduction

Discussion in chapter 3 will elaborate on the term of approaches and the mainframe of the whole research. The methodology selected to focus on achieving the objective of this research. The purpose of this research is to find and investigate the dimension of the safety climate that influences safety performance among Medical Assistance Officer in Kuantan Pahang. The focused dimension of safety climate is employee involvement, management commitment and job satisfaction. The method that involved in this project is preliminary studies on data collection, sampling methods, and data analysis.

3.2 Research framework

The conceptual research framework based on the literature review and hypotheses proposed for this project, refer to Figure 3.1 for further understanding. The safety climate dimension, play the crucial part as an independent variable influences the dependent variable, which is the safety performance. As stated before, the six dimensions of safety climate are the worker involvement, management commitment, job satisfaction, and meanwhile, the dependent variables are safety compliances and safety participation.

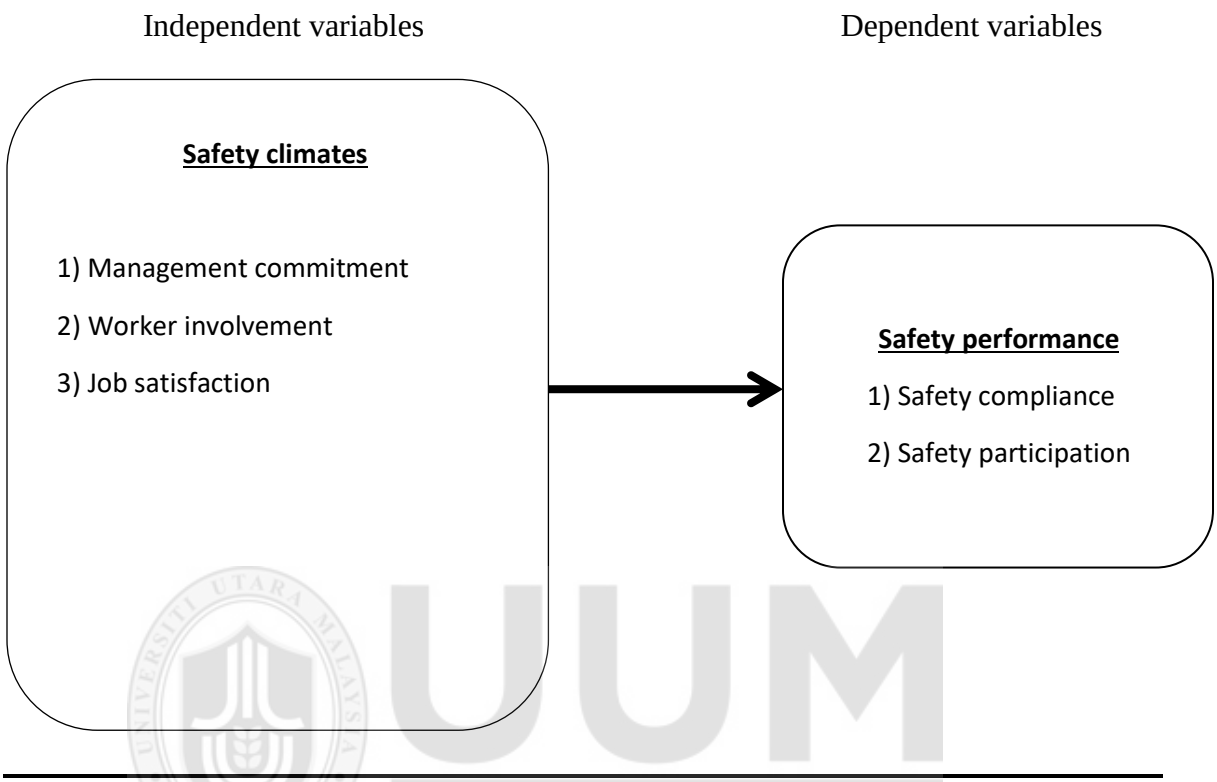


Figure 3.1
Conceptual research framework

3.3 Research hypotheses

From the Conceptual Research Framework, was display the four hypotheses that drafted for this research based on the research objective, refer Figure 3.2. Usually, hypothesis is the statement indicated on the relationship between two or more variables. Hypothesis consists of the variables, the population, and the association between two or more variables. The population was stated to the entire group of persons or fundamental who meet the sampling standards. Usually, hypothesis translate research question into a

forecast of a probable result, and to accelerate the outcome will use the tool of quantitative studies. The hypothesis research was listed as below:

i. Hypothesis 1 (H1): There is a significant relationship between management commitment and safety performance.

ii. Hypothesis 2 (H2): There is a significant relationship between worker involvement and safety performance.

iii. Hypothesis 3 (H3): There is a significant relationship between job satisfaction and safety performance.

iv. Hypothesis 4 (H4): There is a significant influence on safety climate dimensions on safety performance.

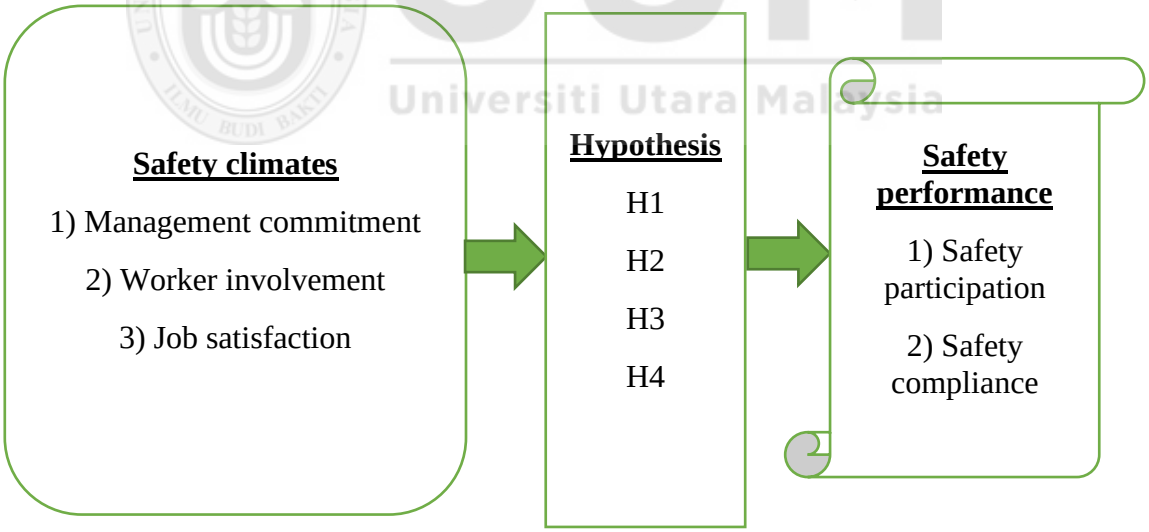


Figure 3.2
Research hypothesis framework

3.4 Research design

Coherently and logically used in research design is to define the overall strategy of the researcher in purpose to integrate the research. In this research design, it will start with the problem statement and ending with the recommendation, please refer to Figure 3.3. This research is pointy to define the connection between independent variables of management commitment, worker involvement, job satisfaction towards dependent variables safety performance (safety participation and safety compliance). For measurement and analysis of the data, the proper identification of the studied problem will consist of the whole blueprint, and the primary attention is gathering the data measurement and analysis of the data. To pointed out the research problem logically and as definite as possible, the research design plays an essential part in guaranteeing the data obtained from the studied. Furthermore, the complexity, difficulty, and length of the description of the research design should achieve the following features:

1. Obviously identified the research problem and vindicated its selection, mainly associated with any valid alternative design that might be used.

2. Synthesize and review previously published literature related to the problems.

3. Clearly and identified specify hypotheses central to the research problems.

4. Describe the data effectively, which will be essential for adequate testing of the hypothesis and described how data would be founded.

5. Explained the methods of analysis to be used in data to determining the hypothesis are true or false.

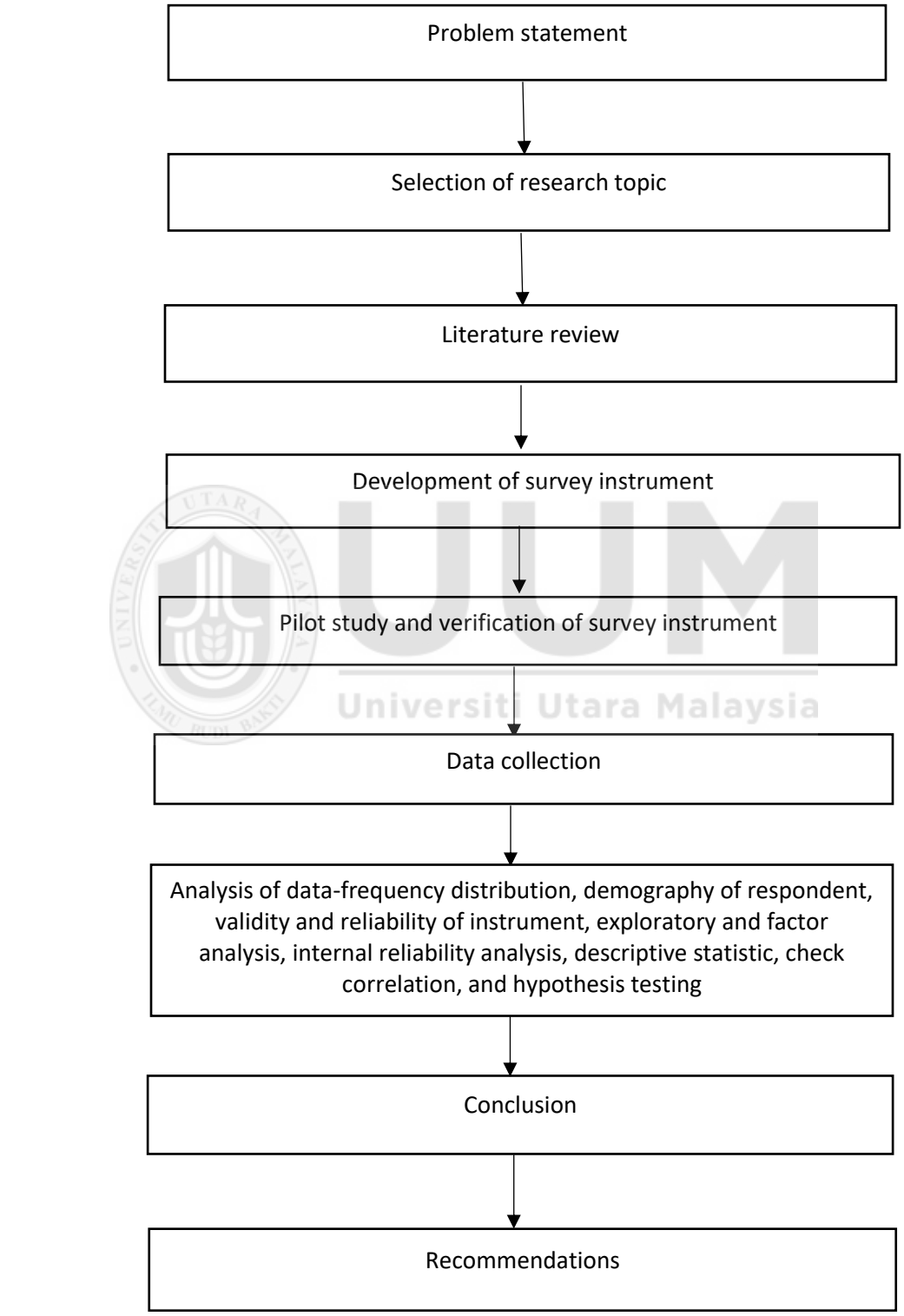


Figure 3.3
Research design illustration

3.5 Operational definition

3.5.1 Safety performance

To make the environment is safe, the safety performance should mainly play an important role. Safety performance can be dividing into four elements, namely using personal protective equipment when handling hazard elements, reminder and concern about practically on standard operation procedure (SOP) at work, always to be communicate about safety at workplace and every employee is aware about their right related to responsibility in safety and health (Crow, Burke & Landis, 2003).

3.5.2 Safety compliance

Always followed the rule and regulation, follow the standard operating procedures, always wearing safety clothing, and using precise tools. It can be defined as safety compliance (Burke *et al*., 2002). In many studies found in the literature related to safety climate, indicated that safety compliance was mainly contributed influences into safety performance (Wong *et al*., 1999).

3.5.3 Safety participation

Safety participation can describe working together to reduce hazards at the workplace, and safety participation also defines active communication to spread awareness among workers to reduced hazards at the workplace (Subramaniam *et al*., 2016). When a worker has an attitude of voluntarily involving safety behavior at the workplace, it is define as safety participation. Vinodkumar and Bhasi (2010) were found that safety participation has substantial influences on safety performance.

3.5.4 Management commitment

Management commitment playing a massive role in reducing hazards at the workplace, this has been approving by many studies. Abudayyeh *et al*. (2006) revealed that from their studies. There is an indicated association relationship between management commitment and frequency of injuries and illness at the workplace. Crumbley (2014) state that strong management commitment is essential to occupational safety and health program when management commitment is poor. It can trigger a high rate of injuries and illness at the workplace.

3.5.5 Worker involvement

Worker involvement is essential to show the attitude of a worker for more responsibility to an organization. Worker involvement to any program within the organization is crucial because it can affect an organization, worker involvement can

participate in the workshop, task force, particular project, meeting, target, and committees (Nurick, 1985).

3.5.6 Job satisfaction

According to Wong (2018) state that job satisfaction had been studied start in the early 1930s, and the researchers had been defining various meaning or opinion regarding job satisfaction. According to Wong (2018) found that Hoppock (1935) was interpreted the meaning of job satisfaction throughout his finding in research, and found that employee perception on job satisfaction can be divided into three main elements such as environment, physiological, and psychological. A significant relationship or strong relationship within an organization between workers and management or workers between their co-workers is the answer to determined and lead to success in an organization. (Bakker *et al*., 2011; Bakker & Schaufeli, 2008).

3.6 Research instrumentation

Data collection from respondents is using the questionnaire survey as a tool. Questionnaire item in term of content and validity is associated through literature review, and past research was used in these studies (Lu & Tsai, 2008). This questionnaire survey form is adapted from the works of Vinodkumar and Bhasi (2010), and Bondevik *et al*. (2014), refer Table 3.1 and Table 3.2. These questions restated, purposely outfit local working practices and culture. Every question was full description statement, according to their real experiences and expression of feeling, the respondent will rate questions in the

survey form. The questionnaire encompasses eight parts with a total of 48 questions using the nominal scale for respondent's demographic data and Likert scale (1 – Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly Agree) for entirely the variables studied in this research. The questions were created according to the reversed-scored layout (Harun, 2014). The questionnaire was prepared in English only.

3.6.1 Safety climate scale

This scale was prepared of three dimensions and is measured with three subscales measuring the assistance medical officer was management commitment, worker involvement, and job satisfaction.

3.6.2 Safety performance scale

This scale contains two dimensions named safety compliance and safety participation, and will measure on two subscales.

Table 3.1
Survey instrument

Variables	Item	Sources	Scale	Alpha value
Management commitment	9	Adapted from Vinodkumar and Bhasi (2010)	1=Strongly disagree to 5=Strongly agree	0.86
Worker involvement	5	Adapted from Vinodkumar and Bhasi (2010)	1=Strongly disagree to 5=Strongly agree	0.69
Job satisfaction	5	Adapted from Bondevik et al. (2014)	1=Strongly disagree to 5=Strongly agree	0.74

Safety compliance	7	Adapted from Vinodkumar and Bhasi (2010)	1=Strongly disagree to 5=Strongly agree	0.76
Safety participation	5	Adapted from Vinodkumar and Bhasi (2010)	1=Strongly disagree to 5=Strongly agree	0.66

Table 3.2
Questionnaire design

Variables	**Researcher**	**Type of questionnaire**
Management commitment	Vinodkumar and Bhasi (2010)	1. Safety is given high priority by the management. 2. Safety rules and procedures are strictly followed by the management 3. Corrective action is always taken when the management is told about unsafe practices. 4. In my workplace, the manager/supervisor does not show interest in the safety of workers. 5. Management considers safety to equally important as services. 6. I feel that management is willing to compromise on safety for increasing services. 7. When the near-miss accident is reported, my management acts quickly to solve the problems. 8. My management does not attend a safety meeting. 9. My management provides sufficient protective equipment for the workers
Worker involvement	Vinodkumar and Bhasi (2010)	1. Management always welcomes opinions from an employee before making the final decisions on safety-related matters. 2. My health facilities have safety committees consisting of representatives of management and employee. 3. Management promotes employee's involvement in safety-related matters. 4. Management consults with the employee regularly about workplace health and safety issues. 5. The employee does not sincerely participate in identifying safety problems.
Safety compliance	Vinodkumar and Bhasi (2010)	1. I use all the necessary safety equipment to do my job. 2. I carry out my work in a safe manner. 3. I follow correct safety rules and procedures while carrying out my job.

		4. I ensure the highest levels of safety when I carry out my job. 5. Occasionally due to over lack of time, I deviate (unlikely) from correct and safe work procedures. 6. Occasionally due to over-familiarity with the job, I deviate from correct and safe work procedures. 7. It is not always practical to follow all safety rules and procedures while doing a job.
Safety participation	Vinodkumar and Bhasi (2010)	1. I always point out to the management if any safety-related matters are noticed in my health facilities 2. I put extra effort to improve the safety of the workplace. 3. I voluntarily carry out tasks or activities that help to improve workplace safety. 4. I encourage my co-workers to work safely. 5. I help my co-workers when they are working under risk or hazardous conditions.
Job satisfaction	Bondevik *et al*. (2014)	1. I always point out to the management if any safety-related matters are noticed in my health facilities 2. I put extra effort to improve the safety of the workplace. 3. I voluntarily carry out tasks or activities that help to improve workplace safety. 4. I encourage my co-workers to work safely. 5. I help my co-worker when they are working under risk or hazardous conditions

3.7 Data collection

In this research, premier data purposely to gain from numerous variables. Premier data was to obtain from various variables and suitably used in the research (Harun, 2014). For data collection, the survey form was distributed to the assistant medical officer in a government health clinic in Kuantan Pahang. The survey form is direct and easy to understand for the respondent. Two weeks given to accomplish the form without any disturbance and pressure from the researcher. When the structure question was given to the

respondent, the most important is their psychological factor that will determine the type of response. The survey form will be collected back from the respondent when they accomplished the form within the time given. When data was accomplished collected, it will be analyzed for further elaboration for discussion.

3.8 Population

The selected group for this research was the assistant medical officer that working at government health facilities in Kuantan, Pahang. This survey population size is limited to the respondent in government health facilities only, and 94 employees (as a respondent), consist of 1 district health office, 10 government health clinic, 6 community health clinic, and a UTC health clinic were involved in this research studies.

3.9 Sampling

Sampling is a select the suitable groups of elements in a population that accomplish the full criteria needed in the targeted population, whereas it consists of the differences in response and constructed invariance in knowledge and skills area. Sampling also is an effective method to gain the data, and limiting the probable errors when involving a vast number of the targeted group is selected. For this research study, all of 94 assistance medical officer who is working at a government health clinic in Kuantan, Pahang involved by 1 district health office, 10 government health clinic, 6 community health clinics and a UTC health clinic. The main purpose is to collect the primary data from the broader population, and the outcomes are to deliver a more balanced perspective. For further

understanding, please refer to Figure 3.4. The studies from Krejcie and Morgan (1970), regarding the number from population size to determine sample size. 94 assistance medical officers were selected as respondents, and the minimum sample should around 71 to 75.

TABLE FOR DETERMINING SAMPLE SIZE FROM A GIVEN POPULATION

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

Note: "N" is population size
"S" is sample size.

Krejcie, Robert V., Morgan, Daryle W., "Determining Sample Size for Research Activities", Educational and Psychological Measurement, 1970.

Figure 3.4
For determining sample size from a given population
Source: Krejcie and Morgan (1970)

3.10 Data collection techniques

Cooper and Schindler (2008) found that to describe the best sampling technique is the whole population participated in sampling from the chosen element, and this will give the real picture of the population. Non-probability is used on data collection techniques for

this research. According to Laerd Dissertation (2012), non-probability sampling has 5 types named as:

a) Quota sampling.
b) Convenience sampling.
c) Purposive sampling.
d) Self – selection sampling.
e) Snowball sampling.

According to Laerd Dissertation (2012), all of this sampling technique is more appropriate and reliable on a student when doing a master level. Non-probability sampling referred to an indicated researcher with strong theoretical reasons for their choice of cases to be included in the sample. Non-probability sampling is more convenient because it is much easier, quicker, and cheaper compared to probability sampling. This technique sampling is suitable for a limited time to finish this research that given three months to complete this research. The researcher will choose purposive sampling from non-probability sampling for this research because much more convenient and suitable for a limited time to finish the research. According to Laerd Dissertation (2012), the reason such as judgmental selective or subjective sampling can be primary reasons for purposive sampling. It is usually purposive sampling reflects a group sampling that depends on the judgment of the researcher especially selecting the people, event, pieces of data or organization, purposive sampling can be divided into 6 categories named as:

i. Maximum variation sampling.
ii. Homogeneous sampling.

iii. Typical case sampling.

iv. Extreme (or deviant) case sampling.

v. Total population sampling.

vi. Expert sampling.

From purposive sampling, the researcher will choose total population sampling because of a limited amount of sampling and manageable size, the population of assistance medical officer in Kuantan Pahang is only 94 and minimum target sampling should be around 71 to 75, refer to full fill requirement Figure 3.4 from Krejcie and Morgan (1970). According to Statistic How to (2019), state that total population sampling is type from purposive sampling, this sampling data technique is when all of the population was selected to be studied, the main reasons of this data collection technique is total population is a manageable size, and a well-defined subgroup of a large population.

To appraising the relationship between safety climate, safety performance, and also the respondent's characteristics, the suitable analysis is correlation analysis. In order to analyze and measure the safety climate's influence on safety performance, each of questions was categorized and contained critical dimensions. According to Yadar (2018), state that correlation analysis well known as statistical procedure. The main objective of this correlation analysis is to test and measure the relationship between quantitative variables and categorical variables, in other meaning this correlation analysis is to describe the measurement degree of connection between 2 variables and usually used in statistical technique for researcher.

3.11 Techniques of data analysis

In this study for statistical analysis, the researcher uses Statistical Package for the Social Sciences (SPSS) version 23. Mainly statistical analysis using for social science in education and research was using SPSS was capable of using different settings such as health-care research, market research, survey organization, extensive data professional, data miner and government (Technopedia, 2019). "Statistical tools are the mean, the arithmetical average of numbers, median and mode, range, dispersion, standard deviation, interquartile range, coefficient of variation, and others" (Begum & Ahmed, 2015, p. 50). Software such as SAS and SPSS are most relevant and able to interpret the result even in huge sample size but the statistical analysis must associate to the objective of the study, and the researcher must gain information related to the population study (Begum & Ahmed, 2015). All of the data that has been collected were purposely for statistical analysis and interpretation of data. This study was using the platform of SPSS version 23 for Windows for statistical analysis. Completeness of the questionnaire is one of the main conditions before it can be entered into SPSS, after that the completed questionnaires will code and entered into SPSS. Cronbach's Alpha is a tool to check for the consistency of the data, and the purposed using Cronbach's Alpha tool is for reliability test and to determine the scale.

According to Statistic Solution (2019), state that Cronbach's alpha provides the researcher an easy method to measure if the score is reliable or not, and it used under postulation by the researcher to have several items calculating the same fundamental hypothesis. According to Nunally (1978), found that adequate alpha level number must than 0.7, and also to determine the characteristic of the respondent's background, and the

method that will use is Pearson's correlation coefficient to determine the strong relationship between independent variables and dependent variables. According to University of the West England (2019), Pearson's correlation coefficient is a technique that's able to search and determine the relationship between two quantities regarding continuous variables such as age, and this technique is to determine relationship two-variable whether there is significant strength or not.

SPSS version 23 software purposely to analyze the data obtained from the questionnaire. The data collected are studied via descriptive analysis, normality test (skewness and kurtosis), reliability analysis, Pearson's correlation test and multiple regression tests. Descriptive statistics are standard deviations and means values for each variable were gained and to be analyzed. Descriptive statistic is meant to interpret the basic features of the data such as descriptive summary statistics for the scalar variables and the measure of the data, and it is so helpful in a research study when dealing with extensive data. This descriptive statistic can manage the data and presented in summary in the table (Statistics Solution, 2019).

3.12 Pilot Studies

A pilot studied with overall 40 respondents was conducted before starting the real survey. According to Cooper and Schindler (2008) state that the appropriate sample sizes of the pilot study is approximately 25 to 100 respondents. The primary purpose is to conclude the reliability of this study and also seen the validity and reliability of the tool

used. This pilot study used the English language only. SPSS will be used to test Cronbach's alpha of the measurement instrument to identify the questionnaire's reliability and validity.

3.13 Conclusion

Chapter three is to describe the development of the studies and also the technical features of the research studies such as study instruments and statistical tools used in this study. According to this study, the empirical relationship between the three safety climate dimensions and two safety performance dimensions attends as the outcome variables. This chapter describes the sampling methods, research Instrumentation that how to prepare a questionnaire survey tool, data analysis technique, and using SPSS version 23 software to analyze collected data and description of the pilot study before conducting the real survey.

CHAPTER 4 RESULT AND DISCUSSION

4.1 Introduction

In chapter four will discuss and elaborate the finding on the analysis from SPSS version 23. All the type of data were analyzed using Cronbach alpha test, normality test, Pearson's correlation, and reliability analysis to determine associations between variables, the data are;

i. Cronbach alpha test is to test the validity and reliability of all independent variables (management commitment, worker involvement, and job satisfaction), the purpose is to an appraisal of a measurement instrument.
ii. Descriptive analysis is to analyze related such as age, grade position, level of education, type healthcare facilities, year of experiences, and gender, also presented in terms of percentage and frequency.
iii. The main objective of the normality test (skewness and kurtosis) is to measure the degree and also a route of asymmetric each variable.
iv. Multiple regression analysis is about to test independent variables (management commitment, worker involvement, and job satisfaction) that influence the dependent variable (safety compliance and safety participation).
v. The correlation coefficient test analysis is describing the strength of the relationship between two variables.

4.2 Cronbach's alpha test analysis for the pilot study

For the pilot study, an agreement from the supervisor, 40 respondents were selected from the assistant medical officer in Kuantan Pahang, and for analysis purposed validity and reliability were using Cronbach's alpha analysis. According to UCLA (Institute of Digital, Research, and Education) in 2019 stated that Cronbach alpha test is the tool to measurement consistency all the variables that within-group and Cronbach's alpha will provide the measurement of scale in terms of reliability all variables. Acceptable Cronbach alpha is over 0.7, and that was agreed by Nunally (1978) state that acceptable Cronbach's alpha must be measured more than 0.7 and lower than 0.7 will not acceptable. From Table 4.1, the independent variable (management commitment, worker involvement, job satisfaction) is more 0.7, and the dependent variable (safety performance) also more than 0.7. The result shown in Table 4.1, that all variables were reliable and had consistency because Cronbach's alpha had more than 0.7. After a discussion with the supervisor, all variables were used in an actual survey that involving 84 from 94 respondents.

Table 4.1
Reliability statistics

Variables	Cronbach's alpha	Cronbach's alpha based on standardized items	Num. of items
Management commitment	0.842	0.855	9
Worker involvement	0.780	0.781	5
Job satisfaction	0.869	0.871	5
Safety performance	0.853	0.889	12

N=40

4.3 Descriptive analysis

4.3.1 Socio-demographic background

Table 4.2 shown the classification socio-demographic for 84 respondents. The first variable is grade the result shown majority is grade U29 as much as 63 (75%), followed by grade U32 total as 17 (20.2%), thirdly is sharing by grade U36 and grade U42 equally by 2 (2.4%) and lastly grade U41 is 0. For gender, variables are dominated by males consist of 69 (82.1%) and respectively, followed by females consist of 15 (17.9%). Third variables is years of experiences and many respondents are experiencing more than 5 years, majority respondent is experiencing 5 years-10 years consist as 35 (41.7%), secondly, 10 years-15 years consist as 24 (28.6%), thirdly above 15 years is 24 (16.7%) and lastly less than 5 years is 11 (13.1%). Forth variables are level of education, consist diploma, degree, and master, and the result shown diploma is dominated by 81 (96.4%), followed by degree only consist 3 (3.6%) and lastly, the master is 0. The last variable of socio-demographic background is health facilities, and most respondent is working at health clinic as amount 72 (85.5%), secondly by community health clinic consist 6 (7.1%), thirdly by UTC health clinic amount as 4 (4.8%) and followed by district health office 2 (2.4%).

Table 4.2
Classification socio-demographic related to respondent

Variable	**Classification**	**Frequency (person)**	**Percentage (%)**
Grade	Grade U29	63	75
	Grade U32	17	20.2
	Grade U36	2	2.4
	Grade U41	0	0
	Grade U42	2	2.4
Gender	Male	69	82.1
	Female	15	17.9
Years of experiences	Less than 5 years	11	13.1
	5 years – 10 years	35	41.7

	10 years – 15 years	24	28.6
	Above 15 years	14	16.7
Level education	Diploma	81	96.4
	Degree	3	3.6
	Master	0	0
Health facilities	District health office	2	2.4
	Health clinic	72	85.7
	UTC health clinic	4	4.8
	Community health clinic	6	7.1

N=84

4.3.2 Research variables

Table 4.3 shown the summarize of the mean and standard deviation for whole variables. The result has shown that the range means value for all variables is between 3.360 to 4.306. The lowest variables for mean value is safety performance is mean value 3.360 with standard deviation 1.2214, secondly, the lowest is safety performance is 3.425 with standard deviation 0.8393, thirdly is management commitment is 3.506 of mean value with 0.9343 of standard deviation, and the highest variable is job satisfaction is mean value 4.306 with standard deviation of 0.7336.

Table 4.3
The mean and standard deviation of the variable

Variables	**Mean**	**Std deviation**
Management commitment	3.506	0.9343
Worker involvement	3.360	1.2214
Job satisfaction	4.306	0.7336
Safety performance	3.425	0.8393

N=84

4.4 Reliability test

Table 4.4 shown all of the variables with the number of the item and with their α value. According to Nunnally (1978), acceptable α value is more than 0.70 and also agreed by Cortina (1993) state that acceptance of α value is > 0.70. There various researches were published related to acceptable alpha range between 0.70 to 0.90 (Nunnally, 1994; Blend & Altman, 1997; Devellis, 2003). Shang and Lu (2009) state that in the early stages of empirical analysis, the best method is using Cronbach's alpha reliability analysis test. In Table 4.4 shown the highest variable in Cronbach's alpha value is worker involvement (0.845) followed by management commitment (0.825), job satisfaction (0.822), and lastly is safety performance (0.767).

Table 4.4
Reliability test

Variable	**Num. of items**	**α value**	**Eliminated item**
Management commitment	9	0.825	-
Worker involvement	5	0.845	-
Job satisfaction	5	0.822	-
Safety performance	12	0.767	-

N=84

4.5 Normality test

Table 4.5
Skewness and Kurtosis value

		Safety performance	Management commitment	Worker involvement	Job satisfaction
N	Valid	84	84	84	84

	missing	0	0	0	0
Skewness		.231	-.140	.003	-.093
Std. Error of Skewness		.263	.263	.263	.263
Kurtosis		-.030	1.012	-.965	-1.024
Std. Error of Kurtosis		.520	.520	.520	.520

Table 4.6
Skewness table range

	Descriptive skewness	**Level of skewness**
1	Skewness is < -1 or > +1	Highly skewed
2	Skewness is range between -1 and -0.5 or between +0.5 and +1	Moderate skewed
3	Skewness is between -0.5 and +0.5	Approximately symmetric

Sources: Bulmer (1979)

From the result in Table 4.5 on Skewness and Kurtosis analysis, it can be shown Skewness for safety performance is 0.231 interpreted approximately symmetric, management commitment is 0.140 interpreted approximately symmetric, worker involvement is 0.003 interpreted as highly skewness and job satisfaction is -0.093 interpreted as moderate skewness, interpretation for Skewness table range can be refer to Table 4.6 . According to UCLA (2020), the primary purpose of Skewness is to measure the degree and also a route of asymmetric. According to George and Mallery (2010) found that the values for asymmetry and kurtosis between -2 and +2 are measured acceptable. From Table 4.5, Kurtosis value for all variables (safety performance, management commitment, worker involvement, and job satisfaction) is acceptable from the lowest value -1.024 to highest value 1.012.

4.6 Correlation test

In this table shown the connection between dependent and independent variables, and this result from analysis Pearson's correlation test, *r*.

Table 4.7
Correlation result

Safety climate	Safety performance
Management commitment	.253*
Worker involvement	.338**
Job satisfaction	.341**

N = 84

According to Altman (1990), correlation is related to statistical. The primary function correlation test is to measuring at probable two way linear related with two constant variables. Mukaka (2012) states that the correlation test is about measuring continuous two variables related to statistical, and when correlation coefficient zero indicated it seems no direct association occurs between two continuous variables. Table 4.7 is shown from analysis Pearson's correlation test related to dependent variables that are safety performance = SP and independent variables (management commitment = MC, worker involvement = WI and job satisfaction = JS).

i. Hypothesis 1 (H1): There is a significant relationship between management commitment and safety performance.

According Table 4.7, hypothesis 1 (H1) shown significant correlation between safety performance and management commitment with (r = 0.253, n = 84). From that result, the null hypothesis was rejected and the alternative hypothesis was accepted.

ii. Hypothesis 2 (H2): Shown a significant relationship between worker involvement and safety performance.

Refer to Table 4.7, hypothesis 1 (H2) shown significant correlation between safety performance and worker involvement with (r = 0.338, n = 84). From that result, the null hypothesis was rejected and the alternative hypothesis was accepted.

iii. Hypothesis 3 (H3): There is a significant relationship between job satisfaction and safety performance.

Refer to Table 4.7, hypothesis 1 (H3) shown significant correlation between safety performance and job satisfaction with (r = 0.341, n = 84). From that result, the null hypothesis was rejected, and the alternative hypothesis was accepted.

iv. Hypothesis 4 (H4): There is a significant influence on safety climate dimensions on safety performance.

Refer to Table 4.7, hypothesis 4 (H4) shown a correlation between safety performance and safety climate (worker involvement, job satisfaction, and also management commitment).

Table 4.8
Correlation table

Range	Level
0.10 to 0.29	Weak
0.30 to 0.49	Moderate
0.50 to 1.0	Strong

Source: Pallant (2007)

4.7 Multiple regression analysis test

The primary purpose of multiple regression analysis tests various types of data and identified the problems. Mainly this analysis test is used in research and to discover the influences between two variables.

Table 4.9
Model summary multiple regression analysis

Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.563[a]	0.317	0.291	2.509

Predictors: (Constant), management commitment, worker involvement, and job satisfaction.

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std Error	Beta	T	Sig
1 (Constant)	32.859	3.332		9.860	.000
Management commitment	.153	.052	.281	2.948	.004
Worker involvement	.190	.057	.313	3.342	.001
Job satisfaction	.471	.109	.407	4.328	0.00

N = 84, Dependent Variables: Safety Performance

Table 4.9 shown the multiple regression analysis results and from the result between dependent variables (safety performance) and all the independent variables (management commitment, worker involvement, and job satisfaction). The result indicated shown the R = 0.563 and Square = 0.317, meaning that multiple regression coefficients between safety performance and all the independent variables are 31.7% variance in safety performance can be clarified by entire independent variables (management commitment,

worker involvement, and job satisfaction). In Table 4.9 also consist of standard coefficient, t value, and sig. value. This result shown that the highest beta value is job satisfaction [β = .407, t = 4.328, sig. value = 0.00]. Secondly, the worker commitment [β = .313, t = 3.342, sig. value = .001], and lastly the management commitment [β = .281, t = 2.948, sig. value = .004]. Hypothesis testing was revealed that all of the independent variables (management commitment, worker involvement, and job satisfaction) were significant influences toward safety performance as designated by p-value (sig. <0.05), which means that all of the independent variables (management commitment, worker involvement, and job satisfaction) are an essential variable influences toward safety performance for assistance medical officer in government health facilities in Kuantan, Pahang.

4.8 Result summarization

Table 4.10
Summarization of research hypothesis

H	Descriptive of hypothesis	Result
H1	Hypothesis 1 (H1): There is a significant relationship between management commitment and safety performance.	Acceptable
H2	Hypothesis 2 (H2): There is a significant relationship between worker involvement and safety performance.	Acceptable
H3	Hypothesis 3 (H3): There is a significant relationship between job satisfaction and safety performance.	Acceptable
H4	Hypothesis 4 (H4): There is a significant influence on safety climate dimensions on safety performance.	Acceptable

4.9 Conclusion

Chapter 4 presented the result by analysis attained for the whole research. The result was generated by SPSS version 23 software, and the analysis of the result was chosen by

most practical and relevant methods to produce the analysis result, the analysis method was correlation test, normality test (Skewness and Kurtosis test), reliability analysis test, descriptive analysis test and multiple regression analysis tests. In Table 4.10 shown that all variables in descriptive hypothesis was acceptable. The last chapter of this research which is chapter 5 will elaborate on an explanation of the finding in chapter 4.

CHAPTER 5 CONCLUSION AND SUGGESTION

5.1 Introduction

This chapter will elaborate and discuss finding, research inference, proposition, and lastly, the conclusion of this chapter. In this study, the variables are safety performance, management commitment, worker involvement, and job satisfaction for the assistant medical officer at health facilities in Kuantan, Pahang.

5.2 Research summary

As stated before, the purpose of this research is to analyze relationships and influences between safety climate (management commitment, worker involvement, and job satisfaction) with safety performance (safety participation and safety compliance). The survey questionnaire was distributed to all of the 94 assistant medical officers at the government community health clinics, UTC health clinic, health clinics, and district health office around the Kuantan district. However, only 84 respondent questionnaires were able to collect. To analyze the data, the method is by the SPSS version 23 software system. This software can generate suitable and relevant for this research using statistical and mathematical methods, which are reliability analysis test, descriptive analysis test, correlation analysis test, and multiple regression analysis tests.

To find a level significant relationship between dependent variables (safety performance) and each independent variables (management commitment, worker involvement, and job satisfaction), Pearson's correlation test was conducted. From that

result, worker involvement, job satisfaction, and management commitment had a significant relationship with dependent variables (safety performance).

As conclusion, this study is to increase the safety performance assistant medical officer at government health facilities in Kuantan, Pahang is to concentrate on worker involvement, job satisfaction, and management commitment. Responsibility among worker related to safety concern in their workplace is come from worker involvement factor. Furthermore, the worker involvement also participate to create safety and health policies, to create standard operation procedure also involving an investigation related to an accident and injuries at the workplace (Tsao, Hsieh & Chen, 2017). Through research prove that job satisfaction will increase safety climate, and the correlation between satisfaction and performance was significant (Packard & Motowildo, 1987). Furthermore, research proves that frequent injuries and illness at the workplace are a significant relationship with management commitment (Abudayyeh *et al*., 2006).

5.3 Discussion

5.3.1 Relationship between management commitments with safety performance

Pearson's Correlation test analysis shown that the management commitment had correlation with the dependent variable (safety performance) with (r = 0.253, n = 84). Management commitment factor is related to increasing safety at the workplace by preventing any injuries by decreasing the rate of injuries and illness also had influenced to decrease safety aspect that can increase the rate of injuries and illness and this had been

proved by the research (Abudayyeh *et al*., 2006). Meanwhile, for the multi regression analysis test, management commitment had significant influence's toward safety performance with (sig. value = 0.004, sig. < 0.05). An important factor that had significant influences' on safety performance is management commitment and employee involvement (Brown & Holmes, 1986; Dedobbeleer & Beland, 1991; Flin *et al*., 2000; Zohar, 1980).

5.3.2 Relationship between worker involvement and safety performance

Correlation analysis test had shown that there is a significant correlation between worker involvement and safety performance with (r = 0.338, n = 84). Significant correlation between worker involvement and safety performance related to assistant medical officers in government health facilities in Kuantan, Pahang, most probably had excellent communication between management and employee. Firstly, concerns related to occupational safety and health issues that employees bring to management are one of the factors that make workers more aware of their work conditions. Secondly, the occupational safety and health committee is functional and active involvement from the employee. Thirdly, the other reason why is a significant correlation between worker involvement and safety performance is management had more effort to consult and made the discussion with employee-related safety issues, and lastly, the employee more initiative to participate in identifying safety-related issues.

Good correlation and relationship by an employee toward workers related to their work activities and procedures are significant important (Lockwood, 1997). It is significantly vital for the employee to involve every aspect of safety-related issues at the

workplace because it can increase organization safety program (Raines, 2011). Meanwhile, in a multi regression analysis test shown, there is an influence on worker involvement toward safety performance with (sig. value = 0.001, sig. <0.05). Raines (2011) states that there is less research related relationship between worker involvement toward impact on safety, health, and environment (SH&E) performance but there is a few research found that there is a significant correlation between worker involvement and safety performance.

5.3.3 Relationship between job satisfactions with safety performance

Correlation analysis test has shown that there is a significant correlation with (r = 0.341, n = 84) between job satisfaction with the dependent variable (safety performance) among assistant medical officers in government facilities health in Kuantan. For multiple regression analysis tests, job satisfaction had influences on safety performance with (sig. value = 0.000, sig. <0.05). The research was conducted on the South African gold mining environment and found that job satisfaction is an essential factor that influences safety compliance (Masia & Pienaar, 2011).

Job satisfaction turns been a significant variable to the assistant medical officers in government health facilities in Kuantan, Pahang to concern about safety-related issues and one of the factors that contribute to lower any near-missed accident or injuries or health problems. When employee feel more on job satisfaction, they become alert and concern to eliminated any physical hazard in the workplace (Bigos, Spengler, Martin, Zeh, Fisher & Nachemson, 1986; Greenwood & Wolf, 1987).

5.3.4 Influence safety climate on safety performance

Influence safety climate on safety performance has elaborated in chapter 2, no doubt, the safety climate can influence safety performance. The result from correlation analysis test shown safety climate has a significant correlation on safety performance and multi regression analysis tests have shown safety climate (job satisfaction, worker involvement and management commitment) had significant influences on safety performance. Kundu *et al*. (2015), state that the critical indicator for safety performance and behavior outcome is safety climate, the degree impact of safety climate on safety performance still sparks argument among researchers. The simplified model theory of safety performance from Neal and Griffin's (1997) consists of antecedents of safety performance (safety climate), determinant of safety performance (understanding, skill and motivation) and components of safety performance (safety task performance and safety text contextual performance).

In government health facilities, the assistant medical officer in Kuantan, Pahang exposed to various hazards, especially form biology hazards and physical hazards, and also facing with patient safety in order to achieve excellent safety performance. To define the level of risk at the workplace and to define the degree of safety performance at the workplace is determined by accident rate at the workplace, level of injuries, and right attitude and discipline at the workplace (Vinodkumar & Bhasi, 2010).

5.4 Recommendations

Based on the result, included discussion and conclusion on this study, some recommendation was chosen and proposed to implement in the organization, and the recommendation was outlined below:

5.4.1 Recommendation to the organization

i. The health facilities, especially health clinics or community clinics or UTC health clinic already established safety committees and likely effective due to good management commitment. Safety and health committee is one of the methods to reduce injuries and illness at the workplace, and this also aligns with the law regarding safety and health issues at the workplace (Hecker, 1994; Liu *et al*., 2010). Safety and health committees are broadly established in an organization but less understood their function and less understood empirically among the level of worker (Morse *et al*., 2013). Therefore, the cooperation between management and the employees must be strengthened in the occupational safety and health committee so that all parties enjoy a safe working environment.

ii. Management needs commitment and efforts to promote safety-related matters to increase awareness about occupational safety and health at the workplace. Furthermore, the management also needs awareness related to insufficient safety equipment at the workplace such as PPE to protect healthcare worker from hazards. Successful safety programs are crucial, and there are a few elements that involved such as teamwork, sufficient resources allocation, worker involvement, and management commitment (Stranks, 2000; Rue Byars, 2001; Abudayyeh *et al*., 2006).

iii. The management and worker need more actively involve any activities related to safety and health issues. Worker involvement is the method to bring effectiveness in safety programs, it involves support from the worker in safety activities, and the worker should give enough space to given their view and given the opportunities to worker implementing their ideas to increase safety and health at the workplace (Peyton & Rubio, 1991; Harper & Koehn, 1998; Ariss, 2003; Abudayyeh *et al*., 2006).

5.5 Conclusion

These studies choose several independent variables (management commitment, worker involvement, and job satisfaction) to prove influences and relationships on the dependent variable (safety performance) on the assistant medical officers in government health facilities at Kuantan Pahang. A few analysis tests were conducted using SPSS version 23 software as discusses in chapter 4. From that analysis clearly, that job satisfaction, worker involvement and management commitment have significant influences on safety performance management. Hopefully, these studies can contribute information and knowledge especially on management occupational safety and health.

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APPENDIX A

SURVEY QUESTIONNAIRE

UUM Kuala Lumpur

Universiti Utara Malaysia

TO WHOM IT MAY CONCERN

Dear Sir/Madam

You are being selected to be part of the respondents of this research because of your position as an assistant medical officer. This survey is introducing to measure the influence of safety climate on safety performance among assistant medical officer at government health facilities in Kuantan Pahang. This survey is supervised by Dr. Munawar bin Mustafa from Universiti Utara Malaysia. Humbly request your sincere and objective responses. Your responses will be guarded with confidentiality and shall be used as the only purpose of this research.

Thank you. Yours faithfully,

Faizal Reza bin Basri.

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Influence of safety climate on safety performance among assistance medical officer at government health facilities in Kuantan Pahang

Section 1: Demographic Detail.

Instruction: Please tick (X) on the related column.

A. Grade position

	U29
	U32

	U36
	U41

	U42

B. Gender

	Male
	Female

C. Years of experiences

	Less than 5 years
	5 years – 10 years

	10 years – 15 years
	Above 15 years

D. Level of education

	Diploma
	Degree
	Master

E. Health facilities

	District health office
	Health clinic

	UTC health clinic
	Community clinic

Instructions: Please rate how much you personally judgment from strongly agree to strongly disagree with these statements. Please circle the correct answer.

1	2	3	4	5
Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**

Section 2: Management Commitment

1. Safety is given high priority by the management.	1	2	3	4	5
2. Safety rules and procedures are strictly followed by the management	1	2	3	4	5
3. Corrective action is always taken when the management is told about unsafe practices.	1	2	3	4	5
4. In my workplace manager/supervisor does not show interest in the safety of workers.	1	2	3	4	5
5. Management considers safety to equally important as services.	1	2	3	4	5
6. I feel that management is willing to compromise on safety for increasing services.	1	2	3	4	5
7. When a near-miss accident is reported, my management acts quickly to solve the problems.	1	2	3	4	5
8. My management does not attend a safety meeting.	1	2	3	4	5
9. My management provides sufficient protective equipment for the workers.	1	2	3	4	5

Section 3: Worker involvement

1. Management always welcomes opinions from the employee before making a final decision on safety-related matters.	1	2	3	4	5
2. My health facilities have safety committees consisting of representatives of management and employee.	1	2	3	4	5
3. Management promotes employee's involvement in safety-related matters.	1	2	3	4	5
4. Management consults with the employee regularly about workplace health and safety issues.	1	2	3	4	5

5. Employee does not sincerely participate in identifying safety problems.	1	2	3	4	5

Section 4: Job satisfaction

1. I like my job.	1	2	3	4	5
2. Working in these health facilities is like being part of a large family.	1	2	3	4	5
3. This health facility is a good place to work.	1	2	3	4	5
4. I am proud to work at these health facilities.	1	2	3	4	5
5. Morale in these health facilities is high.	1	2	3	4	5

Section 5: Safety compliance

1. I use all the necessary safety equipment to do my job.	1	2	3	4	5
2. I carry out my work in a safe manner.	1	2	3	4	5
3. I follow correct safety rules and procedures while carrying out my job.	1	2	3	4	5
4. I ensure the highest levels of safety when I carry out my job.	1	2	3	4	5
5. Occasionally due to over lack of time, I deviate (unlikely) from correct and safe work procedures.	1	2	3	4	5
6. Occasionally due to over-familiarity with the job, I deviate from correct and safe work procedures.	1	2	3	4	5
7. It is not always practical to follow all safety rules and procedures while doing a job.	1	2	3	4	5

Section 6: Safety participation

1. I always point out to the management if any safety-related matters are noticed in my health facilities	1	2	3	4	5
2. I put extra effort to improve the safety of the workplace.	1	2	3	4	5
3. I voluntarily carry out tasks or activities that help to improve workplace safety.	1	2	3	4	5
4. I encourage my co-workers to work safely.	1	2	3	4	5

5. I help my co-workers when they are working under risk or hazardous conditions.	1	2	3	4	5

Thank you so much, I humbly appreciate your time to answer this survey.