

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



**INFLUENCE OF CAREGIVING AND PERSONALITY ON THE
STRESS LEVEL OF CAREGIVERS OF CANCER PATIENTS:
ROLE OF SOCIAL SUPPORT AS A MEDIATING VARIABLE**



ANSA QURAT-UL-AIN

UUM
Universiti Utara Malaysia

**DOCTOR OF PHILOSOPHY
UNIVERSITI UTARA MALAYSIA
2017**



Awang Had Salleh
Graduate School
of Arts And Sciences

Universiti Utara Malaysia

PERAKUAN KERJA TESIS / DISERTASI
(Certification of thesis / dissertation)

Kami, yang bertandatangan, memperakukan bahawa
(We, the undersigned, certify that)

ANSA QURAT UL-AIN

calon untuk Ijazah **PhD**
(candidate for the degree of)

telah mengemukakan tesis / disertasi yang bertajuk:
(has presented his/her thesis / dissertation of the following title):

**"INFLUENCE OF CAREGIVING AND PERSONALITY ON THE STRESS LEVEL OF CAREGIVERS
OF CANCER PATIENTS: ROLE OF SOCIAL SUPPORT AS A MEDIATING VARIABLE"**

seperti yang tercatat di muka surat tajuk dan kulit tesis / disertasi.
(as it appears on the title page and front cover of the thesis / dissertation).

Bahawa tesis/disertasi tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan, sebagaimana yang ditunjukkan oleh calon dalam ujian lisan yang diadakan pada : **06 November 2017.**

*That the said thesis/dissertation is acceptable in form and content and displays a satisfactory knowledge of the field of study as demonstrated by the candidate through an oral examination held on:
November 06, 2017.*

Pengerusi Viva:
(Chairman for VIVA)

Assoc. Prof. Dr. Fauziah Baharom

Tandatangan
(Signature)

Pemeriksa Luar:
(External Examiner)

Prof. Dr. Rosnah Ismail

Tandatangan
(Signature)

Pemeriksa Dalam:
(Internal Examiner)

Dr. Daisy Jane C. Orcullo

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyelia:
(Name of Supervisor/Supervisors)

Prof. Dr. Najib Ahmad Marzuki

Tandatangan
(Signature)

Nama Penyelia/Penyelia-penyelia:
(Name of Supervisor/Supervisors)

Dr. Nabisah Ibrahim

Tandatangan
(Signature)

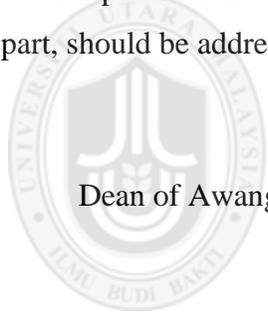
Tarikh:

(Date) November 06, 2017

Permission to Use

In presenting this thesis in fulfilment of the requirements for a postgraduate degree from Universiti Utara Malaysia, I agree that the Universiti Library may make it freely available for inspection. I further agree that permission for the copying of this thesis in any manner, in whole or in part, for scholarly purpose may be granted by my supervisor(s) or, in their absence, by the Dean of Awang Had Salleh Graduate School of Arts and Sciences. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to Universiti Utara Malaysia for any scholarly use which may be made of any material from my thesis.

Requests for permission to copy or to make other use of materials in this thesis, in whole or in part, should be addressed to:



Dean of Awang Had Salleh Graduate School of Arts and Sciences

UUM College of Arts and Sciences

Universiti Utara Malaysia

06010 UUM Sintok

Abstrak

Penjaga tidak formal merupakan antara sumber yang menyediakan penjagaan kepada individu yang menghadapi penyakit kronik seperti kanser. Peningkatan kadar kanser pediatrik telah menyebabkan peralihan pesakit daripada hospital kepada penjagaan di rumah. Peralihan ini mengakibatkan penjaga pesakit kanser pediatrik menghadapi cabaran dari segi sosial dan emosi yang berterusan sehingga mengakibatkan tekanan berkaitan penjagaan pesakit kanser. Menggunakan Stress Process Theory sebagai kerangka teoritikal asas, kajian ini bertujuan mengukur tahap pembolehubah dan mengkaji korelasi serta kesan aspek penjagaan, dimensi personaliti serta sokongan sosial ke atas tekanan penjaga pesakit kanser di Pakistan. Ia juga bertujuan untuk mengukur kesan pengantara sokongan sosial dan peramal terkuat kepada tekanan penjaga. Sejumlah 286 penjaga keluarga telah dipilih sebagai responden dari lapan hospital yang memberikan rawatan kanser. Teknik persampelan rawak berstrata dan mudah digunakan dalam proses ini. Statistik deskriptif dan inferensi telah dijalankan untuk mencari hubungan antara pemboleh ubah bebas (penjagaan dan personaliti), pemboleh ubah pengantara (sokongan sosial) dan pembolehubah bersandar (tekanan penjaga). Dapatan kajian menunjukkan bahawa tiada sebarang hubungan secara langsung yang signifikan antara aspek penjagaan serta tret-tret personaliti extraversion, neuroticism dan openness dengan tekanan. Manakala, tret personaliti conscientiousness dan agreeableness menunjukkan hubungan yang signifikan dengan tekanan yang dihadapi oleh penjaga. Keputusan kajian juga mendedahkan bahawa sokongan sosial merupakan perantara di antara aspek penjagaan dan tekanan serta tret-tret personaliti extraversion, openness, agreeableness dan tekanan. Dapatan kajian juga mendapati bahawa agreeableness merupakan peramal terkuat kepada tekanan penjaga. Kajian ini memaparkan maklumat baharu kepada para penyelidik dan pengamal untuk mengenal pasti peramal kuat tekanan untuk penjaga di sepanjang proses tekanan. Ia menunjukkan impak yang tersendiri bagi personaliti dan sokongan sosial ke atas tekanan penjaga. Oleh itu, bantuan bagi membangun dan mengimplementasikan intervensi yang efektif bagi memenuhi keperluan penjaga perlu ditingkatkan bagi mengurangkan tahap stres dan menambahbaik kualiti hidup mereka.

Kata Kunci: Kanser, Penjagaan, Personaliti, Sokongan Sosial, Tekanan

Abstract

Informal caregivers have always been a source of providing care to the individuals with chronic illness such as cancer. Increasing rate of pediatric cancer has shifted the patients from hospitals to the home settings. This shift involves the caregivers of pediatric cancer to face ongoing social and emotional challenges that may result in enduring illness and caregiving-related stress. Using Stress Process Theory as the foundation for the theoretical framework, the purpose of this research was to measure the level of variables and to examine the correlation and effects of aspects of caregiving, dimensions of personality and social support on the stress of caregivers of cancer patients in Pakistan. It also aimed to measure mediating effect of social support and the strongest predictor of caregiver's stress. A total of 286 family caregivers were chosen as respondents from eight cancer treatment hospitals. Stratified and simple random sampling technique was utilized for this process. Descriptive and inferential statistics were performed in order to find the relationship between independent variables (caregiving and personality), mediating variable (social support) and dependent variable (caregiver's stress). Findings showed that there were no significant direct relation between aspects of caregiving as well as extraversion, neuroticism and openness personality traits with stress. Whereas, conscientiousness and agreeableness personality traits were significantly related to stress of caregivers. Results also revealed that social support acts as a potential mediator between aspects of caregiving and stress as well as extraversion, openness, agreeableness personality traits and stress. Findings also found that agreeableness was the strongest predictor of stress of caregivers. This study presented new information to researchers and practitioners to identify strongest predictors of stress in caregivers along the stress continuum process. It illustrates the distinctive impact of personality and social support on caregiver's stress. Therefore, helps in developing and implementing effective interventions to fulfill caregiver's needs must be enhanced in order to reduce their stress level and improve their quality of life.

Keywords: Cancer, Caregiving, Personality, Social support, Stress

Acknowledgment

Starting in the name of Allah, the most Beneficent and Merciful. He is the One, who brought me to my knees and made me acknowledge my own strength, and out of that knowledge I had been gone through this long PhD Journey. I praise Allah, the Almighty for providing me this opportunity and granting me the capability to proceed successfully. At times when I doubted my ability to move forward, Allah reminded me that I have not been given any challenge that I cannot overcome.

This dissertation calls an end to my unforgettable journey of PhD. It has been kept on track and been seen through to completion with the guidance and support of numerous people. At the end of my thesis, it is a pleasant task to express my thanks to all those who contributed in many ways to the success of this journey. Thanks doesn't seem sufficient but it is said with appreciation and respect to all people for their encouragement, care, understanding and precious friendship.

At this moment of accomplishment, first of all I pay homage to my esteemed advisor, Professor. Dr. Najib Ahmad Marzuki for his unflinching courage and conviction that inspired me a lot. I am indebted to him for his warm encouragement, thoughtful guidance, critical comments, and spending his precious time to read this thesis and giving his valuable suggestions. I owe gratitude to him for providing me insight on many aspects of my dissertation and making me think outside the box. I doubt that I will ever be able to convey my appreciation fully, but I owe him my eternal gratitude. Indeed, he is the one who just gives a little prod behind and you jump to the skies. I hope to continue working with his noble thoughts.

My humble gratitude and heartfelt thanks goes to my honorable co-advisor, Dr. Nabisah binti Ibrahim. She is such an intelligent, humble and spiritual woman who has been always there to support during the whole period of the study and especially for her guidance during the inevitable ups and downs of my academic issues.

I gratefully acknowledge the funding received towards my PhD from the Universiti Utara Malaysia (UUM). Additionally, I appreciatively acknowledge the support of some people

who have knowingly and unknowingly helped me in the successful completion of this thesis.

Last but not the least, my wonderful family has not been short of amazing. I will remain ever grateful to my lovely parents for bestowing me their unconditional love, teachings and believing me. They are the epitome of kindness, honesty and patience. I have learnt from them the true essence of humanity and service to society. Their prayers and loving nature inspire me to be true to my work and duties. They have always been there to offer words of encouragement to keep me motivated.

I still remember the tears in their eyes every time I leave them to continue my PhD journey. I still remember the pep talk they both gave me the day I left for Malaysia. Although times got challenging, especially with this dissertation, their words resonated with me, and making them proud was my motivation. They told me to be strong and now when I have gone through difficult times and made it through, it will be a life achievement not for me but for my parents. Thank you both for being my motivation, my support, and the best parents you could possibly be. I love you both more than words can describe.

Finally, I heart fully thanks my brothers (Badar and Shams) for encouraging me to follow my dreams. They both are the light to my dark nights. Both of them have been always there to support me financially, emotionally and morally. Especially Shams is not only my brother but best friend and a strong supporter. Without him I would not be able to embark on this journey in first place. I am blessed to have such a loving family on whom I can count on when times are rough. Thanks to them for helping in whatever way they could during this challenging period.

ANSA QURAT-UL-AIN

Table of Contents

Permission to Use.....	i
Abstrak.....	ii
Abstract.....	iii
Acknowledgement	iv
Table of Contents.....	vi
List of Tables.....	xii
List of Figures.....	xiii
CHAPTER ONE: INTRODUCTION AND BACKGROUND OF STUDY.....	1
1.1 Introduction.....	1
1.2 Problem Statement.....	10
1.3 Research Questions.....	15
1.4 Research Objectives.....	15
1.5 Significance of the Study.....	16
1.5.1 Theoretical Significance.....	18
1.5.2 Practical Significance.....	18
1.6 Definition of Concepts.....	19
1.7 Scope of the Study.....	22
1.8 Research Framework.....	23
1.9 Research Hypothesis.....	25
1.10 Organization of the Study.....	27
1.11 Summary.....	27

CHAPTER TWO: LITERATURE REVIEW.....	28
2.1 Introduction.....	28
2.2 The Stress of Caregivers.....	29
2.2.1 The Stress Process Model.....	35
2.2.2 Previous Studies on Stress of Caregivers of Cancer Patients.....	38
2.2.3 Concluding Remarks on Stress of Caregivers.....	46
2.3 Personality of Caregivers.....	47
2.3.1 Five-Factor Model of Personality.....	49
2.3.2 Defining the Five Factors.....	50
2.3.3 Previous Studies on Personality and Stress of Caregivers.....	51
2.3.4 Concluding Remarks on Personality and Stress.....	57
2.4 Social Support as Mediating Variable in act of Caregiving, Personality and Stress of Caregivers.....	58
2.4.1 Model of Social Support.....	62
2.4.2 Previous Studies on Social Support as Mediating Variable.....	62
2.4.3 Concluding remarks on social support as mediating variable.....	67
2.5 Underpinning Theories of Proposed Framework.....	67
2.5.1 Pearlin’s Stress Process Theory.....	68
2.5.2 Five Factor Trait Theory.....	70
2.5.3 Uchino’s Social Support Theory.....	73
2.6 Concluding Remarks of the Study.....	74
2.7 Summary.....	75
CHAPTER THREE: RESEARCH METHODOLOGY.....	76

3.1 Introduction.....	76
3.2 Purpose of Research.....	76
3.3 Research Design.....	77
3.3.1 Unit of Analysis	79
3.4 Population and Research Location.....	79
3.4.1 Sample Size.....	81
3.4.2 Sampling Technique.....	84
3.5 Research Instruments.....	85
3.5.1 Caregiving.....	86
3.5.2 Personality Traits.....	87
3.5.2.1 Extraversion.....	88
3.5.2.2 Agreeableness.....	88
3.5.2.3 Conscientiousness.....	89
3.5.2.4 Neuroticism.....	90
3.5.2.5 Openness.....	90
3.5.3 Social support.....	91
3.5.4 Stress.....	91
3.6 Instrument Validity.....	93
3.7 Instrument Reliability.....	94
3.8 Pilot Test.....	96
3.8.1 Validity test of Pilot test.....	97
3.8.2 Reliability test of Pilot test.....	97
3.9 Data Collection Procedure.....	98

3.10 Method of Data Analysis.....	100
3.11 Summary	102
CHAPTER FOUR: RESULTS.....	104
4.1 Introduction.....	104
4.2 Response Rate.....	104
4.3 Common Method Bias Test.....	105
4.4 Analysis of Missing Data.....	106
4.5 Descriptive Statistics Analysis.....	107
4.5.1 Profile of Respondents.....	107
4.5.2 Central Tendencies and Measures of Dispersion.....	109
4.6 Multivariate Factor Analysis.....	110
4.6.1 Evaluation of PLS-SEM result.....	110
4.6.2 The Measurement Model.....	111
4.6.3 The Structural Model.....	120
4.6.3.1 Collinearity.....	120
4.6.3.2 Direct relationship.....	121
4.6.3.3 Mediation test.....	125
4.6.3.4 Coefficient of determination.....	130
4.6.4 Assessment of Effect Size.....	131
4.7 Recapitulation of the Study Findings.....	134
4.8 Summary.....	135

CHAPTER FIVE: DISCUSSION, RECOMMENDATION AND CONCLUSION.....	136
5.1 Introduction.....	136
5.2 Discussion of the Findings.....	136
5.2.1 Level of Aspects of Caregiving, Dimensions of Personality, Social Support and Caregiver’s Stress.....	137
5.2.2 Correlation of Aspects of Caregiving, Dimensions of Personality and Social Support with Stress of Caregivers.....	141
5.2.2.1 Aspects of Caregiving and Stress.....	142
5.2.2.2 Dimensions of Personality and Stress.....	145
5.2.2.3 Social Support and Stress.....	153
5.2.3 Mediating Effect of Social Support.....	156
5.2.3.1 Social Support as a Mediator between Aspects of Caregiving and Caregiver’s Stress.....	158
5.2.3.2 Social Support as a Mediator between Dimensions of Personality and Caregiver’s Stress.....	162
5.2.4 Strongest Predictor of Stress.....	169
5.3 Implications	170
5.3.1 Evidence to Support General Stress Process Theory, Five Factor Trait Theory and Uchino’s Social Support Theory.....	171
5.3.2 Influence of Caregiving, Personality and Social Support on Stress.....	172
5.3.3 Implication of Measurement Instruments.....	173
5.4 Recommendations.....	175
5.4.1 Better Understanding of Caregiving Phenomenon.....	175

5.4.2 Development of Training Programs.....	176
5.4.3 Availability of Social Resources.....	176
5.4.4 Equitable Sharing of Resources in Community.....	177
5.4.5 Therapeutic Interventions.....	178
5.5 Limitations.....	179
5.6 Future Research Directions.....	181
5.6 Conclusion.....	184
REFERENCES.....	187
APPENDICES.....	218



UUM
Universiti Utara Malaysia

List of Tables

Table 3.1 Major cancer care hospitals under consideration of this study.....	80
Table 3.2 Formula for calculation of sample size.....	83
Table 3.3 Results of calculation of sample size.....	83
Table 3.4 Variables and instruments selected.....	85
Table 3.5 Reliability of instruments from previous studies.....	95
Table 3.6 Reliability test.....	98
Table 4.1 Response rate of the questionnaires.....	105
Table 4.2 Summary of respondent's demography.....	107
Table 4.3 Central tendencies and dispersion of variables.....	109
Table 4.4 Loadings, reliability and convergent validity values.....	113
Table 4.5 Discriminant validity.....	116
Table 4.6 Factor loadings and cross loadings.....	117
Table 4.7 Collinearity.....	120
Table 4.8 Results of hypothesis testing (Direct relationship).....	123
Table 4.9 Results of mediation test.....	127
Table 4.10 Effect size.....	132
Table 4.11 Result of hypothesis H6.....	132
Table 4.12 Recapitulation of the study findings.....	134

List of Figures

Figure 1.1 Research framework.....	23
Figure 4.1 Measurement model.....	119
Figure 4.2 Structural model showing t-statistics.....	133



CHAPTER ONE

INTRODUCTION

1.1 Introduction

Cancer as a generic term refers to a group of diseases characterized by the uncontrolled growth and spread of abnormal cells affecting multiple parts of the body (International Agency for Research on Cancer [IARC], 2016). One central feature of cancer, according to National Cancer Institute (2015) is the rapid metabolism of abnormal cells that enter into the adjacent parts of the body by growing beyond their usual boundaries and dispersing to other organs initiating a process of metastasizing which is considered as the major cause of death from cancer.

Worldwide, cancer has become a health burden enormously by reaching every region and socio-economic group. Today, about one in every seven deaths is due to cancer (American Cancer Society, 2016). It is the second and third leading cause of mortality in high-income countries and in low-income countries respectively. Cancer figures among the primary causes of mortality and morbidity, presenting around 14 million of new cases and approximately 8.2 million deaths due to cancer in 2012 with the alarming growth of about 21.7 million new cases by the year 2030 and 13.0 million deaths (American Cancer Society, 2016). This shows that the increase in new cases of cancer up to 70 percent in upcoming two decades is expected.

More than half of the cancer cases (60 percent) that are reported annually occur in Asia, Africa and Central and South America. World Cancer Report (2015) mentioned

that 70 percent of the deaths due to cancer in the world occur in these regions. According to Siegel, Miller and Jemal (2016), the rise of cancer cases will cause mortality rate of 207.9 per 100,000 men and 145.4 per 100,000 women.

According to surveys, childhood cancer is rare when compared to the cancer in adults as it shows only one percent of total diagnosis of cancer (American Cancer Society, 2011). Annually, an estimated 175,000 children under 19 years of age are diagnosed with cancer and less than 40 percent are adequately diagnosed and treated (Children and adolescents cancer statistics, 2016). However, American Cancer Society (2016) states that with medical advances, almost 83 percent of children will be long-term survivors.

In 2014, an estimated 15,780 cases of cancer in children and adolescents of ages 0 to 19 were reported while 1,960 died of the disease. In 2015, an estimated 10,380 new cancer cases, according to Annual Report on the Status of Cancer by Kohler et al. (2015) were expected in children 0 to 14 years of age which represents a decrease in total cancer diagnosis. This shows that rate of deaths from cancer is decreased by 2.1 and 2.3 percent per year from 2002 to 2011 in 0 to 14 and 0 to 19 years of children respectively. Although overall childhood cancer survival rate has been decreased to eighty percent with the advances in technology and treatment, cancer is still the second leading cause of death in children aged 51 to 14 years (Murphy, Xu J, & Kochanek, 2013).

Undoubtedly, the expansion and enhancement of treatments of cancer has resulted in significant progress in the reduction of mortality of childhood cancer. However,

patients who survive may be at risk of progression or recurrence of the primary cancer depending on the type of cancer and the treatment received (Howlader et al., 2013). These continuing changes in the health care leads to the shift of cancer patients to the home setting from the hospitals. This transference directs the involvement of family members in caring of cancer patients at home (American Psychological Association [APA], 2015).

Generally, considerable portion of population of (Informal) caregivers is represented by a family that can be a person of any age who in the home, provides unusual, uncompensated care for months and years investing a great amount of time and energy by performing physical, emotional, social or financial demanding tasks (Abdelmoneium & Alharahsheh, 2016) becoming the essential resource of care for family members with illness, disability and chronic conditions.

These informal caregivers are considered to provide assistance and care to their close sick family member or friend suffering from any physical or psychological problem for an indefinite period of time without being paid (Canadian Caregiver Coalition, 2012). The care they provide varies in time and duration (Van Ryn et al., 2011) around days to weeks. Caregivers, according to Hermanns and Mastel-Smith (2012) has to perform wide range of tasks to meet holistic physical, economical, emotional and social needs of a care receiver. Among the multiple responsibilities, caregivers have to provide physical assistance and sometimes emotional support during the course of the illness. Caregiving includes; Instrumental Activities of Daily Living (IADLs) like preparing meal, house cleaning and transportation and Activities of Daily Living (ADLs) such as eating, toileting and locomotion; emotional and social support and

financial help. In 2011, Aldrich states that considering all of these activities, caregiving is assumed to be a responsibility of providing care that is not only physical but emotional and financial as well.

The importance of caregivers is further strengthened as a result of the rapidly increasing diseases all over the world. Over the years, cancer has been considered to only affect the patient and not the family members as they are not the ones diagnosed with cancer, but the diagnosis of cancer is a life changing event for both the cancer children and adolescents as well as their families. Litzelman, Catrine, Gangnon and Witt (2011) narrated that the traumatic event of diagnosis and the course of treatment of cancer has significant impacts not only on the patients but also the caregivers. Collins and Swartz (2011) indicated that as the degree of the patient's impairment grows so do the demands made on the time, energy, finances, emotional commitment, and other resources of family members.

This indicates that with the diagnosis of cancer in children, the entire family is also diagnosed. The moment of diagnosis projects the entire family into a new, confusing and threatening reality. According to Salama and El-Soud (2012), caregivers have to make them available to bear any physical, emotional, social or economic costs. Additionally, primary caregivers are exposed to several stressors related to their child's cancer which includes the threat to their child's life, clinical visits, repeated hospitalizations, caring for other family members and changes in their roles and responsibilities (Long & Marsland, 2011).

According to Ugalde, Krishnasamy and Schofield (2013) caregiving is a complex and extensive phenomenon causing change in the caregiver's lifestyle. The varied impact of complex caregiving phenomenon includes the instability in family, role strains, odd family reactions and challenges in social and financial support (Family Caregiver Alliance, 2011). Changes that occur are influenced by the constant demands associated with the caregiver role and social isolation. Caregivers often neglect their own basic needs of health and get deprived of sleep and nutrition resulting in exhaustion and distress which ultimately leads to low well-being (Hexem, Mollen, Carroll, Lanctot, & Feudtner, 2011), depression (Ribeiro, Sousa, Vandenberghe, & Porto, 2014), anxiety (Beattie & Lebel, 2011), impaired immune system function (Dunn et al., 2012) and increased morbidity (Perkins et al., 2012).

Das, Hazra, Ray, Ghosal and Banerjee (2010) states that with the diagnosis of cancer in children, different emotional and physical changes in their parents leads to the development of a psychological process termed as stress. Psychological stress is variably defined in literature often based on underlying theory. More of the focus on stress reactions in research is observed in manifestation of strain specifically situation based like helplessness and disease related worry (Lai, 2012). Depending on the caregiving situation, Stenberg, Ruland and Miaskowski (2010) defined stress as the burden felt by the caregiver because of physical, emotional and financial stress as a consequences of his/her caregiving roles.

According to Smith, Williamson, Miller and Schulz (2011), the more a person gets involved in caregiving, the less he/she is able to spend time in fulfilling other family responsibilities, less time for social activities and other personal relationships, these all

then collectively leads a caregiver to experience an emotional stress. Stress is considered as a root of ill or chronic health conditions because research has shown that any change, whether positive or negative, can elicit a stress response (Roddenberry & Renk, 2010). The amount and level of caregiving as well as intensity of tasks performed is proportional to the stress level of caregiver. Lack of alternative in providing care and responsibility is also a determinant level of stress (Smith et al., 2011).

However, large number of cancer related stressors are confronted by the caregivers whose children are diagnosed with cancer. In Atlantic Canada, a study mentioned that approximately 90 percent of the children are diagnosed with cancer between births to 14 years of age annually (Public Health Agency of Canada [PHAC], 2013). The families get stressful due to the psychological, sociological, and financial effects of the disease. Research on the psychosocial adjustment of parents with cancer children, according to Long and Marsland (2011) reveals that parents suffer from anxiety, helplessness and depression shortly after their child is diagnosed with cancer.

Furthermore, extensive literature on caregiving and its effects on caregivers have shown that parents undergo symptoms related to trauma or post-traumatic stress symptoms (PTSS) (Dunn et al., 2012). Diagnosis of cancer for many families appears to be a trauma causing post-traumatic stress reactions. Moreover, post-traumatic stress disorder according to Dunn, et al. (2012) is reported by parents whose children are diagnosed with cancer showing symptoms of acute stress disorder also. Although, acute phase of stroke is survived by patients but many remain cognitively or physically impaired and needs a professional or a family member to provide care and assistance in performing routine activities (Stenberg et al., 2010).

Literature reviews on the outcomes of the caregiving have indicated poor mental health of the caregivers (Collins & Swartz, 2011). Several studies have mentioned that physical health of the caregiver is equally affected by the caregiving phenomenon. This points out that how the caregivers experience this caregiving phenomenon is based on the type of person. A consistent question in a research of caregiving preside that why and how caregivers under same situations show variable and diverse attitudes towards the adoption of the situation. Some of the caregivers show extreme levels of stress while others remain calm in overwhelming stress.

Situations that are experienced by the caregivers are assigned meanings by constructing interactive process in which personality is a major factor that affects emotional and coping responses and eventually the health (Snyder & Christne, 2015). For the sake of knowledge of caregiver's mental and physical health, the inclusion of personality as a variable in caregiving researches can be helpful because in general populations, personality has found to be a vital predictor of both physical and psychological health (Melo, Maroco, & Mendonca, 2011).

Therefore, it is needed to include personality as an important variable in caregiving process as meaning of caregiving in caregiver's life is influenced by the personality (O' Connor, 2015). The personality effects on health depend on complex and long-term set of interacting process. It directly or indirectly affects the mental and physical health of caregivers by predisposing caregiver to interpret circumstances and events as threatening or benign (Finch, Baranik, Liu, & West, 2012). Thus, personality of caregivers plays an important role in perception of an event as more or less stressful even in equivalent caregiving situations.

Stress as a partially “person” variable has been indicated by many studies. Lockenhoff, Duberstein, Friedman and Costa (2011) stated that all trait theories of personality contains mastery, extraversion and neuroticism as central constructs and have a strong linkage with outcomes of health both theoretically and empirically during stressful situations (Weston, Hill, & Jackson, 2014). Caregivers with high score of extraversion and low at neuroticism are reported to experience less depression than caregivers with low extraversion and high neuroticism score (Atherton, Robins, Rentfrow, & Lamb, 2014). Moreover, high scores on mastery, agreeableness and conscientiousness show less stress and less cognitive impairment (Lench, 2011).

Additionally, theoretical model of the stress process of caregiver (Pearlin, Mullan, Semple, & Skaff, 1990) indicates some mediators that possibly forms a linkage between subjective health and personality of a caregiver including social support, coping strategies and differences in appraisal of stress (Lockenhoff et al., 2011). While searching for a potential mediator, it is necessary to know that personality not only influence sensitivity towards stressors but provides resources for the promotion of resilience (McCrae & Costa, 2003). Considering this, social support is taken as a potential candidate. Social support forms an indirect relationship between personality and the health outcomes of a caregiver. Numerous studies have shown positive relations between social support and health (Giesbrecht, Poole, Letoumeau, Campbell, & Kaplan, 2013) although it has been operationalized in numerous ways both structurally and functionally.

Social support is a multidimensional concept which broadly refers to the emotional (showing empathy and encouragement), instrumental (helping with housekeeping) or informational assistance that is received from others. It may also be characterized by the

provider of support, including support from a spouse, relatives or friends, each thought to have independent protective effects against stress and depression. Generally, social support is referred as a feeling of kinship and a sense of belonging with others (Al-Gamal & Long, 2013). It is the perception and actuality that one is cared for and that other people are available to provide support and is the part of social network. Social support can be measured by perceiving the support available to a person, actually received support and the level of integration of a person into a social network (Navneet Kaur, 2014).

Social support according to a number of previous studies has been shown to be a protective factor in the welfare of the caregivers and the patients. According to Gjesfjeld, Greeno, Kim and Anderson (2010), lower level of stress and higher level of satisfaction are reported by the caregivers having more emotional and social support. Additionally, caregivers who take the caregiving less stressful are found to be actively engaged in social and recreational activities than those who are more isolated (Smith et al., 2011). In adult population, including caregivers of children (Hanson, Ferrell, & Grant, 2013), social support and better physical and mental health are repetitively shown to be associated.

It is hypothesized to protect mental health both directly through the benefits of social relationships and indirectly as a buffer against stressful circumstances. Social support is considered to be an important element in strengthening the ability of person to cope with an event that is stressful and the extent of psychological outcomes of the stressful event (Marsland, Long, Thompson, Tersak, & Ewing, 2013). Social support largely impact the psychological adjustment of the parents of children suffering from cancer rather than disease-related factors (Dale et al., 2012), with high social support protecting parents from future psychological difficulties.

Literature shows that it is important to be socially supported as higher burden is experienced by caregivers having less social network whereas, caregivers having stronger social ties are reported to experience less burden and more satisfaction (Lopez & Cooper, 2011). The concept of social support as a mediator against stress in difficult situations is not new. Literature has provided evidence that prediction of mediating effects of social support depends on one's own perception of support (Rodriguez et al., 2012). The studies on the mediating effects of social support on psychological outcomes indicates better quality of life of an individual as it enhances the ability of a person to adapt a stressful situation calmly thus reducing the level of stress.

Hence, according to aforementioned statements, a relation between aspects of caregiving, dimension of personality of caregiver and social support affect the stress level of caregivers. Therefore, this study focused on the stress level of caregivers affected by aspects of caregiving, personality of caregivers and the mediating role of social support.

1.2 Problem statement:

Globally, the burden of cancer is expected to grow to 21.7 million new cancer cases and 13 million cancer deaths by 2030 (Park, Bae, Nam, & Yoo, 2008). In Asian Pacific countries, cancer has become the leading cause of death with around three million new cases and two million deaths (Hanif, Zaidi, Kamal, & Hameed, 2009) in Asia. However, the future burden of cancer in developing countries is expected to grow due to adoption of cancer related lifestyles and simply due to increase in population (Bray, Jemal, Grey, Ferlay, & Forman, 2012). Pakistan is not an exception to the expanding circle of cancer. It ranks sixth among the populous countries in the world and according to Population

Census Organization of the Government of Pakistan, it is having approximately 195.9 million residents. Multiple reasons are lying behind the low cancer registration but according to International Agency for Research on Cancer (IARC, 2012) the estimated figure of cases of cancer is 148,041 per year. The reliable figure of cancer is missing but it is estimated that new cases of cancer during upcoming years will vary between 1.4 to 1.67 million (Rubab, Ibtisam, Samina, Azeemi, & Naveed, 2015).

In Pakistan, among several caregiving studies (Ain, Dar, Ahmed, Munzar, & Yousafzai, 2014; Ansa & Mahmood, 2014; Ansari & Qureshi, 2013; Asima, Rizwan, Arfeen, & Farhana, 2015; Arisha, Seema, & Ghazala, 2013; Majid & Abidi, 2013; Saeed, Ahmed, Shakoor, Ghafoor, & Kanwal, 2012; Shah, Sultan, Faisal, & Irfan, 2013; Yousafzai, Bhutto, Ahmer, Siddiqui, & Selamat, 2011) that have been conducted, a very little data is found focusing on the caregiver's mental health specifically when they are providing care to children. In Pakistan, family members are expected to take up the predominant work of caring for their family member suffering from any illness.

According to Yousafzai, et al. (2011), in Pakistan family members are the main source of caregiving at home who without any formal training, provides care to chronically ill family members, where they find themselves confronted with the caregiver role more because of the cultural expectations and a sense of obligation rather than out of personal interest to help. As Bartolo, Luca, Serrao, Sinforiani, Zucchella and Sandrini (2010) states that caregivers are the second victims of the disease who have to become caregiver suddenly under extreme circumstances with little guidance and minimal preparation, therefore, these family caregivers may be at risk of developing health problems due to the demands of the caregiving role if they appraise their caregiving situation as stressful.

Therefore, it is vital to comprehend the factors influencing the caregiver's strain especially when they are prone to psychological and physical illnesses (Ain et al., 2014).

Moreover, as Asima et al. (2015) stated that the effects of stress on caregiver health can depend on the situation in which the caregiving occurs, it follows that findings from a few reported studies conducted in diverse regions of the world are not be applicable to caregivers of cancer patients in Pakistan due to social, economic and environmental differences.

In addition, there are cultural differences that exist between caregivers from the European and Western cultures because caregivers in Pakistan are mostly influenced by cultural expectations based on the extended family system. Furthermore, people in Pakistan are living an average life where they can meet both ends without an ease, this causes a financial strain and as a result the caregiving situation becomes more stressful compared with caregivers from other well-resourced countries (Nazish et al., 2010).

As Godwin, Swank, Vaeth and Ostwald (2013) narrated that caregivers report 2.5 times more stress than non-caregivers besides financial strain, other factors like emotional and instrumental aid in a caregiving phenomenon is necessary to consider as a base of stress. Among number of caregiving studies in Pakistan, these factors of caregiving are more or less neglected as those studies considered the caregiving phenomenon in general, ignoring its dimensions. Therefore, this study takes into account the multi-dimensional phenomenon of caregiving.

Moreover, it is vital to notice the individual differences in becoming more and less stressed in similar caregiving situations. In this regard, characteristics of the personality

are considered to be among psychological aspects influencing the outcomes of the caregiving (Melo, et al., 2011; Snyder & Christine, 2015). Whilst, an association of Big Five traits of personality and psychological disorders has been studied by few researchers, it is still ambiguous to what extent personality traits provides the onset of stress. This oversight is problematic as understanding of influence of personality on stress provides a ground to explore mechanism by which health is influenced by personality.

According to Lench (2011), psychological health outcomes like stress is found to be linked both theoretically and empirically with almost all of the constructs of the personality especially during stressful situations. Therefore, another impediment is that previously researchers fail to include all personality traits by relying on a single dimension such as neuroticism and conscientiousness and provided evidence of strong linkage between these traits and health (Hampson, 2012). This strong association has made researchers to focus on these traits considering the cost and benefit ratios associated with large scale studies (Nakaya et al., 2010). Theoretically, this is an unfortunate omission as all five traits are associated with health (Chapman, Roberts & Duberstein, 2011; Turiano, Spiro, & Mroczek, 2012). Considering an association of personality traits and onset of stress, an outcome of trait-specific relationship with stress is predicted, based on whether the cognitions and behaviors associated with that trait are closely related to the cause of stress.

Whilst a number of studies showing impact of caregiving on stress of caregivers, only a few known researches in Pakistan has examined whether a caregiver's personality confers vulnerability to stress or conversely offers protection. Therefore, it is vital to evaluate the personalities of caregivers and thus predict the relation between these personality traits

and the possible emergence of mental health problem like stress in the presence of other influential factor like social support.

Number of studies have reported that if the caregiver has a sufficient amount of social support or positive coping resources, caregivers can possibly alleviate or reduce the negative impact that caregiving may have on his or her health (Clay, Grant, Wadley, Perkins, Haley, & Roth, 2013; Casale, & Wild, 2012; Rafiyah, Suttharangsee, & Sangchan, 2011). An adequate social support to a stressed individual can provide protection and can function in maintaining better emotional experience (Maulik, Eaton, & Bradshaw, 2011). However, social support is a multidimensional concept and empirical work has shown that not all dimensions have equal importance for health outcomes (Yousafzai et al., 2011) especially with regard to stress-buffering. Therefore, in this study, the mediating role of social support on the stress level of caregivers of cancer patients was examined.

Out of few studies conducted in Pakistan on the social support, only a small number has examined the direct linkage of social support with stress of caregivers whereas the mediating role of social support between caregiving, personality and stress of caregivers of cancer patients is yet to be studied.

Hence, previous studies conducted in the focus area has only illustrated the psychological outcomes of effects of caregiving whereas, direct effect of personality and mediating role of social support on stress of the caregivers is still to be explored. Viewing the scarcity of studies in Pakistan on caregivers of cancer patients of age 0 to 19 years, this study aimed

to analyze the relation between the stress level of caregivers and their personality traits considering social support as a mediating variable.

Keeping in view of the problem statement, research questions are mentioned in the next section.

1.3 Research Questions:

Following research questions are in accordance to the problem statement.

1. What is the level of aspects of caregiving, dimensions of personality, social support and stress of caregivers of cancer patients?
2. Is there any influence of aspects of caregiving, dimensions of personality and social support on stress level of caregivers of cancer patients?
3. Does social support mediate the relationship between caregiving aspects and stress level of caregivers of cancer patients?
4. Does social support mediate the relationship between dimensions of personality and the stress level of caregivers of cancer patients?
5. Which variable is the strongest predictor of stress among caregivers of cancer patients?

1.4 Research Objectives:

The main objective of the study is to determine the direct influence of caregiving and personality on stress level of caregivers of cancer patients as well as to explore their indirect effect in presence of social support as a mediating variable.

The sub-objectives of the current research are as follows:

1. To identify the level of aspects of caregiving, dimensions of personality, social support and stress of caregivers of cancer patients.
2. To investigate the influence of aspects of caregiving, dimensions of personality and social support on the stress level of caregivers of cancer patients.
3. To examine the mediating effect of social support on relationship between caregiving aspects and stress of caregivers of cancer patients.
4. To examine the mediating effect of social support on relationship between dimensions of personality and the stress level of the caregivers of the cancer patients.
5. To determine the variable that strongly predicts the stress of caregivers of cancer patients.

1.5 Significance of the Study

It is important for society that families continue to provide informal caregiving to family care recipients. The rapidly expanding ratio of disease specifically cancer in children will strain existing formal resources and subsequently informal family caregivers will become even more critical. A voluminous body of research has shown that caregiving stressors exert damaging influences upon both the physical and psychological well-being of caregivers. Informal caregivers are more prone to depression, stress and anxiety having low levels of social support (Bartolo et al., 2010).

There have been studies wherein the caregiver perceives a disruption to the family system due to caregiving responsibilities (Dunn, et al., 2012). However, there are relatively few studies that have tried to determine the effects of caregiving on caregivers of cancer patients taking them as young as 0 to 19-years old.

Given the previous findings and in light of the family systems framework wherein stressors affecting any family member affects and involves all members to some degree (Snyder & Christine, 2015) it seems reasonable that researchers should find some of these caregiving stressors exerting effects upon the caregivers of cancer patients rather than subjects like patient burden, stigmatization, depressive symptoms and expressed emotions (Majid et al., 2013) commonly found in literature.

This research provides a knowledge about the challenges faced by caregivers leaving adverse effect on them. Pearlin's Stress Process Theory (Pearlin et al., 1990) was used to ascertain the factors that strongly contribute in predicting stress of caregivers. The findings may be helpful for practitioners and researchers in recognizing caregiver vulnerabilities to stress along with the caregiver stress process continuum. Efficient and appropriate interventions can be offered for averting adverse effects of stress on caregivers.

Moreover, systematic methodology of research helps this study to specifically contribute to the enrichment of theory of stress of caregivers, social support to the caregivers and at the organization level it helps in providing insight to the policy makers in order to support caregivers and care receivers at the national level. The contribution of this study is both theoretical and practical as it considers the caregiving aspects of caregivers as well as the personality and the social support to the caregivers at the same time. Stress associated to caregiving is also under consideration of the study.

1.5.1 Theoretical significance

The theoretical contribution of this study is that it develops a theoretical framework that provides knowledge of the caregiving aspects, personality, social support and stress. The scientific information about stress of caregivers of cancer patients in Pakistan was gained through this study. It also showed the effect of personality of caregivers on their stress level and how social support mediates their relation. The appropriateness of instruments was done by evaluating the respondents which confirms the reliability and validity of the measuring instrument of this study.

This research helps to bridge the gaps present in the existing theories that have been taken into consideration of this study. The Stress Process Theory (Pearlin et al., 1990), personality trait theory (McCrae & Costa, 1987) and stress-buffering theory (Uchino, 2004) are taken as underpinning theories of this research and it fills the gap by connecting different variables affecting the psychological well-being of caregivers of cancer patients. The generation of the knowledge from this study can contradict or validate previous knowledge hence expanding the knowledge in this area.

1.5.2 Practical significance

Practically, it would be helpful to ascertain vital factors that contribute in stress level of caregivers of cancer patients at individual level in government sector. Until now very few interventions are incorporated in order to cope with the stress of the caregivers individually. Many organizations are working on ensuring the health of caregivers but because organizations do not get benefit from it so at larger scale, research studies are necessary to promote the need of care for the caregivers.

The outcomes of this research will provide practitioners and organizations about the benefits of considering a holistic approach of determining predictors of stress in caregivers and establishing services in order to deal with the stress of caregiving as well as coping well with grief related to disease or death of a care receiver. In addition, administrators and policy makers are provided with the knowledge of significant factors contributing in stress of caregivers which helps them provide beneficial services for preventing stress. This would have a detrimental effect not only on caregivers but also on society as a whole (Pearlin et al., 1990).

Therefore, the outcomes of this study may provide a knowledge about some important variables through which the stress of caregivers of cancer patients can be controlled or minimized. Researchers and psychologists would learn to assess the importance of potential sources of stress of caregivers from the outcomes of this study and how to effectively use the coping strategies and social support in order to develop and initiate therapeutic interventions that can help in the reduction of stress and its harmful effects on physical and mental health of the caregivers.

1.6 Definition of Concepts

The operational definitions of the concepts are as follows.

i) Caregiver

Caregiver is a person of any age that invest considerable amount of energy and time in providing uncompensated and extraordinary care by fulfilling physical, emotional, social or financial demands in the home setting for months or years (Biegel, Sales, & Schulz, 1991). Usually, caregivers are relatives without any formal training of providing care.

ii) Caregiving

It is the unpaid facilitation and service provided to family members or acquaintances that are facing any kind of physical, psychological or developmental problems or aging and in need of support or assistance (Grabel & Adabbo, 2011). Caregiving, according to Pearlin et al. (1990) is the activities and experiences while providing assistance and support to relatives who cannot provide for themselves. Caregiving is further divided into two dimensions that are physical or instrumental and the emotional caregiving.

Physical caregiving is further sub divided into Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs). Instrumental activities involve providing transportation, medication and making phone calls for the patient and Activities of Daily Living involves bathing, cleaning home, preparing meals, getting the patient in and out of bed. Whereas, emotional caregiving is comforting the patient when he/she feels down and make him/her cherish.

Caregiving and its physical dimension were measured by the Stetz Inventory, Part 1 (Stetz, 1986) which was modified by Wallhagen in 1992. On the other hand, emotional caregiving was measured by Berlin Social Support Scale (BSSS) by Schwarzer and Schulz (2013).

iii) Personality

Keeping in view the caregiving aspect of caregiver, the personality is defined as organized and enduring set of psychological traits and mechanisms influencing the interactions and adaptations of the individual to the intra psychic, social and physical environments (Larsen & Buss, 2005).

The personality of a caregiver was measured by the Big Five Inventory (BFI) developed by Goldberg (1993). BFI is a 44-item inventory based on the Big Five Factors by McCrae and John (1992). The five factors included in this inventory are neuroticism, extraversion, openness, agreeableness and conscientiousness. Neuroticism of caregiver is their tendency to face negative effect of caregiving. Extraversion and openness are the reactions towards positive emotions and acceptance of new ideas and sociability. While agreeableness is also the acceptance of altruistic emotions and conscientiousness is the tendency to stay determined while providing care (Toegel & Barsoux, 2012).

iv) Social Support

Social support is the process of interacting in relationships that can improve coping, belonging and competence through either physical or psychosocial resources (Gottlieb, 2000). It also provides psychological resources that assist caregiver in efficiently coping with the stress (Cohen, 2004). It involves both functional and emotional aspects such as availability of an individual as well as support in form of showing empathy, respect and trust. The nature of social support includes the extent to which it is useful in difficult and stressful situations (Cohen, 2004).

In this study, social support was measured with the Medical Outcomes Study: Social Support Survey (MOS-SSS) by Sherbourne and Stewart (1992).

v) Stress

Any change in environment that is considered as threatening, challenging or damaging to the person's dynamic equilibrium produces a state in a human body which is termed as

stress (Smeltzer & Bare, 1992). Stress, according to Pearlin et al. (1990) is a self-defeating situation that impede efforts and goals of the caregivers eventually causing fatigue.

In the present study, the stress of the caregivers was measured by Modified Caregiving Strain Index (MCSI) by Thornton and Travis (2003) that measures the stress related to caregiving. This scale highlights the stress level of caregivers affected by caregiving to their cancer patients.

1.7 Scope of the study

The scope of the study is to find relationship between four constructs named as caregiving, personality, social support and stress of caregivers of cancer patients in Punjab, Pakistan.

Several cancer care hospital locations are involved in this study namely Lahore, Multan, Gujranwala, Faisalabad, Bahawalpur and Islamabad in Pakistan. These hospitals were selected because of the number of patients arriving there as well as due to the Punjab being largest province of Pakistan with large number of cancer care hospitals.

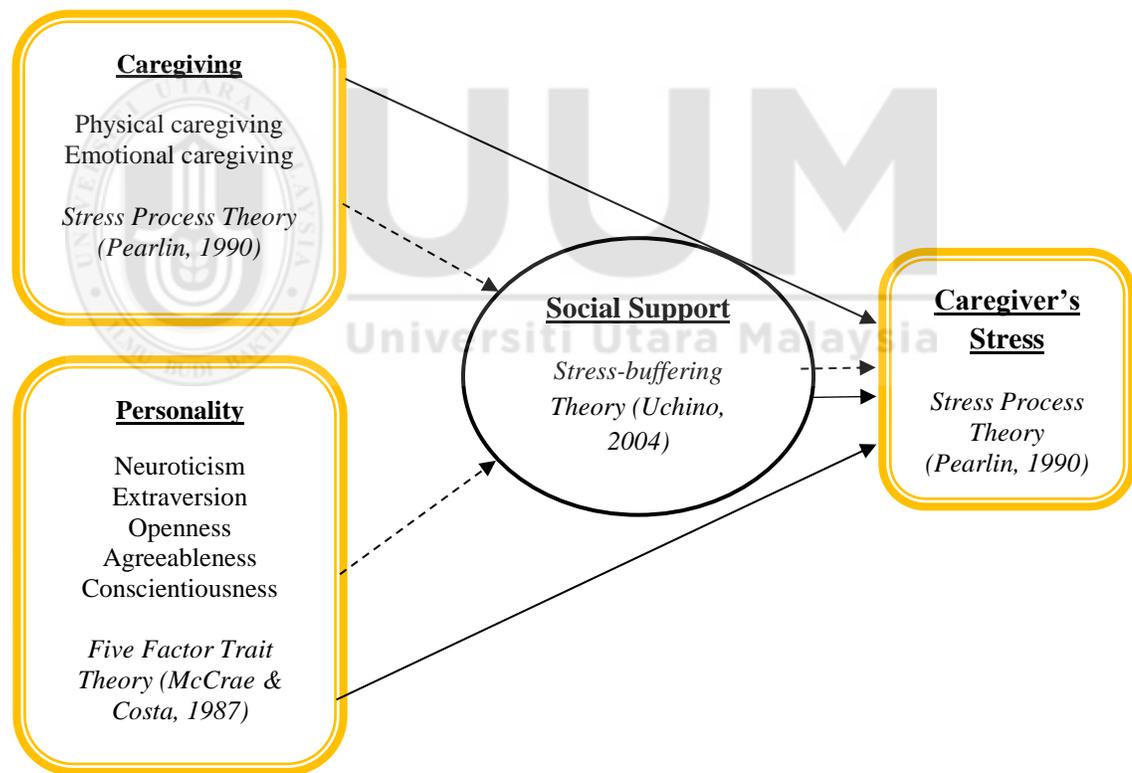
The cancer care hospitals fall under the Ministry of Health, Pakistan Medical and Dental Council (PMDC) which is a legislative authority established as a corporate body under Pakistan Medical & Dental Council Ordinance 1962. It is respected globally and is also the part of international community of medical regulatory authorities (IAMRA). The mission of PMDC is to protect interest of public by establishing standards of higher qualifications in Medicine & Dentistry all over Pakistan.

With the rapid increase of disease especially cancer, Ministry of Health has decided to increase the number of cancer care hospitals that could prevent hospitals from being overcrowded. The government is also planning to build more cancer care hospitals to

increase the quality of facilitation and the non-governmental organizations are developing programs for the care of the caregivers by providing them counseling and helping them get emotionally, physically and mentally stable.

1.8 Research Framework

The research framework was developed to explain the relationship between variables under consideration for this study. This hypothetical model will help in development of answers to the research questions.



Note: Direct arrows show the direct path from independent variables to dependent variables. Dotted arrows show the mediating path from independent to mediating to dependent variable.

Figure 1.1. Research framework

This research framework shows the relation among variables that has been taken into consideration of this study. There are mainly two independent variables that are further divided into their dimensions such as first variable caregiving is having two dimensions physical caregiving and emotional caregiving whereas the second independent variable that is personality is further having five dimensions such as neuroticism, extraversion, openness, agreeableness and conscientiousness. Therefore, taking into consideration all the dimensions of caregiving and personality, the relationship among these dimensions with the mediating variable and the dependent variable is studied independently rather than studying caregiving and personality as a whole. Further, there is one mediating variable namely social support and one dependent variable named as stress. First independent variable which is caregiving is directly pointing to the stress, therefore, the effect of aspects of caregiving on the stress level of caregivers is among one objectives of the study and the other dotted arrow shows the mediating effect of social support on the stress of caregivers. Second independent variable is personality and it is also directly pointing to the stress indicating that effect of dimensions of personality is to be checked on the stress in this study. Small dotted arrow shows the mediating role of social support between dimensions of personality and stress of caregivers. Mediating variable which is, social support is directly pointing to stress indicates the effect of social support on stress as another objective of this study.

Hence, this framework provides a diagrammatic view of the current study and the relation among different variables as well as a theoretical framework for the study.

1.9 Research hypothesis

The research hypothesis are mentioned below based on the empirical objectives mentioned above. These hypotheses are formulated in order to test correlation between independent variables, mediating variable and dependent variable.

H1 Aspects of caregiving and stress of caregivers of cancer patients.

H1a There is a significant correlation between physical caregiving and stress of caregivers of cancer patients.

H1b There is a significant correlation between emotional caregiving and stress of caregivers of cancer patients.

H2 Dimensions of personality and stress of caregivers of cancer patients.

H2a Neuroticism is significantly related to high level of stress.

H2b Extraversion is significantly related to low level of stress.

H2c Openness is significantly related to low level of stress.

H2d Agreeableness is significantly related to high stress level.

H2e Conscientiousness is significantly related to high level of stress.

H3 Social support and stress of caregivers of cancer patients.

H3a There is a significant relationship between social support and stress of caregivers of cancer patients.

H4 Social support as mediator between aspects of caregiving and the stress of caregivers of cancer patients.

H4a Social support mediates the relationship between physical caregiving and the stress of the caregivers of the cancer patients.

H4b Social support mediates the relationship between emotional caregiving and the stress of the caregivers of the cancer patients.

H5 Social support as mediator between dimensions of personality and stress of caregivers of cancer patients.

H5a Social Support mediates the relationship between Neuroticism and the stress of the caregivers of the cancer patients.

H5b Social Support mediates the relationship between Extraversion and the stress of the caregivers of the cancer patients.

H5c Social Support mediates the relationship between Openness and the stress of the caregivers of the cancer patients.

H5d Social Support mediates the relationship between Agreeableness and the stress of the caregivers of the cancer patients.

H5e Social Support mediates the relationship between Conscientiousness and the stress of the caregivers of the cancer patients.

H6 Physical caregiving is the strongest predictor of stress among caregivers of cancer patients.

1.10 Organization of the study

Complete perspective of this research like research questions, research objectives, significance and conceptual and operational definitions of all the construct variables that are explained in this study are addressed in Chapter One. Chapter Two addresses the literature review as well as theories supporting the proposed framework whereas research methodology is explained in Chapter Three followed by the analysis, results and discussion in Chapter Four and Five.

1.11 Summary

This chapter presented the background of the study and identified the gaps in the existing literature that provided the problem statement. Research questions and objectives were also mentioned in accordance to the problem statement. This chapter also illustrated both theoretical and practical significance of the study. Moreover, all the variables under consideration of this study were defined followed by the research framework showing the direct and indirect (mediating) correlation among all variables. At the end, hypothesis were formulated based on empirical objectives of the study in order to test the correlation between independent, mediating and dependent variables. Organization of the study is also presented in this chapter.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1 Introduction

Important element of the study is the notion that caregiving to the cancer patients and the personality of the caregivers influence their stress level while social support is taken as a mediating variable between caregiving and the stress of a caregiver. The caregivers are constantly going through the stress during a caregiving process due to some non-negligible factors like emotional instability, financial crisis and lack of time. Meanwhile social support of the caregivers mediates the stress level of the caregivers while caregiving to their close ones. These factors work interactively in order to minimize the malfunctioning of the caregiver.

In a setup where a person is providing care to the loved one the social support provided to the caregiver can mediate his caregiving role and the stress level. Due to the increasing demands of caregiving, it is mandatory to take into consideration the social support of a caregiver as a mediating variable between the caregiver and his stress level. On the other hand, personality is another factor that influences the stress level of the caregiver. These assumptions are taken into consideration by previous findings and are backed up in this study by theories and different concepts.

This chapter discusses the caregiving and its impact on the stress level of the caregiver of the cancer patients. This explanation includes the relevant theories and the empirical background of the study. Secondly, the effect of personality of the caregivers on the stress

level is explained through the findings of the previous relevant literature supported by theories. Thirdly, the social support and its mediating effects on the stress of the caregivers of the cancer patients will be studied. Lastly, a conclusion about literature will be given.

2.2 The stress of caregivers

Since ancient times, the physiological and psychological well-being of humans has been affected by the stress but from last few decades, the study of numerous facets of the process of stress has begun. Stress as defined by Selye (1976) is the non-specific response of the human body to the demands placed on it. He states that individuals respond to the same events in a similar manner irrespective of the cause, situational context or psychological interpretation of the demanding situation.

Pearlin and Schooler (1978) use the term “stressor” to refer to external events and the term “strain” to refer to stressful situations. Stressors can be categorized according to five major social roles: work, marital, parental, household, economic, and health (Pearlin & Schooler, 1978). Others classify stressors according to the types of content involved such as illness, death, interpersonal or practical (Billings & Moos, 1984; Folkman & Lazarus, 1980). This study will address stressors from both social roles and content types. Pearlin, Sample and Turner (1988) identified two broad domains of stressors or strains: primary stressors and secondary stressors.

Primary caregiver stressors are directly linked to the requirements of the patient and the type and level of the care required. For example, primary stressors can arise from housekeeping activities, providing personal care, and management of financial and legal matters (Pearlin et al. 1988). Role strains and intrapsychic strains are the part of secondary

stressors. Role strains include roles and activities that originate from outside the caregiving situation such as job conflict, economic strains and interference with social and recreational activities. Intrapyschic strains arise from within the individual (Pearlin et al. 1988).

In 1991, stress has been divided into three types by Monat and Lazarus; these three types are physiological, psychological and social. Physiological stress is related to the disturbance in bodily tissues or other physical systems. Social stress occurs due to disruption in social unit while psychological stress is due to the factors that threatens the psychological well-being of an individual. These types of stress may be related but the nature of relation is vague. Considering all important factors causing stress, Monat and Lazarus (1991) defined stress as any occasion in which internal, environmental or both demands overpower the resources of an individual that helps him to adapt to the environment efficiently.

Hence, stress can be explained as the experience that arises due to the transactions between the person and his environment, particularly those transactions in which resources of an individual does not match with the perceived needs or challenges. Stress theory of Lazarus and Folkman (1984) states that stressors are major elements in shaping adaptation. The perception of stress is dependent on the level of demands of environment and the extent of availability of resources that an individual has in order to cope with those demands. Lazarus and Folkman (1984) stated that primary appraisals are the cognitive appraisals of an individual through which loss, harm or any challenge can be recognized that is linked to the occurrence of any emotional or psychological reactions. Whereas, secondary appraisal is a phenomenon in which individuals appraise the stimuli as

requiring a coping response and evaluate their resources in order to determine if they are able to cope well with the situation that means to lessen or eliminate the stress.

Lazarus and Folkman (1984) have focused on how stress is perceived or appraised, on in terms of its perceived characteristics, severity, or the problem itself. On contrary, Pearlin et al. (1988) has argued that stress arises as a function of the distribution of social resources, as well as an individual's status and roles. A lack of social resources either increases the probability of stressful life events or enhances stressfulness once it occurs. For the purpose of this study, Pearlin's Stress Process Model [SPM] (1990) was considered.

While reviewing the literature related to the caregiving stress, functional capability (physical health status, mental health status, and functional performance) and self-care behavior, caregiving stress has been found to have negative influence on physical health and mental health status. Several studies (McCarthy, 2011; Stam, Grootenhuis, Brons, Caron, & Last, 2006) have been conducted using this variable to examine the relationship between functional capability and self-care behavior in elderly caregivers. Several investigators (Lau, Phil, & Au, 2011; Majid & Abidi, 2013) have also noted that physical and mental health were related to self-care behavior in caregivers. Caregivers with better health status and fewer chronic conditions were more likely to perform more health promoting behavior.

In addition, caregivers with higher education were more likely to perform better health promotion. Numerous other studies have been conducted on the relationships between the caregiving stress, caregivers' functional capability, and self-care behavior among elderly

caregivers. Studies on family caregiving have reported that deterioration of the family caregiver's emotional and physical health may be attributed to the chronic stress that arises from the demands of the caregiving role itself (Aneshensel, Pearlin, Mullan, Zarit & Whitlatch, 1995; Pearlin & Skaff, 1996).

However, a well-established fact now is that morbidity, mortality, psychiatric disorder and psychological distress occurs as an outcome of any one or series of negative events experienced between 6 to 12 months by an individual (Bevans & Sternberg, 2012). With respect to mental health, Dunn et al. (2012) argued that only negative changes would exceed the psychological resources of an individual resulting in increase of emotional disorder.

Therefore, it is assumed that stress is an outcome of a situation that is considered as threatening or demanding by the individual in absence of an appropriate coping response. In such situation, individual feel important to respond but the coping response is not appropriate. Stress response is initiated by the stressor that is either imagined or real condition, circumstances or stimulus that starts the stress response process in an individual (Floyd et al., 2011).

The reaction of an individual towards the stressful event that it would negatively affect his or her well-being causes it to become a psychological stressor. Mitnick, Leffler and Hood (2010) stated that individual's perception of an event in stress response is very important to identify an event as a psychosocial stressor.

Hence, any physical or mental strain in response to stressful situation can be damaging. This stress process in the mind and body results in the occurrence of disease states (Martin

& Keats, 2014). This in assistance with the stressful event, individual's thoughts and their physical responses towards behavioral or cognitive coping strategies for the alleviation of stressful events targets the most effective place within stress response process (Marsland et al., 2013). This also happens with the caregiver of the person suffering from any chronic illness.

In the past two decades, according to Collins and Swartz (2011), responsibilities of informal caregivers have been increased due to the shift of health care systems towards home-based setting. Several researches have defined caregivers as someone who provides informal, unpaid care. Canadian Caregiver Coalition (2012) defines informal caregivers as individuals who without being paid provide ongoing care and assistance to the family members or friends in need of physical, cognitive or mental support. A nationally recognized leading authority among caregiver organizations, the Family Caregiver Alliance (2011), published a broadly defined working definition of the family caregiver as any relative, partner or friend who provides a broad range of assistance to the closely related person with a chronic or disabling condition.

Furthermore, Marsland et al. (2013) differentiates caring for children which is parenting from caregiving. This indicates that if a person is providing out of normal care like caring for a child with cancer, it is considered caregiving. On the other hand, Pearlin et al.'s definition (1990), mentioned a specific purpose behind providing care like emotional component and commitment with the patient whereas other researchers did not mentioned any such reason for providing care (Chambers et al., 2012).

Although family caregivers are important in caring for a cancer patient but unfortunately, it negatively affects physical, social, emotional and financial state of a caregiver resulting in stress and other health problems (Narayan, Varghese, Hepburn, Lewis, Paul, & Bhimani, 2015; Palos, Mendoza, Liao, Anderson, Garci, & Cleeland, 2011). The demand of a caregiving process is a unitary stressor because the caregiver usually assists with the daily living tasks of the care recipient over a long period of time. These unpredictable and uncontrollable demands of caregiving can require additional physical, emotional, social and financial resources (Litzelman et al., 2011).

Parents of the children suffering from cancer have to deal with multiple demands of caregiving such as medical and developmental interventions in association with other family needs (Narayan et al., 2015), leading to the parental stress (Shah et al., 2013). Stress of parents can strongly predicts the psychological well-being of the caregivers (Cramm and Nieboer, 2011). Caregivers feel lack of control over the routine activities and events resulting in the parental stress which leads to the poor well-being (Quinn, Clare, & Woods, 2015). Other factors like limited social activities and lack of informal support also increases the parental stress (Beattie & Lebel, 2011; Okoye & Asa, 2011).

The reason why some caregivers cope well with the stressful situations and others do not is still to be explored further. Stress is considered as the balance in internal ability to cope with the external demands and it occurs when an individual fails to fulfill the other objectives of life due to increasing demands of a particular objective (Cramm & Nieboer, 2011). Factors that modify the caregiver stress includes the characteristics of both the care recipient and the caregiver (Beattie & Lebel, 2011), their shared history, socioeconomic factors and cultural context (Fujinami et al., 2014). The outcomes of the stress are

influenced by all these factors suggesting that occurrence of stress is due to various factors rather than just a care provision of an ill child.

Impact on caregivers may be regulated by a distinctive combination of factors. Researchers have started developing theoretical models and frameworks for the better understanding of a complex phenomenon of caregiving (Mitnick et al., 2010) for the identification of interrelationships between characteristics of child and the caregiver, resources of caregiver and their stress due to illness of the child. The study of these interrelating mechanisms is important for the prevention of outcomes of stress and traditionally health sectors have overlooked this research aspect of child health (Borneman et al., 2015). Generally, people are aware of the influence of these above stated factors but understanding of the relative strength of these factors for caregivers of children with cancer in particular is scarce.

To find the relation between different stressors, Pearlin et al. (1990) in his Stress Process Model has described that distress may occur due to the direct effect of some stressors, whereas some effects indirectly depending on the available support and other resources. Following is the Stress Process Model by Pearlin (1990) that describes the direct, indirect and mediating stressors that effect the psychological functioning of the caregivers.

2.2.1 The Stress Process Model

Pearlin's Stress Process Model (SPM) explains the stressful experiences; therefore it is intuitive to consider stress research and the Stress Process Model (SPM) as a theoretical base for exploring the experience of caregiving of cancer children.

As articulated by Pearlin et al. (1988) research about stress starts with a requirement or need that people confront and perceive. Operationalization of Stress Process Model (SPM) by Pearlin and colleagues' (1990) is based on the community-dwelling caregiver of the Alzheimer's disease. Over time the model has been adapted to consider the stress of caring for ill patients who has been placed in long-term care and it has been utilized to consider the stress of caring for an individual with AIDS and Cancer (Pearlin, Anehensel, & LeBlanc, 1997).

The six components of the SPM model are (a) background and context; (b) primary stressors; (c) secondary role strains; (d) secondary intrapsychic strains; (e) outcomes; and (f) mediators (Pearlin et al., 1990). Background and context characteristics are instinctive characteristics that stimulate the stress and any succeeding outcomes such as socio-demographic characteristics. In the SPM, any activity or condition that creates problems for an individual or threatens the efforts making him fatigued is considered as a primary stressor (Pearlin et al., 1990).

In Pearlin and colleagues' application of the stress process to caregiving, some indicators of primary stressors are how the caregiver perceives the cognition of the patient. The difficulty of caregiver activities, such as his or her ability to manage relationships with his or her sick relatives or friends, grows as a result of the patient's disease (Pearlin et al., 1990). When the patient becomes more dependent, the caregiver must perform greater amounts of more difficult work for the care recipient. Therefore, disturbing behavior of patients and his dependence on caregiver as well as cognitive status are objective stressors in regard to their connection with patient's health, behavior and functional capabilities. In

short, primary stressors include the problem behaviors and the caregiver's subjective perception of overload.

In SPM, secondary stressors are identified from role strains and intrapsychic strains which are included in demands of the patients that caregiver requires to satisfy and fulfill or in the restructured relationship between the patient and caregiver (Pearlin et al., 1990). Several conditions are productive of secondary stressors such as role strains like economic strain, occupation conflict, the conflict between the caregiver and other relatives of the dementia patient and intrapsychic strains such as self-concept, self-esteem or role capability. Secondary role strains are considered as the roles of non-caregiving that are compromised due to the caregiving activities such as family and economic problems. Personality state and self-concept that are effected by the caregiving process are considered as intrapsychic strains.

A basic foundation of this stress process model is that "one set of stressors can lead to another" (Pearlin et al., 1990). Due to this fact, it is essential to cognize the concept that primary stressors or direct stressors may have an impact on role and intrapsychic strains which are indirectly linked to caregiving. Consequences of stressors such as physical or mental health and ability to withstand social roles are often associated to the wellbeing of a caregiver. (Pearlin et al., 1990). Mediators have found to mediate or govern the effects of stress on its outcomes (Pearlin et al., 1988). Most stress research only assesses mediators in terms of extent to which the association between the stressors and the outcomes is buffered.

The SPM was developed to consider family caregiving stress, rather than care receiving stress. A slightly modified version of the Stress Process Model provides an initial point for exploration of stress process of chronic illness from caregiver's point of view.

2.2.2 Previous studies on stress of caregivers of cancer patients

The diagnosis of cancer in children or adolescents is among the most intense, disturbing and long lasting experiences that caregivers can have. The unanticipated and life-threatening cancer diagnosis leading to invasive medical treatments and its sequel appears as an obstruction in the normal activities and routines of entire family and impose stressors of different durations, impacts and predictability (Ghufran, Andrades, & Nanji, 2014; McCarthy, 2011; Vrijmoet-Wiersma, Klink, Kolk, Koopman, Ball, & Egeler, 2008).

With the significant progress in the treatment of cancer and coordination of care, various types of cancer that were considered fatal are curable and have become chronic life-threatening diseases (Northouse, Katapodi, Schafenacker, & Weiss, 2012). According to Kim and Knight (2008), the confrontation of parents with diagnosis of cancer leads to the initiation of a psychological process that is termed as psychological stress.

Later, Majid et al. (2013) added that even with improvements done to prolong life, there is still an association of childhood cancer with incurability, loss and suffering. Family members are prone to a new situation involving repeated hospital visits, financial losses and alterations in family responsibilities that may obstruct the performance of tasks by child and family that are inherent to the developmental process (Beattie & Label, 2011; Nayaran et al., 2015).

Empirical research presenting the impact of cancer on family members is still limited (Ellis, 2012; Lund, Ross, Peterson, & Groenvold, 2015; Molassiotis, Wilson, Blair, Howe, & Cavet, 2011). The detrimental impact of cancer have been mentioned in existing studies on the various aspects of family caregivers' quality of life (Lund et al., 2015; Marsland et al., 2013) and emotional well-being (Quinn et al., 2015; Dunn et al., 2012).

Recently, the health teams are made to consider that cancer in childhood is a stressful event for families which affects them adversely during the treatment phase (Ahmed, 2012) and even after its termination where child is cured (Cousino & Hazen, 2013). Some researches focus on evaluating the effect of childhood cancer in the family caregivers, however controversial results have been gained by these studies where some reported good adjustment while others indicated high rates of parental stress (Rodriguez et al., 2012).

The caregivers have to perform several disease related tasks like providing emotional support (Ellis, 2012; Molassiotis et al., 2011) physical care (Fujinami et al., 2014) treatment monitoring (Given & Grant, 2012) and symptom management (Juarez, Branin, & Rosales, 2014). These tasks can be emotionally, physically, socially, and financially demanding (Ferrell & Baird, 2012) and considerable strain is experienced by 10–50 percent of the caregivers (Cousino & Hazen, 2013). Consequences of caregiving such as stress have been frequently reported.

Patterns of stress has been investigated by various studies in addition to the physical and emotional impact of the pediatric cancer (Grant et al., 2013). Generally, it is indicated by literature that at the diagnosis stage, high levels of stress occurs which declines over the

six months during the treatment phase (Borneman, Bluman, Klien, Thomas, & Ferrell, 2013). While examining the emotional strain through different phases of cancer, several other noticeable themes appear such as proportion of parents reporting stress, actions related to the stress reactions and the evolution of reactions over the time span (McCarthy, 2011). The distinguished phases are consolidation or diagnostic phase, initial treatment phase, active treatment phase and adaptation.

Other studies have also mentioned that parents develop coping strategies through the adaptation period and gets less stressful as compared to the time of diagnosis (Zebrack et al., 2012). However, few studies have revealed that caregivers of children who survived cancer shows the symptoms of stress even after the child was cured or the treatment was completed (Lund et al., 2015). These parents reported the constant fear of death and continuous involvement in health issues of the child as the cause of stress (Ferrell, Hanson, & Grant, 2012).

A cross-sectional study by Alves, Guirardello and Kurashima (2013) in Brazil from 27 January-15 June 2009, including 101 parents of cancer children showed higher level of stress. The events such as impact of the disease on child's life were considered the most stressful for the parents. Given the time since diagnosis, parents of children with short time showed higher level of stress (Given & Grant, 2012). Studies addressing stress pointed the high stress rate at time of diagnosis that declines gradually, though remain higher than stress experienced by healthy children (Grant & Ferrell, 2012). In 2008, Patino-Fernandez, Pai, Alderfer, Hwang, Reilly and Kazak also studied the stress of parents with newly diagnosed children with cancer and found that 51 percent (N = 66) of mothers and 40 percent (N = 29) of fathers were suffering from acute stress disorder.

Considerable evidence is present indicating parental distress in form of anxiety, depression and posttraumatic stress around the time of diagnosis of child's cancer (Given, Given, & Sherwood, 2012). There are noteworthy rates of stress such as 51 percent of mothers and 40 percent of fathers met DSM-IV criteria for Acute Stress Disorder within two weeks of child's diagnosis of cancer (Dunn et al., 2012).

Caregiver's emotional stress may be heightened due to the unpredictability of the course of cancer, threat to life and its reoccurrence (Brant, Beck, Dudley, Cobb, Pepper, & Miaskowski, 2011; Cousino & Hazen, 2013). In the analysis of six cross-sectional studies conducted by Vrijmoet-Wiersma et al. (2008), the construct of unpredictability in childhood cancer was examined. Outcomes indicated that parents of children immediately after treatment showed more signs of uncertainty as compare to those parents whose children have gone through treatment one to five years before. Almost 66-90 percent of parents showed unpredictability after the treatment was terminated.

Additionally, few parents of cancer survivors continually showed uncertainty about the well-being of their children even after the years of treatment cessation. In short, proper health decisions are interfered with the high levels of uncertainty. In the long term, when uncertainty of parents become chronic by pervading the disease trajectory, it leads to the development of post-traumatic stress symptoms (Cousino & Hazen, 2013).

In addition, Lindahl-Norberg, Lindblad and Boman (2006) mentioned that parents with cancer children showed more depressive symptoms as compared to those with healthy children. Depressive symptoms were reported to be at low level in parents who have passed long time since diagnosis but another study by Lou (2006) presented the persistent

signs of high depression than parents with normal children. However, it has been suggested by longitudinal studies that symptoms of stress may be maintained over the time period especially when parents show moderate to severe levels of stress.

In another study conducted by Alderfer, Cnaan, Annunziato and Kazak (2005), 57 percent of fathers and 68 percent of mothers of children under treatment of cancer reported stress from moderate to severe level. Sub-clinical stress have been found to be prominent consisting of intrusive thoughts and physiological arousal at reminders as well as avoidance of treatment-related events. Stress rate of parents of cancer survivors was found to be in a range between 10-42 percent whereas stress range from moderate to high level in parents whose children were currently under treatment. In short, parents of cancer survivors showed high level of stress than healthy children parents but lower stress level than other traumatized or stressed groups (Northouse et al., 2012).

Furthermore, Bruce (2006) did an extensive review of articles on stress of cancer survivor children and their parents. Review mentioned few risk factors associated with cancer and stress such as gender, other physical ailments, increase in other stressful events, severity of disease and treatment, poor support, family conflicts and emotion-focused coping. It is always under debate that whether traumatic stress is relevant in describing emotional reactions of parents with cancer children. Nonetheless, stress symptoms in parents are a major concern that requires appropriate intervention particularly after the diagnosis (Ghufran et al., 2014). Early intervention is required in assessing early signs of stress since the disturbing symptoms may increase with the passage of time.

Moreover, Docherty, Thaxton, Allison, Barfield and Tamburro (2012) in New Zealand did a cross-sectional study in which all cancer children aged 0-14 years during a defined period were ascertained from the national cancer registry and other databases. The study included 179 fathers and 218 mothers of cancer children and reported poor psychological health of the parents.

In 2012, in a study by Dunn et al. on the posttraumatic symptoms of cancer children, almost two thirds of mothers (66%) and fathers (60%) met the diagnostic criteria proposed by Jurbergs, Long, Ticonia and Phipps (2009). Few years back, Skalla and Ferrell (2015) also found manifestation of different symptoms of stress six months after treatment. The symptoms indicated post-traumatic stress disorder in 35 percent of parents, consistent with that of Axia, Tremolada, Pillon, Zanesco and Carli (2006). In turn, Greening and Stoppelbein (2007) found only 7 percent of the sample presenting levels of stress. Conversely, Jurbergs et al. (2009) did not report any difference in symptoms of posttraumatic stress disorder between parents of healthy children and of cancer patients. Later in 2013, Boman, Kjallander, Eksborg and Becker found a significant relation of stress and caregivers of cancer patients.

Kohlsdorf, Marina, Costa Junior and Luiz (2012) did a meta-analysis by selecting studies published between 1996 and 2009 addressing psychosocial aspects on parents or caregivers. The results showed that treatment negatively impact (financial costs, changes in routine) the caregiver's life in accordance with behavioral disorders (depression and distress).

Family members who are confronting illness of their loved ones are found to be more stressed than the patient suffering from cancer. The distress is due to the role and needs of caregiver and because of witnessing the suffering of patient (Juarez et al., 2014). Several studies examined the emotional distress reported by cancer patients and their family members. Okoye and Asa (2011) and Quinn, Clare, McGuinness and Woods (2012) also found a relationship between distress of caregiver and care recipient.

Cousino and Hazen (2013) in their study identified 96 articles showing variable results of stress related to care provision. In 2012, Fernandes, Muller and Rodin also found depressive symptoms in parents of children with cancer under age of 18. Parenting stress has been found to be linked with numerous factors related to cancer. In caregiver sample of Netherlands, parents were found to experience more stress whose children are newly diagnosed with cancer or are currently under treatment (Juarez et al., 2014).

In addition, Meecharoen, Northouse, Sirapo-ngam and Monkong (2013) selected 23 studies published from 1994 to 2009 for a review. Moderate to high level of stress in family caregivers were reported by some quantitative studies. Marcusen (2010) reported a moderate to high stress level in family caregivers while Stenberg et al. (2010) found moderate stress level.

Soylu, Ozaslan, Karaca and Ozkan (2015) selected total of 100 patients and their caregivers from a major hospital in Kayseri, Turkey. Substantial differences between anxiety of caregivers with terminally ill cancer and caregivers with advanced ill cancer patients ($p < .05$) were found. Lund et al. (2015) in a cross-sectional study from January-

July 2010, on 856 cancer patients found that 59 percent of the caregivers of the cancer patients were suffering from stress.

In 2012, Masood, Beenish, Zubia and Shaukat conducted an analysis in three tertiary care hospitals of Pakistan in order to ascertain the impact of disclosure of cancer diagnosis to the families. The results of this study showed that stress levels were increased in 59 (40.1%) caregivers whereas remained the same in 61 (41.5%) and decreased in 27 (18.4%) family members. This indicates that stress resides in all caregivers but the level of stress varies. Almost similar results were found in a study by Ansari and Qureshi in 2013, in which they examined the stress level of nuclear and joint families of cancer patients in Pakistan and found that nuclear families have high level of stress as compared to the joint families. On the contrary, in 2014, Ansa and Mahmood from Pakistan concluded that caregivers have very low level of stress.

Another study by Majid and Abidi in 2013 on the caregivers of thalassemia major provided significant results related to stress of caregivers. This study reported that parents of thalassemia patients have higher level of stress as compared to the parents of normal children. Similar results were found by the study conducted in Pakistan considering stress of parents of children with leukemia where 65% (n=60) of mothers were depressed (Iqbal & Siddique, 2002).

In summary, the existing literature narrated that caregivers of children with cancer are more prone to stress. Diagnosis of disease and following treatment is both traumatic and stressful for the caregivers. Therefore, the commonly accepted viewpoint is that role of

caregiver is strenuous and hazardous to the health of caregiver and with the increase in need of informal caregivers, the pool of potential caregivers is decreasing.

2.2.3 Concluding remarks on stress of caregivers

Aforementioned voluminous studies showed that caregivers and their stress level have gained much importance within last few decades. Stress as the negative consequence of caregiving is apparent in many studies that can interfere with the caregiver's quality of life and the act of providing care to the loved ones. Researches indicate that caregiving to the ill family member plays vital role in the different facets of caregiver's life. These physical, psychological and social domains of caregiver's life can lead to the worse physical health, disturbed socioeconomic life and increased levels of stress.

It has been found by the literature that various kinds of support is needed by the cancer patients such as instrumental aid, psycho-social support and dealing with routine activities. Caregivers are often unprepared for providing care to the cancer patients at home and that is the reason why they feel burdensome. Very limited amount of support is provided by the health care providers because they are more towards solving patient's problems (Sun et al., 2015).

Since caregivers of pediatric cancer patients are more likely to develop and experience disruptive emotional manifestations of strain that prevails over a long time in them, it is pertinent to prevent risk factors at an early stage so that caregivers more at risk of maladjustment could be detected and supported. Caregivers who are already having some psychological problems should be given attention as they may deal with crisis of caregiving with much ease. Providing knowledge about the factors that can cause stress

may help in identification of caregivers who are in need of psychological intervention and prevent them from developing negative emotional stress manifestations beyond the “normal” reactions to diagnosis of cancer.

Hence, it is revealed by the research findings that various health outcomes of caregivers providing care to the cancer patients at home is still to be explored. Additionally, studies showed that physical, social, psychological, financial as well as spiritual well-being of the caregiver is affected due to caregiving for cancer patient (Meecharoen et al., 2013; Rodriguez et al., 2012).

Thus, caregivers of cancer patients are found to be stressed due to the increasing demands of caregiving. Research also stated that caregiving is affected due to the caregiver strain and ultimately patient suffers the adverse effects. Therefore, facilitating the caregiver is proportional to serving the patient (National Cancer Institute, 2012).

2.3 Personality of caregivers

Personality, according to Allport (1937) is among the most abstract words of language that have around fifty different meanings derived from diverse fields of theology, sociology, philosophy, psychology and law. Although, personality theorists disagree each other about the meaning of personality but they all believe that some stable characteristics resides in individuals that influence their behavior and attitudes forming the personality. Hogan (1991) stated that there are two different meanings of personality but was unable to define them separately which leads to confusion. He mentioned first as person’s social reputation; referring to how an individual is perceived by others. It is an observer’s perspective of the personality and is verified publically. The other one is structures and

processes explaining the person's behavior due to certain characteristics and it is private and must be inferred.

Personality as defined by McCrae and Costa (2003) is a style that is interpersonal, enduring and motivational explaining behavior in diverse situations. Furthermore, Funder (2004) defined personality as individual's pattern of thought, behavior and emotion in accordance with open or hidden psychological mechanism. Whereas, personality of an individual is defined as the set of psychological traits and mechanisms that are persistent and influence his/her interactions with, and adaptations to, the physical, social and intrapsychic environments (Larsen & Buss, 2005). In other words, personality is defined by Sanders (2007) as a possession of set of characteristics which is organized and dynamic and uniquely affects the person's motivations, behaviors and cognitions in number of situations.

Different definitions of personality have been presented by various personality theorists depending on the theoretical perspectives. According to Ryckman (2004), the psychoanalytic defines personality from a biological perspective, while trait perspective is used by other theorists which assumes that there are no dispositional factors that are regular and persistent in individuals. In sum, personality traits are stable and psychological in nature that provides a reason of the person's behavior. They examine individual's behavioral, cognitive and affective style and reflect who he/she is.

Costa and McCrae (1992) worked in the field of personality and established the Big Five personality factors notable in contemporary literature, including extraversion, neuroticism, and openness to experience, agreeableness, and conscientiousness. Five-

factor personality traits structure (Goldberg, 1993) has been selected for this study because of the wide replication of the personality dispositions. This model helps in describing personality comprehensively along the broad dimensions of neuroticism, extraversion, agreeableness, openness to experience and conscientiousness. The meta-analysis done by numerous researchers provided the validity of personality traits including the significant work by Gurven, Reuden, Massenkoff, Kaplan and Lero Vie (2013). Basically, personality described how an individual typically thought, felt and related to others. Personality focused on the individual's attitudes, inclinations and preferences. In addition, consistency in personality trait or characteristics are also significant.

For the purpose of this study, The Five-Factor Model (Costa & McCrae, 1995; Goldberg, 1993) has been selected which will measure the neuroticism, extraversion, openness, agreeableness and conscientiousness traits of personality.

2.3.1 Five -Factor model of personality

Costa and McCrae (1992) developed the Big Five Factor Model consisted of Neuroticism; Extraversion, Openness to experience, Conscientiousness and Agreeableness personality domains. This Big Five Factor Model is taken as current dominant framework for studying personality as it is widely used as narrated by Ozer and Benet-Martinez (2006). According to Costa and McCrae (1992), through five broad domains, this model provided parsimonious yet reasonably comprehensive representation of personality.

2.3.2 Defining five factors

The definitions of the five factors were in accordance to Costa and McCrae (1992). Through describing the individual's outlook on the five factors, researchers would be able to provide detail justifications of an individual's characteristics focusing on his/her emotion, interpersonal, experience, attitude, and motivation styles.

According to Costa and McCrae (1992), Neuroticism (N) is the tendency to get emotionally upset easily as well as emotions like anger, anxiety and depression are likely to overcome other positive emotions. Neuroticism refers to impulse control and emotional stability and is referred by its low pole which is emotional stability. According to Toegel and Barsoux (2012), high need for stability forms a calm and stable personality whereas low need for stability manifests a reactive personality. People having high score on neuroticism experience negative emotions and get stressed easily (McCrae & Costa, 2003). In contrast, people with low score on neuroticism shows calm personality without getting upset in stressful situations (Costa & McCrae, 1992).

Secondly, Extraversion (E) is associated with assertiveness, positivity, sociability and energy. High extraversion score indicates a dominant and attention-seeking behavior. Low score on extraversion shows a reserved and isolated personality (Toegel & Barsoux, 2012). Extroverts are highly active, social and positive (McCrae & Costa, 2003).

Meanwhile, Openness to experience (O) personality reflects the extent of creativity, novelty and curiosity. It also describes the extent of person being independent and how he can give preference to different activities over a strict routine. McCrae and Costa

(2003) stated that unpredictability and lack of focus is connected with high openness. Conversely, closed-mindedness and stubbornness is associated with low openness.

Next, Agreeableness (A) is tendency to be empathetic than hostile towards others. It is the extent to which a person is well-tempered and has helpful nature. High agreeable persons are submissive and naive while low agreeable are competitive and untrustworthy (Toegel & Barsoux, 2012).

Lastly, Conscientiousness (C) is an affinity to be organized and reliable. High conscientiousness indicates stubborn and obsessive personality. Low conscientiousness shows spontaneous and flexible personality but can be perceived as unreliable (Toegel & Barsoux, 2012). Low moral standards are shown by low conscientiousness persons and they are also less goal-oriented (Costa & McCrae, 1992).

2.3.3 Previous studies on personality and stress of caregivers

When an individual's well-being is challenged, he or she may be stressed. Not all stress is bad; however, when it undermines mental and physical health, issues arise. Stress is a common and inevitable phenomenon of life from which a temporary as well as long term discomfort arises. Scientific information has confirmed that personality traits are vital factors in the identification of stress events and later approaching and responding those events (Dumitru & Cozman, 2012). Personality traits works as a trainer that prepares the individual to think and act similarly in response to variety of different situations and stimuli.

Studies have also shown that some personality traits can predict stress level. According to Atherton et al. (2014) personality influences how an individual perceives and reacts to his or her environment. Although human is creative and self-determining in responding to stressful events, researchers have found that stress coping traits are relatively stable in individuals going through stressful situations (Weston & Jackson, 2016). Folkman and Lazarus (1980) added people selected ways to cope with specific problems they were dealing and the contexts within the problems occurred according to their personality.

Many researchers like Strober (2016) revealed in their research that coping resources are directly affected by certain personality types. According to Marnie (2008), coping is a monitoring process that helps in reducing the adverse feelings arising from stressful events. Many studies (Barlett & Anderson, 2012; Connor-Smith & Flaschbart, 2007; van Berkel, 2009) have considered the relationship between personality and coping processes. It has been shown by some studies that personality traits like extraversion that are considered to be adaptive are positively linked to the active coping styles (Connor-Smith & Flaschbart, 2007) whereas maladaptive traits such as neuroticism are negatively related to the coping of stress (Barlett & Anderson, 2012).

The relationship of personality and coping suggest that maladaptive traits make an individual to experience more stress because they are unable to use adaptive coping strategies (van Berkel, 2009). However, not all studies have shown the consistent results while considering the relationship of personality traits with the stress. Some researchers found no significant relation between personality traits like conscientiousness, agreeableness and openness with coping of stress (David & Suls, 1999). A study by

Barlett et al. (2012) has showed no relationship between extraversion and stress coping such as finding social support and accepting responsibility.

Moreover, it has been observed in studies that individuals with extravert personality traits use active coping for reducing stress whereas neurotic individuals show passive coping strategies (Bakker, Van der Zee, Lewig, & Dollard, 2006; Vollrath & Torgersen, 2000). Costa et al. (1992) neurotic individuals find it difficult to use active coping strategies and this trait is linked more to the avoidant coping. Moreover, extraversion was shown to be positively associated with active coping such as problem-focused coping and seeking social support. Conscientiousness is also related to problem-focused coping such as planning and accepting responsibilities whereas agreeableness is positively linked to social support (Bakker et al., 2006) that seeks active coping and planning reappraisals and negatively related to avoidance, self-blame and wishful thinking. Additionally, previous research findings also showed that openness and positive reinterpretation and active coping are positively related.

Several other studies on neuroticism identified that higher scores of neuroticism is related to negative emotions in stressful situations (Duggan, Friedman, McDevitt, & Mednick, 2014). These characteristics turn into worst subjective mental and physical health. While in case of extraversion, high subjective well-being (Strober, 2016) and low level of depression provides the evidence of better mental health of highly extraverted individuals.

Number of studies showed linkage between self-rated health and extraversion (Gonzalez-Abraldes, Millan-Calenti, Lorenzo-Lopez, & Maseda, 2013) but association of extraversion with physical health is merely studied previously as compared to studies of

neuroticism. A study by Reynolds and Livingston (2012) suggests that individuals who score high on extraversion scales of Big Five personality measurements employ active coping strategies like problem solving and seeking social support. On contrary, highly neurotic personality traits are linked to a higher experience of stressful situations (Weston & Jackson, 2016).

In recent years, remaining three personality traits have gained increasing importance particularly conscientiousness. A meta-analysis by Bogg and Roberts (2004) indicated that individuals appear to be organized and self-disciplined who scores high on this trait. This in turn, is linked to better subjective health by promoting greater health behaviors. Confidence and sense of competence is also reported by highly conscientious people which may partially affect their mental health (Friedman, Kern, Hampson, & Duckworth, 2013).

Although mental flexibility enhances cognition and might help an individual to perform well in stressful situation, still there is a scarce research on the health implications of openness and agreeableness (King, Jackson, Morrow-Howell, & Oltmanns, 2014). Primarily, agreeableness is a willingness to cooperate with others; therefore, association of openness with physical health is small although it has been linked to better mental health by various studies (Ferguson, 2013).

In accordance with above mentioned study, Lench (2011) found a positive relationship between stress and personality. According to them, neuroticism renders as an important predicting variable because it positively correlated with stress. This is consistent with

other findings in that people with neurotic characteristics tend to be more anxious and fearful, which can lead to experiencing more stress (Weston et al., 2014).

Besides, Lockenhoff et al. (2011) reported positive association of conscientiousness and negative association of neuroticism with mental health. On the contrary, caregiver strain and self-efficacy were found to mediate the personality traits and subjective health of caregivers. However, personality might be directly or indirectly associated with physical and mental health as it may incline caregiver to interpret event as threatening or benign (Melo et al., 2011).

Thus, in relatively equivalent situations, some caregivers feel more stressed than others depending on the personality. Caregiving situation is differently affected by personality traits. For instance, the study conducted by Eloise, Tew, Naismith, Pereira and Simon (2013) indicated that caregiver stress and physical symptoms were associated with neuroticism, extraversion and conscientiousness of a caregiver which is in consistence with the study conducted in 2015 by Natasha O'Connor.

Moreover, the benefits or risks of health could be exacerbated by becoming a caregiver. For instance, neurotic individuals who show increased exposure to stressors may experience more harmful effects of caregiving as compared to everyday benign hassles (Melo et al., 2011). Likewise, conscientious person is able to cope well during varied demands of caregiving due to his high level of confidence and organization (Hampson, Edmonds, Goldberg, Dubanoski, & Hillier, 2015). On contrary, merits and demerits of personality traits might be minimized by so pervasive demands of caregiving. This shows

that subjective health of caregiver is not much affected by personality traits as compared to the health of general population.

Up till now, health implication of personality traits among caregivers has been found to be scarce empirically. Present literature on caregivers of cancer patients, older adults or children has considered only three of the personality traits that assessed all five-factor dimensions (Snyder & Christine, 2015). This is in contrast to hundreds of publications that examined other factors related to caregivers' health.

In summary, neuroticism has gained a large amount of attention in the limited literature of personality traits. Caregivers who score high on neuroticism tends to show negative emotions and depression throughout the stressful event (Eloise et al., 2013), lower perceptions of caregiving-related benefits, greater caregiver burden and distress (Gonzalez-Abraldes et al., 2013), more sensitivity to caregiving-related stressors, worse subjective mental health and fewer health promoting behaviors (Ferguson, 2013).

Additionally, studies on extraversion indicated that lower negative emotions are linked with the caregiver who is extravert (Sherman, Nave, & Funder, 2013). He is likely to be less sensitive to stressors related to caregiving and have better subjective health (Elios et al., 2013). Moreover, higher levels of agreeableness show a good coping behavior of the caregiver and a better relation with the care recipient whereas positive perceptions are found to be linked with openness for care-related growth and a better caregiving relationship (Lautenschlager, Kirz, Loi, & Cramer, 2013). However, only fewer studies have examined the correlation between openness and agreeableness with the physical and mental health of caregivers.

A summary of studies by Ferguson (2013) indicated that one's health is greatly affected by intensity of stressor rather than the duration of stressor. Therefore, person might get stressed due to enduring nature of personality traits that eventually affect the wellness level of an individual (Finch et al., 2012).

Hence, to understand the variation of personality factors that made individuals more resilient and resourceful, or more vulnerable to stress, it is pertinent to learn about human from a socially-embedded perspective through understanding the individual personality in individual, familial, and cultural contexts.

2.3.4 Concluding remarks on personality and stress

Overall, the reported association of personality of caregiver and health outcomes appears to be consistent with the findings from the general population. Higher level of conscientiousness and extraversion is linked to better subjective and objective health, greater neuroticism is connected to worse health outcomes and agreeableness and openness are associated weakly. Yet, there are many inconsistencies in the present literature.

Furthermore, different outcomes have been investigated by associating personality and health. Some of the measures are different in theoretical conceptualization of variables under investigation and some relied on single-item health ratings. Moreover, studies varied in considering the relevant covariates comprising of demographic profile of caregivers and level of impairment of care receivers. For example, an association of personality and subjective health have been found to be affected by chronological age in non-caregiver population (Finch et al., 2012), but similar relation in caregiving population

needs to be explored. Besides the methodological concerns, some other questions are unanswered. Perhaps the most imperative concern is the principal mechanism through which personality of a caregivers translates into stress outcomes.

2.4 Social Support as mediating variable in aspects of caregiving, personality and stress of caregivers

Regardless of the number of studies on the association of health and social support, the concept of social support has operationalization and definition problems. Social network is the most commonly used term for the social support whereas social integration, social networks and social ties are vaguely used (Hill, Weston, & Jackson, 2014). Nonetheless, social support by most indicators is said to be composed of function and structure that are distinct in aspects and phenomenon and must be examined.

According to Holt-Lunstad, Smith and Layton (2010), the social support is structurally a tie among people and different aspects are considered to describe it like the number of social relationships, frequency of contacts with various members in social network, density and reciprocity and multiplicity of relationships among network members (Kerenhappachu & Sridevi, 2014). Formal and informal relationships makes the structure of social relations.

On other hand, social support is valuable functionally, as it comprises of both tangible and intangible forms of support from family and friends. Further studies on social support and its types mentioned one or more forms of social support like emotional and tangible support (Compas, Jaser, Dunn, & Rodriguez, 2012). Emotional support is the support

from others in form of behavior that give caregiver a sense of comfort and ease while tangible support is the instrumental behavior that promote the responsibilities of caregiving (Wang, 2014).

In 1988, House, Umberson and Landis defined social support as the functional aspects of social relationships that potentially and positively reduce stress by showing concern about the caregiver as well as emotional caring or instrumental assistance and information that others can offer. In order to understand social support that is available and positively received, it is necessary to examine the content of social relations of caregivers because similar kind of support is not provided by all relationships.

Since 1970s and 1980s, the association of social support and health were first investigated; the knowledge of complexity of social support and literature relating health to social support has gained shape. Social support has been mentioned as a multidimensional construct by some researchers by describing different forms of social support that can affect individual's physical and mental health (Rafiyah et al., 2011).

Hence, social support can be defined as verbal or non-verbal communication that takes place between the support provider and the support recipient. Social support reduces the uncertainty of situation and enhances the perception of person on life control. Various aspects of social support forms a linkage in order to help people in difficult situations and improve the physical and mental well-being of an individual (Thoits, 2011).

However, social support is a multidimensional concept and empirical work has shown that not all dimensions have equal importance for health outcomes. For example, structural support like social network size, have been found to be less important than

functional support, such as quality or types of available support (Maulik et al., 2011). In addition, actual support received has less effect on mental health than the perception of adequate available support (Kong & You, 2013).

Globally, a number of studies have indicated social support as a protector in the well-being of caregivers of children. Social support measures the extent of support available from family and friends in the time of crisis (Kong, Zhao, & You, 2013). Repeatedly, the association of mental health and social support of caregivers has been mentioned. Caregiving related stressors have been found to deleteriously affect caregiver mental and physical health (Palos et al., 2011) while social support through different pathways is hypothesized to positively impact health outcomes, such as promoting self-esteem and positive health behaviors, alleviating stress effects and providing access to the coping resources (Wang, Cai, Qian, & Peng, 2014).

In addition, earlier studies have indicated inconsistent findings between caregiving experience and social support. Empirical evidence suggested that social support lessens the costs of caregiving and ameliorates caregiving burden/stress (Pearlin et al., 1990; Weston et al., 2016). On the other hand, other studies found that social support is not positively associated with caregiving experience and some personal relationships are not supportive at all (Pettit, Roberts, Lewinsohn, Seeley, & Yaroslavsky, 2011).

One of the reasons for this difference may be the fact that different studies measure different aspects of social support. Garipey et al. (2016) argued that extent of available support and satisfaction from the support should be examined separately. For instance, adequacy with social support has been suggested to be strongest predictors of health of

caregivers by most researches as compared to the amount of available support. However, research on caregiving stress associated with social support found that the types of social support correlated with different relationships to caregiving stress (Maulik et al., 2011).

Additionally, Reeta Arffman (2012) stated that affection from the social relation strengthens the sense of belongingness in an individual. Child well-being is also reported to be connected with the social support of the caregiver as better parenting and child health has been linked to the health of caregiver (Kong & You, 2013).

It has been found that human behavior is influenced by variety of social support and the social roles of individuals (Driscoll et al., 2010). Much of the research is engrossed on the advantageous effect of social support on the individual who experience stress. The relation between social support and stress has been stated by two theoretical hypotheses (Cohen & Wills, 1985). The direct effect hypothesis states the advantageous effect of social support on individual regardless of intensity of stress whereas stress-buffer hypothesis states that social support plays a protective role in stressful situations to prevent any harm from stress (Uchino, 2004).

For this study, in order to investigate the mediating effect of social support on act of caregiving, personality and stress, stress-buffering model by Uchino (2004) is considered and mentioned below.

2.4.1 Model of social support

In 1985, two major models explaining the protective role of social support was identified by Cohen and Wills. Principle effect model is the first which indicates that social support provides a general positive context to an individual without considering the stressful events. The second which is largely studied with the coping strategies is the stress-buffering effect of social support. This model suggests that sufficient social support can moderate or offset the effect of stress on health.

Later in 2004, Uchino presented the stress-buffering model that is taken into consideration for this study. According to buffering-model, the effects of stress on well-being can be protected or buffered by the social support. It is hypothesized that presence of social support can produce less distress during stressful event as compared to the absence of social support. Caregivers are helped by the social support in redefining stress and supplying coping strategies or resources that reduces the severity of the stress (Smith, Hill, Kocanovik, 2015).

According to stress-buffering hypothesis, the social support is suggested to protect health in general as well as in stressful circumstances (Driscoll et al., 2010). Stress-buffering is observed when there is a strong link between stressor and mental health in individuals with low social support.

2.4.2 Previous studies on social support as mediating variable

Social support is considered as a resource of good mental health for adults and caregivers of children (Reich, Lounsbury, Zaid-Muhammad, & Rapkin, 2010). The feeling of being

connected with others enhances an ability to cope better in stressful situations and individual experience less anxiety and depression. Moreover, lower incidence of disease and faster recovery has been associated with the social connections (Compas et al., 2012). Conversely, low self-esteem and psychological distress are reported to be associated with less social connections (Smith et al., 2015).

For better parental functioning, the interaction of stress and support has received much attention (Kong & You, 2013). In numerous studies, social support has been positively linked with better caregiver mental health and better quality of parenting and parent–child interaction (Casale & Wild, 2012). In turn, good mental health and effective parenting results in better child developmental outcomes (Reich et al., 2010). A few studies in the same analysis by using path modeling have linked caregiver, his/her social support and child outcomes. For example, high level of social support to the parents cause less distress, more self-efficacy and better parenting which ultimately helps a child to better adjust psychosocially (Maulik et al., 2011).

Rosell-Murphy et al. (2014) in collaboration with the ICIAS study protocol found that by increasing the primary caregiver’s social support, the quality of life increases and caregiver burden decreases. Kohlsdorf et al. (2012) in a meta-analysis of studies from 1996-2009 found the significant relationship between social support and mental health of caregivers in various studies while only few showed no relation between caregiver’s mental health and social support.

Kim and Knight (2008) indicated that caregivers who have lower instrumental support have higher cortisol level that indicates a greater psychological stress. Moreover, results

of analysis of Casale et al. (2013) suggest social support as a constructive resource of mental health by showing direct association between anxiety and social support.

Although coping is not directly affected by social support, still it is seen to be linked with the effects of caregiver strain and coping with strain (Kuo, Fitzgerald, Operario, & Casale, 2012). Regardless of the mediating or moderating role of social support, there are some benefits especially for caregivers. Caregiver stress have been found to be alleviated by social support which in turn, provide more coping strategies to deal with behavioral and emotional problems of child (Strom & Egede, 2013). Munsell, Kilmer, Cook and Reeve (2012) showed a significant relation between caregiver's social connections and stress with the well-being.

Garipey, Honkaniemi and Quesnel-Vallee (2016) found that satisfaction with social support of caregivers providing care to the psychiatric patients buffers the effects of stress. The study on influence of social support on self-esteem and psychological outcomes indicated the mediating effect of social support on indicators of well-being (Djundeva, Mills, Wittek, Steverink, 2015). The studies in USA and Taiwan showed inconsistency in buffering effect of social support on stress of caregivers. A study in Taiwan by Huang, Xia, Sun, Zhang and Wu (2009), discovered less depressive symptoms in caregivers with high emotional support.

Previously, Strom and Egede (2012) mentioned that social support may act as a mediator between caregiving demands and depression of a caregiver of cancer patients. Moreover, Pi-Ming Yeh, Mary and Su-Chuan Yuan (2009) examined how support from family influences the health of family caregivers in a Taiwanese hospital. A sample of 91 family

caregivers of hospitalized cancer patients showed a negative correlation between caregiver's health and family support.

Moreover, Casale and Wild (2012) in a systematic literature of 20 database groups conducted between May and June 2011 found that four of the 15 studies reviewed did not provide any significant association between the social support and the outcomes of health while ten studies reported direct associations between social support and mental health and three reported indirect association. One of these studies also found that less psychiatric disorder occurs in presence of increased social support.

Further, Navneet kaur (2014) also reported a significant relation between high caregiving stress and low social support. Whereas, Smojver-Azic and Bezinovic (2011) found higher level of social support is reported by females as compared to the males which agree with another research of Sonnenberg, Deeg, Van Tilburg, Vink, Stek and Beekman (2013) and Pfeifer, Silva, Lopes, Matsukura, Santos and Pinto (2014).

In addition, over 2009-2010, a household survey that is cross-sectional in nature was conducted to find stress-buffering effect of social support by Casale, Cluver, Crankshaw, Kuo, Lachman and Wild (2015) with 2,477 South African adolescents of age 10–17 years and their adult caregivers. The results showed that three studies provided evidence of stress buffering of specific stressors.

Findings of a further two studies suggest a stress-buffering effect of social support on mental health. Lakey and Orehek (2011) found that person reporting low social support showed a negative status of health, therefore increasing psychological distress whereas no connection was stated between distress and mental health of the individuals with higher

level of support. Additionally, no significant correlation was established between distress and size of social network, indicating that quality is more important than quantity of support in moderating psychological distress reactions (Park, Jang, Lee, Ko, & Chiriboga, 2014).

Wang et al. (2014) narrated that parent's stress gets crucial over the time due to lack of information regarding disease, physical condition of child, treatment procedures and side effects. Social support from family members, colleagues, friends and neighborhood is imperative. Generally, social support is available highly at the time of disclosure of disease and decline over the treatment phase where mothers are in more need of support than fathers (Sonnenberg et al., 2013).

In Western and Eastern families, the prevalence of similar experiences with pediatric cancer is highlighted by various authors. Both groups showed similar changes and responses to domestic and professional routine in company with somatic symptoms (Lima, Cardoso, & Silva, 2016). Regardless of the culture, the initial stages of treatment of cancer require more parental involvement, adaptation to requirements of treatment and social support (Rosell-Murphy et al., 2014).

Hence, the direct and the buffering-effects of social support vary in the structure and function of social support in the caregiving literature which shows its multi-dimensional nature. But for this study, stress buffering-effect of social support is under consideration.

2.4.3 Concluding remarks on social support as mediating variable

Social support is a context-specific and complex construct and individuals need support based on their personality, situation, culture and expectations. Findings from previous studies are not found to be consistent as few elements of social support are not linked with positive outcomes of health but yet it is positively or negatively associated with physical and mental health of an individual. Furthermore, the quality of social connections is more important than simply having someone to rely on during hard days.

Findings of studies reviewed reinforce the significance of strengthening social support as an essential element of interventions of caregiver's mental health as well as the need for further investigation of relation of social support of caregivers and their health is also highlighted.

2.5 Underpinning theories of proposed framework

Number of psychological theories addresses the effects of caregiving, social support, personality and stress on each other in order to promote the well-being of the caregivers. The main theories that can be related to the stress of caregivers, personality and social support of caregivers are Stress Process Theory by Pearlin (1990), Five Factor Theory by McCrae and Costa (1987) and Uchino's social support theory (2004) respectively.

All of these theories are beneficial for the understanding of the ontological, ethical and philosophical paradigm of this research but Pearlin's Stress Process Theory is the underpinning theoretical structure of this study. This theory explains a comprehensive interaction between the caregivers, their primary and secondary stressors, effects of caregiving and all the coping mechanism that can be done through any

moderating/mediating variable like social support. However, Five Factor Theory describes how caregiver personality translates the stress related to care provision differently on basis of their different personality traits. Additionally, Uchino's theory of social support describes the mediating effect of social support on the stress and caregivers and their personality.

2.5.1 Pearlin's Stress Process Theory

The basic premise of the Stress Process Theory as it applies to caregiving is that certain life events (i.e., primary stressors) create conditions of chronic strain that lead to a proliferation of secondary stressors (Pearlin et al., 1990). Within the caregiving model the intersection of the various roles of the caregiver results in secondary stressors such as role strains and intrapsychic strains. The intrapsychic strains arise from the primary stressor's action upon the self-concept of an individual and can be exemplified by the amount of confidence in one's ability to provide competent care.

Primary stressors

In 1988, Pearlin et al. began a longitudinal survey of 555 principal caregivers to elderly relatives afflicted with Alzheimer's disease. They collected data via qualitative interviews conducted at 1-year intervals over 3-years. The researchers used factor analyses on the data collected to identify and create measures of the various stressors involved with intensive caregiving. They defined primary stressors as the events and experiences derived directly from the care recipient's illness. The primary stressors were further broken down into objective and subjective measures. Objective measures generally included the care recipient's cognitive status, ability to accomplish ADLs and IADLs, as

well as any extent behavioral problems. Subjective measures included the perceived impact of the primary stressors upon the caregiver.

Secondary stressors

Secondary stressors arise from the severity of the primary stressors. These stressors are not secondary in terms of their significance on the stress outcomes. They are as powerful in their own right as the primary stressors. The secondary stressors are the beginning of the stress proliferation process (Pearlin et al., 1990). Secondary stressors contain the caregiver's role strains as well as intrapsychic strains.

The outcome measure of Pearlin's stress process model (Pearlin, et al., 1990) is well-being. Although Pearlin et al. contend elevated levels of subjective intrapsychic strains may be the precipitating decisive factors leading to the more global symptoms of depression and caregiver burden, these strains can be moderated by the presence of social supports and good coping skills evidenced by the measure of mastery.

Mediators

Pearlin et al. (1990) found that the psychosocial resources of social supports and levels of mastery did not mediate or moderate the impact of stressors related to caregiving. More specifically, they found that the instrumental aspects of social supports such as formal support and informal support were not buffers against the impact of other care-related primary or secondary stressors.

Pearlin et al. (1990) also found that psychosocial resources exerted independent effects on stress outcomes. The researchers proposed that this unexpected result was due to the caregiver's perception that the situation was or had become so demanding that additional

help was necessary to sustain a level of adequate care, thus adding to the perceived burden of the role.

The final aspects of Stress Process Theory are the outcome measures or the individual's well-being. Psychosocial resources and mastery or self-efficacy do have an effect on the outcome measure that is stress. Pearlin et al. (1990) found that caregivers who receive an increasing amount of assistance from friends and family have declining levels of stress over time. They also found that these resources like psychosocial support do not eliminate the stress proliferation process but they can ameliorate the effects over time

2.5.2 Five Factor Trait theory

The blocks with who we are build and the force that helps us do what we want to do is difficult to understand. Perhaps, this is the reason that study of personality is considered as an interesting sub-discipline in the field of psychology in comparison to others disciplines. Number of people has tried to attain the knowledge of reason of individual's behavior both scientifically or informally but trait theory is one of the most common and well known answers to this query.

Over the 50 years, the evidence of trait theory has been emerging that began with the work of Fiske (1949) and later expanded by other researchers like Norman (1967), Goldberg (1981), and McCrae & Costa (1987). According to Ferguson (2013), personality traits are the distinguishing factors or qualities of a person that helps them think or act in similar way in response to variety of different situations. Whereas, trait theory is an approach to study human personality by identifying and measuring the extent to which certain personality traits are recurring through thoughts and behavior, for instance, shyness,

anxiousness, openness and many other vary person to person. Number of personality traits are considered in this approach which are measured by the degree of their recurrence that later determines the personality of an individual.

For several years, plenty of other approaches of trait theory exist that includes Gordon Allports's (1937) list of 4,000 personality traits, Raymond Cattell's (1950) sixteen-personality factors and Hans Eysenck's (1991) three-factor theory. Allport (1937) states that traits are the tendencies to determine predispositions that an individual have to respond. These traits are general and lasting responses through which broad consistencies in behavior are produced. It was believed by Allport (1937) that personality structure or pattern of disposition of an individual is determined by the particular trait structure that is unique within that individual. Moreover, trait as defined by Cattel (1950) is the basic unit as a "mental structure" of personality that is inferred by behavior as a fundamental construct that accounts for consistency of behavior. Later, Eysenck (1991) stated that main traits of personality forms independent dimensions of personality. One is changeable-unchangeable dimension called as extraversion-introversion dimension. The second reflects an emotional-non emotional or instability-stability dimension called as neuroticism-normal dimension.

However, various researchers indicated Cattell's theory as complex and Eysenck's theory as limited in scope. Whereas, other schools of personality theory like psychoanalytic theories that focus on interaction and conflict of components of personality or theories that categories people into personality buckets are in contrast with the trait theory.

Consequently, the five-factor theory was developed that describes the main traits forming a personality. Currently psychologists have settled on some of the basic traits of personality like introversion versus extroversion and are agreed on the five core traits of personality.

The "Big Five" personality traits are broadly categorized that includes; Extraversion that consists of characteristics like sociability, excitability, assertiveness and emotional expression. Secondly, Agreeableness that includes traits such as dependence, compassion and other prosocial behaviors. Thirdly, Conscientiousness includes thoughtfulness and goal-directed behaviors. Fourthly, Neuroticism is a trait of emotional instability, anxiety and sadness. Lastly, Openness is a trait of high insight and imagination.

It is vital to be aware that there are two extremes between each of the five personality factors. For instance, extraversion indicates the range between extreme introversion and extreme extraversion. Normally, people lie in between these two extreme poles.

The universality of Big Five traits is also accepted by McCrae and his colleagues. A study on 50 culturally varied people has also mentioned that these five traits can be used to accurately describe the individual's personality.

David Buss (1995) has projected an evolutionary explanation for these five core personality traits, and suggested that most important qualities which help in shaping our social landscape are comprised of these five personality traits.

2.5.3 Uchino's Social support theory

Uchino gave the concept of social support as “the functions that are provided by social relationships” (Uchino, 2004). This social support by the relationships have been associated with the health outcomes by various theories of social support but the model developed in each theory describes a different process. Social support theories are divided into two main theories: direct effect theories and stress-related theories.

Direct effect theories focuses on the advantages of social support by taking into account social control, social identity, or loneliness models (Uchino, 2004). Social identity model narrates that individual's involvement in social networks positively affects the health by increasing self-esteem and meaning of life. Moreover, social control model also affects health positively by pressurizing the individual to act healthy while in social network that can enhance an obligation to life. On contrary, loneliness model mentions that loneliness leads to low self-esteem and obligation to life leading to poor health outcomes (Uchino, 2004). Consequently, overall health is affected by these negative health behaviors.

Stress-related theories have gained most attention in the previous researches. The focus of these theories is the role of social support in stress-related processes. The buffering model of social support states that social support is important for a healthy behavior as it buffers the negative effects of stress on health (Cohen, 2004). This model mentions that health is affected by different stressors through appraisal process which can be adjusted by social support (Uchino, 2004). Therefore, according to buffering model, the intensity of extremely stressful events can be reduced by the social support that facilitates the coping strategies over the course of time (Uchino). Conversely, stress-prevention model

suggests social support as healthy because it prevents people from being exposed to the stressful life events (Uchino).

2.6 Concluding remarks

Caregiving of a child suffering from chronic illness like cancer has been a stressful process for the caregivers including parents. In order to cope with the stressors related to caregiving, a caregiver should be fully aware of the environment causing stress and be intact with his/her personality trait to ensure better physical and mental health.

The theoretical framework for this study is developed from taking into account Pearlin's Stress Process Theory (1990), Five Factor theory by McCrae and Costa (1987) and Uchino's theory of social support (2004). These theories are selected because they link and develop central constructs of this study. This study intends to explore the standard information on caregivers of children with cancer keeping in view the personality and the social support of the caregivers.

A personality show behavior across several dimensions as it is complex and variable. These behaviors are due to an interaction of individual's personality and the situation-oriented variables. The reaction of the person is dependent on the situations but mostly, the reactions of the individuals are completely according to the personality traits. Therefore, in this study, the specific personality traits are kept in view so that the coping mechanism of the caregiver could be enhanced as well as the amount of social support and its moderating effects are beneficial in order to increase the physical and mental health of the caregiver that can ultimately help in the good care of the care recipient.

Although voluminous researches are present on stress, social support, personality and pediatric chronic illness but the manifestation and relation of these concepts to caregiver stress still needs to be studied further. Nevertheless, personality and social support are suggested to be related to caregiver well-being and mental health along with other factors in ensuring the better mental health of the caregiver.

2.7 Summary

In this chapter, previous studies related to stress of caregivers, personality and social support has been mentioned. The important theories relevant to the conceptual and theoretical framework are also mentioned like Stress Process Theory (SPT) of Pearlin that defines the stress and stressors related to caregiving of chronically ill patients. This stress process model mentions the way stressors affect the physical and psychological well-being of caregivers and it helps in clarifying questions from the literature.

The methodology to investigate the impact of caregiving, personality and social support on stress is discussed in Chapter Three.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the overview of the methodology that is used to gain logical sequence of the process of research. This comprises of research design, target population, sampling technique, sample size and methods of data analysis including basic data screening, descriptive analysis and inferential statistical techniques. The present study also introduced mediating variable, therefore, Structural Equation Modeling (SEM) was used for the analysis of mediation through Partial Least Square (PLS) which is a variance based method. Moreover, results of the pilot study are also mentioned.

3.2 Purpose of research

According to Chin (2010) the accomplishment of the objectives by conducting the research and how these obtained results are later used is referred as the purpose of study. Three primary purposes of research are identified by various researchers, named as descriptive, exploratory and hypothesis testing (Sekaran & Bougie, 2010). Exploratory research is conducted when the problem of the study has not been clearly and significantly defined. This approach helps in describing the situation, seeking new insights, asking key questions and using new perspectives for dealing with a set of phenomena. Qualitative methods are always used by this approach. Meanwhile, narrative description, classification and measured relationships are used for the accurate explanation of the phenomenon through the descriptive research. In other words, according to Sekaran and

Bougie, (2010) descriptive research represents an accurate profile of events, organizations, or situations. Finally, by hypothesis testing, according to Sekaran and Bougie (2010), researchers reveal the causal relationships among variables.

Based on the above explanation, the present research study mainly focused on testing the developed hypotheses that are based on the research questions and objectives mentioned in Chapter One. Specifically, the present study intends to explain the mediating effect of social support on relation between aspects of caregiving, dimensions of personality and stress of caregivers of cancer patients.

3.3 Research Design

A research design is termed as a strategic plan that includes specific methods and procedures for the collection and analysis of required data on the study population for obtaining the solution of problem statement (Sekaran & Bougie, 2010; Zikmund, Babin & Griffin, 2010). The selection of the research design depends on the availability of the existing variables or constructs. If the variable has been widely used in different contexts then the validity and reliability of the measurement is confirmed as tested previously by other researchers. Since the development of new measure was not required for this study, the qualitative method could not be justified. Weighing the line of reasoning, the quantitative survey method was considered more suitable for this research.

Quantitative data is a measurement where numbers represent the phenomenon that is being studied (Hair, Black, Babin, & Anderson, 2010). A survey research design was adopted for this study. This survey method is adopted when the thoughts, feelings, and opinions about a given situation are to be assessed by collecting primary data from the

respondents (Fisher, 2010). In the survey method, the researcher is allowed to gather quantitative data and analyze it using descriptive and inferential statistics. Following this, the relationship between variables and the reason of the relation can be suggested that later produces the models of the relationship among variables (Saunders, Lewis, & Thornhill, 2009).

The survey research as suggested by Zikmund, Babin, Carr and Griffin (2013) is cheap, quick and helps in accurate assessment of a given population. Moreover, the collection of data from a large sample through questionnaires in survey research is easy and inexpensive compared to the interviews, observations and secondary data. During interview, the answers of respondents may be influenced by the characteristics or nature of the interviewer as compared to the questionnaires. Additionally, observations gained through the interview may not provide a better understanding of certain behaviors as people behave differently when they become aware that they are being observed (Zikmund et al., 2013).

Therefore, a survey method is found to be more appropriate for the present study that uses questionnaire as the instrument for data collection. This is because the study involved collection of data from the caregivers of cancer patients in order to investigate the mediating effect of social support on the relationship between aspects of caregiving, dimensions of personality and stress of the caregivers of the cancer patients. In addition, this study also examined the direct relationship between aspects of caregiving and stress of caregivers as well as between different types of personality and stress of caregivers. In other words, this study gathered quantitative data in order to describe the characteristics of the caregivers and summarize the information and testing of the stated hypotheses.

Moreover, the data was collected at one time only therefore, this study is cross-sectional in nature.

3.3.1 Unit of Analysis

According to Sekaran and Bougie (2010), and Zikmund et al. (2010), unit of analysis must be explained by researchers in order to find a solution to the problem statement. The unit of analysis can be explained as the aggregation level of the data that is to be collected during the phase of data analysis (Sekaran & Bougie, 2010). The unit of analysis may be at the individual, group or organizational level. This study, in an effort to understand how caregiving and personality effect stress of caregivers of cancer patients taking social support as mediating variable, indicates that the data has to be collected from the caregivers of cancer patients. Therefore, unit of analysis of this study was caregivers of cancer patients.

3.4. Population and Research Location

Population is defined by Cooper and Schindler (2008) as a set of people, events or records that possess the desired information that can answer questions of measurement. The population for the present study which examines the influence of caregiving aspects and dimensions of personality on stress level of caregivers of cancer patients having social support as a mediating variable was the caregivers of cancer patients in Pakistan. The caregivers of all cancer types were taken into consideration as this study purports to measure the stress of all caregivers of cancer patients and not of any particular cancer type. There are about twenty three cancer care hospitals in Pakistan located in different

cities but for this study, eight cancer hospitals were selected as indicated in table 3.1.

Table 3.1

Major Cancer Care Hospitals under consideration of this study

Hospitals	Population (Pediatric Ward)
Lahore	
Inmol Hospital	45
CENUM (Centre for Nuclear Medicine)	50
SKMCH (Shaukat Khanum Memorial Cancer Hospital)	120
Islamabad	
NORI (Nuclear Medicine, Oncology and Radiotherapy Institute)	80
Multan	
MINAR (Multan Institute of Cancer Medicine and Radiotherapy) Cancer Hospital	50
Gujranwala	
GINUM (Gujranwala Institute of Nuclear Medicine and radiotherapy)	60
Faisalabad	
PINUM (Punjab Institute of Nuclear Medicine) Cancer Hospital	50
Bahawalpur	
BINO (Bahawalpur Institute of Nuclear medicine and Oncology)	50

Source: Awareness about Cancer in Pakistan, 2013

For this research, appropriate locations were selected based on the highest number of cancer patients. In accordance with the approach of selecting appropriate location for the survey depending on the population of respondents, the main eight cancer care hospitals were selected that are located in different cities of Punjab as it is the biggest province of Pakistan. The cities of Punjab having cancer hospitals are Lahore, Islamabad, Multan, Gujranwala, Faisalabad and Bahawalpur.

These selected locations are highly challenging in terms of the large number of cancer patients because of the rural areas in the premises from which patients and their families move to these locations for cancer treatment facing intense stress that might be financial, emotional or social.

A fundamental requirement for cancer control programs is population based cancer data but in Pakistan still there is no National Cancer Registry, though some registries like Karachi Cancer Registry (KCR) and Punjab Cancer Registries are working in isolation. In 2005, the setup was made for the Punjab Cancer Registry in order to determine the statistics of cancer on population level in the region (Badar, 2013). In Punjab, the perspective of formation of this registry was to measure the cancer burden through a sample population.

In Pakistan, cancer registry staff has conducted a number of studies by the data available for Karachi (Bhurgri, Bhurgri, Hassan, Zaidi, Rahim, & Sankaranarayanan, 2000), Quetta (Bhurgri, Pervez, Usman, Khan, Bhurgri, & Kasi, 2002), Punjab (Aziz, Sana, Akram & Saeed, 2004) and Hyderabad (Bhurgri et al., 2005). However, at national level the percentage of occurrence of cancer is not accurately estimated despite it being among the leading causes of mortality. Additionally, statistics of survival rate and exact number of cancer patients getting admitted in hospitals is also not available (Bhurgri et al., 2006).

3.4.1 Sample Size

Sample size is the subset of a population required to ensure significant results (Sekaran & Bougie, 2010). Number of units required to obtain accurate findings is referred as sample size (Fink, 2002). Sampling is usually preferred instead of data collection from every element of the population because of the former's practicality (Zikmund et al., 2010). The selection of a sample results is a more successful outcome because of the reduction in fatigue and in potential errors from the data collected, especially when a large number of elements are involved (Sekaran & Bougie, 2010).

Fink (2002) state that determining the correct sample size is crucial for generalization purposes. According to Zikmund et al. (2010) as sample size increases, the likelihood of the error generally decreases. Pallant (2010) also mentioned that although the consensus among scholars about the sample size is limited, a larger sample is proven to represent the population better. Therefore, relatively huge samples are always inclined since it yields statistically significant results. Based on the rule of thumb, an effective sample size is considered to be in between 30 and 500 depending on the sampling design and the research questions to be investigated.

According to Curran–Everett, Taylor and Kafadar (1998), a sample size that is several times larger (ten times) than the number of variables in multivariate studies is often required which is later confirmed by Gujrati (2010) that number of observations must be greater than number of variables in the model.

Tanaka (1993) signaled that sample more than 400 would influence the analysis in structural equation modeling to become sensitive in case any variance is detected leading to the poor fit of goodness of fit measure. Thus, the best sample size as recommended by Tanka (1993) would be between 100 to 400 samples. Whereas, Hair et al. (2010) recommends 500 samples as the appropriate minimum size sample. This statement affirms the one of Chou and Bentler (1995) who states that large sample size in confirmatory factor analysis and structural equation modeling is directly proportional to the accurate results of the parameters. However, Chou and Bentler (1995) reiterate that there should be at least 200 respondents to ensure accuracy in estimating the parameters.

Considering the highlighted views on appropriate sample size, the calculation of proper sample size from totaled population size of cancer patients was established through sample size calculation website. As mentioned in the previous section, there is no accurate number of cancer registries in Punjab province but a registry report released in 2016 mentioned that almost 8,637 new cancer cases has been diagnosed in a focus area where 864 cases are of children less than or equal to 18 years of age (Punjab Cancer Registry, 2016). Therefore, Table 3.2 shows the formula used for calculation of sample size from the given population.

Table 3.2

Formula for calculation of sample size

Sample size,	$n = [Deff * Np (1-p)] / [d^2 / Z^2 1-\alpha/2 * (N-1) + p * (1-p)]$
Where	d = desired absolute precision or absolute level of precision
	n = sample size
	deff = design effect
	N = population size
	\hat{p} = the estimated proportion
	$\hat{q} = 1 - \hat{p}$

The results obtained from the calculation of the sample size are mentioned below in table

3.3

Table 3.3

Results of calculation of sample size

Population size(for finite population correction factor or fpc)(N):	864
Hypothesized % frequency of outcome factor in the population (p):	50%+/-5
Confidence limits as % of 100(absolute +/- %)(d):	5%
Design effect (for cluster surveys-DEFF):	1
Sample Size (n) for Various Confidence Levels	
Confidence Level (%)	Sample Size
95%	267
80%	139
90%	207
97%	306
99%	376
99.9%	481
99.99%	551

Source: <http://www.calculator.net/sample-size-calculator.html>

In the calculation of sample size, the four values are, i) population size – 864; ii) anticipated % frequency (p) – 50% of the population with the outcome of interest; iii) confidence limits as +/- percent of 100– 5% of confidence interval and lastly iv) design effect – when simple random sampling is done for the selection of individuals then the design effect (DEFF) is left as one. Figure 3.3 shows the sample sizes for various confidence levels from 95% to 99.99%. Mostly the 95% confidence level is used; therefore, the sample size is 267.

The sample size is in line with Krejcie and Morgan (1970) and Cohen (1969) where they have recommended that sampling size for the population size is approximately at 267. Therefore, sample size somewhat satisfied the proposed minimum size by Krejcie and Morgan (1970), Cohen (1969) and Tanaka (1993).

3.4.2 Sampling Technique

According to Kumar (2011), a sampling technique can be defined as a method or procedure of selecting a sample from the target population. Simple random with cluster sampling is appropriate especially when the research design covers several geographical clusters (Sekaran et al., 2010). The objective of the cluster sampling is to obtain the cluster economically while preserving the distinctiveness of a probability sample. Cluster sampling technique has advantages in terms of simplicity and cost (Saunders et al., 2009). Therefore, this study employed cluster sampling technique to divide the twenty three cancer hospitals located in different geographical regions of the country. Another reason behind using this sampling technique was that the sample was to be identified in two stages. The first stage was selecting eight cancer hospitals in Punjab from twenty three

hospitals in Pakistan as Punjab is the largest province of the country. Secondly, keeping the age group in mind; the children and adolescent cancer patients were identified by random sampling and their caregivers were contacted. (The sampling table is illustrated in Chapter Four).

3.5. Research instruments

After the selection of sample, the questionnaires were distributed to the respondents. To ensure the best results, the importance of a good instrument is acknowledged that can minimize Type I and Type II error. Few of the most appropriate and suitable instruments were selected for the measurement of four constructs of this study after an extensive literature review.

The questionnaire consisted of six sections namely demographics, physical caregiving, emotional caregiving, personality, social support and stress instruments. Respondents were asked about their demographic characteristics such as gender, age, marital status, education level, and occupation, relation of caregiver and care receiver and duration of illness of caregivers. Answer to these questions were measured on a categorical scale. The instruments used to measure all the variables of this study are listed in table 3.4

Table 3.4

Variables and Instruments selected

Variable	Measurement Scale
Caregiving	Caregiving Tasks (Wallhagen, 1992) and Berlin Social Support Scale (Schwarzer & Schulz, 2013)
Personality	Big Five Inventory (BFI) (Goldberg, 1993)
Social Support	Medical Outcomes Study: Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1992)
Stress	Modified Caregiver Strain Index (Thornton and Travis, 2003)

The detail of the above mentioned scales selected for the measurement of the variables of the current study is as follows.

3.5.1 Caregiving

Caregiving is an act of providing unpaid facilitation to the person who is facing any physical, psychological or developmental problems and need some other person to take care of him by providing physical or emotional assistance. For the assessment of caregiving experience, different screening tools were used but for this study, Caregiving Tasks Questionnaire by Wallhagen (1992) was used for assessment of Physical caregiving and Berlin Social Support Scale by Schwarzer and Schulz (2013) was used for assessment of emotional caregiving.

The physical caregiving tasks scale have questions related to different dimensions of caregiving such as physical including Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs). There are 15 items of the caregiving tasks questionnaire. The scale for this instrument ranged from “1” as never to “5” as every day. There is no negative question and maximum score is 75 while minimum is 15. To obtain the level of physical caregiving, difference of maximum and minimum scores was obtained which was further divided by three to categorize the level of caregiving into low, moderate and high. Given that, the difference of 75 and 15 was 60 which is divided by 3 providing low (15-35), moderate (35-55) and high (55-75) levels of physical caregiving. Low scores indicates low level of caregiving whereas high score indicates the extensive involvement in caregiving. The reported reliability of this scale is .86 (Wallhagen, 1992)

The Berlin Social Support Scale (BSSS) has questions related to emotional caregiving. There are 12 items in this instrument. The scale of the caregiving ranged from strongly disagree (1) to strongly agree (5). There are three negative items that are reversely scored. Scale scores were gained by summing up scores of all item responses where maximum score is 48 and minimum is 24. The levels of emotional caregiving were categorized as low (24-32), moderate (32-40) and high (40-48). High score indicates the extent of providing emotional caregiving. The reliability of this scale is .75 (Schwarze & Schulz, 2013).

Recently, these scale has been used by Krok (2014), Patil, Shetty, Subramanyam, Shah, Kamath and Pinto (2014), Khamarko and Myers (2013), Kilis-Pstrusinska et al. (2013), Kim (2012) and Palompon, Ente and Bantugan (2011) in their studies.

3.5.2 Personality Traits

Personality comprises the number of ways by which an individual reacts and interacts with others (Lautenschlager et al., 2013). In addition, personality traits are defined as a set of characteristics of a person, which distinctively affect his or her cognition, motivation, and behavior in a variety of situations (Ryckman, 2004). To measure personality traits, Big Five Inventory by Goldberg (1993) was used. The Big-Five framework according to Eloise et al. (2013) is through which most variances in human personality can be classified into five domains namely Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness.

There are a total of 44 items in this inventory and a five-point Likert scale that ranged from “1” as strongly disagree to “5” as strongly agree was used to measure all items. Out

of 44 items, 16 items are negative (2, 6, 8, 9, 12, 18, 21, 23, 24, 27, 31, 34, 35, 37, 41 and 43) which were re-coded by subtracting all reversed-scored items from 6 (John, Naumann & Soto, 2008). The reliability of this scale is .80 (John & Srivastava, 1999), whereas the reliability of the different dimensions of the personality is mentioned in the succeeding section.

Previously, several researchers like Eloise et al. (2013), Allred, Granger and Hogstrom (2013), Anthony, Erin, Julie, Mark, Francis, Klea, Joshua and Peter (2012), Hahn, Gottschling and Spinath (2012) Hudson, Roberts and Lodi-Smith (2012) and Back et al. (2010) have used BFI as an instrument to measure personality traits in their studies.

3.5.2.1 Extraversion

Extraversion is operationally defined as warmth, gregariousness and assertiveness, as well active and excitement-seeking behavior and positive emotions (Lazaridès, Belanger & Sabourin, 2010). This definition confirms to that used by Goldberg (1993). Some examples of the items include “I am talkative” and “I am full of energy.” The total number of items of Extraversion trait is eight having three negative items where minimum score is 20 while maximum score is 28. The levels of extraversion were categorized as low (20-22), moderate (23-25) and high (26-28). High score indicates that a person has an Extraversion personality. The reliability of the scale reported was 0.88 (John & Srivastava, 1999).

3.5.2.2 Agreeableness

Agreeableness is operationally defined as the extent to which a person is friendly, tolerant, helpful, altruistic, modest, trustworthy, and straightforward (Neuman, Wagner, &

Christiansen, 1999). Agreeableness also refers to compliance, altruism, modesty, trust, straightforwardness and tender-mindedness (Lazarides et al., 2010). This definition confirms to those used by McCrae (2005). Some examples of the items include “I am helpful with others” and “I am generally trusting.” There are nine items to measure Agreeableness with four negative items where minimum score is 25 and maximum score is 29. The levels of agreeableness were categorized as low (25-26), moderate (27-28) and high (28-29). High score indicates Agreeable personality of a person. The reliability of the scale reported was 0.79 (John & Srivastava, 1999).

3.5.2.3 Conscientiousness

Conscientiousness is operationally defined as the degree of reliability, diligence, caution, self-discipline, ambition, perseverance, and responsibility of an individual (Wallace & Chen, 2006). Conscientiousness also refers to efforts toward achievement, competence, deliberation, duty, order, and self-discipline (Lazarides et al., 2010). This definition agrees with that used by several scholars (Wallace & Vodanovich, 2003). Some examples of the items include “I do a thorough job” and “I am a reliable worker”. The total number of items of Conscientiousness trait is nine having four negative items where minimum score is 25 while the maximum score is 29. The levels of conscientiousness were categorized as low (25-26), moderate (27-28) and high (28-29). The high score indicates the Conscientiousness personality of a person. The reliability of the scale reported was 0.79 (John & Srivastava, 1999).

3.5.2.4 Neuroticism

Neuroticism is operationally defined as the level to which an individual is calm and enthusiastic versus being depressed and frustrated (Gonzalez-Abrales et al., 2013). Emotional stability also refers to an individual's level of anxiety, hostility, impulsiveness, self-consciousness, and vulnerability (Lautenschlager et al., 2013). This definition is similar to those used by several scholars (Eliose, et al., 2013). Some examples of the items include "I am depressed" and "I can be tensed." There are eight items to measure Neuroticism having three negative items where minimum score is 20 and maximum score is 28. The levels of neuroticism were categorized as low (20-22), moderate (23-25) and high (26-28). High score indicates Neuroticism personality. The reliability of the scale reported was 0.84 (John & Srivastava, 1999).

3.5.2.5 Openness

Openness is operationally defined as creativity, intellect and willingness to experiment or to try new things. Intellect also refers to feelings, ideas, values, actions and fantasy (McCrae, 2005). This definition is in agreement with those used by several scholars (Neuman et al., 1999). Some examples of the items include "I am curious about many things" and "I am a deep thinker." There are total ten items to measure Openness having one negative item where minimum score is 14 and maximum score is 46. The levels of openness were categorized as low (14-24), moderate (25-35) and high (36-46). High score indicates the Openness personality of a person. The reliability of the scale reported was 0.81 (John & Srivastava, 1999).

3.5.3 Social Support

Social support is the process of interacting in relationships that can improve coping, belonging and competence through either physical or psychosocial resources (Gottlieb, 2000). For the measurement of the multidimensional approach of social support the Medical Outcomes Study- Social Support Survey by Sherbourne and Stewart (1992) was used. The development of MOS-SSS was based on considerations from theory and the reviews related to the already developed instruments for the measurement of social support.

The 10 items of this instrument were used in this study. The respondents have to rate their responses on a five-point Likert scale. Possible endorsements are strongly disagree (1) to strongly agree (5). To obtain an overall support index, average of (1) the scores for all items included is calculated where minimum score is 10 and maximum score is 50. There is no negative statement. The levels of social support were categorized as low (10-23), moderate (23-36) and high (37-50). The high score shows that the respondent receives maximum social support. Overall reliability of this instrument is .97 (Gjesfjeld et al., 2010).

This scale has been previously used by Compas, Schetter, Abdou, Hobel, Glynn and Sadman (2008), Gjesfjeld, Greeno and Kim (2008), Gjesfjeld et al., (2010), Kruthof, Visser-Meily and Post (2012) and Surkan, Peterson, Hughes and Gottlieb (2006).

3.5.4 Stress

Stress is the overloaded, wounded or tensed state that in this study is considered as a dependent variable. Stress is among major determinants of health status (Carter, Lyons,

Stewart, & Archbold, 2010) therefore an instrument that can measure stress adequately is of main interest. In the literature, the terms “strain” and “stress” are used alternatively that is why for the assessment of caregiver’s stress the Modified Caregiver Strain Index (MCSI) formed by Thornton and Travis (2003) was used. MCSI was used to measure the stress of caregivers providing long-term care to the close ones and can be applied to the caregivers of any age.

The original version of this tool is Caregiver Strain Index (CSI) which was developed in 1983 and this Modified Caregiver Strain Index (MCSI) is a recent version of CSI. In 2003, the MCSI was developed by taking 158 family caregivers who are assisting aged people living in a community-based setting.

MCSI measures strain associated to caregiving phenomenon. It is a 10-question tool with no negative item. A three-point Likert-type scale is used ranging from ‘Yes, on a regular basis’ to ‘Never’ where minimum score is 10 and maximum score is 30. The levels of caregiver’s stress were categorized as low (10-16), moderate (17-23) and high (24-30). The high score indicates the higher the level of caregiver strain (Thornton & Travis, 2003). The overall reliability of this scale was .90 (Lisa, 2013).

Recently, this scale has been used by Sharma, Kaur, Kumar and Singh (2014), Rodrigo, Fernando, Rajapakse, De Silva and Hanwella (2013), Zyada, Sheta, Degwi and Saad (2013), Kelly et al. (2012) and Raju, Kaur and Pandian (2012) in their studies of caregivers and caregiving.

3.6 Instrument Validity

Instrument validity is of significant importance as it refers to the level to which an instrument measures what it purports to measure. It requires an instrument to be reliable but it can be reliable without being valid. Validity is concerned with the meaningfulness of components of research. While measuring variables, researchers are concerned whether they are measuring what they want to measure (Drost, 2011). Four types of validity are considered by researchers namely statistical conclusion validity, internal validity, constructs validity, and external validity. Greener (2008) suggested the importance of face validity and internal validity whereas recommending construct validity as the essential aspect for data analysis.

Construct validity indicates the goodness of transformation of an idea or a concept refers as construct into an operating reality (Trochim & Donnelly, 2006). Therefore, in this study, construct validity was also conducted in order to ensure whether the obtained results from the adapted item fit the theories around which the test was designed. Construct validity in this study was determined by two ways, i.e., convergent validity and discriminant validity (Hair, Hult, Ringle & Sarstedt, 2013; Vanderstoep & Johnston, 2009).

Convergent validity is the third requirement for the validation of the measurement models. It identifies the positive correlation among indicators of a particular framework (Chin, 2010). Generally, convergent validity of reflective constructs is confirmed by using Average Variance Extracted (AVE). Moreover, in PLS-SEM, AVE is also considered equal to communality of a construct (Hair et al., 2013).

Furthermore, under measurement model, the verification of criteria of quality is done by the discriminant validity. Basically, the difference of reflective constructs is indicated by the discriminant validity. In measurement models, two different approaches are used to judge the discriminant validity i.e. Fornell-Lacker criterion and cross-loadings (Hair, Ringle, & Sarstedt, 2011). Fornell-Lacker criterion inspects discriminant validity at construct level while cross-loading is examined at indicator level.

The scales selected for this study has been previously developed and their validity has been assessed before in various studies, however, the validity of the instruments for this study was assessed in the measurement model and the results are mentioned in the Chapter Four.

3.7 Instrument Reliability

In addition to the validity, the reliability of the instruments is a major concern in order to measure some behavior or attribute accurately (Creswell, 2012). It refers to the stability and consistency of measurement providing same results at one time or over the period by taking into account different conditions. Various kinds of reliability are internal consistency and indicator reliability.

Internal consistency is a test done for the measurement of reliability of a set of indicators through Cronbach's alpha and Composite Reliability (CR). Cronbach's alpha which is a reliability coefficient indicates the closeness of the indicators by providing equal weight to indicators (Chin, 2010). On contrary, Hair et al. (2013) argued that Cronbach's alpha is a conservative measure as it underestimates the internal consistency reliability of reflective constructs.

In addition, indicator reliability confirms that reflective construct is explaining the indicator variance (Gotz, Liehr-Gobbers & Krafft, 2010; Hair et al., 2011). As a rule of thumb, the value of indicator loading in reflective construct of already formed questionnaire should be greater than 0.60 and 0.5 for newly developed questionnaire. Furthermore, unidimensionality of the constructs can be identified by calculating factor loading of all items (Hair et al., 2011).

Internal consistency measured by Cronbach's alpha results from previous studies of the scales selected for this study are highlighted in Table 3.5. 15 items of Caregiving task questionnaire (Wallhagen, 1992), 12 items of Berlin Social Support Scale (Schwarzer & Schulz, 2013), 44 items of Big Five Inventory (Goldberg, 1993), 10 items of Medical Outcomes Study-Social Support Survey (Sherbourne & Stewart, 1992) and 10 items of Modified Caregiving Strain Index (Thornton & Travis, 2003) were previously tested and validated.

Table 3.5
Reliability of instruments from previous studies

Instruments	Items	Past Reliability	Scale
Caregiving task questionnaire	15	r= .86 (Wallhagen, 1992)	Likert type format 5 point; Strongly agree - strongly disagree
Berlin Social Support Scale	12	r= .75 (Schwarzer & Schulz, 2013)	Likert type format 5 point; Strongly agree - strongly disagree
Personality	44	r= .80 (John & Srivastava, 1999)	Likert type format 5 point; Strongly agree - strongly disagree
Extraversion	8	r= .88	
Conscientiousness	9	r= .79	
Openness	10	r= .81	
Agreeableness	9	r= .79	
Neuroticism	8	r= .84	
Medical Outcomes Study-Social Support Survey	10	r= .97 (Gjesfjeld, Greeno, Kim & Anderson, 2010)	Likert type format 5 point; Strongly agree - strongly disagree

Modified Caregiving Strain Index	10	r= .90 (Lisa, 2013)	Likert type format 3 point; On a regular basis – Never
--	----	------------------------	---

The above mentioned Cronbach's alpha values are reported by the previous studies, whereas for the present study, the reliability was measured by both Cronbach's alpha and composite reliability. The results of the reliability of the instruments for the current study are mentioned in the next chapter.

3.8 Pilot Test

The preceding section has mentioned the reliability of the instruments that have been previously developed and reported. However, there is a need of a pilot study to ensure the reliability of the scales for the given sample of the current study. Sekaran and Bougie (2010) and Zikmund et al. (2010) described pilot study as a test that is conducted primarily before the administration of the final questionnaire for the assessment of goodness of a particular instrument for the purpose of the reliability of the scale.

Moreover, improvement of format and contents of questionnaire signifies the pilot study (Trochim & Donnelly, 2006). A pilot test was conducted for the current study by selecting 30 respondents to test the validity and reliability of the survey instruments selected for this study. Secondly, pilot study provided an insight to the actual conditions of the effect of assessment which allowed to anticipate potential problems and to adjust them before conducting the research on actual sample. Pilot study is mainly conducted to check the validity and reliability of the instrument.

3.8.1 Validity Test of Pilot Study

To ensure how well an instrument measures what it is purported to measure, content/face validity was conducted in this study. Small sample of respondents as well as panel of experts were consulted to provide their judgement on the appropriateness of items chosen to measure the construct. Experts consulted included senior lecturers, associate Professors and Professors in The Islamia University of Bahawalpur and Punjab University Lahore, Pakistan.

After the observation of experts were taken into account, an improved versions of instruments were adapted by the researcher that was administered for the pilot study. Mostly, sample is small in pilot study (Fink, 2002), therefore, a total of 30 copies of the questionnaires were randomly administered. The high response rate was achieved due to the personal distribution and collection of questionnaires. Rate of return was 100 percent. The reliability of measurement instruments were observed through internal consistency of Cronbach's alpha values.

3.8.2 Reliability Test of Pilot Study

After running reliability test for pilot study using SPSS v23, it was observed that all the instruments had a high reliability standard ranging from 0.71 to 0.96 that goes in line with the criterion of Hair et al. (2010) and Sekaran and Bougie (2010) that a Cronbach's alpha coefficient below 0.70 is considered as an average reliability while higher than 0.70 indicates a high reliability standard. Therefore, keeping this observation into account, it was concluded that all the constructs were reliable, and therefore there was no need to remove any item.

Table 3.6

Reliability Test

Constructs/Dimensions	Number of Items	Cronbach's Alpha
Physical Caregiving	15	.87
Emotional Caregiving	12	.91
Personality	44	.87
Extraversion	8	.95
Agreeableness	9	.95
Conscientiousness	9	.72
Neuroticism	8	.71
Openness	10	.84
Social Support	10	.96
Stress	10	.89

The satisfactory results of validity and reliability of the pilot study directs the researcher towards the administration and collection of data from the actual sample selected for the current study.

3.9 Data Collection Procedure

After obtaining the sample size and selecting the appropriate instruments for this study, the process of data collection begins. For this study, the collection of data started in the month of November 2016 after conducting the pilot test. Personally administered questionnaire were used for the collection of data. It was compulsory for this study to use personally-administered method in order to achieve the required number of responses and to ensure that results are not affected by the non-response bias.

According to Sekaran and Bougie (2010), personally-administered questionnaire helps in developing greater understanding between the researcher and the respondent during the introduction of the survey. It also helps in clearing up any query of respondent

immediately while increasing the response rate since the questionnaires can be collected immediately in a short period of time.

For the collection of data, initially, an official letter was collected from the Awang Had Saleh Graduate School (AHS GS), introducing the researcher and also explaining the purpose of the study. Therefore, this letter was used to get permission from the Medical Superintendents of the respective hospitals for the collection of data. The questionnaire was prepared in a booklet form. According to Sudman and Bradburn (1982), a booklet-type questionnaire prevents pages from being lost or misplaced and provides ease in turning the pages.

The questionnaire was of four pages including the cover letter that clearly highlighted the background and purpose of the study and also provides instructions on how to answer the questionnaire. To further increase the willingness of the participants to partake in the survey, their secrecy and confidentiality were confirmed in the cover letter. Additionally, along with the cover letter, an informed consent was signed by each respondent that provided their willingness to participate in a survey.

Before the formal data collection, a permission was taken from the Medical Superintendent of all the hospitals for assessing the record of the hospital regarding the details of the cancer patients. After the record is taken, caregivers of selected cancer patients were contacted for administering the questionnaire.

3.10 Method of Data Analysis

The collection of the data from the respondents leads to the analysis of data. Method of data analysis is the statistical technique and tools that are used by researchers to analyze data, investigate research hypotheses and consequently refine theories. In this study, descriptive and inferential statistics were employed for analyzing the data in three steps. In first step preliminary analysis that includes the response rate, the normality test, detection of outlier, and correlation analysis was performed. Descriptive statistics including frequency and percentage were also calculated to describe the demographic profile of the respondents. In second step, the testing of measurement model that includes internal consistency, indicator reliability, discriminant validity and convergent validity was done. Finally, as the study introduces mediation, therefore, for the analysis of mediation, the Partial Least Squares Structural Equation Modeling (PLS-SEM) was adopted for data analysis.

After the collection of raw data from the respective locations, the usable data from the questionnaires were keyed-in and coded in to the Statistical Package for the Social Sciences (SPSS v23). In SPSS, the data underwent screening by running frequency test to find data entry errors for each variable in order to identify the missing value using the respective mean values. Further, demographics were compared and described using descriptive statistics (Saunders et al., 2009).

Lastly, the PLS-SEM which is the second generation SEM was adopted. SEM has become an important approach for investigating cause and effect relation between latent constructs (Hair et al., 2011). Generally, PLS-SEM is a path modelling statistical method for

modelling complex multivariate analysis of relationships between observed and latent variables (Esposito Vinzi, Chin, Henseler, & Wang, 2010). The PLS-SEM approach is a strong, superior and flexible tool for statistical model building as well as testing and predicting theory (Lowry & Gaskin, 2014; Ringle, Wande, & Becker, 2014; Robins, 2012). Wan Afthanorhan (2013) states that PLS-SEM path modeling provides better reliable and valid confirmatory factor analysis.

In social sciences, PLS-SEM have been used by various researchers as a statistical methodology (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). PLS-SEM has been used widely due to its ability of assessing latent variables and their relationship with items (outer model) and testing the relationship between the latent variables (inner model) (Hair, Sarstedt, Pieper, & Ringle, 2012; Henseler & Sarstedt, 2013).

PLS-SEM handles the non-normal data vigorously because of its flexible assumptions about the normal distribution of variables (Henseler et al., 2013). Particularly, the paths under conditions of normality with large sample sizes are estimated by PLS-SEM that detects variance among groups as compared to the covariance-based SEM approach (Marcoulides, Chin, & Saunders, 2009). However, PLS-SEM method is preferable for small sample size under non-normality conditions. Although, the approach is less sensitive to size and normal distribution of sample, even in moderately non-normal data a large sample size is required (Marcoulides & Saunders, 2006). PLS-SEM addresses the problem of statistical power within analysis in similar conditions of data than covariance based SEM (Haenlein & Kaplan, 2011; Reinartz, Haenlein, & Henseler, 2009). However, various benefits of PLS-SEM like small sample size, abnormality of data and prediction

ability are added advantages for PLS-SEM method rather than a condition (Sarstedt, Ringle, & Hair, 2014).

To this end, it has been clearly demonstrated that PLS-SEM is a superior model performing estimates and other co-variance based regressions models for assessing mediation better than the first generation. Particularly, it can be applied in social sciences research as a multivariate analysis technique but it is allowed for complex models that include chains of effects, such as mediation and other more complex relationships (Lowry & Gaskin, 2014).

Specifically, based on the arguments for choosing a suitable technique to estimate structural equation models, PLS-SEM was implemented for this study due to the complexity of the research model. This is in line with Haenlein and Kaplan (2004) and Hair et al. (2012) that PLS-SEM is more suitable for model with high number of exogenous latent variables explaining small number of endogenous latent variables. Therefore, this study used Smart PLS v3.0 (Ringle et al., 2014) in order to determine the outer model (reliability, convergent validity and discriminant validity) and the inner model (significance of the path coefficients, coefficient determination and the effect size).

3.11 Summary

This chapter elaborates the methodology of the research such as research design, sampling technique, data collection procedure and data analysis technique that enables the researcher to answer all research questions mentioned in the previous chapter. In addition, detail explanation of the survey instrument and the strategy for data collection was presented along with the results of pilot study. At the end, PLS-SEM as a method of data

analysis using SPSS v23 and SmartPLS was highlighted in order to conduct preliminary data analysis, descriptive statistics, measurement model and structural model evaluation.



CHAPTER FOUR

RESULTS

4.1 Introduction

The primary purpose of this chapter is to provide results of the research objectives stated in Chapter One which include demographics using descriptive statistics, reliability and validity, as well as results of the hypotheses tests. This chapter presents the research findings of the study based on the data collected from respondents from eight cancer hospitals of Punjab, Pakistan. Firstly, this chapter contains the results of response rate, common method bias tests, preliminary data analysis and the profile of the respondents. Secondly, the descriptive statistics analysis is carried out to achieve the research Objective One using SPSS v23. Thirdly, the results of tests for reliability and validity of the scales are assessed and presented which include the measurement model based on the PLS-SEM analysis using SmartPLS 3.0 and finally, the results of the testing of hypotheses, coefficient determination and the effect size are examined and reported in order to achieve Objective Two to Five of the present study.

4.2 Response Rate

The data used for this research was collected from the caregivers of cancer patients from eight cancer hospitals located in the Punjab, province of Pakistan. In this study, questionnaires were personally distributed to help in quick completion of the questionnaires. Three hundred questionnaires were returned out of three hundred and thirty five questionnaires. Consequently, this makes the response rate of 89%. However,

only 286 questionnaires out of 300 responses obtained were used for further analysis making a valid response rate of 95% (Yehuda, 1999). This is because out of the 300 questionnaires collected, fourteen were discovered to be wrongly filled and rejected for further analysis. The original sample size obtained was 267 whereas the number of returned questionnaires was 286 therefore, the analysis was done taking 286 as a sample size.

Table 4.1
Response Rate of the Questionnaires

Hospitals	Sample needed (according to Krejcie & Morgan, 1970)	Population	Distributed Rate	Returned Rate	Useable Rate
Inmol Hospital	24	45	26	22	21
CENUM	27	50	30	27	26
SKMCH	61	120	62	56	53
NORI	42	80	55	50	48
MINAR	27	50	38	33	31
GINUM	32	60	46	42	40
PINUM	27	50	37	32	30
BINO	27	50	41	38	37
Total	267	505	335	300	286

4.3 Common Method Bias Test

Common method bias is the variance that is exclusively attributable to the procedure of measurement in contrast to the actual variables that are represented by measures (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Since, the data for both endogenous and exogenous variables were collected at the same time, there are chances of distortion of data collection due to common method bias. Therefore, given this potential problem caused by common method bias, a test is conducted in this study that ensures absence of variance in observed scores and confirms that correlations are not inflated due to the effects of method. According to Bagozzi (2011), numerous arguments exists on the

seriousness of common method bias on data. It is therefore important to consider before heading for the further analysis. Common method bias has been treated by several procedures and techniques such as wording questions in reverse, transparency of items, confidentiality of the respondents and statistical Harman's one-factor test (Podsakoff et al., 2003).

For the present study, Harman's one-factor test was used to check the common method bias. The findings of un-rotated factor analysis with 91 items of all the variables of the study revealed that no single factor accounted for more than 50% of the variance. The results indicated absence of common method bias by presenting less than 10.02% of the total variance accounted by a single factor. This is in agreement with Lowry and Gaskin (2014), who argued the presence of common method bias only when single factor accounts for more than 50% of the variance.

4.4 Analysis of Missing Data

For the multivariate analysis, it is essential to prepare data by screening and editing. Screening is important to be conducted as it identifies the possible harm to the basic assumptions which is related to the application of multivariate techniques (Hair Jr et al., 2010). Additionally, preliminary examination of the data provides a profound understanding of the collected data. Therefore, any missing data was checked and treated accordingly.

Considering the negative effects of missing data, a protective action was taken at the collection point in an attempt to reduce their occurrence. While receiving the completed questionnaires, all questions were checked to ensure that they were answered properly. In

case of any missing answer, a respondent was asked to complete the questionnaire appropriately. In addition to the preliminary cautions in completing the questionnaires, Hair et al. (2013) suggested that mean should be used to replace the missing values if they are less than 5% per item.

In the present study, analysis of the missing values indicated that all indicators had less than 5% of missing values. The range of missing value lies from 0.2% to 1%. Hence, SPSS v23 was used to replace the missing values by mean replacement.

4.5 Descriptive statistics analysis

In this section, descriptive statistics analysis is facilitated to analyze the profile of respondents and to achieve the Objective One of the study which was to investigate the level of caregiving, dimensions of personality, social support and stress of caregivers.

4.5.1 Profile of Respondents

Respondents were requested to specify a number of aspects related to their demographic profile. The following Table 4.2 provides the results of the profile of the respondents.

Table 4.2
Summary of Respondents' Demography

Gender	Frequency	Percent
Male	80	28
Female	206	72
Age	Frequency	Percent
20-30 years	14	4.9
30-40 years	93	32.5
40-50 years	163	57
Above 50 years	16	5.6
Marital Status	Frequency	Percent
Single	24	8.4
Married	228	79.7

Table 4.2 continued

Divorced/Widowed	34	11.9
Education level	Frequency	Percent
Primary	21	7.3
Secondary	53	18.5
Intermediate	43	15
Graduation	77	26.9
Masters	74	25.9
Other	18	6.3
Occupation	Frequency	Percent
Govt. Sector	82	28.7
Private Sector	51	17.8
Own business	65	22.7
Other	88	30.8
Relation of caregiver and care receiver	Frequency	Percent
Mother/Father	214	74.8
Brother/Sister	40	14
Grandparent	19	6.6
Other relation	13	4.5
Duration of illness	Frequency	Percent
0-3 years	191	66.8
4-6 years	66	23.1
7-10 years	29	10.1

Table 4.2 illustrates the demographic profile of the respondents showing more than half of the females providing care to the young patients at home whereas males accounts for only 28 percent of the caregivers. The average age of these caregivers was between 30-40 years being married and having a sick child to take care of. Most of the respondents were university graduated and were employed in government or private sector where few were running their own business and the rest were having multiple occupations. Most of the respondents were parents and very low percentage of caregivers were of siblings or grandparents. The duration of illness in most children was around three years showing more than 0.5 percent of children suffering from cancer from last three years.

4.5.2 Central tendencies and measures of dispersion

Descriptive statistics such as minimum and maximum values were obtained for all the variables which were physical caregiving, emotional caregiving, personality domains, social support and caregivers' stress. As stated earlier in Chapter Three, in order to fulfill the Objective One of this study, the variables are categorized as low, moderate and high by taking the difference between maximum and minimum score obtained by the respondents and then dividing the total score by three. The analysis looked at the mean and categories of the variables of this study. All variables used Likert-type formatted scale. The findings are presented in Table 4.3.

Table 4.3
Central tendencies and dispersion of variables

Variables	Mean	Category
Physical caregiving (15)	55	Moderate
Emotional caregiving (12)	43	High
Extraversion (8)	26	High
Agreeableness (9)	28	High
Conscientiousness (9)	27	Moderate
Neuroticism (8)	23	Moderate
Openness	35	Moderate
Social support (10)	39	High
Caregiver stress (10)	23	Moderate

Given the mean values of the variables, physical caregiving was found to be at the moderate level whereas emotional caregiving to the care receivers was at high level. With respect to personality traits, extraversion and agreeableness was found to be at the high level. On other hand, mean values of conscientiousness, neuroticism and openness indicate the moderate level of these traits. Moreover, social support was found to be at high level whereas moderate level of caregiver's stress was indicated by its mean value.

4.6 Multivariate factor analysis

After the analysis of descriptive statistics for achieving Objective One, the next step was the multivariate factor analysis which was conducted through PLS-SEM using SmartPLS 3.0 in order to achieve Objective Two to Five.

4.6.1 Evaluation of PLS-SEM Result

In PLS-SEM, two models were assessed for the factor analysis. First is the measurement model (outer model) and second is the structural model (inner model). The measurement model involves the assessment of validity and reliability of the items (indicators). Whereas, structural model assess the relationships between the latent variables.

Before the analysis of data through PLS-SEM, it is important to configure the model in a way that it should be clearly understood. For this purpose, it is essential to clarify which indicators are reflective and which are formative because approach in testing reflective measurement model is quite different from approach used in testing formative measurement model (Hair Jr. et al., 2013; Lowry & Gaskin, 2014). Reflective indicators are indicators which serve as the representative of the latent variables. They are highly correlated and interchangeable in such a way that the removal of any of the indicators will not alter the meaning of the latent variables (Haenlain & Kaplan, 2004). However alterations in the latent variables will directly cause changes in the assigned indicators.

On the contrary, formative indicators are indicators which cause or form the measurement of the latent variable and therefore, not interchangeable among themselves. Changes of any of them will have consequential effect on the validity of the measured latent variable. In addition, casual priority from the constructs to the indicators shows reflective variables

and from indicators to the construct shows formative variables (Diamantopoulos & Winklhofer, 2001). According to Rossiter (2002), when the indicators represents the consequences than it should be taken as reflective while if they are the cause of the construct than they should be taken as formative. Adding to this, Jarvis, MacKenzie and Podsakoff (2003) states that if items are mutually interchangeable than they are reflective and if items cannot be interchanged than they are formative.

Considering all the aforementioned statements, it has been found that all of the latent variables of this current study were reflective. Furthermore, the analysis did not involve testing second-order structures that contain two layers of components. Therefore, the study constructs in the inner model were treated as first order constructs.

4.6.2 The Measurement Model

As stated earlier, the first step in PLS-SEM analysis is the assessment of the measurement model (outer model). The outer model deals with the measurement of the component, which determines how well the indicators (items) load theoretically and associate with respective constructs. In other words, analysis of the outer model confirms that the survey items measure the constructs they were designed to measure, thus ensuring that they are reliable and valid. As it has been stated in Chapter Three that all instruments (constructs) were adapted from the previous studies therefore, the PLS-SEM analysis begins with the reliability and validity of the construct measures in measurement model.

In PLS-SEM analysis, two main criteria for the evaluation of the outer model are the reliability and validity (Hair Jr. et al., 2013; Ramayah, Lee, & In, 2011). Reliability and validity provides the conclusion about the nature of the relationship among constructs

(inner model). The suitability of the outer model can be assessed by looking at: (1) individual item reliabilities, for example, indicator reliability and internal consistency reliability using Composite Reliability (CR); (2) convergent validity of the measures associated with individual constructs using Average Variance Extracted (AVE); and (3) discriminant validity using Fornell-Larcker criterion and the indicator's outer loadings.

To begin with, internal consistency usually measures the consistency of result between items of the same test. It measures whether the proposed items measuring the construct are producing similar scores (Hair Jr. et al., 2013). In this study, internal consistency reliability was assessed by examining CR in addition to Cronbach's alpha as Hair et al. (2014) mentioned composite reliability as a better tool as compared to Cronbach's alpha for measurement of internal consistency.

According to Hair Jr. et al. (2013), unlike Cronbach's alpha, CR does not assume an equal indicator loading of construct. Values for CR varies between 0 and 1; the threshold value should not be lower than 0.60 (Henseler & Sarstedt, 2013) but value from 0.70 and above is most desirable (Hair, et al., 2014). Accordingly, CR value between 0.6 and 0.7 indicates average internal consistency, while value between 0.70 and 0.90 is regarded as more adequate (Nunnally & Bernstein, 1994). Therefore, in this study, Cronbach's alpha and CR values for all the constructs were examined, and the results in Table 4.4 show that all CR and Cronbach's alpha values are above the recommended threshold value of 0.70 (Hair et al., 2013). The CR values in this study range in between 0.84 to 0.98; indicating the reliability of the measurement model.

Convergent validity refers to the extent to which measures of the same constructs that are theoretically related to each other are related (Henseler, Ringle, & Sinkovics, 2009). Hence, it shows the degree of correlation among the measures of the same construct (Hair Jr. et al., 2013). Hair et al. (2014) named it is Average Variance Extracted (AVE). To achieve adequate convergent validity, there should be at least 50% of variance in indicators of each construct (Bagozzi & Yi, 1988; Fornell & Larcker, 1981; Hair et al., 2014). In other words, AVE value of 0.50 indicates adequate convergent validity. In this study, convergent validity was assessed by examining AVE values. Results in Table 4.4 show that the AVE value of all the constructs exceeds 0.50 (Hair et al., 2012; Henseler et al., 2009). The result reveals that AVE values range from 0.50 to 0.71; therefore, it was concluded that convergent validity is established.

Table 4.4
Loadings, Reliability and Convergent Validity Values

Variables	Items	Loading	Cronbach's			Discriminant Validity?
			Alpha	CR	AVE	
PC	PC12	0.792	0.904	0.921	0.565	Yes
	PC14	0.798				
	PC15	0.805				
	PC2	0.724				
	PC3	0.711				
	PC4	0.726				
	PC5	0.769				
	PC7	0.709				
	PC8	0.721				
	EC1	0.678				
EC	EC10	0.796	0.881	0.905	0.517	Yes
	EC11	0.782				
	EC12	0.581				
	EC2	0.850				
	EC4	0.701				
	EC6	0.752				
EXT	EC7	0.546	0.892	0.921	0.702	
	EXT2	0.633				

Table 4.4 continued

	EXT3	0.876				
	EXT4	0.893				Yes
	EXT5	0.887				
	EXT7	0.872				
	AGR2	0.779				
	AGR3	0.520				
	AGR4	0.832				
AGR	AGR6	0.838	0.874	0.903	0.576	Yes
	AGR7	0.828				
	AGR8	0.831				
	AGR9	0.616				
	CONS1	0.699				
	CONS5	0.731				
CONS	CONS6	0.666	0.785	0.844	0.525	Yes
	CONS7	0.896				
	CONS9	0.595				
	NEU2	0.721				
	NEU4	0.768				
NEU	NEU5	0.666	0.808	0.854	0.545	Yes
	NEU6	0.903				
	NEU7	0.597				
	OPEN1	0.721				
	OPEN2	0.768				
	OPEN3	0.666				
OPEN	OPEN4	0.903	0.924	0.940	0.692	Yes
	OPEN5	0.597				
	OPEN6	0.622				
	OPEN7	0.826				
	SS1	0.681				
	SS10	0.767				
	SS8	0.758				
	SS2	0.632				
SS	SS3	0.601	0.876	0.900	0.501	Yes
	SS4	0.723				
	SS5	0.698				
	SS6	0.763				
	SS9	0.728				
	CS1	0.874				
	CS10	0.863				Yes
	CS2	0.887				
CS	CS3	0.890	0.950	0.958	0.719	
	CS4	0.600				
	CS6	0.871				
	CS7	0.875				
	CS8	0.871				

Table 4.4 continued

CS9	0.862
Note: AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support, CR=Composite Reliability, AVE=Average Variance Extracted	

Discriminant validity was considered as a third step in assessment of measurement model. Discriminant validity refers to the degree to which one construct is actually different from another construct. In other words, it reflects whether the measures of constructs that are theoretically not related to each other are truly not related to each other (Hair Jr. et al., 2013). For the assessment of discriminant validity, Fornell-Larcker criterion is the most common approach (Hair Jr. et al., 2013). Another is cross-loading examination method which is more liberal as more constructs exhibit discriminant validity in it.

Discriminant validity is said to be established when value of square root of AVE of each construct is greater than highest correlation of construct with other latent construct (Hair Jr. et al., 2013; Henseler et al., 2009). Therefore, in this study, assessment of discriminant validity is done by comparing square root of the AVE for each construct with correlations. Table 4.5 shows Fornell-Larcker Criterion assessment results with the square root of the constructs.

The square root of AVEs on the diagonal in bold is higher than the values of the inter-construct on the same columns and rows with few exceptions. Hair, Gabriel and Patel (2014) suggest that if one or two discriminant validity results do not match the rule of thumb in the study, it is alright to proceed with the analysis as the content validity is more important and not all indicators can be deleted. Thus, discriminant validity on each construct was found to be established (Hair Jr. et al., 2013; Henseler et al., 2009).

Table 4.5

Discriminant Validity

Variables	AGR	CS	CONS	EC	EXT	NEU	OPEN	PC	SS
AGR	0.759								
CS	0.698	0.848							
CONS	0.089	0.164	0.724						
EC	0.638	0.536	0.059	0.719					
EXT	0.802	0.612	0.096	0.622	0.838				
NEU	0.085	0.141	0.943	0.065	0.078	0.738			
OPEN	-0.115	-0.113	-0.094	-0.228	-0.103	-0.133	0.832		
PC	0.673	0.557	0.107	0.209	0.646	0.111	-0.197	0.752	
SS	0.682	0.545	0.121	0.681	0.647	0.138	-0.334	0.326	0.708

Note: the bold values represent the square root of Average Variance Extracted (AVE)

AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

At the end of measurement model, it is vital to assess the outer factor loadings for the assessment of indicator's contribution to assigned construct. Outer loadings were examined based on the threshold value of 0.50 and above (Hair Jr. et al., 2010). However, Hair Jr. et al. (2013) stressed that outer loading greater than 0.40 but less than 0.70 should be carefully analyzed and deleted only if it increases the value of CR and AVE. Based on these recommendations regarding item deletion, almost 20% of total items were deleted which are PC1, PC9, PC10, PC11, PC13, EC3, EC5, EC8, AG1, AG5, EXT1, EXT6, CONS2, CONS3, CONS4, CONS8, OPEN8, NEU1, NEU3 and CS5.

Table 4.5 indicates that all the bold values of the loading are above than 0.50, specifying reasonable inclusion of the indicators to assigned constructs. Additionally, Hair Jr. et al., (2013), states that discriminant validity can be assessed by examining the indicators' outer loadings by assessing whether outer loading of an indicator is higher than its cross-loading with other constructs. Hence, Table 4.5 indicates that problem of discriminant validity is absent as all loadings are greater than 0.5, except one value of agreeableness in relation

to extraversion (0.802) and one of conscientiousness in relation to neuroticism (0.943) which can be neglected as the assessment of content validity by a panel of experts indicates that the indicator loaded on the separate constructs are indeed distinct (Hair et al, 2014).

Table 4.6
Factor Loading and Cross Loading

Items	AGR	CS	CONS	EC	EXT	NEU	OPEN	PC	SS
AGR2	0.779	0.487	0.049	0.523	0.659	0.063	-0.131	0.529	0.577
AGR3	0.520	0.241	-0.047	0.300	0.454	-0.045	0.103	0.290	0.274
AGR4	0.832	0.526	0.034	0.560	0.724	0.023	-0.136	0.566	0.604
AGR6	0.838	0.609	0.081	0.552	0.751	0.079	-0.059	0.568	0.571
AGR7	0.828	0.663	0.120	0.555	0.630	0.106	-0.132	0.606	0.586
AGR8	0.831	0.632	0.136	0.495	0.570	0.139	-0.184	0.578	0.587
AGR9	0.616	0.408	0.012	0.311	0.417	0.005	0.094	0.317	0.278
CONS1	0.058	0.144	0.699	0.017	0.075	0.512	-0.051	0.093	0.043
CONS5	0.081	0.085	0.731	0.028	0.119	0.768	-0.075	0.087	0.063
CONS6	0.025	0.037	0.666	-0.033	0.025	0.666	0.000	0.002	0.043
CONS7	0.097	0.170	0.896	0.110	0.054	0.903	-0.137	0.120	0.168
CONS9	0.008	0.075	0.595	-0.020	0.100	0.515	0.040	0.001	0.033
CS1	0.605	0.874	0.139	0.453	0.563	0.109	-0.038	0.485	0.462
CS10	0.633	0.863	0.135	0.487	0.543	0.109	-0.129	0.491	0.475
CS2	0.654	0.887	0.193	0.501	0.584	0.177	-0.140	0.558	0.538
CS3	0.578	0.890	0.173	0.471	0.533	0.158	-0.115	0.498	0.488
CS4	0.375	0.600	0.064	0.305	0.371	0.069	0.029	0.307	0.319
CS6	0.575	0.871	0.177	0.403	0.485	0.140	-0.056	0.421	0.418
CS7	0.604	0.875	0.157	0.470	0.532	0.129	-0.078	0.504	0.460
CS8	0.586	0.871	0.095	0.437	0.490	0.079	-0.123	0.422	0.416
CS9	0.660	0.862	0.099	0.525	0.537	0.087	-0.163	0.519	0.543
EC1	0.450	0.425	0.009	0.678	0.509	0.014	0.081	0.593	0.412
EC10	0.540	0.451	0.098	0.796	0.469	0.125	-0.111	0.613	0.660
EC11	0.535	0.441	0.098	0.782	0.469	0.097	-0.107	0.628	0.597
EC12	0.265	0.204	0.055	0.581	0.232	0.066	-0.437	0.476	0.654
EC2	0.545	0.500	0.054	0.850	0.576	0.061	-0.201	0.764	0.641
EC4	0.334	0.301	0.011	0.701	0.353	0.010	-0.094	0.599	0.449
EC6	0.501	0.414	0.079	0.752	0.473	0.087	-0.265	0.587	0.552
EC7	0.312	0.151	-0.092	0.546	0.350	-0.105	-0.130	0.419	0.317
EC9	0.551	0.456	-0.015	0.731	0.545	-0.030	-0.181	0.584	0.565
EXT2	0.443	0.322	0.018	0.317	0.633	0.016	0.059	0.320	0.280
EXT3	0.695	0.570	0.091	0.542	0.876	0.060	-0.164	0.556	0.621
EXT4	0.662	0.534	0.124	0.507	0.893	0.093	-0.112	0.546	0.547

Table 4.6 continued

EXT5	0.761	0.558	0.051	0.602	0.887	0.050	-0.084	0.609	0.583
EXT7	0.743	0.529	0.097	0.580	0.872	0.090	-0.068	0.613	0.597
NEU2	0.049	0.087	0.582	0.037	0.083	0.721	-0.131	0.092	0.088
NEU4	0.081	0.085	0.731	0.028	0.119	0.768	-0.075	0.087	0.063
NEU5	0.025	0.037	0.666	-0.033	0.025	0.666	0.000	0.002	0.043
NEU6	0.097	0.170	0.896	0.110	0.054	0.903	-0.137	0.120	0.168
NEU7	-0.016	0.021	0.528	-0.050	-0.043	0.597	-0.071	0.020	0.045
OPEN1	-0.112	-0.102	-0.092	-0.210	-0.096	-0.140	0.721	-0.166	-0.323
OPEN2	-0.068	-0.066	-0.088	-0.209	-0.052	-0.123	0.768	-0.191	-0.294
OPEN3	-0.125	-0.125	-0.113	-0.198	-0.091	-0.127	0.666	-0.171	-0.291
OPEN4	-0.071	-0.058	-0.045	-0.178	-0.094	-0.067	0.903	-0.135	-0.229
OPEN5	-0.105	-0.097	-0.058	-0.166	-0.077	-0.106	0.597	-0.150	-0.265
OPEN6	-0.110	-0.105	-0.011	-0.195	-0.131	-0.025	0.622	-0.161	-0.246
OPEN7	-0.072	-0.096	-0.121	-0.163	-0.065	-0.165	0.826	-0.164	-0.275
PC12	0.437	0.411	0.075	0.718	0.419	0.074	-0.269	0.792	0.667
PC14	0.517	0.453	0.051	0.720	0.481	0.059	-0.175	0.798	0.577
PC15	0.587	0.523	0.094	0.773	0.577	0.103	-0.207	0.805	0.620
PC2	0.519	0.434	0.098	0.506	0.493	0.070	0.001	0.724	0.443
PC3	0.571	0.439	-0.004	0.570	0.553	-0.001	0.034	0.711	0.461
PC4	0.563	0.433	0.156	0.558	0.552	0.133	-0.028	0.726	0.486
PC5	0.564	0.479	0.142	0.559	0.557	0.139	-0.094	0.769	0.557
PC7	0.377	0.261	0.060	0.536	0.331	0.080	-0.185	0.709	0.534
PC8	0.412	0.304	0.048	0.558	0.392	0.088	-0.367	0.721	0.597
SS1	0.316	0.291	0.048	0.518	0.320	0.054	-0.271	0.451	0.681
SS10	0.580	0.471	0.086	0.486	0.567	0.091	-0.310	0.557	0.767
SS8	0.661	0.534	0.145	0.568	0.699	0.137	-0.200	0.620	0.758
SS2	0.250	0.195	0.071	0.525	0.220	0.098	-0.220	0.428	0.632
SS3	0.245	0.212	0.112	0.466	0.232	0.118	-0.347	0.345	0.601
SS4	0.464	0.343	0.019	0.569	0.415	0.051	-0.246	0.525	0.723
SS5	0.571	0.462	0.010	0.619	0.544	0.019	-0.111	0.554	0.698
SS6	0.553	0.458	0.149	0.583	0.476	0.165	-0.210	0.531	0.763
SS9	0.511	0.356	0.122	0.561	0.449	0.142	-0.286	0.595	0.728

Note. The bold values indicate the items that belong to column's construct

AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

Following is the diagrammatic view (Figure 4.1) of the measurement model indicating items with their factor loadings and cross loadings.

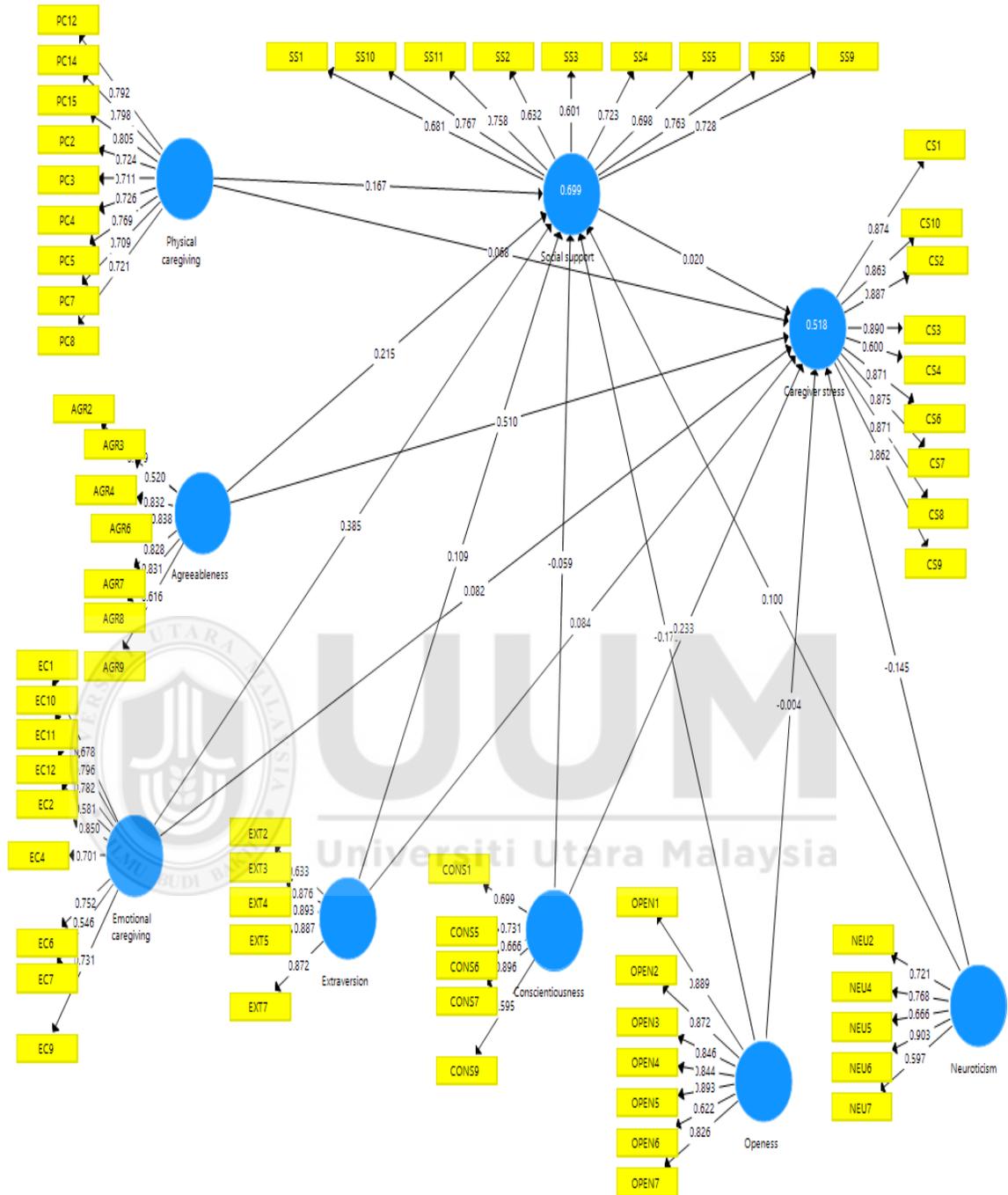


Figure 4.1 Measurement Model

After obtaining the satisfactory results of the assessment of the measurement model (outer model), where reliability and validity were adequately indicated by the latent variables, the further step was the evaluation of the structural model.

4.6.3 The Structural Model

As mentioned earlier, once the measurement model (outer model) is examined and the reliability and validity of the model are established, the next step was to evaluate the structural model (inner model). This involved assessing the outer model's predictive abilities and the relationships between the constructs. Initially, in the assessment of the structural model, it is crucial to address the lateral collinearity issues as suggested by Hair Jr. et al. (2013).

4.6.3.1 Collinearity

Collinearity occurs when two variables that are hypothesized to be causally related measure the same construct. Values of Variance Inflated Factor (VIF) are used for its measurement. According to Hair, Ringle and Sarstedt (2011), value of 5 or higher indicate a potential collinearity problem. Table 4.7 presents the outcomes of lateral collinearity test. All the inner VIF values are less than 5, indicating lateral multicollinearity is not a concern in the study (Hair et al., 2014).

Table 4.7
Collinearity

Constructs	CS	SS
AGR	3.349	3.195
CONS	4.139	3.127
EC	3.797	3.305
EXT	3.069	3.030
NEU	4.220	3.187
OPEN	1.180	1.084
PC	3.629	3.537
SS	3.317	

Note. AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

After checking and reconfirming absence for collinearity problem, the next step was to assess the structural model. According to Hair Jr. et al. (2014), the key criteria for assessing the structural model in PLS-SEM are the significance of the path coefficients, coefficient determination (R^2), and the effect size (f^2).

4.6.3.2 Direct Relationships

In this study to test hypothesis 1 to 15 comprehensively that directs to the achievement of Objectives Two to Five, a systematic model analysis of the structural model was carried out to provide a detailed picture of the results. The evaluation of the inner model begins with an assessment of the direct relationships between the exogenous variables and the endogenous variable.

PLS-SEM is a non-parametric analysis that does not make assumptions about the distribution of the data. If the data is not normal, the t-values will be inflated or deflated which will lead to Type 1 error. Hence, it is suggested to use bootstrapping procedure. In the bootstrapping procedure, a large number of sub-samples (e.g. 5000) are extracted from the original sample and replaced to determine standard errors of bootstrap, which provides t-values for significance testing of the structural path (Wong, 2013). Additionally, the bootstrap result approximates the normality of the data. The reason for this is that the character of PLS-SEM is distribution-free (Hair et al., 2012). As such the standard errors used in the calculation of the t-values are calculated from the bootstrapping procedure. Hence, the purpose is to avoid inflation or deflation of the standard errors due to non-normality issues.

To get the t-values for the loadings and the path coefficients, bootstrapping procedure needs to be used. While using bootstrapping procedure, it should be noticed that bootstrap samples should be high but must be at least equal to the number of valid observations used to estimate the model. For the final results preparation, it is recommended to use a large number of bootstrap subsamples (e.g. 5000). Considering these recommendations, the original number of cases was used as original sample and 5,000 was used as bootstrapping samples (Hair et al., 2011; Hair et al., 2012; Hair Jr. et al., 2013; Henseler et al., 2009) in this study.

Initially, the model analyzed the direct relationship between the independent variables and the dependent variable (H1a to H2e). Additionally, the mediation analysis was done where the relationship between mediator variable and dependent variable was also examined (H3a) as well as H4a to H5e.

Based on the PLS-SEM algorithm and bootstrapping procedure as mentioned above, Table 4.8 shows the path coefficient of the independent variables, mediating variable and the dependent variable as well as the t-statistics and p-values.

Table 4.8

Results of Hypotheses Testing (Direct Relationships)

Hypotheses/Path		Path Coefficient	Standard Deviation	T Statistics	p-values	Result
H1a	PC -> CS	0.068	0.090	0.761	0.223	Not supported
H1b	EC -> CS	0.082	0.078	1.057	0.146	Not supported
H2a	NEU -> CS	0.145	0.131	1.107	0.134	Not supported
H2b	EXT -> CS	0.084	0.079	1.056	0.146	Not supported
H2c	OPEN -> CS	-0.004	0.037	0.112	0.455	Not supported
H2d	AGR -> CS	0.510	0.079	6.431	0.000	Supported
H2e	CONS -> CS	0.233	0.143	1.646	0.052	Supported
H3a	SS -> CS	0.020	0.070	0.282	0.389	Not supported

Note. AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

Table 4.8 shows that H1a to H2c are not supported. Hypothesis H1a stated that there is a significant relationship between physical caregiving and stress of caregivers whereas the results of H1a (β .06; $t=0.761$; $p>.05$) found no relationship between physical caregiving and stress of caregivers.

Additionally, H1b stated that there is a significant relationship between emotional caregiving and stress of caregivers whereas results of H1b (β .08; $t=1.057$; $p>.05$) showed no relationship between these emotional caregiving and stress of caregivers.

Moreover, H2a stated that neuroticism is significantly related to higher level of stress whereas findings of H2a (β .14; $t=1.107$; $p>.05$) indicates absence of correlation between neuroticism and stress of caregivers.

Furthermore, H2b stated that extraversion is significantly related to low level of stress whereas results of H2b (β .08; $t=1.056$; $p>.05$) found presented no relationship between extraversion and caregiver's stress.

In addition, H2c stated that openness is significantly related to low level of stress whereas findings of H2c (β -.004; $t=0.112$; $p>.05$) showed absence of relationship between openness personality trait and stress of caregivers.

On the contrary, H2d is supported which stated that agreeableness is significantly related to higher level of stress as findings (β .51; $t=6.43$; $p<.01$) showed positive relation of agreeableness with the stress of caregivers indicating that caregiver stress increases with the increase in agreeableness.

Another variable conscientiousness was also found to be positively significant (β .23; $t=1.64$; $p<.05$) in relation to stress of caregivers indicating that H2e is also supported which stated that conscientiousness is significantly related to higher level of stress which indicates that level of stress increases if the person has more conscientious personality trait.

Furthermore, the introduction of mediation in the model showed that social support (β .02; $t=0.28$; $p>.1$) is not related to the caregiver stress which indicates that H3a is also not supported stating that there is a significant relationship between social support and stress of caregivers.

The results of the direct hypothesis provides the answer to the research question Two that directs to the achievement of Objective Two which aims to investigate the direct influence of physical caregiving, dimensions of personality and social support on the stress of caregivers of cancer patients. After the achievement of Objective Two, results of mediation were analyzed that provides the results of Objectives Three and Four.

4.6.3.3 Mediation Test (Indirect relationships)

Mediation analysis examines the influence of independent variable on the dependent variable by means of an intervening variable. However, it has been observed by Preacher and Hayes (2008) that there are numerous techniques for assessing mediation such as serial approach or causal steps strategy (Hoyle & Robinson, 2004) that are also known as four conditions of Baron and Kenny (Baron & Kenny, 1986). Several other approaches used to analyze mediation are Sobel test (Sobel, 1982) or product of coefficient method, distribution of the product approach (MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Fritz, Williams, & Lockwood, 2007) and bootstrapping approach (Hayes, 2009; Preacher & Hayes, 2008). However, recently used mediation analysis approach is the bootstrapping method, where an empirical representation of an indirect effect of the distribution of the sample is generated by bootstrapping (Hayes, 2009; Rucker, Preacher, Tormala, & Petty, 2011).

Generally, some conditions in the four steps of Baron and Kenny (1986) for mediation analysis needs to be met. The first condition is explaining total effect (x-y) relationship between independent and dependent variables (c). However, the significance of total effect is not essential as indirect effect could be significant in its absence and mediation can also occur (Rucker et al., 2011; Zhao, Lynch, & Chen, 2010).

The second condition is the significant effect of the indirect relationships. In other words, the effect of the independent variables on the dependent variable are assumed to be through the mediator variable (Preacher & Hayes, 2008). The mediating effect is the effect of independent variable on the mediating variable which in turn effect the dependent

variable (a and b). Therefore, if any of the indirect effects through the mediator variable is not significant, then the mediator variable cannot mediate the effect of independent variables on the dependent variable (Preacher & Hayes, 2008).

Finally, the direct effect of independent variables on the dependent variable should be insignificant or smaller than the relationship prior to the inclusion of the mediator variable (c'). However, Rucker et al. (2011) questioned the emphasis on the importance of change in the direct relationship after including the mediator variable and the use of terms, such as full versus partial mediation.

In the bootstrapping method, after the assessment of direct relationships, the path model is estimated with the mediator variable. The focus is on whether the independent variables and the mediator relationship and mediator and dependent variable relationship are significant. This is necessary but not sufficient to conclude mediation effect. Lastly, the product of the two significant path coefficients is divided by the standard error of the product ($(axb)/Sab$) to examine the significance of the indirect effect.

The justification and advantages of bootstrapping method to test mediation have been highlighted by several studies, such as Hair Jr. et al. (2013), Hayes and Preacher (2010), Hayes (2012), Preacher and Hayes (2008) and Zhao et al. (2010). Moreover, Shrout and Bolger (2002) argued that bootstrapping methods could be used to take care of the normal distribution as it allows the distribution of the indirect effect to be tested empirically. In addition, Hayes and Preacher (2010) and Preacher and Hayes (2008) conclude that the main advantage of bootstrapping approach is that it does not require any assumptions about the sampling distributions of the indirect effect or its product.

In other words, the confidence interval in bootstrapping method can be asymmetrical rather than at regular confidence intervals in other methods which is because they are based on an empirical estimation of the sampling distribution of the indirect effect, unlike other methods that assume normal sampling distribution. Similarly, bootstrapping result provides interval estimate of a population parameter that cannot be obtained by using other mediation tests (Lockwood & MacKinnon, 1998).

Knowing the advantage of bootstrapping method over other methods, Hair Jr. et al., (2014) and Hayes & Preacher (2010) suggested to test the significance of the mediation using bootstrapping methods. Hence, this study tested the mediating role of social support on the influence of aspects of caregiving and dimensions of personality on stress level of caregivers though PLS-SEM using the bootstrapping procedure with 286 cases and 5,000 sub-samples. Table 4.9 shows the results of mediation test.

Table 4.9
Results of Mediation Test

Hypothesis/ Path	Path		T Statistics	P-Values	5.00%	95.00%	Result
	Coefficient	(STDEV)					
H4a PC->SS->CR	0.088	0.043	2.047	0.021	0.022	0.158	Mediation
H4b EC->SS->CR	0.219	0.046	4.767	0.000	0.147	0.304	Mediation
H5a NEU->SS->CR	0.049	0.064	0.764	0.223	-0.030	0.179	Mediation
H5b EXT->SS->CR	0.057	0.033	1.757	0.040	0.012	0.113	Mediation
H5c OPEN->SS->CR	-0.087	0.020	4.267	0.000	-0.122	-0.055	Mediation
H5d AGR->SS->CR	0.118	0.043	2.764	0.003	0.063	0.204	Mediation
H5e CONS->SS->CR	-0.023	0.062	0.371	0.355	-0.148	0.061	Mediation

Note. AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

After including the mediator variable which is social support in this study, the bootstrapping result of 5,000 samples was used to multiply path a and path b. Then the

product of the two significant paths was divided by the standard error of the product of the two paths $((axb)/Sab)$ to get the t-value.

It is therefore clear from Table 4.9 that H4a which states that social support mediates the relationship between physical caregiving and social support is supported as the findings ($\beta.08$; $t=2.04$; $p<.05$) showed the significance of social support in relation to these independent and dependent variable. This indicates that social support acts as a mediator between physical caregiving and stress of caregivers.

Further, H4b stated that social support mediates the relationship between emotional support and caregivers' stress, hence, results ($\beta.21$; $t=4.76$; $p<.01$) showed that H4b is also supported which indicates that emotional support is indirectly linked through social support with the stress of caregivers.

On the contrary, results of H5a ($\beta.04$; $t=.76$; $p>.05$) indicated that H5a is not supported which stated that social support mediates the relationship between neuroticism and caregivers' stress. This indicates that social support has no mediation effect in relation to neuroticism personality trait and stress of caregivers.

Whereas, H5b is found to be supported according to the results ($\beta.05$; $t=1.75$; $p<.05$) showing that social support mediates the relationship between extraversion and stress of caregivers. This finding points that the stress of caregivers is indirectly linked to the extrovert personality of caregivers in presence of social support as a mediating variable.

Additionally, relationship between openness and stress of caregivers is also found to be mediated by social support according to the findings ($\beta-.08$; $t=4.26$; $p<.01$) which implies

that H5c is also supported that stated the presence of social support as a mediating variable in relation to openness and caregiver's stress.

Moreover, H5d was also supported which stated that social support acts as a mediating variable between agreeableness and stress of caregivers because results (β .11; $t=2.76$; $p<.01$) indicated that social support provides an indirect association of agreeableness personality trait and stress of caregivers.

On other hand, Table 4.8 shows that social support does not mediate the relationship between conscientiousness and caregiver stress (β -.02; $t=-0.37$; $p>.1$) which implies that H5e is not supported which stated that social support mediates the relationship between conscientiousness and caregivers' stress.

Hence, these results of the mediation analysis or indirect relationships between independent variables and dependent variables provided the answers of research question three and four. These results directs to the achievement of Objectives Three and Four that aims to examine the meditating effect of social support on relationship between aspects of caregiving and caregivers' stress and the mediating effect of social support on relationship between dimensions of personality and caregivers' stress respectively.

Further, in order to check the predictive accuracy of model, a coefficient of determination was analyzed that showed the combined effect of exogenous variables on endogenous variable.

4.6.3.4. Coefficient of Determination (R^2)

The third step in assessment of structural model is the coefficient of determination (R^2) of endogenous latent variables (Hair Jr. et al., 2013). R^2 is a measure of the model's predictive accuracy and it can also be viewed as the combined effect of exogenous variables on endogenous variable(s). The effect ranges from 0 to 1 with higher values indicating higher level of predictive accuracy. According to Cohen (1988), R^2 values of .27, .13 and .02 indicate substantial, moderate and weak R^2 values, respectively where Chin (2010) mentioned values of 0.67, 0.33, 0.19 as substantial, moderate and weak respectively. Later in 2014, Hair et al. mentioned 0.75, 0.50, and 0.25 as substantial, moderate and weak values respectively. Results show that the R^2 value of social support (.69) is substantial and caregiver stress (.52) is moderate. This R^2 value is higher than the one reported by Hakala (2013).

The R^2 value indicates that all the seven exogenous variables (PC, EC, AGR, NEU, CONS, EXT and OPEN) combined together in the model explain 70% of variance in the mediating variable of social support. Similarly, the holistic R^2 value indicates that all the eight exogenous variables (PC, EC, AGR, NEU, CONS, EXT, OPEN and SS) combined together in the model explain 52% variance in the endogenous variable (caregiver stress). Consequently, based on the assessment of the R^2 of the endogenous latent variables of caregiver stress (.52) and social support (.69), it is concluded that the model has substantial predictive validity.

After the accuracy of the model was checked, the effect size of variables was analyzed that is the Fifth and last Objective of the research that aims to find out the variable that strongly predicts the stress of caregivers of cancer patients.

4.6.4. Assessment of Effect Size (f^2)

Having assessed the coefficient of determination of the endogenous constructs, the next criterion assesses the effect size (f^2) as suggested by Hair Jr. et al. (2013). Effect size is the difference in R^2 between the main effects when particular exogenous construct is in the model and when it is omitted from the model. In other words, f^2 measures the strength of one exogenous construct in explaining a certain endogenous construct in terms of R^2 . According to Cohen (1988), f^2 values of 0.35, 0.15 and 0.02 are considered large, medium and small effect sizes respectively. However, Chin, Marcolin and Newsted (2003), stress that even the tiniest strength of f^2 should be considered to influence endogenous variables.

$$f^2 = \frac{R^2 \text{ Included} - R^2 \text{ Excluded}}{1 - R^2 \text{ Included}}$$

In this study, the effect size for the exogenous construct found to be statistically significant to affect the endogenous variables. The result in Table 4.10 shows the effect size of the particular exogenous construct on the respective endogenous construct. The result indicates that most of the exogenous constructs have small effect size on their respective endogenous construct. Whereas, agreeableness has a medium effect on the caregiver stress.

Table 4.10
Effect Size (f^2)

Variables	CS	Effect size
AGR	0.161	Medium
CONS	0.012	Small
EC	0.004	Small
EXT	0.005	Small
NEU	0.005	Small
OPEN	0.000	-
PC	0.003	Small

Note: AGR=Agreeableness, CS=Caregiver Stress, CONS=Conscientiousness, EC=Emotional Caregiving, EXT=Extraversion, NEU=Neuroticism, OPEN=Openness, PC=Physical Caregiving, SS=Social Support

The results of effect size (f^2) indicated that Agreeableness is the strongest predictor of caregivers' stress. This finding provided the answer of the fifth and last question directing to Objective Five that aims to find out the strongest predictor of caregivers' stress.

Table 4.11
Result of Hypothesis H6

Hypothesis	Decision
H6 Physical caregiving is the strongest predictor of caregivers' stress	Not supported

Table 4.11 indicates that H6 of the study is not supported as it stated that Physical caregiving was the strongest predictor. Conclusively, it was found that Agreeableness has a strong influence on the stress of caregivers as compared to any other variable under consideration of this study.

Following is the diagrammatic view (Figure 4.2) of structural model showing the items of the constructs and their t-statistics values.

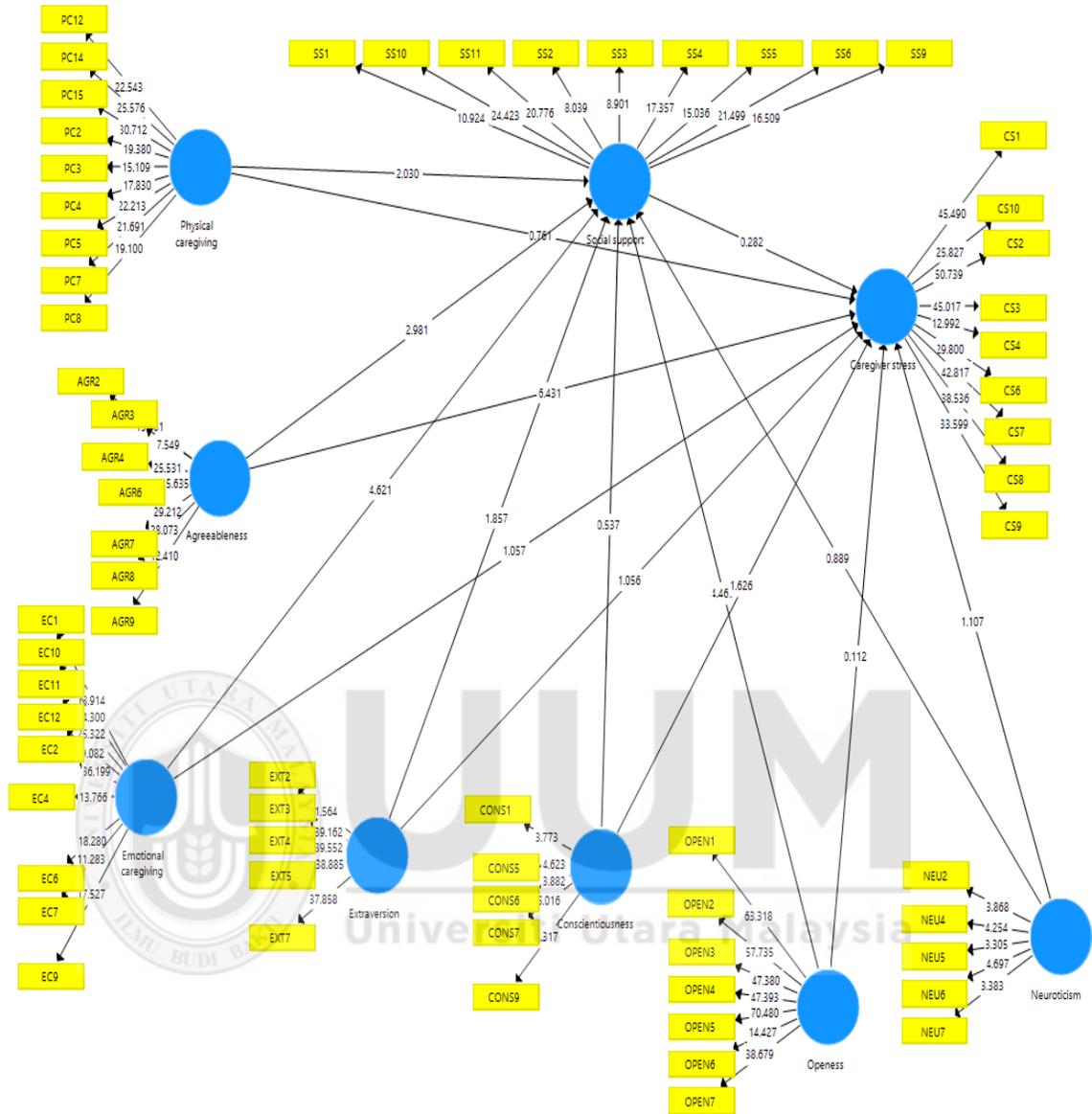


Figure 4.2 Structural Model showing t-statistics

4.12 Recapitulation of the Study Findings

	Statement of Hypotheses	Results
H1	Caregiving and stress of caregivers of cancer patients	
H1a	There is a significant correlation between physical caregiving and stress of caregivers of cancer patients	Not supported
H1b	There is a significant correlation between emotional caregiving and stress of caregivers of cancer patients	Not supported
H2	Types of personality and stress of caregivers of cancer patients	
H2a	Neuroticism is significantly related to high level of stress	Not supported
H2b	Extraversion is significantly related to low level of stress	Not supported
H2c	Openness is significantly related to low level of stress	Not supported
H2d	Agreeableness is significantly related to high level of stress	Supported
H2e	Conscientiousness is significantly related to higher level of stress	Supported
H3	Social support and stress of caregivers of cancer patients	
H3a	There is a significant relationship between social support and stress of caregivers of cancer patients	Not supported
H4	Social support as a mediator between caregiving and the stress of caregivers of cancer patients	
H4a	Social support mediated the relationship between physical caregiving and the stress of the caregivers of the cancer patients	Supported
H4b	Social support mediated the relationship between emotional caregiving and the stress of the caregivers of the cancer patients	Supported
H5	Social support as a mediator between types of personality and stress of caregivers of cancer patients	
H5a	Social support mediates the relationship between neuroticism and the stress of caregivers of the cancer patients	Not supported
H5b	Social support mediated the relationship between the extraversion and the stress of caregivers of the cancer patients	Supported
H5c	Social support mediates the relationship between the openness and the stress of the caregivers of the cancer patients	Supported

Table 4.7 continued

H5d	Social support mediated the relationship between the agreeableness and the stress of caregivers of cancer patents	Supported
H5e	Social support mediates the relationship between the conscientiousness and the stress of caregivers of cancer patients	Not supported
H6	Caregiving is the strongest predictor of stress among caregivers of cancer patients	Not supported

4.8 Summary

This chapter presents the statistical analysis of quantitative data collected through questionnaire distributed in eight cancer hospitals in Punjab, Pakistan. The chapter presents the results of the research questions of this study. The descriptive statistics was carried out using SPSS v23 to give the profile of caregivers and to examine the level of caregiving, personality, social support and stress of caregivers that fulfilled Objective One. Further, multivariate analysis was carried out through PLS-SEM in order to test the formulated hypothesis. Direct relationship among variables was examined that presented the results of Objective Two. Additionally, mediation test was analyzed that fulfilled the Objective Three and Four of this study. Finally, for achieving the research Objective Five, the effect size was examined followed by the summary of results of hypothesis.

CHAPTER FIVE

DISCUSSION, RECOMMENDATION AND CONCLUSION

5.1. Introduction

This chapter presents the discussion of all the findings in detail. It focuses on reviewing the research results and their reflection and consideration according to the outcomes of the research while discussing those findings with previous researches. The inferences of findings, its limitations and suggestions for further studies are also incorporated in this chapter. This research tested hypothesis in order to recapitulate, by seeking the correlation, differentiation and influence of all independent, mediating and dependent variables.

5.2. Discussion of the findings

The subsequent chapter provides a concise review of the previously recapitulated findings of the research according to the proposed research questions. A thorough elaboration of the findings is provided. In addition, discussion of each construct is done that is directed to answer all research questions, ultimately, addressing the research objectives. Since, a Stress Process Theory was the main underpinning theory of this study, the discussion will be directed in accordance with that theory.

5.2.1. Level of aspects of caregiving, dimensions of personality, social support and caregivers' stress.

The first objective of the study was to investigate the intensity level of aspects of caregiving, dimensions of personality, social support and caregivers' stress. Descriptive statistical analysis was performed to answer the first research question that directly fulfilled the first research objective. Caregiving aspects, personality and social support were measured on five-point formatted Likert scale while caregivers' stress was measured on three-point formatted Likert scale.

In the present study, the caregivers identified their own health problems where average score for majority of caregivers was above half point in a range of possible scores. The findings indicated only fair to good mental health of caregivers who are continuously providing care to their children suffering from cancer. According to Beattie and Label (2011), individuals dealing with the health concerns of a sick child as well as their own health problems bears "double burden". As a result, a caregiver can possibly experience more stress due to exerting more energy. This stress, according to Martin and Keats (2014) is perceptual and its symptoms can be examined and restrained by the caregiver.

Maintaining the stress level of the caregivers while providing a care to the chronically ill children and adolescents is definitely a strenuous task especially when the caregiving demands are high. Therefore, managing stress in the caregivers would be quite difficult and complicated. While seeking the other crisis associated with the act of caregiving, it is pertinent to know how an individual preserves his/her own well-being.

This research disclosed some interesting upshots that exposed the unknown factors of caregivers. Once they opt the caregiver role, how they manage to deal with the daily stress by staying physically and mentally sound is imperative.

Therefore, question one attempted to examine the presence and level of aspects of caregiving, personality dimensions and social support. Manifestation of these constructs would suggest relevance of the problem statement of the study.

The findings of Objective One revealed the significant presence of all constructs under consideration of the study. The level of these constructs was gained by following the mean values of physical caregiving as moderate and emotional caregiving as high, whereas extraversion and agreeableness were at high level and conscientiousness, neuroticism and openness were at moderate level. Additionally, social support was also at high level but caregiver stress was found to be at moderate level.

The manifestation of both physical and emotional caregiving at moderate and high level confirmed that these constructs are sensitive in producing stress in caregivers. Besides, the results also implied the presence of personality in examining the caregivers' stress as individuals are prone to stress varying on their personality traits. Additionally, high level of social support available to the caregivers was also found to be linked with the stress of caregivers.

During the survey, it was found that stress was associated with the caregiving process. Every caregiver was experiencing stress to a certain level. Therefore, most of the caregivers were mentally prepared to experience this stressful situation. Stress Process Theory suggest that stress may be perceived both as a challenge or a crisis (Pearlin et

al., 1990). The caregivers may accept the stressors as a challenge to overcome or may perceive them as a catastrophe.

Perceiving the stressors as a challenge suggests that with the passage of time, caregivers have made constructive efforts to manage the stressful situation that redefines their entire situation (Cousino & Hazen, 2013). This explanation of perception of stress may dichotomize stressors artificially as a challenge or crisis. However, this perception appears to be subjective as every caregiver interpret an event differently which is occurring in a caregiving situation.

The existence of factors such as physical and emotional caregiving proved that perception of caregiving process is associated with the stress of caregivers. This is also described in the Stress Process Theory (Pearlin et al., 1990) that each factor is associated with the other and are interrelated with each other. Changing the one stress related factor can cause a change in another factor. In this case, caregiver's act of providing physical and emotional care combined with the perception of challenge or crisis may alter their mental health by reducing or increasing stress respectively.

However, the subjective perception of the stressors may obstruct measuring the cognitive pattern of each individual. Even if stressors are perceived as a challenge and a caregiver cope well with the stressors, there is a possibility that caregiver of patient with chronic illness might not recover well from crisis and stressful situation (Marcusen, 2010). Therefore, question one was also aimed at exploring the level of personality and its dimensions as well. The findings implied that the presence of personality traits such as agreeableness at high level may prone the caregivers to high level of stress. These

personality traits molded the adjustments of caregivers during a caregiving process depending on their individual dominant personality trait (Finch et al., 2012). Essentially, stress level of each caregiver was interrelated to their personality type.

Presence of personality as a significant factor in a caregiving process as explained through five domains which were neuroticism, extraversion, openness to experience, agreeableness and conscientiousness indicates the importance of personality in controlling and maintaining the stress of caregivers. Therefore, it is essential to consider personality as a potential factor while examining the stress of the caregivers.

Besides physical and emotional caregiving as well as personality, the presence of social support was also part of question one. Stress Process Theory (Pearlin et al., 1990) suggested the presence of coping mechanisms or the mediating variables that can help in dealing with the chronic stressors. Therefore, social support was considered as a mediating variable in this study. Findings indicated that when caregivers have sufficient psychological, social or interpersonal support, they cope with the stressful caregiving situations very well. Social support in previous studies (Djundeva et al., 2015; Garipey et al., 2016; Thoits, 2011; Wang et al., 2014) was found to be a strong coping mechanism.

Moreover, moderate level of stress is in line with the previous studies conducted by Greening et al. (2007) and Jurbergs et al. (2009) in which stress level of caregivers was found to be in low to moderate range. In addition, Marcusen (2010) and Ansa and Mahmood (2014) also reported moderate levels of stress in caregivers of cancer patients. This indicates that all caregivers experience stress but the level of stress varies depending on the individual or situation.

Conclusively, in compliance with the caregiving situation and factors associated with the caregiver's stress, it was found that aspects of caregiving and dimensions of personality and social support are potential factors affecting the stress of caregivers.

5.2.2 Correlation of aspects of caregiving, dimensions of personality and social support with stress of caregivers

The results were meant to accomplish research Objective Two of the present study. Objective Two aimed to analyze the direct influence of physical and emotional caregiving, dimensions of personality and the social support on the stress of caregivers. The findings indicated no direct association between the physical caregiving and emotional caregiving with stress. Whereas, in personality, agreeableness and conscientiousness were found to be directly related to the stress of caregivers while no direct relation was found between extraversion, neuroticism and openness. For social support, it was also found to be not directly associated with the stress of caregivers.

Overall, out of all the hypothesis (H1a, H1b, H2a, H2b, H2c, H2d, H2e and H3a) proposed to examine the direct relation of the independent and mediating variable with the dependent variables, only two were accepted. This landed support to the Stress Process Theory of Pearlin et al. (1990) and attenuating prerequisites prior advancing analysis on possible mediation that intervened constructs relationships in the study. Therefore, the manifestation of the findings of direct relationship are preceded by the analysis of the mediation. Following are the interpretation of the findings of the direct relationships.

5.2.2.1 Aspects of caregiving and stress

The finding of hypothesis H1a revealed that physical caregiving and emotional caregiving are not directly related to the stress of caregivers. The findings stands in stark contrast with the previous studies (Bevans et al., 2012; Collins & Swartz, 2011; Marsland et al., 2013) that presents the strong relationship between these variables.

Caring for a child or adolescent with cancer has been linked to the proliferation of stress of caregivers (Martin & Keats, 2014) where level of burden tends to decline the mental health of the caregivers. Regardless of this pattern, outcomes with greater diversity are exhibited by caregivers in which they experience varying degrees of stress in similar situations. The present study considered the influence of Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs) and emotional support on the stress of caregivers and found some contradictory results as compared to the previous studies.

In particular, the physical demands and the emotional demands of the care receivers were found to be related with the higher degree of stress in caregivers. Cross-sectional studies have identified influence of providing instrumental and emotional caregiving on despair, role conflict, life satisfaction, and psychological health (Djundeva et al., 2015). On contrary, null effect or deleterious effects of informal assistance on caregiver stress has been found by other researcher (Anehensel et al., 1995). The reported effects of emotional assistance on caregiver distress are also equivocal. Although some researchers have identified an association between informal caregiving and lower levels of caregiver strain (Kudubes, Bektas, & Ugur, 2014) other researchers have reported mixed or null effects

(Grover & Dutt, 2011). The findings of this study also showed no association between the stress and physical and emotional caregiving.

The findings of this study may be inferred by the fact that act of instrumental and emotional caregiving may appear ineffective in increasing stress or this physical or emotional assistance may not appear as stressors to the caregivers. In support to this, Ensel and Lin (1991) proposed an independent stress deterrent model, in which stress of an individual is affected individually by stressors with no relationship between stressors and outcomes. Aneshensel and colleagues' (1995) work supports the independent stress deterrent model, which added to support the findings of this study that physical and emotional caregiving may not appear as stressors and does not play a significant role in stress of caregivers.

Furthermore, it may be supported by the fact that most of the caregivers were married females who were already providing physical assistance while staying at home to all the family members. As well as, in Pakistan, women are mostly housewives that stays at home and perform all Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs). Therefore, when it comes to the caregiving of their sick child, they might not feel burdened due to the excessive physical demands of the caregiving. This helps in maintaining their stress level as stated by Wilborn-Lee (2015) where caregivers take their role as challenge and cope well with the stressful situations.

Further, in support to the outcomes of these hypothesis, significant differences has been found regarding the caregiving role of the Pakistani caregivers as compared to those of any other countries. For the caregivers in Pakistan, these physical and emotional

caregiving demands may not be burdensome because of the societal norms regarding the care for a sick individual. In Pakistan, caregiving at home is a strong cultural imperative act (Ansa & Mahmood, 2014) and is viewed as the inherent part of the role of a family. This is further reinforced by the view that dependent state of the child or adolescent is accepted by the caregivers and therefore, they may not feel stressed.

Moreover, the outcomes of this study in relation between caregiving and stress is supported by the previous study by Kruithof, Visser-Meily and Post (2012) in which the same Caregiver Strain Index was used to assess the caregivers' stress. This study also reported weak association between caregiving experiences and stress of caregivers. Hence, it can be assumed that Caregiver Strain Index can be improved by adding either more questions or more categories to answer, for example a 5-item Likert scale ranging from strongly disagree to strongly agree may provide a significant association between caregiving demands and stress of caregivers (Kruithof et al., 2015).

Apart from this, results showed different distribution of item response, the negative answers were significantly low in percentage in study population. This directs that population under the study has less negative and more positive caregiving experiences. The strengths of the correlations of the Caregiver Strain Index with the reference measures in this study are in line with the literature (Visser-Miley, Post, Riphagen & Lindeman, 2004). However, several explanations can be suggested. First, as mentioned above, the scale consists of three-point scores that limits the opportunity to identify variability of caregiving experiences. Secondly, the population under consideration of this study was an average hospital population and comprised of caregivers who were providing care to

children with cancer from a short time period resulting in population with less negative caregiving experiences.

Additionally, the absence of significant association between physical and emotional caregiving and stress of caregivers may be partly explained by the fact that the Modified Caregiver Strain Index (MCSI) only focused on individual caregivers. Additional factors such as personal or internal resources as well as patient's severity of illness and degree of incapacitation may affect caregiver's stress.

Moreover, literature has also identified several other factors that affect the wellbeing and the health of the caregiver including demographic profile, socioeconomic status and other specific characteristics of the caregiving situation. However, studies provided varied effects of caregiving situation on a caregiver with some finding worse effects (Litzelman et al., 2011; Narayan et al., 2015) while others presenting positive effects when multiple other aspects of caregiving situation were considered (Carbonneau, Caron & Desrosiers, 2010). Therefore, it can be accounted that besides physical and emotional caregiving, there might be other factors influencing stress of caregivers.

5.2.2.2 Dimensions of personality and stress

Hypothesis 2 (2a, 2b, 2c, 2d, 2e) predicted that personality traits such as neuroticism, agreeableness and conscientiousness are concomitant to higher levels of stress while extraversion and openness are associated with low levels of stress. However, the present study revealed some of the contradictory findings to the previous research. The contradictory result was on the absence of correlation between stress and the personality

domains which are neuroticism, extraversion and openness to experience whereas agreeableness and conscientiousness presented positive association with the stress.

Although contradicting to the findings on the correlation of stress and personality domains for general population as highlighted by previous research (Atherton et al., 2014; McCrae & Costa, 2003; Weston et al., 2016), yet this finding corresponded with Melo et al. (2011) when the finding proved the existence of correlation between personality traits and burden, depression and distress of caregivers.

According to McCrae and Costa (2003), neuroticism is the tendency to be more disposed to the psychological stress. It was found previously that caregivers exhibiting more neurotic traits were less likely to cope with the caregiving demands and experience more stress. In addition, individuals with neurotic personality trait may be more stressed due to their inability to manage their emotions that make them feel negative and guilty, which ultimately hinders their ability to cope well (Eloise et al., 2013). But for this study, the results indicated the absence of relation between neuroticism and stress.

In a research by Hampson (2012) on the personality process, it was demonstrated that neuroticism and stress is not significantly associated with each other rather their association varies according to the individual as well as situations. Similarly, Gonzales-Abraldes et al. (2013) in an exploratory study of influence of neuroticism on burden of caregivers explained that the association between these two depends on the situation of caregiving and the available resources to the caregivers. In consistent to this, the findings of the current study may not be considered to fully deviate with the existing literature on relationship between neuroticism and stress.

Moreover, as demonstrated by the present study, neurotic personality is not linked with the stress of the caregivers. It is supported by the previous studies of Duxbury, Higgins and Smart (2011) and Perz, Ussher, Butow and Wain (2011) in which demographic characteristics of caregiver such as age, gender, employment and socioeconomic status were found to be significant factors in measuring caregiver's quality of life. Findings demonstrated that age and quality of life of a caregiver were positively related as caregiver with the passage of time, become habituated to the caregiving demands, therefore, considering the situation less stressful (Garlo, Leary, Van Ness, & Fried, 2010).

Besides, caregivers of cancer patients are well aware of their duties of providing physical and emotional care to the sick children and tries to cope well with the stressful situations where their neurotic personality would not be surfaced to make them feel stressed. It increase the possibility of caregivers to easily develop stress coping strategies that shape their mental health while caregiving (Lockenhoff et al., 2011).

Moreover, the absence of relationship between extraversion and stress also raise questions. Particularly, individuals with extraversion personality trait are optimistic and jovial (McCrae & Costa, 2003) therefore, they are more expressive than the individuals with neurotic personality trait. When faced with caregiving demands, extraverts may express good coping skills and therefore, not prone to the stress. Their extraversion personality trait helps them tackle all caregiving demands well and therefore, does not make them stressful.

Another reason of absence of correlation between extraversion and stress of caregivers may be that extrovert individuals are more expressive and outgoing therefore, they

employ active coping skills such as problem solving and seeking alternate ways to deal with the stressful situations. Extroverts are motivated to seek stimulation by cultivating interesting activities and seeking out companionship. This supposition is also supported by Reynolds and Livingston (2012) who in their study reported that extroverts are imaginative, emotionally different as well as behaviorally flexible and can survive better than any other personality trait individuals.

Additionally, extraverted people tend to be optimistic and feel comfortable in the presence of others. People who are higher in extraversion tend to have a more positive outlook on life. A factor termed “optimistic control,” characterized by optimistic expectation for life outcomes, positive self-esteem, hope, and internal control, is positively correlated with extraversion (Roohafza, Sadeghi, Shirani, Bahonar, Mackie & Sarafzadegan, 2009).

Additionally, positive affect has been shown to underlie thoughts about the future more than negative affect (Hoerger et al., 2016) which may impact how individuals higher in extraversion judge the possibility of future health declines. Given that middle aged and older people may assume their health deterioration with the passage of time and that caregivers are more prone to such deterioration, caregivers low in extraversion may judge their health more accurately (Sorenson, Hirsch, & Lyness, 2014).

In contrast, individuals with high extraversion trait may overlook the signs and symptoms of disease and fail to report these to physicians. Although a positive outlook on life has many physical and mental health benefits (Cloninger, 2004), some studies suggest that unrealistic optimism about the future in the face of vulnerability to health issues may

undermine specific risk reduction behaviors (Shepperd, Klein, Waters & Weinstein, 2013).

Moreover, the communicative and socially active nature of extroverts help them air their grievances rather than letting them fester. People who let off steam in this way probably suffer less from intense consequences of taxing situations (Eliose et al., 2013). Therefore, in the caregiving situation, it would not be wrong to say that extroverts enjoy better health because they are widely believed to protect themselves against the ravages of psychological stress.

Furthermore, in this study, openness was also found to be not correlated with the stress of caregivers. Although high level of openness in experience was generally advantageous to the individuals, this trait is often applicable for certain kinds of tasks within caregiving context. Moreover, in some aspects, the trait interfered with the work of an individual especially if an individual is providing care to the sick children at home. Therefore, relevant to caregivers and their nature of work, openness to experience personality would not be appropriate.

This was because caregivers' job should adopt low openness to enable them to deal with the caregiving tasks or conversely, caregivers being open to the experiences may help them deal efficiently with the caregiving situations (O'Connor, 2015). Additionally, blending caregivers' nature of work with the openness to experience personality with factors such as openness to fantasy, aesthetics, feelings, actions, ideas and values may enable caregivers to engage themselves so they do not experience stress related to the caregiving situation.

As caregivers, people were set in their ways and were traditional in their values. Besides, the higher openness to experience of a caregiver would lead him/her to experience both positive and negative emotional states. McCrae and Costa (2003) also stated that unpredictability and lack of focus is connected with high openness. It is because caregivers with this personality trait are more open and vigilant to experiences and challenges associated with the caregiving demands. Therefore, in the caregiving situation, the possibility of dealing well with the strenuous demands by the openness to experience personality is higher. In tandem with their nature of work, it would be appropriate for caregivers to conduct themselves accordingly.

Further, the present study discovered similarity of finding compared to previous research specifically on the correlation between stress and personality domains which were conscientiousness and agreeableness (McCrae & Costa, 1987). This present study discovery insinuated previous findings by Lockenhoff et al. (2011) and Atherton et al. (2014) and was supported. Lockenhoff et al. (2011) explicitly defended conscientiousness as among the predictors of health based on his extensive amount of personality trait research.

Meanwhile, Hampson et al. (2015) supported on positive correlation between health behavior and personality domains particularly conscientiousness. In addition, McCrae and Costa (2003) asserted that conscientiousness would enable an individual to encounter work demands constructively which in turn linked to the wellness of an individual. However, in the present study, stress is found to be positively correlated with conscientiousness personality trait. Therefore in the case of caregiving, traits under conscientiousness personality such as cautiousness, dutifulness and orderliness were

among the essentials to caregiving demands and are assumed to enhance the stress level of caregivers.

Researchers were also able to conclude that caregivers who had the personality trait of conscientiousness were more organized and self-disciplined. These are traits that are linked to taking positive, health-promoting actions. Caregivers who scored high in conscientiousness were also more confident in their abilities and felt competent in their caregiving roles. It has been suggested that this contributes to lower rates of depression and an overall sense of mental well-being in the face of caregiving challenges.

In addition, Lockenhoff et al. (2011) stated that conscientiousness and caregiver strain were correlated with subjective mental health as these traits ensured them the satisfaction of fulfilling caregiving demands appropriately. Similarly, Chapman et al. (2011) found negative correlation between conscientiousness and parenting stress. However, the data for this study, indicated that caregivers with conscientious personality trait are more prone to stress.

Further, it is supported by the fact that caregivers with conscientious personality are more focused on the task at hand and spend more time in order to ensure that it is completed appropriately along with other demands of caregiving. Moreover, this greater focus on the fulfillment of caregiving demands and fear of not properly performing the caregiver role may raise the stress level of caregivers. Therefore, a conscientious individual may be more stressed due to multiple caregiving demands because their focus is on completing the required task rather than being indulging in any other constructive activities.

Lastly, hypothesis of this study stated that caregivers with the agreeableness personality trait have high level of stress. Lockenhoff et al. (2011) reported that agreeableness and stress are negatively correlated where individuals with this personality trait copes well with the stress. Whereas, the findings of this study reported that there is a positive correlation between agreeableness personality trait of a caregiver and stress. As such it can be inferred that the caregivers may have viewed themselves as the main source of providing care that is why they have to perform every task related to the caregiving.

Moreover, the contradicting finding on the positive correlation between agreeableness and stress may be mainly due to the caregiving situation. This ground for negative correlation result may be mainly due to the strenuous demands of caregiving. While providing care, individuals are more vulnerable to stress because they agree to perform and accomplish their all caregiving tasks in brief periods of time.

Under major apprehension, caregivers were also socially and internally scrutinized for the choices and actions they take while caregiving. Additionally, caregiving requires long hours of care and attention to any of the caregiving demands. Therefore, to effectively adjust with their kind of duties, these caregivers had to agree with what comes in their way. They restrained themselves from showing their true emotions and conducted themselves according to the nature of their work leading to the caregivers' stress (Lau et al., 2011).

In addition, once individuals have taken a role of caregivers, they become a different person due to the exigency of the nature of their work and caregiving demands that differed from the usual. Caregivers with the agreeableness personality traits have to show

trust, sympathy, altruism and morality to the patients during the caregiving process. This expression of emotions in addition to the caregiving demands might become tough for caregivers as they themselves are going through a stressful situation thus, making him/her stressed. In reality, due to the nature of their work, caregivers were less guarded and more affected by the psychological consequences of the caregiving.

Overall, caregivers with different personality traits had less tendencies to rate themselves low on their ability to perform their caregiving jobs. They reported better physical health and emotional well-being. Researchers could not rule out other factors such as age and other contextually relevant factors, but overall, the type of personality a person has can make caregiving less stressful, with less adverse health effects, because people with those personality traits tend to be more resilient in the face of challenging situations.

In summary, the findings of the hypothesis revealed that neuroticism, extraversion and openness personality traits are not associated with the stress of the caregivers whereas conscientiousness and agreeableness are the personality traits that are positively associated with the caregivers' stress.

5.2.2.3 Social support and stress

The hypothesis H3a of this study under Objective Two stated that there is a significant correlation of social support with the stress of the caregivers. It has been observed that family members who appears to take the caregiving role often experience physical and mental strain inherent to caregiving role. Whereas, their stress could be relieved due to the availability of social resources. Social support from formal or informal helpers has been explained as a way to lessen the effect of caregiving on stress of caregivers.

However, the finding of this study is in contradiction to the previous studies in caregiving in which social support appears to be significantly correlated with the stress experienced by caregivers. For the present study no significant correlation was found between social support and stress of caregivers.

These findings are in line with those of meta-analysis conducted by Casale and Wild (2012). In the analysis of studies on the association of social support and mental health, ten showed direct relationship while three showed indirect relationship of social support with health and four showed no association of social support and mental health of caregivers. Similarly, Guyard, Fauconnier, Mermet and Cans (2011) in the literature review also found low or no direct connection between social support and caregiver's stress.

However, the absence of relationship between stress of caregiver and social support is deliberated an unusual outcome in the literature (Al-Gamal & Long, 2013; Guyard et al., 2011). This result can be explained by the construct that ground the MOS-SSS, provided that the instrument inspects the perception of availability of multiple types of support to the respondent without considering the specific demands of caregiving.

Literature has suggested that the stress is caused by the alterations in life plans of caregivers accompanied by low self-esteem and financial difficulties as well as the high levels of investment required by the illness of a child (Dantas, Pontes, Assis, & Collet, 2012; Polita & Tacla, 2014). Additionally, these factors develop the feelings of incompetence to care for a child properly which lead to the dissatisfaction of caregiver with the caregiving role (Ribeiro et al., 2014). Considering the stress as the risk factor for

both caregivers and care receivers, then the perceived social support acts as a protective factor, provided that scores on instrument were high; this finding is parallel to that reported by Pfeifer et al. (2014).

Even though respondent were found to be contended with the available social support, still it does not seem to reduce the caregiver's level of stress. The high scores exhibited by the social support instrument indicates that the participants are loved whenever they need to. However, according to Lima, Afonso, and Silva (2015), availability of a person who can provide this type of support does not guarantee that the affection and understanding required by the respondent is provided because that person may not always be the one who the caregiver would like, generally his/her spouse. The support from the spouse seems to be an important element in family dynamics because absence of support from a spouse is associated with clinical stress.

Moreover, an assumption could be made that caregivers were satisfied with the type of support that they were asked to evaluate. However, a specific support demand like sharing care related tasks may be analyzed inadequately and may have compromised the analysis of influence of social support on stress of caregivers. Additionally, although available social support was high, considerable ratio of caregivers (approximately 33 percent) from item analysis were found to have no one available to share worries and to provide emotional comfort.

Furthermore, it may be inferred that stress, as an emotion, may not respond to the provided social support by informal social networks. However, it is evident from the data of the present study that there is absence of strong direct relationship between social support and

stress. It is noticeable that stress of caregivers of cancer children is related to the satisfaction and perception of social support (Kong et al., 2013; Palos et al., 2011; Lima et al., 2015). The outcomes of the present study indicated that availability of social resources particularly from the family seems to be adequate but does not influence the stress of caregiver directly.

Knowledge about the mechanism of correlation may raise a question of whether influence of support varies for different diseases and behaviors. According to Smith et al. (2015), it is still unclear in literature of health and social support that which aspects of support are important to what kinds of situations. Future research should try to distinguish whether the knowledge of availability of support is influential or the actual occurrence of supportive exchanges for self-management behavior. It could be speculated that actual support is beneficial when disease-specific support is required whereas perception of social environment might be advantageous to more general kinds of support for self-management. Adding to it, more attention should be given to the individual differences in amount of support required and whether the provided support matches those requirements.

5.2.3 Mediating effect of social support

In this section, the researcher conferred and deliberated discussion focusing at Objective Three and Four of this present study. Objective Three aimed at proving the mediating effect of social support on physical and emotional caregiving while Objective Four aimed at providing the mediating effect of social support on dimensions of personality.

The result based on the modified model revealed that social support had noteworthy effect on the aspects of caregiving and dimensions of personality as well as stress. Social support is the factor that mediated relationship between aspects of caregiving and stress of caregivers. On other hand, relationship between few dimensions of the personality such as agreeableness, extraversion and openness and stress is also mediated by the social support. The significance of path coefficients between physical caregiving and emotional caregiving as exogenous variables, social support as mediating variable and caregivers' stress as endogenous variable suggested significant support for the Hypothesis H4a and H4b respectively.

Likewise, significant path coefficient between Extraversion, Openness and Agreeableness as exogenous variables, social support as mediating variable and caregiver's stress as endogenous variable supported the Hypothesis H5b, H5c and H5d respectively whereas no mediating effect of social support was found between Neuroticism and Conscientiousness and stress of caregivers that indicated that H5a and H5e were not supported.

The findings of this research had successfully established the existence of social support as a mediator. This present study supported previous research on the importance of social support as a mediator in maintaining better mental and physical health of caregivers (Compas et al., 2012; Navneet Kaur, 2014; Rafiyah et al., 2011). As mentioned earlier, two objectives were established considering the mediating effect of social support therefore, Objective Four and Objective Five are explained separately in the succeeding section.

5.2.3.1 Social support as mediator between aspects of caregiving and caregiver's stress

In a caregiving situation, caregivers experienced significant stress each day to balance the caregiving demands and the routine activities (Ellis, 2012). Due to continuous demands of caregiving, caregivers can get exhausted and experience extreme levels of stress as they are not adequately equipped with the proper training (Long & Marsland, 2011; Ugalde et al., 2013). However, individuals with high level of social support would be able to endure problems encountered during caregiving process. Social support acts as a stress-buffering factor in shaping better mental health of caregivers.

Previously, the role of social support and its effect on caregivers has been abundantly explored. Social support has been considered as a way to reduce the negative effects of caregiving. Therefore, it was postulated that relationship between demands of caregiving and stress of caregivers would be mediated by the social support. Thus, the hypothesis was supported as social support in this study was found to be significantly mediating the relationship between caregiving and stress of caregivers.

In the current investigation, evidence for the mediating effects of social support, mainly in analyses focused on the caregiving demands and stress of caregivers was found. The results directed that the presence of social support may influence the stress level of caregivers which is in consistence with the finding of general literature on stress that is experienced in caregiving situation (Hill et al., 2014; Juarez et al., 2014; Thoits, 2011). Consistent with predictions, it was also found that to be certain about the availability of support when required reduces the otherwise deleterious effect of stress on caregivers.

From the findings, it can be inferred that high level of social support provided to the caregivers makes them less reactive to the stressors occurring in their environments as compared to the caregivers having low level of social support. As predicted, the results of present study further revealed that caregivers with more social support had sustained the stress related to the caregiving situation whereas those with low social support had decreased situational control (Wang, 2014). Collectively, these potential findings are parallel to the previous longitudinal and cross-sectional studies in which social support as a mediator between caregiving demands and well-being of individuals was assessed at one point in time (Arffman et al., 2012; Munsell et al., 2012; Navneet Kaur, 2014).

Additionally, findings indicated that there is a significant impact of social support includes both perceived and actual emotional and instrumental support. Presence of social support to caregivers while providing instrumental/physical care such as regularity in medication, adherence and frequent visits to health care centers has been considered to positively affect the caregiver's mental health (Gjesfeld et al., 2010). It could be argued that instrumental support is vital during caregiving process that focuses on caregivers. For instance, in caregivers of cancer patients, Palos et al. (2011) determined that instrumental support to caregivers enhance the coping ability of caregivers. This would advocate that effect of social support on caregiver's stress is attributed to be more effective when the support provided is instrumental or physical.

Moreover, according to Uchino (2004), emotional support such as social attachment and able to discuss or share decisions and fears with another person may also be a component of social support (Uchino, 2004). Indeed, Driscoll et al. (2010) established that high level of perceived social support was linked to the increase in survival rate up to 24 months.

Similarly, Reich et al. (2010) described the significant correlation of functional aspects of social support with the less stress and better quality of life among parents of children with chronic illness. Subsequently, it was affirmed that social support is a potential buffer that leads to better coping and consequently better health outcomes.

Further, mediating model (Uchino. 2004) perceives that social support is a factor that helps in changing the way in which illness of a patients is appraised by the caregiver as well as it alters the activities of a caregiver. Mediating model further assumes that social support is effective under high levels of stressors which indicates that strength or direction of the relationship between stressors and stress of caregivers is effected by social support (Baron & Kenny, 1986). In support to this, Garipey et al. (2016) in his study found that various dimensions of social support directly effect on psychiatric disorder. While some of the connotations were across high levels of stress, others were significantly for mothers with low stress levels (Sonnenberg et al., 2013) which suggests that effect of high level of stress on mental health may be too large to by stand the impact of support.

Similarly, Holt-Lunstad et al. (2010) indicated that satisfaction with social support was associated with less self-reported stress. Kim and Knight (2008) also found the correlation between higher levels of support with the lower levels of stress. Consequently, it was postulated that stability of network is important while determining the influence of social support rather than only considering the effects of presence of social support on caregiver's mental health.

Likewise, Family Caregiver Alliance (2011) also suggested that loyalty and strong social bonds among families may buffer and support caregivers. Burden of caregiving may be

influenced by the strong bonds especially if responsibilities of caregiving are distributed among family members. Furthermore, Knight and Sayegh (2010) pointed that structural differences observed in caregiver networks are brought by the ethno cultural factors, thus affecting the availability and opportunities of support and sharing of caregiving tasks. Informal support is still a vital factor in mediating the burden of caregivers. As in all Asian cultures, the value of family over an individual is always emphasized, thus sense of identity and emotional well-being of an individual are closely tied to the family. Needless to say, family is the only significant source of providing support to the caregivers of chronically ill children and adolescents.

Moreover, as compared to many other countries, Pakistan has few treatment home institutions, where the existing ones are not affordable by many. Therefore, the traditional structure of extended families and reliance on family members for caregiving has increased the burden of caregiving, consequently leading to the poor mental health of caregivers. Nevertheless, if an informal care is taken as the source of fulfilling increasing care needs, a government should devise policy that can promote and encourage informal caregiving in the society.

However, social support is a multidimensional concept and empirical work has shown that not all dimensions have equal importance for health outcomes. For example, functional properties of support such as types or quality of support has been found to be more important than the structural aspects of support like size of social network (Polita & Tacla, 2014) especially with regard to stress-buffering. In addition, actually received support is less likely to be linked with mental health as compared to the perceived availability of social support (Dantas et al., 2012; Lima et al., 2015). Effects of social

support on caregiver health are also relevant to child well-being, as caregiver health has been associated with better child and parent health (Knight & Sayegh, 2010). Thus, a comprehensive understanding of association of social support and caregiver health is required in order to promote better health policies and interventions, especially for caregivers of cancer patients. However, this area has remained vastly under-explored in Pakistan.

5.2.3.2 Social support as mediator between dimensions of personality and caregiver's stress

One of the main goals of the present investigation was to examine the association between personality and stress of caregivers of children and adolescents with cancer. An important next step was to extend these findings by examining mediators of the association, such as social support. Given that personality has prognostic implications for a variety of health outcomes and the mounting evidence for the role of personality in health and longevity (Chapman et al., 2011; Chapman, Weiss, Fiscella, Muenning, Kawachi & Duberstein, 2015), it is important to explore ways to assess personality in clinical settings in order to target and tailor efforts to modify potentially inflated or deflated misperceptions of one's own health. Understanding the mediating factors that contribute to perceived health threats among caregivers can help prevent the commonly observed negative effects of caregiving.

Personality, in relation to social support may plays a vital and indirect role in affecting stress of caregivers. Significant relationships between personality and social support with health outcomes have been shown in number of studies. Although, there are various ways

in which social support was operationalized both structurally and functionally, there is evidence on the presence of social support that is most crucial in predicting the buffering effect of social support on stress (Casale & Wild, 2012; Navneet Kaur, 2014). The stress-buffering hypothesis (Cohen & Wills, 1985) is established by the findings that adverse changes in psychological functioning associated with stress are mitigated by the positive interpersonal relationships.

Existing studies on the social support of caregivers showed that perceived support is a significant factor in self-reported health (Lima et al, 2016). This is in agreement with literature indicating that perceived adequacy of social support ease the burden of caregiver (Pfeifer et al., 2014; Rebiero et al., 2014) and becomes worst when support is insufficient. A point not often discussed is that personality can influence stress when mediated by social support (O' Connor, 2015). Thus, an indirect pathway through which personality relates to stress in presence of social support was tested as the Objective Four of this study.

Taken together, the findings of role of mediators in present literature is parallel with theoretical models of the caregiver stress process (Pearlin et al., 1990). However, the subsets of personality traits that typically includes neuroticism and their effects on mental health were the focus of most studies. While studying the relationship of personality with stress in particular, mostly conscientiousness and neuroticism were mainly considered to be associated with stress (Lockenhoff et al., 2011; O'Connor, 2015). Hence, in the present study, all Big Five personality traits have been considered. The observed associations of the findings between caregiver personality and stress in presence of social support as a mediating variable congregate with those found in the general population.

Sometimes, it is said that mental health is affected by personality as it is the sources of channeling experiences encountered by an individual; partly this effect of personality on mental health is due to its linkage with social support. Abundantly, studies has shown the correlation of social support and mental and physical health (Cohen & Wills, 1985), but how it operates is still to be explored. Caregiving has mostly studied in relation to chronic diseases which leaves caregiver with a lifetime of experiences that affects how one deals with stress.

It has been indicated by past efforts that certain personality traits that have been inherited assist in making individuals more susceptible and resistant to distress and its disadvantages. Particularly, neuroticism and conscientiousness that appears to be more protective traits are linked to different interpretations of stimuli by taking it as eustress or distress, challenging or threatening. It is believed that conscientious personality trait takes stimuli as challenging due to providing rational solution whereas neuroticism trait apprehends stimuli as distressful and threatening because of its association with adverse reaction (Chapman, Hampson & Clarkin, 2014).

Inconsistent with prior studies, the relationship between neuroticism and conscientiousness with the stress of caregivers is not found to be mediated by social support provided to the caregivers. Previously, even though coping was found to mediate the correlation of conscientiousness and neuroticism with mental health, but analysis of the present study suggest that for examining the relation between neuroticism and conscientiousness with stress of caregivers, there may be additional mediators that were not considered in this study.

Given the findings, it appears that individuals with neurotic personality trait have difficulty in coping adaptively. Usually, ineffective coping strategies are used by such individuals that leads to poor outcomes. To explain this finding, it can be explicated that there is a connection of neuroticism with subjective reports of stress symptoms and stressful events (Lockenhoff & Carstensen, 2004). Highly neurotic individuals are more susceptible to irrational thoughts and helplessness and have less control on their impulses. They are more prone to negative emotions (Costa & McCrae, 1992) that consequently direct their efforts of coping towards managing painful emotions (Gandhi, Reid, Huang, Kimberlin & Kauf, 2013). Therefore, there is a possibility that these individuals show maladaptive and passive coping styles.

Form these findings it could be assumed that neurotic individuals may have impoverished social supports because they are different type of people and may not be chosen by majority to spend time with them. Moreover, it can also be inferred that people high in neuroticism may have weak social ties or less skilled in becoming a part of a social network especially if they are experiencing chronic stressors related to caregiving (O'Connor, 2015).

In addition, findings can also be supported by the fact that neurotic individuals may be completely immersed in their caregiving tasks that they would not have many cognitive resources to spare for anything else, and thus in turn prevent their social involvement. Moreover, as stated by Weston and Jackson (2016), neuroticism tends to inhibit one's ability to adapt, by functioning as a warning system which is activated by perceptions of environmental uncertainty. Thus, highly neurotic individuals are more likely to view

social support as a disadvantaged factor and focus more on their internal stimuli that help them cope well in a caregiving situation.

Similarly, for the conscientious personality trait, the absence of mediating effect of social support may be supported by the fact that high level of confidence and organization of conscientious individual may be favorable while juggling with the demands of caregiving (Friedman et al., 2013). Alternatively, the advantages or disadvantages of the social support may be overshadowed by the pervasive influence of caregiving demands. From this perspective, caregiver with conscientious personality may be less prone to stress as compared to conscientious individuals in general population.

Additionally, as conscientious personality individuals are competent, dutiful, disciplined, deliberate and diligent, therefore the main focus of such caregivers is only on the caregiving demands and the process and do not have much time to get socially active. Further, because they are strong willed and goal-directed (Toegel & Barsoux, 2012), thus, the social support does not effect in any part of caregiving process as they are willing to put forth more effort in order to fulfill their caregiving demands perfectly.

These findings are in agreement with the previous research where conscientiousness has been found to have a negative relationship with social support because conscientious individuals are inclined to have positive emotions of achievement due to which they utilize coping strategies for solving practical aspects of stressors and successfully dealing with stress (Friedman et al., 2013) thus, minimizing the effect of social support. Hence, in the present study, neuroticism and conscientiousness in relation to stress are not mediated by social support.

Further, the findings of the present study suggest that agreeableness, extraversion and openness are mediated by social support when studied in relation to stress. These findings are in hand with the previous finding of Atherton et al. (2014) as greater sociability, high level of activity and experiencing positive emotions are associated with extraversion personality (Costa & McCrae, 1992; McCrae & Costa, 2003). Indeed, good subjective well-being of extraverted individuals provides the evidence of better mental health (Lockenhof et al, 2011; Toegel & Barsoux, 2012) and lower rates of stress (Finch et al., 2012) in presence of social support.

Moreover, the findings on extraversion is supported by the analysis of Eliose et al. (2013) where findings suggested that caregivers with extraversion personality are socially active and thus, exhibit lower negative emotions and stress (Ferguson, 2013; Fisher & Dickinson, 2014), more adaptive coping strategies (Compas et al., 2012), more benefit-finding (Melo et al., 2011), lower sensitivity to caregiving-related stressors (Eliose et al., 2013), lower burden and strain (Gonzalez-Abraldes et al., 2013), and better mental and physical health (Ferguson, 2013; Lockenhoff et al., 2011; O'Connor, 2015)

Likewise, social support was found to play a mediating role between agreeableness and stress of caregivers. It may be supported by the fact that because of the personal characteristics of agreeableness personality individuals, they would have an engrained social network where they are more compassionate to others rather than being antagonistic. Additionally, they are well-tempered and helpful therefore, they seek support as a factor that positively influence the stress related to caregiving demands.

These findings are consistent with the previous research where higher levels of agreeableness were presented to be linked with less maladaptive coping (Snyder & Christine, 2015) and a better relationship with the care recipient (Lautenschlager et al., 2013). It can be further assumed that as agreeableness personality is more altruistic and willing to cooperate with others (Toegel & Barsoux, 2012), therefore, caregivers with this trait tends to accept social support provided to them during a caregiving process.

Further, for the relation between openness and stress of caregivers, social support was also found to mediate the relation. This could be attributable to the fact that in a caregiving process, higher levels of openness may be effective due to the assistance provided through social support while fulfilling overwhelming demands of the caregiving. This finding is in agreement to the previous studies where openness was indicated to be related with positive perceptions of relationship between caregiving and growth (Hampson et al., 2015).

Additionally, the mental flexibility of individuals with openness personality trait allows them to interact socially with their environment that can facilitates adjustment in stressful situations and helps in promoting physical and cognitive well-being. However, research on the health implications of openness and agreeableness is comparatively scarce and needs to be studied further in association with social support and stress of caregivers.

Subsequently, the conclusion was upheld in the study that personality traits were significantly related to the social support which were consequently related to the mental health of caregivers specially stress. Hence, it is concluded that social support acts as a channel for the part of the effect of personality on stress and mental health. Significantly,

it was found that stress was related to social support among caregivers. Thus, it is essential to explore the aspects of social support that are linked to stress in order to develop interventions that can ameliorate the effect of stress on caregivers.

5.2.4 Strongest predictor of stress

The last objective of the present study was proposed to find the strongest predictor of the caregiver's stress. Hypothesis H6 lies under this Objective Five and states that physical caregiving is the strongest predictor of stress. Whereas, from the findings of the current study, it was found that Agreeableness personality trait is the strongest predictor of the stress of caregivers.

These findings can be attributable by the fact that agreeableness, whose facets include altruism, compliance, modesty, straightforwardness, tendermindedness, and trust (McCrae & Costa, 2003) has also been found to be associated positively with several relationship variables, such as relationship satisfaction, therefore, these altruistic and compassionate emotions of caregivers towards the care receivers might in turn affect the mental health of given sample of caregivers by increasing their stress level. In fact, the role of agreeableness was much more pervasive than it has been hypothesized.

Given the effect size, the strong association of the variables contradict with those reported previously by Lockenhoff and colleagues (2011) for a caregiving population that indicated moderate effects of conscientiousness and agreeableness and large effects of instrumental and emotional caregiving. In contrast to prior studies, however, caregiving demands and other personality traits have small effect on the stress of caregivers. Plausibly, the shared responsibilities in the present sample of caregivers may have served

as a standardizing force that overshadowed any strong association between caregiving tasks and other personality traits.

One notable exception to this outcome is a lack of research that examined the relationship of personality of caregivers with their mental health. However, observed associations appears to be complex and inconsistent across samples. Seemingly, methodological limitations or under-identification of variables may be linked to contradictory results. On contrary, there is an ample evidence of linkage between personality traits and subjective health of non-caregiving population however, the pattern of association differs across the five factors systematically.

5.3. Implications

This research presents several theoretical and practical implications to the knowledge on caregiving, personality and social support particularly in caregivers' stress. Initially, this research proved an empirical support for the general Stress Process Theory (Pearlin et al., 1990), Five factor trait theory (McCrae & Costa, 1992) and Uchino's social support theory (Uchino, 2004).

Secondly, the research accomplished in revealing the reasonable relationship between aspects of caregivers, dimensions personality and the level of stress of caregivers. The research also revealed the presence of social support as a significant variable between aspects of caregiving and few of the personality dimensions. Last but not least, the research presented proof for the construct validity of each instrument employed in this research.

5.3.1 Evidence to support the general Stress Process Theory (Pearlin et al., 1990), five factor trait theory (McCrae & Costa, 1992) and Uchino's social support theory (Uchino, 2004).

In general, proof of existence and interrelation of the caregivers' stress, personality and social support were presented in accordance to general Stress Process Theory (Pearlin et al., 1990).

According to Pearlin et al. (199) caregiving is a life event that creates conditions of chronic strain leading to the proliferation of secondary stressors. This correlation between each variables in model as well as the impact of predictor and mediating variables on dependent variables had in fact proved that the theory was justifiable and applicable to the research and selected respondents. Additionally, the research outcomes identified which caregiver stressors are most significant in caregiver vulnerability to stress. These results may also help in identifying theory-driven risk factors (Pearlin et al., 1990) for caregivers and also assist in spotting the vulnerable point of caregivers in order to ameliorate quality of life of caregivers before their stress becomes chronic.

Further, the evidence of appropriateness of using five factor trait theory was also demonstrated by this study thus confirming the inclusion of personality as a potential variable while understanding a caregiving process. The association of personality traits such as agreeableness and conscience with stress level of caregivers substantiated that the caregivers' stress varies from person to person having different personality traits.

In addition, Uchino's social support theory (2004) was also proved to be significant inclusion in gaining the knowledge about caregiving process. The findings showed that

social support acts as a significant mediating variable between caregiving and dimensions of personality while acting as a coping mechanism.

Through this paradigm, this research was able to study the psychological strengths of caregivers, their nature of stress, manifestation and ways to enhance the mental health. Social psychology has contributed to the improvement of the quality of lives of both caregiver and care receiver by consciously recognizing and helping them with their crisis. Lima et al. (2015) added in this regard that the most serious mental health such as depression or post-traumatic stress disorder could not be prevented by working alone on pathogenic model. They were of the opinion that prevention would be possible by intervention of assisting caregivers systematically rather than only trying to solace them.

5.3.2 Influence of caregiving, personality and social support on caregivers' stress

Prior to the analysis of mediation, this study verified the correlations magnitude between aspects of caregiving, dimensions of personality and social support with stress. Findings of the research revealed that social support as a mediating variable was a potential contributor in revealing the stress of caregivers as it explicates the linkages between caregiving aspects and dimensions of personality.

Basically, this study provided explanations to all five questions. This study extended the knowledge in social psychology by simultaneously investigating aspects of caregiving and personality as pertinent predictors of stress as well as including social support as a possible intervention between independent and dependent variables.

Expectantly, the conclusions of this study provides a further step in providing middle range theoretical explanation of how responsibilities are managed by the families in a

caregiving relationship. Social support may acts as a mean to translate the caregiving and stress relationship by initiating conversations with caregivers about their workload and health. These outcomes regarding social support suggest a potential buffer to be explored in the stress process theoretical framework of Pearlin and colleagues (Pearlin et al., 1991; Aneshensel et al., 1995).

Moreover, the findings of this study provides a better understanding of health care needs of caregivers. These findings could help practitioners and clinicians to identify the stress level of caregivers along the stress process continuum and develop resources in order to target stressors and to provide interventions for preventing stress from causing physical and emotional deterioration among caregivers.

Adding to it, the findings from this research can be used by professionals, researchers and organizations to organize and facilitate family and community with multicomponent resources that could fulfill the needs of both care receiver and caregiver. This information could also be used by social workers, physicians and nurses to develop caregiver assessment tools to identify caregiver stressor and provide interventions to eliminate stress of caregiver before it has stronghold on the caregiver's quality of life.

5.3.3 Implication of measurement instruments

Practically, there are several implications on this study. Initially, considering the obstinate level of caregivers' stress while caregiving to a cancer children and maintaining their mental health, this study initiates in validating Modified Caregiver Strain Index (MCSI) by Thornton and Travis (2003) to measure caregivers' stress level. The validation

procedure of these instruments had gone through Confirmatory Factor Analysis (CFA) using two statistical tools that are SPSS v23 and SmartPLS.

Additionally, Physical Caregiving Task instrument (Wallhagen, 1992), Berlin Social Support Scale (BSSS) (Schwarzer & Schulz, 2013), Big Five Inventory (BFI) (Goldberg, 1993) and Medical Outcome Study-Social Support Survey (MOS-SSS) (Sherbourne & Stewart, 1992) were also validated to check the influence of physical caregiving, emotional caregiving, personality and social support respectively on the stress level of caregivers of cancer patients.

For caregiving questionnaires, the factor analysis results pointed to Instrumental Activities of Daily Living (IADLs) and Activities of Daily Living (ADLs) as well as emotional aspects to be reliable factors in measuring stress of caregivers of cancer patients. Convergent validity and discriminant validity of the measurement had also been proven. It was observed that these factors were independent but inter-related since they still remain statistically independent. The results also proved the strength of these measurements as applied to the cross cultural and contextual elements.

Additionally, for personality, as elaborated in Chapter Four, it was evident that five personality factors consist of neuroticism, extraversion, openness, agreeableness and conscientiousness existed and surfaced in the data. Similarly, the results of reliability and validity for social support and stress instruments were satisfactory comparable to the findings of previous study (Kruithof et al., 2015).

Taking into account the findings, all instruments were proved to be reliable and valid to be used in the current research setting. Besides the good psychometric properties of

instruments, validity of the instruments needs to be enhanced through replication of research in a similar setting. Therefore, the replication of the research was suggested using different sample of caregivers in different locations in order to strengthen the validity of these measurements.

5.4 Recommendations

Aiming at exploring and explaining the association of caregivers' stress with different aspects of caregiving, dimensions of personality and social support to caregivers of cancer children and adolescents, the present study established the aspects of the variables that are interrelated. This association enables to keep an eye on the magnitude and consequences of caregiving phenomenon in order to plan effective and efficient human resource strategies and trainings of decision making. Following are some of the recommendations for the future research.

5.4.1 Better understanding of caregiving phenomenon

The potential recommendation involves a better understanding of a caregiving phenomenon to the individuals that are chronically ill and the influence of caregiving on the caregivers. It is because over the last couple of years, changes in health care system has directed the patients requiring long-term care to recover at home instead of a hospital. Therefore, patients with chronic illness have to be taken care by the informal caregivers at home. This shift involves the caregivers to go through a sudden change in their roles and responsibilities which mean an increase in physical, emotional and financial responsibilities. This in turn, influence the caregiver's quality of life and increases the burden and stress. Therefore, seeking and understanding about the variable that

substantially contribute to the stress of caregivers and their quality of life will offer insight into how a stress and burden of a caregiver can be reduced.

5.4.2 Development of training programs

The recommendation for developing training programs will be an addition to the body of knowledge in decreasing stress and refining quality of life of caregivers. As all factors under consideration of this study influence the stress of caregivers to certain level, therefore, in order to enhance the quality of life, treatment centers and hospitals should plan training programs for the caregivers considering the health care demands of a care receiver. These programs should provide the knowledge about the level of care required by the patient as well as to prepare the caregiver about the caregiving tasks prior to the discharge of patient from the rehabilitation center or hospital. Additionally, these programs can provide healthy life to a caregiver by reinforcing and improving personality through character building. Providing awareness to the caregiver through education and training would help in minimizing stress of caregiver at the initial stages of caregiving process and make them physically, psychologically and socially strong.

5.4.3 Availability of social resources

Referring to the partaken caregivers in this research, it was conceived that participants with high level of social support showed low levels of stress. This indicates that the availability of the social support to the caregivers would likely to decrease their stress level and increase performance as a caregiver. It directs to the notion that in presence of social support, caregivers can cope well with the strenuous act of caregiving. Thus, it is suggested that caregivers be made aware of the influence of their social resources so it

may assist them to figure out their coping resources while in a stressful situation during caregiving.

On other hand, caregivers who have been providing care over a prolonged period of time could mentor the inexperienced or less experienced caregivers and provides them peer support. This results in building confidence and resilience in new caregivers.

Additionally, findings of the study indicated that stress of caregiver is reduced with the use of available social resources. These findings could encourage social change by providing community resources to the caregivers such as emergency phone numbers or on-call resources that should be available all days a week. Local communities based on social support resources should provide internet and telephone resources so caregivers who are unable to leave home should attend to the caregiver support resources. Practically, these resources should be able to fulfill the requirements of the caregivers.

5.4.4 Equitable sharing of resources in community

In addition, the structural inequalities of care provision directs to the need to pursue more equitable sharing of resources that are available to facilitate the role of a caregiver. Ministry of health should initiate training programs or policies that helps to explore caregiving process and the related challenges through public discussions. Policy makers at local and national level should provide resources for funding the employees who are providing care in order to ensure their financial security and help them maintain a work-life balance.

5.4.5 Therapeutic interventions

Another recommendation is the use of therapies by counsellors and social workers as an intervention for caregivers of patients with chronic illness. Counsellors can apply individual therapy, family therapy and educate the caregivers with the problem-solving techniques. With the application of family stress therapy, the resources are increased as these resources can positively influence perception, coping and adaptation. By finding resources, caregivers may be educated by focusing on their perceptions, problem-solving and coping skills. These theories influence the quality of life of a caregiver by the mutual interaction of perception and coping strategies. Resultantly, synergistic interventions integrating all factors becomes more influential and long-term having sustained effects because perceptions and coping methods changes over time depending on the circumstance.

Besides, for the caregivers of cancer patients in particular, health professionals should note efforts of caregiving and impending caregiving responsibilities and invite an active entry into a caregiving role. Further, clinicians need to be aware of the signs of overburden in family caregivers. Additionally, guidelines can be incorporated for early referral by the practice standards when it becomes obvious that dividing the workload of a caregiver is appropriate. This would lessen the caregiving stress and the associated health factors and eventually providing better care to the cancer patients.

In the nutshell, more focus is required to achieve overall well-being and augmenting the mental health of caregivers. Implementation of a strategic health and fitness programs that contributed to caregivers' quality of life might reduce their negligence towards their own

health whilst at the same time increasing their outcome as a caregiver. The hospital managements and ministry of health should be highly committed in ensuring successful accomplishment of programs and rehabilitation centers should also focus on population of caregivers in planning effective strategies that can minimize their stress due to caregiving responsibilities.

5.5. Limitations

There are a few shortcomings of the research that should be explained while contemplating the findings of the research. No matter what, necessary actions were carried out to guarantee these drawbacks did not jeopardize the findings of the study.

First limitation of the research was that although findings indicating moderate stress level among caregivers of children is consistent with previous research by Pinquart and Sorensen (2011), yet absence of data on co-residence of care receiver and caregiver prevented the assessment of degree to which this might reflect differences in residential closeness (Siegler, Brummett, Williams, Haney, & Dilworth-Anderson, 2010). On contrary, the living arrangements of caregivers such as living alone or in joint family were also not included as a covariate which indicates that this might be another limitation.

In addition, some simple kinship profiles (parental differences as a caregiver or variation in number of care receiver) and complex caregiving profiles (caring for more than one person) that are potentially important were not considered. Even though the majority of caregivers were mothers, other relatives who are caregivers were also taken into consideration of this study. This dependence of care receiver on different family members may be a limitation considering that child may have different interaction with the

caregiver and in turn caregiver might have different emotional reaction towards the child's illness.

Moreover, a multidimensional model was provided by the Stress Process Theory (Pearlin et al., 1990) consisting of multiple variables. Considering all those variables from a theoretical model would have been a menacing task. Therefore, all the variables that Stress Process Theory has mentioned were not included in the present study. The selected variables of this study were based on existing literature and research findings. The research questions were selected from the dataset based on face validity and mapped onto the caregiver stress model.

Further, the analyses was also restricted to the mental health of the caregiver at the time of collection of data. Even though the cross-sectional design of this study indicated significant relations between caregivers and their functioning, however, this design limited the ability to examine the causal relationship. The study did not collect information on the stage or level of disease progression of the cancer patients. It can be assumed that caregivers' health will vary based on the type of cancer patients they are caring and it is believed that caregiving experience might be different between stage 1, stage 2 and stage 3 of cancer children. Further longitudinal studies may help in describing the roles of family members and caregiver strain during the course of illness.

In addition, as this survey is based on self-report therefore, it may present the social desirability bias. Social desirability is the tendency of the respondents to over report their good characteristics and under report their bad characteristics in order to be accepted by

others. There is a probability that caregiver has reported himself as the good caregiver having substantial personality traits that results in bias responses.

Another limitation of this study was the availability of appropriate data collection instruments that could be applied in a Pakistani setting. This lack of readily available Pakistani tools for the assessment of caregivers was a substantial limitation of the present study. The measurement scale used in this research is only designed to assess the stress of caregivers generally as it is a general instrument that can be administered in different populations and settings. More disease specific assessment instruments are needed. This resulted in limitation of providing base to local research needs on previous studies conducted in western culture influencing mental health of caregivers.

Thus these scientific barrier instigated the researcher to experience the shortcoming of applying stress as opposed to mental health measurements in the study. Furthermore, the instrument used to assess stress was not validated for extensive use in Pakistan. Hence, the challenge was validating the instrument based on Pakistani culture and ethnic background through proper procedure.

5.6. Future research directions

Though results of this research were informative, future research is deemed necessary to enhance knowledge on aspects of caregiving, dimensions of personality, social support and stress of caregivers during a caregiving process. Indeed this research has the capability to introduce groundwork for future research. Several appropriate suggestions are explicated.

The outcomes of this research indicated varying statistical significance of independent variables, demands of caregiving or caregivers' personality and the dependent variable caregiver's stress. However, plethora of literature suggested that stress of caregiver is influenced by caregiving demands and personality of a caregiver. Further research to predict the relationship of aspects of caregiving, personality and stress with a heterogeneous population of caregivers providing care to the individuals with different chronic illnesses is required within the context of caregiver stress model.

Primarily, women are considered to take on the caregiving role, however, men are also becoming primary caregivers as evident by the percentage of men and women participated in this research survey. According to the researchers, men and women deal with and manage stress differently as men socialize to delegate whereas women have to perform their task themselves. Even though these explanations of social and cultural differences might be plausible descriptions for managing stress by men and women, still future research is required in order to examine the differences of how male and female respond to similar stressful caregiving situations.

In addition, replication of the research using larger sample size which represents the population of cancer patients in various cancer treatment hospitals is the next essential measure. Larger sample size provides the confidence that findings would be in line with other similar groups. The replication of the research on caregivers living in different geographic locations possibly will facilitate generalization of findings to caregivers in Pakistan. Since the current research only takes into account of certain hospitals in South of Pakistan, it is recommended that the research be replicated to all hospitals in Pakistan to get a complete picture of stress level of caregivers of cancer patients.

Moreover, a tool can be developed that specifically includes the variables related directly to the caregiver strain including internal resources, care receiver's needs and severity of illness. Future studies should examine the relationship between resources of caregiver and stress in order to appraise all family and social resources comprehensively that could help in coping well with the crisis.

A mixed method employing both qualitative and quantitative approach also is recommended for future research. Triangulation method offers an advance value of data quality to enhance the researchers' knowledge regarding the occurrence under study. In social sciences, it is more preferable to integrate both the questionnaires and interviews during data collection in order to study human behavior accurately. Merits of choosing triangulation method is that quantitative research could be completed by further developing findings derived from qualitative research and vice versa.

Another important future direction on personality and caregiving will be to gain an understanding of how people create meaning in their caregiving role and how they integrate caregiving psychologically into their sense of identity. Linkage of self-discrepancies and caregiving role negatively affect the appraisals and alterations in immune responses. Knowledge of how caregiving is perceived in the self and affects personal goals will be essential for understanding psychological appraisal processes and effects on subjective health outcomes. A noticeable future research direction is to examine whether personality prospectively predicts as much of variance in health as it does when measures are taken concurrently.

One more suggestion for future research direction is the need to scrutinize on caregivers' stress among caregivers in Pakistan. Feedback from face-to face interviews during preliminary investigation have revealed that from viewpoint of Pakistan there have been a scant knowledge of the issues pertaining to caregivers' stress and coping mechanisms within the literature. Therefore, another potential issue is to look at in future research is caregivers' coping ability and its measurement according to Pakistani respondents, culture and norms. In addition, future research also needs to probe into other possible stressors in caregiving process.

The comments given by the caregivers at the end of the survey and the amount of variation explained by structural model, both, suggest that all the relevant sources of stress are not covered. Future research need also assess variation in the effectiveness of different coping mechanisms across different sources of stress. Finally, variation across race and gender in the use of effective coping strategies should be examined.

5.7. Conclusion

Regardless of the limitations in the study, the research objectives have been apprehended and research questions were answered. All of the five research questions were answered that accomplished the objectives of this study. Moreover, contradictory findings were integrated by the researcher and average size of relationship between aspect of caregiving and personality of caregivers on one hand and stress on the other were estimated.

Although a plethora of knowledge is present in literature regarding the caregiving, personality, social support and stress, this research abridged the gaps in caregiving literature. This study described the caregivers' stress and the related factors especially in

Pakistan by associating these variables and describing the significant impact of social support as a mediating variable between caregiving, personality and stress.

The present study presented numerous conclusions with regard to aspects of caregiving, personality and social support effects on stress of caregivers. First, pertaining to the Stress Process Theory (Pearlin et al., 1990), it was found to be a useful theoretical framework for predicting caregivers' stress among informal caregivers. Secondly, because association of caregiving demands and personality with stress outcomes was only small to moderate, it was concluded that mediating variable may increase or decrease the size of correlation between demands of caregiving and its outcomes.

Thirdly, regarding the mediating effect of social support on the relationship between aspects of caregiving, dimensions of personality and stress, the study found social support to be a significant mediator among the variables. The accessibility of community and family support resources and their utilization by the caregivers would counterbalance the deleterious effects of stress on caregivers (Pearlin et al., 1990). With regard to Stress Process Theory (Pearlin et al.), it was deliberated as a valuable theory for the development and implementation of social support resources that helps in reducing stress of caregivers thus, ameliorating the quality of life. It is imperative to have an access to the resources since the role of caregiver intensifies with the progression of the chronic disease (Pearlin et al., 1990).

Furthermore, it is one of the few studies to explore the complete five-factor model of personality (Costa & McCrae, 1992) while caring for cancer patients. Results indicated that some personality factors, most notably agreeableness, serve as diatheses for the

development of internalizing and externalizing problems when one perceives themselves to be under significant stress. In fact, relationships between the five factors and stress emphasize the importance of traits in interpreting psychological threat and harm associated with specific life events. Current findings extend previous research with caregiving adult populations on the association of personality with mental health of caregivers of cancer children and adolescents, lending support to arguments that personality trait acts differently in caregiving population.

Lastly, it was concluded that heterogeneity of the results can be explained by the differences in the sample characteristics as whether caregivers are themselves young or adult and whether care is provided to the children or adults with or without chronic illness.

As a whole, the results of this research contributed in manifold through the literature content and the potential outlook in researching human behavior in Pakistan as well as to the improvement of the human resource practices in Ministry of Health through understanding the psychological aspects of the whole process.

Considering the panorama presented here and the postulation that children are an integral part of a dynamic and cohesive system, it is pertinent for future studies to seek an understanding of the association of the psychosocial profile of the families of children suffering from cancer, caregiver's stress and social support in various Pakistani settings.

REFERENCES

- Abdelmoneium, A. O. & Alharahsheh, S. T. (2016). Family home caregivers for old persons in the Arab region: Perceived challenges and policy implications. *Open Journal of Social Sciences, 4*, 151-164.
- Ahmad, K. (2012). Informal caregivers to chronically ill older family members: Caregiver's experiences and problems. *A Research Journal of South Asian Studies, 27*, 101-120.
- Ain, Q. U., Dar, N. Z., Ahmad, A., Munzar, S., & Yousafzai, A. W. (2014). Caregiver stress in stroke survivor: Data from a tertiary care hospital -a cross sectional survey. *BioMed Central Psychology, 2*(1), 49.
- Alderfer, M. A., Cnaan, A., Annunziato, R. A., & Kazak, A. E. (2005). Patterns of posttraumatic stress symptoms in parents of childhood cancer survivors. *Journal of Family Psychology, 19*(3), 430-440.
- Aldrich, N. (2011). CDC seeks to protect health of family caregivers. Retrieved from: http://www.chronicdisease.org/nacdd-initiatives/healthyaging/meeting-records/HA_CIB_HealthofFamilyCaregivers.pdf/view.
- Al-Gamal, E., & Long, T. (2013). Psychological distress and perceived support among Jordanian parents living with a child with cerebral palsy: A cross-sectional study. *Scandinavian Journal of Caring Sciences, 27*(3), 624-631. doi:10.1111/j.1471-6712.2012.01071.x
- Allport, G. W. (1937). *Personality: A psychological interpretation*. New York, NY: Holt, Rinehart & Winston.
- Allred, A., Granger, M., & Hogstrom, T. (2013). The relationship between academic major, personality type, and stress in college students. *Eukaryon, 9*.
- Alves, D. F. S., Guirardello, E. B., & Kurashima, A. Y. (2013). Stress related to care: The impact of childhood cancer on the lives of parents. *Revista Latino-Americana de Enfermagem, 2*, 356-362.
- American Cancer Society (2011). *Breast cancer facts & figures 2011-2012*. Atlanta: American Cancer Society, Inc.
- American Cancer Society. (2016). *Global Cancer Facts & Figures 3rd Edition*. Atlanta: American Cancer Society.

- American Psychological Association [APA]. (2015). Retrieved from <http://www.apa.org/pi/about/publications/caregivers/research/methods/definition.aspx>
- Aneshensel, C., Pearlin, L., Mullan, J., Zarit, S., & Whitlatch, C. (1995). *Profiles in Caregiving, The Unexpected Career*. San Diego: Academic Press.
- Ansa, T., & Mahmood, K. (2014). The relationship of stress and hopelessness among caregivers of life threatening illnesses. *Journal of education and practice*, 5(23), 19-23.
- Ansari, B., & Qureshi, S. S. (2013). Stress and coping in caregivers of cancer patients. *Interdisciplinary Journal of Contemporary Research in Business*, 4(11), 35-39.
- Anthony, J., Erin, G., Julie, R., Mark, H., Francis, S., Klea, B., Joshua, F., & Peter, F. (2012). Does applicant personality influence multiple mini-interview performance and medical school acceptance offers? *Academic Medicine*, 87(9), 1250-1259.
- Arffman & Reeta. (2013). *Social support promoting coping for caregivers caring of people with Alzheimer's disease*. PhD Thesis
- Arisha, Q., Seema, Z. L., & Ghazala, R. (2013). Perceptions of primary caregivers of children with disabilities in two communities from Sindh and Baluchistan, Pakistan. *Disability, CBR and Inclusive Development Journal*, 24(1). doi 10.5463/DCID.v24i1.193
- Asima, M. K., Rizwan, T., Arfeen, F., & Farhana, K. (2015). Quality of life of caregivers and non-caregivers. *Annals of Pakistan Institute of Medical Sciences*, 11(1), 35-39.
- Atherton, O. E., Robins, R. W., Rentfrow, P. J., Lamb, M. E. (2014). Personality correlates of risky health outcomes. *Journal of Research in Personality*, 50, 56-60.
- Axia, G., Tremolada, M., Pillon, M., Zanesco, L., & Carli, M. (2006). Post-traumatic stress symptoms during treatment in mothers of children with leukemia. *Journal of Clinical Oncology*, 24(14), 2216-2217.
- Aziz, Z., Sana, S., Akram, M., & Saeed, A. (2004). Socioeconomic status and breast cancer survival in Pakistani women. *Journal of Pakistan Medical Association*, 54, 448-453.
- Back, M., Stopfer, J., Vazire, S., Gaddis, S., Schmukle, S., Egloff, B., & Gosling, D. (2010). Facebook profiles reflect actual personality, not self-idealization. *Psychological Science*, 21(3), 372-374. doi:10.1177/0956797609360756

- Badar, F. (2013). Cancer registration in Pakistan. *Journal of College of Physicians and Surgeons*, 23(8), 611-612.
- Bagozzi, R. P. (2011). Measurement and meaning in information systems and organizational research: Methodological and philosophical foundations. *MIS Quarterly*, 35(2), 261–292.
- Bagozzi, R. P., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94.
- Bakker, A. B., Van der Zee, K. I., Lewig, K. A., & Dollard, M. F. (2006). The relationship between the Big Five personality factors and burnout: A study among volunteer counselors. *Journal of Social Psychology*, 146, 31–50.
- Barlett, C. P., & Anderson, C. A. (2012). Direct and indirect relations between the Big five personality traits and aggressive and violent behavior. *Personality and Individual Differences*, 52, 870–875.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Bartolo, M., Luca, D. D., Serrao, M., Sinforiani, E., Zucchella, C., & Sandrini, G. (2010). Caregiver burden and needs in community neuro-rehabilitation. *Journal of Rehabilitation Medicine*, 42, 818–822.
- Beattie, S., & Lebel, S. (2011). The experience of caregivers of hematological cancer patients undergoing a hematopoietic stem cell transplant: A comprehensive literature review. *Psycho-Oncology*, 20(11), 1137–1150.
- Bevans, M. F., & Sternberg, E. M. (2012). Caregiving burden, stress, and health effects among family caregivers of adult cancer patients. *Journal of the American Medical Association*, 307(4), 398–403.
- Bhurgri, Y., Bhurgri, A., Hassan, S. H., Zaidi, S. H., Rahim, A., & Sankaranarayanan, R. (2000). Cancer incidence in Karachi, Pakistan: First results from Karachi cancer registry. *International Journal of Cancer*, 85(3), 325–329.
- Bhurgri, Y., Bhurgri, A., Nishter, S., Ahmed, A., Usman, A., Pervez, S., Kayani, N.,...Bashir, I. (2006). Pakistan - Country profile of cancer and cancer control 1995-2004. *Journal of the Pakistan Medical Association*, 56(3), 124-130.
- Bhurgri, Y., Pervez, S., Bhurgri, A., Faridi, N., Usman, A.,...Kazi, L. A. (2005). Increasing incidence of non-Hodgkin's lymphoma in Karachi, 1995-2002. *Asian Pacific Journal of Cancer Prevention*, 3, 364-369.

- Bhurgri, Y., Pervez, S., Usman, A., Khan, J. A., Bhurgri, A., & Kasi, Q. (2002). Cancer patterns in Quetta (1998–1999). *Journal of Pakistan Medical Association*, 52(12), 560–565.
- Biegel, D. E., Sales, E., & Schulz, R. (1991). *Family caregiving in chronic illness*. Newbury Park, CA: Sage.
- Billings, A., & Moos, R. (1984). Coping, stress and social resources among adults with unipolar depression. *Journal of Personality and Social Psychology*, 46(4), 877-891.
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin*, 130(6), 887-919.
- Boman, K. K., Kjallander, Y., Eksborg, S., & Becker, J. (2013). Impact of prior traumatic life events on parental early stage reactions following a child's cancer. *Plos One*, 8(3), e57556. doi:10.1371/journal.pone.0057556
- Borneman, T., Bluman, O., Klein, L., Thomas, J., Ferrell, B. (2013) Spiritual care for Jewish patients facing a life threatening illness. *Journal of Palliative Care*, 29(1) 58-62.
- Borneman, T., Sun, V., Williams, A. C., Fujinami, R., Del Ferraro, C., Burhenn, P., Irish, T...., Buga, S. (2015). Support for patients and family caregivers in lung cancer: educational components of an interdisciplinary palliative care intervention. *Journal of Hospice & Palliative Nursing*, 17(4), 309-318. doi: 10.1097/njh.0000000000000165
- Brant, J. M., Beck, S. L., Dudley, W. N., Cobb, P., Pepper, G., & Miaskowski, C. (2011). Symptom trajectories during chemotherapy in outpatients with lung cancer colorectal cancer, or lymphoma. *European Journal of Oncology Nursing*, 15(5), 470–477. doi: 10.1016/j.ejon.2010.12.002.
- Bray, F., Jemal, A., Grey, N., Ferlay, J., & Forman, D. (2012). Global cancer transitions according to the Human Development Index (2008-2030): A population based study. *Lancet Oncology*, 13, 790-801. doi: 10.1016/S1470-2045(12)70211-5
- Bruce, M. (2006). A Systematic and conceptual review of posttraumatic stress in childhood cancer survivors and their parents. *Clinical Psychology Review*, 26(3), 233-256.
- Buss, D. (1995). Evolutionary Psychology: A new paradigm for psychological science. *Psychological Inquiry*, 6(11), 1-30.
- Canadian Caregiver Coalition. (2012). *A caring voice newsletter: Respite*. Ottawa: Author.

- Carbonneau, H., Caron, C., & Desrosiers, J. (2010), Development of a conceptual framework of positive aspects of caregiving in dementia. *Dementia*, 9(3) 327–353. doi:10.1177/1471301210375316
- Carter, J. H., Lyons, K. S., Stewart, B. J., & Archbold, P. G. (2010). Does age make a difference in caregiver strain? Comparison of young versus older caregivers in early-stage Parkinson's disease. *Movement Disorders*, 25, 724–730. doi: 10.1002/mds.22888
- Casale, M., & Wild, L. (2012). The relationship between social support and the health of HIV-positive caregivers of children: A review of the empirical literature, vulnerable children and youth studies. *An International Interdisciplinary Journal for Research, Policy and Care*, 7(3), 260-282. doi: 10.1080/17450128.2012.668232
- Casale, M., Cluver, L., Crankshaw, T., Kuo, C., Lachman, J. M. & Wild, L. G. (2015). Direct and indirect effects of caregiver social support on adolescent psychological outcomes in two South African AIDS-affected communities. *American Journal of Community Psychology*, 55, 336–346. doi:10.1007/s10464-015-9705-3
- Cattell, R. B. (1950). *Personality: A systematic, theoretical and factual study*. New York: McGraw Hill.
- Chambers, S. K., Girgis, A., Occhipinti, S., Hutchison, S., Turner, J., Morris, B., & Dunn, J. (2012). Psychological distress and unmet supportive care needs in cancer patients and carers who contact cancer help lines. *European Journal of Cancer Care*, 21(2), 213–223. doi: 10.1111/j.1365-2354.2011.01288.x
- Chapman, B. P., Hampson, S., & Clarkin, J. (2014). Personality informed interventions for healthy aging: conclusions from a National Institute on Aging Work Group. *Developmental Psychology*, 50(5), 1426–1441. doi: 10.1037/a0034135
- Chapman, B. P., Roberts, B. W., & Duberstein, P. R. (2011). Personality and longevity: Knowns, unknowns, and implications for public health and personalized medicine. *Journal of Aging Research*, 1–24. Retrieved from: <http://dx.doi.org/10.4061/2011/759170>
- Chapman, B. P., Weiss, P., Fiscella, K., Muennig, P., Kawachi, I., & Duberstein, P. (2015). Mortality risk prediction: can comorbidity indices be improved with psychosocial data? *Medical Care*, 53(11), 909–915.
- Children and adolescents cancer statistics. (2016). American Cancer Society.

- Chin, W. W. (2010). How to write up and report PLS analyses. In V. E. Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares* (pp. 655-690). Berlin: Springer-Verlag.
- Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189–217.
- Chou, C. P., & Bentler, P. M. (1995). Estimates and tests in structural equation modeling. In Rick, H. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues, and Applications* (pp. 37-55). Thousand Oaks, CA: Sage Publications.
- Clay, O. J., Grant, J. S., Wadley, V. G., Perkins, M. M., Haley, W. E., & Roth, D. L. (2013). Correlates of health-related quality of life in African American and Caucasian stroke caregivers. *Rehabilitation Psychology*, 58(1), 28–35. doi: 10.1037/a0031726
- Cloninger, C., (2004). *Feeling Good: The Science of Well Being*, Oxford University Press, New York: NY.
- Cohen J. (1988). *Statistical Power Analysis for the Behavioral Science* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, J. (1969). *Statistical Power Analysis for the Behavioral Sciences* (1sted.). Hillsdale: Lawrence Erlbaum Associates.
- Cohen, S. (2004). Social relationships and health. *American Psychologist*, 59, 676–684.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Collins, L. G., & Swartz, K. (2011). Caregiver Care. *American Family Physician*, 83(11).
- Compas, B. E., Jaser, S., Dunn, M. J., & Rodriguez, E. M. (2012). Coping with chronic illness in childhood and adolescence. *Annual Review of Clinical Psychology*, 8, 455–480. doi: 10.1146/annurev-clinpsy-032511-143108
- Compas, B., Schetter, C. D., Abdou, C. M., Hobel, C. J., Glynn, L. M., & Sandman, C. A. Familialism, social support and stress: positive implications for pregnant Latinas. *Cultural Diversity and Ethnic Minority Psychology*, 14(2), 155-162. doi: 10.1037/1099-9809.14.2.155
- Connor-Smith, J. K., & Flaschbart, C. (2007). Relations between personality and coping: A meta-analysis. *Journal of Personality and Social Psychology*, 93, 1080–1087.

- Cooper, D. R., & Schindler, P. S. (2008). *Business research method* (10th ed.). Boston: McGraw-Hill Irwin.
- Costa, P. T. Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI): Professional Manual*. Odessa, FL: Psychological Assessment Resources.
- Costa, P. T., & McCrae, R. R. (1995). Domains and facets: Hierarchical personality assessment using the Revised NEO Personality Inventory. *Journal of Personality Assessment*, *64*, 21-50.
- Cousino, M. K., & Hazen. (2013). Parenting stress among caregivers of children with chronic illness: A systematic review. *Journal of Pediatric Psychology*, *38*(8), 809. doi:10.1093/jpepsy/jst049
- Cramm, J. M., & Nieboer, A. P. (2011). Psychological well-being of caregivers of children with intellectual disabilities: using parental stress as a mediating factor. *Journal of Intellectual Disability Research*, *15*(2), 101-113. doi: 10.1177/1744629511410922
- Creswell, J. W. (2012). *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (4th ed.). California: Sage
- Curran-Everett, D., Taylor, S., & Kafadar, K. (1998). Fundamental concepts in statistics: Elucidation and illustration. *Journal of Applied Physiology*, *85*, 775–86.
- Dale, W., Mohile, S., Eldatah, B., Trimble, E., Schilsky, R., Cohen, H., Muss, H.,...Hurria, A. (2012). Biological, clinical, and psychosocial correlates at the interface of cancer and aging research. *The Journal of the National Cancer Institute*, *104*(8), 581-589. doi: 10.1093/jnci/djs145.
- Dantas, M. S. A., Pontes, J. F., Assis, W. D., & Collet, N. (2012). Family's abilities and difficulties in caring for children with cerebral palsy. *Revista Gaúcha de Enfermagem*, *33*(3), 73-80. doi:10.1590/S1983-14472012000300010
- Das, S., Hazra, A., Ray, B., Ghosal, M., & Banerjee, T. (2010). Stroke. *Journal of American Heart Association*, *41*, 2965–2968.
- David, J. P., & Suls, J. (1999). Coping efforts in daily life: Role of big five traits and problem appraisals. *Journal of Personality*, *67*, 265–294.
- Diamantopoulos, A., & Winklhofer, H. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research*, *38*(2), 269-277.

- Djundeva, M., Mills, M., Wittek, R., & Steverink, N. (2015). Receiving instrumental support in late parent-child relationships and parental depression. *Journals of Gerontology Series B Psychological Sciences and Social Sciences*, 70, 981–994. doi:10.1093/geronb/gbu136
- Docherty, S. L., Thaxton, C., Allison, C., Barfield, R. C., & Tamburro, R. F. (2012). The nursing dimension of providing palliative care to children and adolescents with cancer. *Clinical Medicine Insights: Pediatrics*, 6, 75-88. doi: 10.4137/CMPed
- Driscoll, K., Johnson, S., Barker, D., Quittner, A., Deeb, L., Geller, D. E., Gondor, M., & Silverstein, J. H. (2010). Risk factors associated with depressive symptoms in caregivers of children with type 1 diabetes or cystic fibrosis. *Journal of Pediatric Psychology*, 35, 814-822. Retrieved from: <http://dx.doi.org/10.1093/jpepsy/jsp138>
- Drost, E. (2011). Validity and reliability in social science research. *Education Research and Perspectives*, 38(1), 105-123.
- Duggan, K., Friedman, H., McDevitt, E., & Mednick, S. (2014). Personality and healthy sleep: The importance of conscientiousness and neuroticism. *PLoS ONE* 9(3): e90628. doi:10.1371/journal.pone.0090628
- Dumitru, V. M., Cozman, D. (2012). The relationship between stress and personality factors. *Human and Veterinary Medicine*, 4, 34-39. Retrieved from: hvm.bioflux.com.ro
- Dunn, M. J., Rodriguez, E. M., Barnwell, A. S., Grossenbacher, J. C., Vannatta, K., Gerhardt, C. A., & Compas, B. E. (2012). Posttraumatic stress symptoms in parents of children with cancer within six months of diagnosis. *Health Psychology: Official Journal of the Division of Health Psychology, American Psychological Association*, 31(2), 176–185. doi: 10.1037/a0025545
- Duxbury, L., Higgins, C., & Smart, R. (2011). Elder care and the impact of caregiver strain on the health of employed caregivers. *Work*, 40, 29-40. doi:10.3233/WOR 2011-1204
- Ellis, J. (2012). The impact of lung cancer on patients and carers. *Chronic Respiratory Disease Journal*, 9, 39-47. doi: 10.1177/1479972311433577
- Eloise, H., Tew, S. L., Naismith, Pereira, M., & Simon, J. G. (2013). Quality of life in Parkinson's disease caregivers: The contribution of personality traits. *BioMed Research International*. doi:10.1155/2013/151872
- Ensel, W. M., & Lin, N. (1991). The life stress paradigm and psychological distress. *Journal of Health and Social Behavior*, 32, 321-341.

- Esposito Vinzi, V., Chin, W. W., Henseler, J., & Wang, H. (2010). Editorial: Perspectives on partial least squares. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares: Concepts, methods and applications* (pp. 1–813). Berlin Heidelberg: Springer.
- Eysenck, H. J. (1991). Dimensions of personality: 16, 5 or 3? Criteria for a taxonomic paradigm. *Personality and individual differences*, *12*, 773-790.
- Family Caregiver Alliance. (2011). *Caregivers count too! A toolkit to help practitioners assess the needs of family caregivers*. San Francisco, California: Family Caregiver Alliance.
- Ferguson, E. (2013). Personality is of central concern to understand health: towards a theoretical model for health psychology. *Journal of health psychology review*, *1*, 532-570. doi: 10.1080/17437199.2010.547985
- Fernandes, C., Muller, R., & Rodin, G. (2012). Predictors of parenting stress in patients with hematological cancer. *Journal of Psychosocial Oncology*, *30*(1), 81-96. doi: 10.1080/07347332.2011.633978
- Ferrell, B. R., Hanson, J., & Grant, M. G. (2012). An overview and evaluation of the oncology family caregiver project: Improving quality of life and quality of care for oncology family caregivers. *Psycho-Oncology*. doi:10.1002/pon.3198
- Ferrell, B., & Baird, P. (2012). Deriving meaning and faith in caregiving. *Seminars in Oncology Nursing*, *28*(4), 256-261. doi: 10.1016/j.soncn.2012.09.008.
- Finch, J. F., Baranik, L. E., Liu, Y., & West, S. G. (2012). Physical health, positive and negative affect, and personality: A longitudinal analysis. *Journal of research in psychology*, *46*, 537-545. doi: 10.1016/j.jrp.2012.05.013
- Fink, A. (2002). *How to sample in surveys: The survey kit* (7th ed.). California: Sage.
- Fisher, C. (2010). *Researching and writing a dissertation: A guidebook for business students* (3rd ed.). England: Pearson Education Limited
- Fisher, L., & Dickinson, W. P. (2014). Psychology and primary care: New collaborations for providing effective care for adults with chronic health conditions. *American Psychologist*, *69*, 355–363. doi: 10.1037/a0036101
- Fiske, D. W. (1949). Consistency of the factorial structures of personality rating from different sources. *Journal of Abnormal Social Psychology*, *44*, 329-344.

- Floyd, A., Dedert, E., Ghate, S., Salmon, P., Weissbecker, I., Studts, J. L., & Sephton, S. E. (2011). Depression may mediate the relationship between sense of coherence and quality of life in lung cancer patients. *Journal of Health Psychology, 16*(2), 249–257. doi: 10.1177/1359105310371856
- Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior, 21*(30), 219-239.
- Fornell, C., & Larcker, D. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(3), 39-50.
- Friedman, H. S., Kern, M. L., Hampson, S. E., & Duckworth, A. L. (2013). A new life-span approach to conscientiousness and health: Combining the pieces of the causal puzzle. *Developmental Psychology, 10*, 1037/a0030373. doi: 10.1037/a0030373
- Fujinami, R., Sun, V., Zachariah, F., Uman, G., Grant, M., & Ferrell, B. (2014). Family caregivers' distress levels related to quality of life, burden, and preparedness. *Psycho-Oncology*. doi: 10.1002/pon.3562.
- Funder, D. C., (2004). *The personality puzzle* (3rd ed.). New York: W. W. Norton
- Gandhi, P.K., Ried, L. D., Huang, I. C., Kimberlin, C. L., & Kauf, T. L. (2013). Assessment of response shift using two structural equation modeling techniques. *Quality of Life Research, 22*(3), 461–471. Doi: 10.1007/s11136-016-1290-x
- Gariépy, G., Honkaniemi, H., & Quesnel-Vallée, A. (2016). Social support and protection from depression: Systematic review of current findings in Western countries. *The British Journal of Psychiatry, 115*, 169094. doi:10.1192/bjp.bp.115.16909
- Garlo, K., O'Leary, J. R, Van Ness, P-H., & Fried, T. R. (2010). Burden in caregivers of older adults with advanced illness. *Journal of the American Geriatric Society, 58*(12), 2315-2322. doi:10.1111/j.1532-5415.2010.03177.x
- Ghufran, M., Andrades, M., & Nanji, K. (2014). Frequency and severity of depression among mothers of children with cancer: Results from a teaching hospital in Karachi, Pakistan. *British Journal of Medical Practitioners, 7*(1), 701-705.
- Giesbrecht, G. F., Poole, J. C., Letourneau, N., Campbell, T., & Kaplan, B. J. (2013). The buffering effect of social support on hypothalamic-pituitary-adrenal axis function during pregnancy. *Psychosomatic Medicine, 75*(9), 856–62. doi:10.1097/PSY.0000000000000004

- Given, B., & Grant, M. (2012). Studies of caregivers of older patients needed. *Journal of Geriatric Oncology*, 3(4), 295-298. doi:10.1016/j.jgo.2012.07.007
- Given, B., Given, C., & Sherwood, P. (2012). The challenge of quality cancer care for family caregivers. *Seminars in Oncology Nursing*, 28(4), 205-212. doi:10.1016/j.soncn.2012.09.002
- Gjesfjeld, C., Greeno, C., & Kim, K. (2008). A confirmatory analysis of an abbreviated social support instrument: The MOS-SSS. *Research on Social Work Practice*, 10(10), 1-7.
- Gjesfjeld, C., Greeno, C., & Kim, K., & Anderson, C. (2010). Economic stress, social support, and maternal depression: Is social support deterioration occurring? *Social Work Research*, 34(3), 135–143.
- Godwin, K. M., Swank, P. R., Vaeth, P., & Ostwald, S. K. (2013). The longitudinal and dyadic effects of mutuality on perceived stress for stroke survivors and their spousal caregivers. *Aging and Mental Health*, 17(4), 423–431. doi: 10.1080/13607863.2012.756457
- Goldberg, L. R. (1981). Language and individual differences: The search for universals in personality lexicons. In L. Wheeler (Ed.), *Review of personality and social psychology*, (Vol. 2, pp. 141- 165). Beverly Hills, CA: Sage.
- Goldberg, L. R. (1993). The structure of phenotypic personality traits. *The American Psychologist*, 48(1), 26-34.
- Gonzalez-Abraldes, I., Millan-Calenti, J. C., Loorenzo-Lopez, & L., Maseda, A. (2013). The influence of neuroticism and extraversion on the perceived burden of dementia caregivers: An exploratory study. *Archives of Gerontology and Geriatrics*, 56(1), 91-5. doi:10.1016/j.archger.2012.07.011
- Gottlieb, B. H. (2000). Selecting and planning support interventions. In S. Cohen, L. Underwood, & B. H. Gottlieb (Eds.), *Social support measurement and interventions: A guide for health and social scientists* (pp. 195–220). New York, NY: Oxford University Press.
- Gotz, O., Liehr-Gobbers, K., & Krafft, M. (2010). Evaluation of structural equation models using the partial least squares (PLS) approach. *Handbook of partial least squares* (pp. 691–711). Springer.
- Grabel, E., & Adabbo, R. (2011). Perceived burden of informal caregivers of a chronically ill older family member: Burden in the context of the Transactional Stress Model of Lazarus and Folkman. *GeroPsych*, 24(3), 143-154.

- Grant, M., & Ferrell, B. R. (2012). Oncology family caregivers: Introduction. *Seminars in Oncology Nursing*, 28(4), 203-204. doi:10.1013/j.soncn.2012.09.001
- Grant, M., Sun, V., Fujinami, R., Sidhu, R., Otis-Green, S., Juarez, G., Klein, L., & Ferrell, B. (2013). Family caregiver burden, skills preparedness, and quality of life in non-small cell lung cancer. *Oncology Nursing forum*, 40(4), 337-346. doi: 10.1188/13.ONF
- Greener, S. (2008). *Business research methods*. BookBoon. Retrieved from: <http://www.bookboon.com>
- Greening, L., & Stoppelbein, L. (2007). Brief report: Pediatric cancer, parental coping style and risk for depressive, posttraumatic stress and anxiety symptoms. *Journal of Pediatric Psychology*, 32, 1272-1277.
- Grover, S., & Dutt, A. (2011). Perceived burden and quality of life of caregivers in obsessive-compulsive disorder. *Psychiatry and Clinical Neurosciences*, 65, 416-422. doi:10.1111/j.1440-1819.2011.02240.x
- Gujarati, D. N. (2010). *Essentials of econometrics*. McGraw-Hill
- Gurven, M., von Rueden, C., Massenkoff, M., Kaplan, H., & Vie, M. L. (2013). How Universal Is the Big Five? Testing the Five-Factor Model of Personality Variation among Forager-Farmers in the Bolivian Amazon. *Journal of Personality and Social Psychology*, 104(2), 354-370. doi: 10.1037/a0030841
- Guyard, A., Fauconnier, J., Mermet, M. A., & Cans, C. (2011). Impact on parents of cerebral palsy in children: A literature review. *Archives de Pédiatrie*, 18(2), 204-214. doi:10.1016/j.arcped.2010.11.008
- Haenlein, M., & Kaplan, A. M. (2004). A beginner's guide to partial least squares analysis. *Understanding Statistics*, 3(4), 283-297.
- Haenlein, M., & Kaplan, A. M. (2011). The influence of observed heterogeneity on path coefficient significance: Technology acceptance within the marketing discipline. *The Journal of Marketing Theory and Practice*, 19(2), 153-168.
- Hahn, E., Gottschling, J., & Spinath, F. (2012). Short measurements of personality-validity and reliability of the GSOEP Big Five Inventory (BFI-S). *Journal of Research in Personality*, 46(3), 355-359.
- Hair Jr., J. F., Black, J. W., Babin, B. J., & Anderson, E. R. (2010). *Multivariate data analysis* (7th ed.). Englewood Cliffs: Prentice Hall.

- Hair Jr., J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–12. doi: 10.1108/EBR-10-2013-0128
- Hair, J. F., Gabriel, M. L., & Patel, V. K. (2014). AMOS Covariance-Based Structural Equation Modeling (CB-SEM): Guidelines on its Application as a Marketing Research Tool. *Revista Brasileira de Marketing*, 13(02), 44-55.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2013). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Thousand Oaks: Sage.
- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–151.
- Hair, J. F., Sarstedt, M., Pieper, T. M., & Ringle, C. M. (2012). The use of partial least squares structural equation modeling in strategic management research: A review of past practices and recommendations for future applications. *Long Range Planning*, 45(5-6), 320–340.
- Hakala, H. (2013). Entrepreneurial and learning orientation: Effects on growth and profitability in the software sector. *Baltic Journal of Management*, 8(1), 102–118.
- Hampson, S. E. (2012). Personality processes: Mechanisms by which personality traits “get outside the skin.” *Annual Review of Psychology*, 63, 315–339.
- Hampson, S. E., Edmonds, G. W., Goldberg, L. R., Dubanoski, J. P., & Hillier, T. A. (2015). A life-span behavioral mechanism relating childhood conscientiousness to adult clinical health. *Health Psychology*, 34, 887–895. doi: 10.1037/hea0000209
- Hanif, M., Zaidi, P., Kamal, S., & Hameed, A. (2009). Institution-based cancer incidence in a local population in Pakistan: Nine year data analysis. *Asian Pacific Journal of Cancer Prevention*, 10, 227-230.
- Hanson, J., Ferrell, B., & Grant, M. (2013). Website and resources for cancer family caregivers. *Journal of the Advanced Practitioner in Oncology*, 4(4), 269-272.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408–420.
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved from <http://www.afhayes.com/public/process2012.pdf>

- Hayes, A. F., & Preacher, K. J. (2010). Quantifying and testing indirect effects in simple mediation models when the constituent paths are nonlinear. *Multivariate Behavioral Research, 45*, 627–660.
- Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics, 28*(2), 565–580.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of Partial Least Squares Path Modeling in International Marketing. *Advances in International Marketing, 20*(1), 277-319.
- Hermanns, M., & Mastel-Smith, B. (2012). Caregiving: A qualitative concept analysis. *The Qualitative Report, 17*(75), 1-18.
- Hexem, K. R., Mollen, C. J., Carroll, K., Lanctot, D. A., & Feudtner, C. (2011). How parents of children receiving pediatric palliative care use religion, spirituality, or life philosophy in tough times. *Journal of Palliative Medicine, 14*(1), 39–44. doi: 10.1089/jpm.2010.0256
- Hill, P. L., Weston, S. J., & Jackson, J. J. (2014). Connecting social environment variables to the onset of major specific health outcomes. *Psychology & Health, 29*(7), 753-767. doi: 10.1080/08870446.2014.884221
- Ho, B., Friedland, J., & Rappolt, S., et al. (2003). Caregiving for relatives with Alzheimer's disease: Feelings of Chinese-Canadian women. *Journal of Aging Studies, 17*, 301-321.
- Hoerger, M., Coletta, M., Sörensen, S., Chapman, B., Kaukeinen, K., XinTu., & Duberstein, P. (2016). Personality and Perceived Health in Spousal Caregivers of Patients with Lung Cancer: The Roles of Neuroticism and Extraversion. *Journal of Aging Research, 7*. doi:10.1155/2016/5659793
- Hogan R. (1991). Personality and personality measurement. In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (2nd ed., pp. 327–396). Palo Alto, CA: Consulting Psychologists Press.
- Holt-Lunstad, J., Smith, T., & Layton, J. (2010). Social Relationships and Mortality Risk: A Meta- Analytic Review. *PLoS Medicine, 7*(7), e1000316. doi: 10.1371/journal.pmed.1000316
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science, 241*(4865), 540-545.
- Howlader, N., Noone, A., Krapcho, M., Neyman, N., Aminou, R., Waldron, W.,...Edwards, B. (2013). *SEER Cancer Statistics Review, 1975-2010*. Bethesda, MD: National Cancer Institute.

- Hoyle, R. H., & Robinson, J. C. (2004). Mediated and moderated effects in social psychological research: Measurement design and analysis issues. In C. Sansone, C. C. Morf, & A. T. Panter (Eds.), *The Sage handbook of methods in social psychology* (pp. 213–233). Thousand Oaks, CA: Sage
- Huang, J. P., Xia, W., Sun, C. H., Zhang, H. Y., Wu, L. J. (2009). Psychological distress and its correlates in Chinese adolescents. *Australian and New Zealand Journal of Psychiatry*, *43*, 674–680.
- Hudson., Roberts., & Lodi-Smith. (2012). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith. *Journal of Research in Personality*, *60*, 12-23. doi:10.1016/j.jrp.2015.09.004
- International Agency for Research on Cancer [IARC]. (2016). *Agents Classified by the IARC Monographs, 1*, 114.
- Iqbal, A., & Siddiqui, K. S. (2002). Depression among parents of children with acute lymphoblastic leukemia. *Journal of Ayub Medical College Abbottabad*, *14*, 6-9.
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, *30*(3), 199-218.
- John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin, & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.
- John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 114-158). New York, NY: Guilford Press.
- Juarez, G., Branin, J., Rosales, M. (2014). The cancer caregiving experience of caregivers of Mexican Ancestry. *Hispanic Health Care International*, *12*(3), 120-129. doi:10.1891/1540-4153.12.3.120
- Jurbergs, N., Long, A., Ticonia, L., & Phipps, S. (2009). Symptoms of posttraumatic stress in parents of children with cancer: Are they elevated relative to parents of healthy children? *Journal of Pediatric Psychology*, *34*, 4–13.
- Kelly, D. H., McGinley, J. L., Huxham, F., Menz, H. B., Watts, J., Ianssek, R.,...Morris, M. (2012). Health-related quality of life and strain in

caregivers of Australians with Parkinson's disease: An observational study. *BMC Neurology*, 12(57). doi: 10.1186/1471-2377-12-57

Kerenhappachu, M. S., & Sridevi, G. (2014). Care giver's burden and perceived social support in mothers of children with mental retardation. *International Journal of Scientific and Research Publications*, 4(4), 1-6. doi: 10.1007/s00467-013-2532-6

Khamarko, K., & Myers, J. (2013). *The influence of social support on the lives of HIV-infected individuals in low -and middle income countries*. World Health organization.

Kilis-Pstrusinska, K., Wasilewska, A., Medynska, A., Grenda, R., Kluska-Jozwaik., Leszczynska, B.,...Zwolinska, D. (2013). Psychosocial aspects of children and families of children treated with automated peritoneal dialysis. *Journal of Pediatric Nephrology*, 28(11), 2157-2167. doi: 10.1007/s00467-013-2532-6

Kim, J. H., & Knight, B. G. (2008). Effects of caregiver status, coping styles, and social support on the physical health of Korean American caregivers. *Gerontologist*, 48, 287–299. doi: 10.1093/geront/48.3.287

Kim, M. (2012). *Relationship between types of social support, coping strategies and psychological distress in individuals living with congenital heart disease*. PhD Thesis.

King, H. R., Jackson, J. J., Morrow-Howell, N., & Oltmanns, T. F. (2014). Personality accounts for the connection between volunteering and health. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 70, 691–697. doi: 10.1093/geronb/gbu012

Knight, B. G., & Sayegh, P. (2010). Cultural values and caregiving: The updated sociocultural stress and coping model. *Journal of Gerontology: Psychological Sciences*, 65(1), 5–13. doi: 10.1093/geronb/gbp096

Kohler, B. A., Sherman, R. L., Howlader, N., Jemal, A., Ryerson, A. B., Henry, K. A.,...Penberthy, L. (2015). Annual report to the nation on the status of cancer, 1975-2011, featuring incidence of breast cancer subtypes by race/ethnicity, poverty, and state. *Journal of National Cancer Institute*, 107(6). doi: 10.1093/jnci/djv048

Kohlsdorf., Marina., Costa Junior., & Luiz, A. (2012). Psychosocial impact of pediatric cancer on parents: a literature review. *Paidéia (Ribeirão Preto)*, 22(51), 119-129. doi: 10.1590/S0103-863X2012000100014

Kong, F., & You, X. (2013). Loneliness and self-esteem as mediators between social support and life satisfaction in late adolescence. *Social Indicators Research*, 110(1), 271–279.

- Kong, F., Zhao, J., & You, X. (2013). Self-esteem as mediator and moderator of the relationship between social support and subjective well-being among Chinese university students. *Social Indicators Research*, 112(1), 151–161. doi:10.1111/j.1099-0860.1997.tb00003.x
- Mayall, B. (2000).
- Krejcie, R. V., and Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Krok, D. (2014). Religiousness and social support as predictive factors for mental health outcomes. *Archives of Psychiatry and Psychotherapy*, 2, 65-76.
- Kruithof, W. J., Visser-Meily, J. M. A., & Post, M. W. M. (2012). Positive caregiving experiences are associated with life satisfaction in spouses of stroke survivors. *Journal of Stroke and Cerebrovascular Disease*, 21, 801–807. doi: 10.1016/j.jstrokecerebrovasdis.2011.04.011
- Kudubes, A. A., & Bektas, M., & Ugur, O. (2014). Symptom frequency of children with cancer and parent quality of life in Turkey. *Asian Pacific Journal of Cancer Prevention*, 15, 3487-3493. doi: 10.7314/APJCP.2014.15.8.3487
- Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners*. Los Angeles, CA: Sage.
- Kuo, C., Fitzgerald, J., Operario, D., & Casale, M. (2012). Social support disparities for caregivers of AIDS-orphaned children in South Africa. *Journal of Community Psychology*, 40(6), 631–644. doi:10.1002/jcop.20521
- Lai, D. (2012). Effect of financial costs on caregiving burden of family caregivers of older adults. *Sage Open*, 2.
- Lakey, B., & Orehek, E. (2011). Relational regulation theory: A new approach to explain the link between perceived social support and mental health. *Psychological review*, 118(3), 482-495. doi: 10.1037/a0023477
- Larsen, R. J., & Buss, D. M. (2005). *Personality psychology: Domains of knowledge about human nature* (2nd ed.). New York: McGraw Hill.
- Lau, K. M., Phil, M., & Au. A. (2011). Correlates of informal caregiver distress in Parkinson's disease: A Meta-analysis. *Clinical Gerontologist*, 34, 117-131. doi:10.1080/07317115.2011.539521
- Lautenschlager, N. T., Kirz, A. F., Lois, S., & Cramer, B. (2013). Personality of mental health caregivers. *Current Opinion in Psychiatry*, 26(1), 97-101. doi:10.1097/YCO.0b013e32835997b3.

- Lazaridès, A., Bélanger, C., & Sabourin, S. (2010). Personality as moderator of the relationship between communication and couple stability. *Europe's Journal of Psychology*, 6(2), 11- 31. doi: 10.5964/ejop.v6i2.182
- Lazarus, R., & Folkman, S. (1984). *Stress, appraisals and coping*. New York: Springer Publishing Company
- Lench, H.C. (2011). Personality and health outcomes: making positive expectations a reality. *Journal of Happiness Studies*, 12(3), 493-507. doi:10.1007/s10902-010-9212-z
- Lima, M. B. S., Afonso, T., & Silva, S. C. (2015). Primary caregivers of autistic children in the Amazon. *Apae Ciência*, 2(1), 21-36. Retrieved from <http://apaeciencia.org.br/index.php/revista/article/view/62/30>
- Lima, M. B. S., Cardoso, V. S., & Silva, S. S. C. (2016). Parental stress and social support of caregivers of cerebral palsy children. *Paidéia (Ribeirão Preto)*, 26(64), 207-214. doi:10.1590/1982-43272664201608
- Lindahl-Norberg, A., Lindblad, F., & Boman, K. K. (2006). Support seeking, perceived support, and anxiety in mothers and fathers after children's cancer treatment. *Psycho-Oncology*, 15(4), 335–343.
- Lisa, L. O. (2013). The Modified Caregiver Strain Index (MCSI). *Hartford Institute for Geriatric Nursing*, 14.
- Litzelman, K., Catrine, K., Gangnon, R., & Witt, W. P. (2011). Quality of life among parents of children with cancer or brain tumors: The impact of child characteristics and parental psychosocial factors. *Quality of Life Research*, 20, 1261-1269.
- Lockenhoff, C. E., & Carstensen, L. (2004). Socio-emotional selectivity theory, aging and health: the increasingly delicate balance between regulating emotions and making tough choices. *Journal of Personality*, 72(6), 1395–1424.
- Lockenhoff, C. E., Duberstein, P. R., Friedman, B., & Costa Jr., P. T. (2011). Five-factor personality traits and subjective health among caregivers: the role of caregiver strain and self-efficacy. *Psychology and Aging*, 26(3), 592–604. doi:10.1037/a0022209
- Lockwood, C. M., & MacKinnon, D. P. (1998). *Bootstrapping the standard error of the mediated effect*. In 23rd annual meeting of SAS Users Group International (pp. 997–1002). Cary: NC
- Long, K. A., & Marsland, A. L. (2011). Family adjustment to childhood cancer: A systematic review. *Clinical Child and Family Psychology Review*, 14, 57–88. doi: 10.1007/s10567-010-0082-z

- Lopez, M., & Cooper, L. (2011). *Social Support Measures Review. Final report*. National center for Latino child and Family Research.
- Lou, V. W. (2006). Factors related to the psychological well-being of parents of children with leukemia in China. *Journal of Psychosocial Oncology*, 24(3), 75–88.
- Lowry, P. B., & Gaskin, J. (2014). Partial Least Squares (PLS) Structural Equation Modeling (SEM) for building and testing behavioral causal theory: When to choose it and how to use it. *IEEE Transactions on Professional Communication*, 57(2), 123–146.
- Lund, L., Ross, L., Peterson, M. A., & Groenvold, M. (2015). The interaction between informal cancer caregivers and health care professionals: A survey of caregivers' experiences of problems and unmet needs. *Support Care Cancer*, 23(6), 1719-1733. doi:10.1007/s00520-014-2529-0
- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology*, 58, 593–614.
- MacKinnon, D. P., Fritz, M. S., Williams, J., & Lockwood, C. M. (2007). Distribution of the product confidence limits for the indirect effect: program PRODCLIN. *Behavior Research Methods*, 39(3), 384–389.
- Majerovitz, S. D. (2001). Formal versus informal support: Stress buffering among dementia caregivers. *Journal of Mental Health and Aging*, 7, 413-423.
- Majid, S., & Abidi, M. (2013). Quality of life and coping styles of care-givers of patients suffering from thalassemia major. *International Journal of Medical and Pharmaceutical Sciences*, 3(10), 41-48.
- Marcoulides, G. A., & Saunders, C. (2006). PLS: A Silver Bullet? *MIS Quarterly*, 30(2), 3-5.
- Marcoulides, G., Chin, W., & Saunders, C. (2009). A critical look at partial least squares modeling. *MIS Quarterly*, 33(1), 171–175
- Marcusen, C. (2010). Information and communication needs of individuals living with advanced cancer. *Seminars in Oncology Nursing*, 26, 151-156. doi:10.1016/j.soncn.2010.05.006
- Marnie, B. M. (2008). *The role of personality following the September 11th terrorist attacks: big five trait combinations and interactions in explaining distress and coping*. PhD Thesis.
- Marsland, A. L., Long, K. A., Howe, C., Thompson, A. L., Tersak, J., & Ewing, L. J. (2013). A pilot trial of a stress management intervention for primary caregivers of children newly diagnosed with cancer: Preliminary evidence

that perceived social support moderates the psychosocial benefit of intervention. *Journal of Pediatric Psychology*, 38(4), 449–461. doi: 10.1093/jpepsy/jss173

- Martin, A. C., & Keats, M. R. (2014). The impact of yoga on quality of life and psychological distress in caregivers for patients with cancer. *Oncology Nursing Forum*, 41(3), 257-264. doi: 10.1188/14.ONF
- Masood, J., Beenish, Q., Zubia, M., & Shaukat, A. J. (2010). Disclosure of cancer diagnosis: Pakistani patients' perspective. *Middle East Journal of Cancer*, 1(2), 89–94.
- Maulik, P. K., Eaton, W. W., Bradshaw, C. P (2011). The effect of social networks and social support on mental health services use, following a life event, among the Baltimore Epidemiologic Catchment Area cohort. *Journal of Behavioral Health Services & Research*, 38(1), 29–50. doi: 10.1007/s11414-009-9205-z
- McCarthy, B. (2011). Family members of patients with cancer: What they know, how they know and what they want to know. *European Journal of Oncology Nursing*, 15, 428-441. doi: 10.1016/j.ejon.2010.10.009
- McCrae, R. R. & John, O. P. (1992). An Introduction to the Five-Factor Model and its applications. *Journal of Personality*, 60, 175-215. doi: 10.1111/j.1467-6494.1992.tb00970.x
- McCrae, R. R. (2005). Personality structure. In B. A. Winstead, V. J. Derlega, & W. H. Jones (Eds.), *Personality: Contemporary theory and research* (pp. 192-216). Belmont, CA: Thomson Wadsworth.
- McCrae, R. R., & Costa, P.T. (1987). Validation of the five-factor model of personality across instruments and observers. *Journal of Personality and Social Psychology*, 52, 81-90.
- McCrae, R. R., & Costa, PT. (2003). *Personality in adulthood*. New York, NY: Guilford.
- Meecharoen, W., Northouse, L. L., Sirapo-ngam, Y., & Monkong, S. (2013). Family caregivers for cancer patients in Thailand: An integrative review. *Sage Open*, 1-10. doi:10.1177/2158244013500280
- Melo, G., Maroco, J., & de Mendonça, A. (2011). Influence of personality on caregiver's burden, depression and distress related to the BPSD. *International Journal of Geriatric Psychiatry*, 26(12), 1275-1282. doi:10.1002/gps.2677

- Mitnick, S., Leffler, C., & Hood, V. L. (2010). Family caregivers, patients and physicians: ethical guidance to optimize relationships. *Journal of General Internal Medicine*. doi 10.1007/s11606-0091206-3.
- Molassiotis, A., Wilson, B., Blair, S., Howe, T., & Cavet, J. (2011). Living with multiple myeloma: experiences of patients and their informal caregivers. *Supportive Care in Cancer*, *19*, 101–111. doi: 10.1007/s00520-009-0793-1
- Monat, A., & Lazarus, R. S. (1991). Stress and coping--some current issues and controversies. In A. Monat, & R. S. Lazarus (Eds.), *Stress and Coping* (pp. 1-15). New York, NY: Columbia University Press.
- Munsell, P. E., Kilmer, R. P., Cook, J. R., & Reeve, C. L. (2012). The effects of caregiver social connections on caregiver, child and family well-being. *American Journal of Orthopsychiatry*, *82*, 137-145.
- Murphy, S. L., Xu, J., & Kochanek, K. D. (2013). *Deaths: Final Data for 2010. National Vital Statistics Reports*. Hyattsville, MD: National Center for Health Statistics, 61(4).
- Nakaya, N., Bidstrup, P. E., Saito-Nakaya, K., Frederiksen, K., Koskenvuo, M., Pukkala, E.,...Johansen, C. (2010). Personality traits and cancer risk and survival based on Finnish and Swedish registry data. *American Journal of Epidemiology*, *172*, 377–385. doi: 10.1093/aje/kwq046
- Narayan, S. M., Varghese, M., Hepburn, K., Lewis, M., Paul, I., & Bhimani, R. (2015). Caregiving experiences of family members of persons with dementia in South India. *American Journal of Alzheimer's disease and other Dementias*, *30*(5), 508-516. doi: 10.1177/15333175145675
- National Cancer Institute, 2015
- Navneet Kaur. (2014). Caregiving burden and social support among caregivers of schizophrenic patients. *Delhi psychiatry journal*, *17*(2), 337-342.
- Nazish, I., Riaz, M., Haider, I. I., Lubna, A., Amna, O., & Ahsan. (2010). Caring for the caregivers: Mental health, family burden and quality of life of caregivers of patients with mental illness. *Journal of Pakistan psychiatric society*, *7*(1).
- Neuman, G. A., Wagner, S. H., & Christiansen, N. D. (1999). The relationship between work team personality composition and the job performance of teams. *Group and Organization Management*, *24*, 28-45.
- Norman, W. T. (1967). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*, *66*, 574-583.

- Northouse, L., Katapol, M. C., Schafenacker, A., & Weiss, D. (2012). The impact of caregiving on the psychological well-being of family caregivers and cancer patients. *Seminars in Oncology Nursing*, 20(4), 236-245.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.
- O'Connor, N. (2015). *The correlation among personality characteristics, stress, and coping of caregivers of individuals with intellectual and developmental disabilities*. Walden University: Scholar Works.
- Okoye, U. O., & Asa, S. S. (2011). Caregiving and stress: Experience of people taking care of elderly relations in South-eastern Nigeria. *Arts and Social Sciences Journal; ASSJ-29*, 1-9.
- Ozer, D. J., & Benet-Martinez, V. B. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57, 401–421
- Pallant, J. (2010). *SPSS Survival Manual: A Step by Step Guide to Data Analysis using SPSS* (4th ed.). Maidenhead: Open University Press.
- Palompon, D. R., Ente, R., & Bantugan, J. (2011). Predictors of depression among institutionalized elderly clients. *Asian Journal of Health Social Qualitative Section*, 1(1), 128-142.
- Palos, G. R., Mendoza, T. R., Liao, K. P., Anderson, K. O., Garcia-Gonzalez, A., Hahn, K.,...Cleeland, C. S. (2011). Caregiver symptom burden: The risk of caring for an underserved patient with advanced cancer. *Cancer*, 117(5), 1070-1079. doi:10.1002/cncr.25695
- Park, N. S., Jang, Y., Lee, B. S., Ko, J. E., Chiriboga, A. (2014). The impact of social resources on depressive symptoms in racially and ethnically diverse older adults: variations by groups with differing health risks. *Research on Aging*, 36, 322–342. doi: 10.1177/0164027513486991
- Park, S., Bae, J., Nam, B. H., & Yoo, K. Y. (2008). Aetiology of cancer in Asia. *Asian Pacific Journal of Cancer Prevention*, 9, 371-380.
- Patil, B., Shetty, N., Subramanyam, A., Shah, H, Kamath, R., & Pinto, C. (2014). Study of perceived and received social support in elderly depressed patients. *Journal of Geriatric Mental Health*, 1, 28-31.
- Patino-Fernandez, A. M., Pai, A. L., Alderfer, M., Hwang, W. T., Reilly, A., & Kazak, A. E. (2008). Acute stress in parents of children newly diagnosed with cancer. *Pediatric Blood and Cancer*, 50, 289–292.
- Pearlin, L. I., & Schooler, C. (1978). The structure of coping. *Journal of Health and Social Behaviors*, 19(2), 2-12.

- Pearlin, L. I., & Skaff, M. M. (1996). Stress and the life course: A paradigmatic alliance. *The Gerontologist*, *36*, 229–247.
- Pearlin, L. I., Aneshensel, C. S., & LeBlanc, A. J. (1997). The forms and mechanisms of stress proliferation: the case of AIDS caregivers. *Journal of Health and Social Behavior*, *38*(3), 223-236.
- Pearlin, L. I., Mullan, J. T., Semple, S. J., & Skaff, M. M. (1990). Caregiving and the stress process: An overview of concepts and their measures. *Gerontologist*, *30*, 583-595.
- Pearlin, L. I., Sample, S., & Turner, H. A. (1988). Stress of AIDS caregiving. A preliminary overview of the issues: *Death Studies*, *12*, 501-517.
- Penley, J. A., & Tomaka, J. (2002). Associations among the Big five, emotional responses, and coping with acute stress. *Personality and Individual Differences*, *32*, 1215–1228.
- Perkins, M., Howard, V.J., Wadley, V.G., Crowe, M., Safford, M.M., Haley, W.E.,...Roth, D.L. (2012). Caregiving strain and all-cause mortality: evidence from the Regards study. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. doi:10.1093/geronb/gbs084
- Perz, J., Ussher, J. M., Butow, P., & Wain, G. (2011). Gender differences in cancer carer psychological distress: An analysis of moderators and mediators. *European Journal of Cancer Care*, *20*, 610-619. doi:10.1111/j.1365-2354.2011.01257x
- Pettit, J. W., Roberts, R. E., Lewinsohn, P. M., Seeley, J. R., & Yaroslavsky, I. (2011). Developmental relations between perceived social support and depressive symptoms through emerging adulthood: Blood is thicker than water. *Journal of Family Psychology*, *25*(1). 127-136. doi: 10.1037/a0022320
- Pfeifer, L. I., Silva, D. B. R., Lopes, P. B., Matsukura, T. S., Santos, J. L. F., & Pinto, M. P. P. (2014). Social support provided to caregivers of children with cerebral palsy. *Child: Care, Health and Development*, *40*(3), 363-369. doi:10.1111/cch.12077
- Pi-Ming, Yeh., Mary, E., Wierenga., SU-Chuan, Yuan. (2009). Influences of psychological well-being, quality of caregiver-patient relationship, and family support on the health of family caregivers for cancer patients in Taiwan. *Asian Nursing research*, *3*(4), 154-166.
- Pinquart, M., & Sorensen, S. (2011). Spouses, adult children and children-in-law as caregivers of older adults: A meta-analytic comparison. *Psychology and Aging*, *26*(1), 1-14. doi:1037/a0021863

- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *The Journal of Applied Psychology*, 88(5), 879–903.
- Polita, N. B., & Tacla, M. T. G. M. (2014). Network and social support to families of children with cerebral palsy. *Escola Anna Nery*, 18(1), 75-81. doi:10.5935/1414-8145.20140011
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891.
- Public Health Agency of Canada. (2013, October). *Core Competencies for Public Health – Draft 2*.
- Punjab Cancer Registry (2016).
- Quinn, C., Clare, L., & Woods, R. T. (2015). Balancing needs: The role of motivations, meanings and relationship dynamics in the experience of informal caregivers of people with dementia. *Dementia*, 14(2), 220-237. doi: 10.1177/1471301213495863
- Quinn, C., Clare, L., McGuinness, T., & Woods, R. T. (2012). The impact of relationships, motivations, and meanings on dementia caregiving outcomes. *International Psycho-geriatrics*, 24, 1816–1826. doi: 10.1017/S1041610212000889
- Rafiyah, I., Suttharangsee, W., Sangchan, H. (2011). Social support and coping of Indonesian family caregivers caring for persons with schizophrenia. *Nurse Media Journal of Nursing*, 1(2), 159–169.
- Raju, R. S., Kaur, P., & Pandian, J. D. (2012). Psychosocial problems, quality of life, and caregiver burden among stroke caregivers in India. *International Journal of Stroke*, 7(1), 100-101. doi:10.1111/j.1747-4949.2011.00721.x
- Ramayah, T., Lee, J. W. C., & In, J. B. C. (2011). Network collaboration and performance in the tourism sector. *Service Business*, 5(4), 411–428
- Reich, W., Lounsbury, D., Zaid-Muhammad, S., & Rapkin, B. (2010). Forms of social support and their relationships to mental health in HIV-positive persons. *Psychology, Health & Medicine*, 15(2), 135–145.
- Reinartz, W., Haenlein, M., & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *International Journal of Research in Marketing*, 26(4), 332–344.

- Reynolds, C. R., & Livingston, R. B. (2012). *Mastering modern psychological testing: Theory and methods*. Boston, MA: Pearson.
- Ribeiro, M. F. M., Sousa, A. L. L., Vandenberghe, L., & Porto, C. C. (2014). Parental stress in mothers of children and adolescents with cerebral palsy. *Revista Latino-Americana de Enfermagem*, 22(3), 440-447. doi:10.1590/0104-1169.3409.2435
- Ringle, C. M., Wande, S., & Becker, J.-M. (2014). *Smartpls 3.0*. Hamburg: SmartPLS. Retrieved from <http://www.smartpls.com>
- Robins, J. (2012). Editorial Partial-Least Squares. *Long Range Planning*, 45(5-6), 309-311.
- Roddenberry, A., & Renk, R. (2010). Locus of control and self-efficacy: Potential mediators of stress, illness, and utilization of health services in college students. *Child Psychiatry and Human Development*, 41(4), 353-370. doi:10.1007/s10578-010-0173-6
- Rodrigo, C., Fernando, T., Rajapakse, S., De Silva, V., & Hanwella, R. (2013). Caregiver strain and symptoms of depression among principle caregivers of patients with schizophrenia and bipolar affective disorder in Sri Lanka. *International Journal of Mental Health*, 7(2). doi:10.1186/1752-4458-7-2
- Rodriguez, E. M., Dunn, M. J., Zuckerman, T., Vannatta, K., Gerhardt, C. A., & Compas, B. E. (2012). Cancer-related sources of stress for children with cancer and their parents. *Journal of Pediatric Psychology*, 37, 185-197. doi: 10.1093/jpepsy/jsr054
- Roohafza, H., Sadeghi, M., Shirani, S., Bahonar, A., Mackie, M., & Sarafzadegan, N. (2009). Association of socioeconomic status and life-style factors with coping strategies in Isfahan Healthy Heart Program, Iran. *Croatian Medical Journal*, 50, 380-386.
- Rosell-Murphy, M., Bonet-Simo, J., Baena, E., Prieto, G., Bellerino, E., Sole, F.,...Mimoso, S. (2014). Intervention to improve social and family support for caregivers of dependent patients: ICIAS Study Protocol. *BioMed Central Family Practice*, 15, 53. doi: 10.1186/1471-2296-15-53
- Rossiter, J. R. (2001). The C-OAR-SE procedure for scale development in marketing. *International Journal of Research in Marketing*, 19(4), 305-335.
- Rubab, Z. K., Ibtisam., Samina, T., Azeemi., & Naveed. (2015). Lung carcinoma types, gender and its changing trend in the Punjab, 2008-2012. *Science International*, 27(1), 243-246.

- Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation analysis in social psychology: Current practices and new recommendations. *Social and Personality Psychology Compass*, 5(6), 359–371. doi: 10.1111/j.1751-9004.2011.00355.x
- Ryckman, R. (2004). *Theories of personality*. Belmont, CA: Thomson/Wadsworth.
- Saeed, Z., Ahmed, A. M., Shakoor, A., Ghafoor, F., & Kanwal, S. (2012). Depression in patients on hemodialysis and their caregivers. *Saudi journal of Kidney Diseases and Transplantation*, 23, 946-952.
- Salama, R., & El-Soud, F. (2012). Caregiver burden from caring for impaired elderly: A cross sectional study in rural Lower Egypt. *Italian Journal of Public Health*, 9. doi: 10.2427/8662
- Sanders, B. A. (2007). Using personality traits to predict police performance. *Policing: An International Journal of Police Strategies*, 31, 129-147.
- Sarstedt, M., Ringle, C. M., & Hair, J. F. (2014). PLS-SEM: Looking back and moving forward. *Long Range Planning*, 1–6.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). India: Pearson Education
- Schwarzer, R., & Schulz, U. (2013). Berlin Social Support Scales (BSSS). *Measurement Instrument Database for the Social Science*. Retrieved from www.midss.ie
- Sekaran, U., & Bougie, R. (2010). *Research Methods for Business: A Skill Building Approach* (5th ed.). New Jersey: John Wiley and Sons.
- Selye, H. (1976). *The stress of life* (2nd ed.). New York: McGraw-Hill.
- Shah, H., Sultan, S. M., Faisal M., & Irfan. (2013). Psychological distress among caregivers of patients with schizophrenia. *Journal of Ayub Medical College Abbottabad*, 25, 3-4.
- Sharma, A., Kaur, S., Kumar, T, M., & Singh, A. (2014). Extent of the burden of caregiving on family members of neurosurgical inpatient in a tertiary care hospital in North India. *Journal of Neuroscience Nursing*, 46(1), E3-E9.
- Shepperd, J., Klein, W. M., Waters, E. A., & Weinstein, N. D. (2013). Taking stock of unrealistic optimism. *Perspectives on Psychological Science*, 8(4), 395–411. doi: 10.1177/1745691613485247
- Sherbourne, C. D., & Stewart, A. L. (1992). Role functioning measures. In A.L. Stewart and J.E. Ware (Eds.), *Measuring functioning and well-being: The*

Medical Outcomes Study approach (pp. 205-219), Durham, NC: Duke University Press.

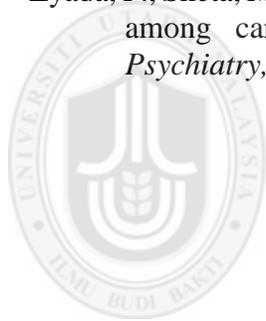
- Sherman, R. A., Nave, C. S., & Funder, D. C. (2013). Situational construal is related to personality and gender. *Journal of Research in Personality, 47*(1), 1–14.
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*(4), 422.
- Siegel, R. L., Miller, K. D., & Jemal, A. (2016). Cancer statistics, 2016. *A Cancer Journal for Clinicians, 65*, 5–29. doi:10.3322/caac.21254
- Siegler, I. C., Brummett, B. H., Williams, R. B., Haney, T. L., & Dilworth-Anderson, P. (2010). Caregiving, residence, race, and depressive symptoms. *Aging and Mental Health, 14*, 771–778. doi:http://dx.doi.org/10.1080/13607861003713257
- Skalla, K., & Ferrell, B. (2015). Challenges in assessing spiritual distress in survivors of cancer. *Clinical Journal of Oncology Nursing, 19*(1), 99-104. doi: 10.1188/15.CJON.99-104
- Smeltzer, S. G., & Bare, B. G. (1992): *Brunner and Suddah's textbook of medical-surgical nursing* (7th ed.). Philadelphia: JB Lippincott.
- Smith, G. R., Williamson, G. M., Miller, L. S., & Schulz, R. (2011). Depression and quality of informal care: A longitudinal investigation of caregiving stressors. *Psychology and Aging, 26*(3), 584–591. doi:10.1037/a0022263
- Smith, L., Hill, N., & Kocanovik, R. (2015). Experiences of depression, the role of social support and its impact on health outcomes. *Journal of mental health, 24*(6), 342-346. doi: 10.3109/09638237.2014.954693
- Smojver-Azic, S., & Bezinovic, P. (2011). Sex differences in patterns of relations between family interactions and depressive symptoms in adolescents. *Croatian Medical Journal, 52*, 469–477. doi: 10.3325/cmj.2011.52
- Snyder, & Christine, M. (2015). *Dementia caregiver personality traits and coping strategies: association with care recipient outcomes*. All Graduate Theses and Dissertations. Paper 4235.
- Sobel, E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290–312.
- Sonnenberg, C., Deeg, D., van Tilburg, T., Vink, D., Stek, M., Beekman, A. (2013). Gender differences in the relation between depression and social

- support in later life. *International Psychogeriatrics*, 25, 61–70. doi: 10.1017/S1041610212001202
- Sorensen, S., Hirsch, J. K., & Lyness, J. M. (2014). Optimism and planning for future care needs among older adults. *Geropsychology*, 27(1), 5–22. doi: 10.1024/1662-9647/a000099
- Soylu, C., Ozaslan, E., Karaca, H., & Ozkan, M. (2015). Psychological distress and loneliness in caregiver of advanced oncological inpatients. *Journal of Health Psychology*, 1-11. doi:10.1177/1359105314567770
- Stam, H., Grootenhuis, M. A., Brons, P. P., Caron, H. N., & Last, B. F. (2006). Health-related quality of life in children and emotional reactions of parents following completion of cancer treatment. *Pediatric Blood and Cancer*, 47(3), 312–319.
- Stenberg, U., Ruland, C. M., Miaskowski, C. (2010). Review of the literature on the effects of caring for a patient with cancer. *Psycho-Oncology*, 19, 1013-1025.
- Stetz, K. (1986). *The experience of spouse caregiving for persons with advanced cancer*. PhD Thesis.
- Strober, L. B. (2016). Personality in multiple sclerosis: impact on health, psychological wellbeing, coping and overall quality of life. *Journal of psychology, health and medicine*, 1-10. doi: 10.1080/13548506.2016.1164321
- Strom, J. L., & Egede, L. E. (2012). The impact of social support on outcomes in adult patients with type 2 diabetes: a systematic review. *Current Diabetes Report*, 12(6), 769–781. doi:10.1007/s11892-012-0317-0.
- Sudman, S., & Bradburn, N. (1982). *Asking Questions: a Practical Guide to Questionnaire Design*. USA: Jossey-Bass
- Sun, V., Grant, M., Koczywas, M., Freeman, B., Zachariah, F., Fujinami, R.,...Ferrell, B. (2015). Effectiveness of an interdisciplinary palliative care intervention for family caregivers in lung cancer. *Cancer*. doi: 10.1002/cncr.29567
- Surkan, P. J., Peterson, K. E., Hughes, M. D. & Gottlieb, B. R. (2006). The role of social networks and support in postpartum women's depression: A multiethnic urban sample. *Maternal and Child Health Journal*, 10(4), 375-383.
- Tanaka, J. S. (1993). Multifaceted conceptions of fit in structural equation models. In K. A. Bollen, & J. S. Long (Eds.). *Testing Structural Equation Models*. Newbury Park, CA: Sage.

- Thoits, P. A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, 52(2), 145–161. doi: 10.1177/0022146510395592
- Thornton, M., & Travis, S. S. (2003). Analysis of the reliability of the Modified Caregiver Strain Index. *The Journal of Gerontology, Series B, Psychological Sciences and Social Sciences*, 58(2), 129.
- Toegel, G., & Barsoux, J. L. (2012). How to become a better leader. *MIT Sloan Management Review*, 53, 50–60.
- Trochim, W. M., & Donnelly, J. P. (2006). *The Research Methods Knowledge base*. Atomic Dog (3rd ed.).
- Turiano, N. A., Spiro, A., & Mroczek, D. K. (2012). Openness to experience and mortality in men: Analysis of trait and facets. *Journal of Aging and Health*, 24, 654–672. doi: 10.1177/0898264311431303
- Uchino, B. N. (2004). *Social support and physical health: Understanding the health consequences of our relationships*. New Haven, CT: Yale University Press.
- Ugalde, A., Krishnasamy, M., & Schofield, P. (2013). Development of an instrument to measure self-efficacy in caregivers of people with advanced cancer. *Psycho-oncology*, 22(6), 1428–1434. doi: 10.1002/pon.3160
- Van Berkel, H. (2009). *The relationship between personality, coping styles and stress, anxiety and depression*. PhD Thesis. Malaysia
- Van Ryn, M., Sanders, S., Kahn, K., Van Houtven, C., Griffin, J. M., Martin, M.,...Rowland, J. (2011). Objective burden, resources, and other stressors among informal cancer caregivers: A hidden quality issue? *Psycho-Oncology*, 20(1), 44–52. doi: 10.1002/pon.1703
- Vanderstoep, S. W., & Johnston, D. D. (2009). *Research methods for everyday life: Blending qualitative and quantitative approaches*. San Francisco: John Wiley & Sons, Inc.
- Visser-Meily, J. M., Post, M. W., Riphagen., & Lindeman, E. (2004). Measures used to assess burden among caregivers of stroke patients: a review. *Clinical Rehabilitation*, 18, 601–623.
- Vollrath, M., & Torgersen, S. (2000). Personality types and coping. *Personality and Individual Differences*, 29, 367–378.
- Vrijmoet-Wiersma, J., Klink, J.M., Kolk, A.M., Koopman, H.M., Ball, L.M., & Egeler, R.M. (2008). Assessment of parental psychological stress in

- pediatric cancer: A Review. *Journal of Pediatric Psychology* 33(7), 694–706.
- Wallace, C., & Chen, G. (2006). A multilevel integration of personality, climate, self-regulation, and performance, *Personnel Psychology*, 59, 529 – 557.
- Wallace, J. C., & Vodanovich, S. J. (2003). Workplace safety performance: Conscientiousness, cognitive failure, and their interaction. *Journal of Occupational Health Psychology*, 8, 316 – 327.
- Wallhagen, M. I. (1992). Caregiving demands: Their difficulty and effects on the well-being of elderly caregiver. *Scholarly Inquiry for Nursing Practice*, 6(2), 111-133.
- Wan Afthanorhan, M. W. A. B. (2013). A comparison of Partial Least Square Structural Equation Modeling (PLS-SEM) and Covariance Based Structural Equation Modeling (CB-SEM) for confirmatory factor analysis. *International Journal of Engineering Science and Innovative Technology*, 2(5), 198–205.
- Wang, X. (2014). Subjective well-being associated with size of social network and social support of elderly. *Journal of Health Psychology*. doi:1359105314544136
- Wang., Cai., Qian., & Peng. (2014). Social support moderates stress effects on depression. *International Journal of Mental Health Systems*, 8(41). doi:10.1186/1752-4458-41
- Weston, S. J., & Jackson, J. (2016). How do people respond to health news? The role of personality traits. *Psychology & Health*. doi: 10.1080/08870446.2015.1119274
- Weston, S. J., Hill, P., & Jackson, J. (2014). Personality traits predicts the onset of disease. *Social Psychological and Personality Science*, 6(3), 309-317. doi: 10.1177/1948550614553248
- Wilborn-Lee, B. (2015). *The Effects of Stress and Burden on Caregivers of Individuals with a Chronic Illness*. Walden dissertation and doctoral studies.
- Wong, K. K. (2013). Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques Using SmartPLS. *Marketing Bulletin*, 24(1), 1-32.
- World Cancer Report, 2015
- Yehuda, B. (1999). Response rate in academic studies: A comparative analysis. *Human Relations*, 52(4), 421–438.

- Yousafzai, A., Bhutto, N., Ahmar, S., Siddiqui, M., & Selamat, S. (2011). Caregivers' stress of cancer patients in a tertiary care hospital. *Journal of Postgraduate Medical Institute (Peshawar - Pakistan)*, 22(1), 62-65.
- Zebrack, B., Stuber, M., Meeske, K., Phipps, S., Krull, K., Qi Liu, ... Zeltzer, L. (2012). Perceived positive impact of cancer among long-term survivors of childhood cancer: A report from the childhood cancer survivor study. *Psychooncology*, 21(6), 630–639. doi:10.1002/pon.1959.
- Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, 37, 197–206.
- Zikmund, W. G., Babin, B. J., & Griffin, M. (2010). *Business Research Methods*. Mason, Ohio, South-Western.
- Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2013). *Business research methods* (8th ed.). Canada: South-Western, Cengage Learning.
- Zyada, F., Sheta, M., Degwi, H., & Saad, R. (2013). Anxiety, depression and strain among caregivers of terminally ill patients. *Egyptian Journal of Psychiatry*, 34, 77-84. doi: 0.7123/01.EJP.0000419667.93575.14



UUM
Universiti Utara Malaysia

APPENDIX





UNIVERSITI UTARA MALAYSIA

06010 UUM Sintok, Kedah Darul Aman, Malaysia. Tel: 604 - 928 4000

21 October 2016

TO WHOM IT MAY CONCERN,

Dear Sir/Madam,

DATA COLLECTION FOR RESEARCH PURPOSE (PhD)

This letter confirms that Ansa Qurat-ul-ain (900377) is a PhD student at the School of Applied Psychology, Social Work and Policy, Universiti Utara Malaysia (UUM). Currently, she is doing a research under my supervision titled "*Influence of Caregiving and Personality on the Stress Level of Caregivers of Cancer Patients: Role of Social Support as a Mediating Variable*". The objective of her research is to examine the influence of caregiving, personality and social support of caregivers on their stress level.

The information collected from the participants through the survey process (questionnaire) will be kept private and confidential. Your cooperation in this regard is highly appreciated.

Thank you.

Sincerely,

PROF DR. NAJIB AHMAD MARZUKI
Professor of Psychology
School of Applied Psychology, Social Work and Policy
Universiti Utara Malaysia
MALAYSIA



Informed Consent Form

I, the undersigned, confirm that I have read and understood the information about the thesis, as provided in the cover letter. I voluntarily agree to participate in the project. I understand I can withdraw at any time without giving reasons and that I will not be penalized for withdrawing nor will I be questioned on why I have withdrawn.

The procedures regarding confidentiality have been clearly explained to me as well as the use of the data in research, publications, sharing and archiving has been explained to me. I, along with the Researcher, agree to sign and date this informed consent form.

Name of Participant

Signature

Date



Influence of Caregiving and Personality on the Stress Level of Caregivers of Cancer

Patients: Role of Social Support as a Mediating Variable

Dear Respondent,

This is a survey regarding influence of caregiving and personality on the stress level of cancer patients. Only 10-20 minutes of your precious time are required to fill in the attached questionnaires. All the questions are to be answered. It is assured that all the information will be kept confidential and will be used only for the study purpose. It is also assured that anonymity will be maintained.

Please be honest in your response so true results in our research could be obtained. Your cooperation in this regard is highly acknowledged.

Ansa Qurat-ul-ain
PhD Scholar

SECTION A: Demographic Information

Direction: Please tick in the relevant information.

1. **Gender:** Male: Female:
2. **Age:** 20-30 years 30-40 years
40-50 years Above 50 years
3. **Marital Status:** Single: Married: Other:
4. **Educational level:**
Primary Secondary Intermediate
Graduation Masters Other
5. **Occupation:**
Govt. Sector Private Sector Own business Other
6. **Relation of caregiver and care receiver:**
Mother/Father Brother/Sister
Grandparent Other relation
7. **Duration of illness:** 0-3 years: 4-6 years: 7-10 years:

SECTION B

Caregiving Tasks Questionnaire (Physical Caregiving)

Direction: Please tick the columns that best describes about caregiving activities that you may or may not doing now for care-receiver.

Sr. No.	Items	Strongly Disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly Agree=5
1	I help care-receiver with eating his/her food.					
2	I help care-receiver with personal care (Dressing, bathing or hair care)					
3	I help care-receiver use the toilet, bedpan or commode.					
4	I help care-receiver walk across the room.					
5	I help care-receiver get in and out of bed, chair or couch.					
6	I plan care-receiver's meals.					
7	I prepare care-receiver's meals.					
8	I take care of care-receiver's banking, paying bills or other financial matters.					
9	I do shopping, appointments, or run errands for care-receiver.					
10	I help care-receiver with writing letters, phone calls, or other personal communications.					
11	I help care-receiver with laundry or other household chores.					
12	I provide transportation for care-receiver in getting from home to other places.					
13	I help care-receiver take her medications and /or prescribed treatments.					
14	I contact doctor about care-receiver's					

	medications and/or treatment needs.					
15	I check on care-receiver during the night.					

Berlin Social Support Scale (Emotional Caregiving)

Direction: Think about the patient. How did you interact with him during caregiving?
Mark the columns that apply to you.

Sr, No.	Items	Strongly disagree= 1	Disagree =2	Neutral =3	Agree= 4	Strongly agree=5
1	I showed him/her how much I cherish and accept him.					
2	I comforted him when he/she was feeling bad.					
3	I left him/her alone.					
4	I didn't have much empathy for him/her.					
5	I criticized him.					
6	I made him/her feel valued and important.					
7	I expressed my concern about his/her condition.					
8	I reassured him/her that he can rely completely on me.					
9	I encouraged him/her not to give up.					
10	I was there when he/she needed me.					
11	I did a lot for him/her.					
12	I took care of daily duties that he could not fulfill on his/her own.					

SECTION C

Big Five Inventory (BFI)

Direction: Please tick each statement to indicate the extent to which you agree or disagree with that statement.

I see myself as someone who...

Sr. No.	Items	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree=5
1	Is talkative					
2	Tends to find fault with others					
3	Does a thorough job					
4	Is depressed, blue					
5	Is original, comes up with new ideas					
6	Is reserved					
7	Is helpful and unselfish with others					
8	Can be somewhat careless					
9	Is relaxed, handles stress well					
10	Is curious about many different things					
11	Is full of energy					
12	Starts quarrels with others					
13	Is a reliable worker					
14	Can be tense					
15	Is ingenious, a deep thinker					
16	Generates a lot of enthusiasm					
17	Has a forgiving nature					
18	Tends to be disorganized					
19	Worries a lot					
20	Has an active imagination					
21	Tends to be quiet					
22	Is generally trusting					
23	Tends to be lazy					

24	Is emotionally stable, not easily upset					
25	Is inventive					
26	Has an assertive personality					
27	Can be cold and aloof					
28	Preserves until the task is finished					
29	Can be moody					
30	Values artistic, aesthetic experiences					
31	Is sometimes shy, inhibited					
32	Is considerate and kind to almost everyone					
33	Does things efficiently					
34	Remains calm in tense situations					
35	Prefers work that is routine					
36	Is outgoing, sociable					
37	Is sometimes rude to others					
38	Makes plans and follows through with them					
39	Gets nervous easily					
40	Likes to reflect, play with ideas					
41	Has few artistic interests					
42	Likes to cooperate with others					
43	Is easily distracted					
44	Is sophisticated in art, music, or literature					

SECTION D

Medical Outcomes Study- Social Support Survey

Direction: How often is each of the following kinds of support available to you if you need it? Tick one number on each line.

Sr. No.	Items	Strongly disagree=1	Disagree =2	Neutral =3	Agree =4	Strongly agree=5
1	Someone you can count on to listen to you when you need to talk.					
2	Someone to give you information to help you understand a situation					
3	Someone to give you good advice about a crisis.					
4	Someone to confide in or talk to about yourself or your problems					
5	Some whose advice you really want					
6	Someone to share your most private worries and fears with					
7	Someone to turn to for suggestions about how to deal with personal problem					
8	Someone who understands your problems					
9	Someone to help you if you were confined to bed					
10	Someone to take you to doctor if you needed it					

SECTION E

Modified Caregiving Strain Index

Directions: Here is a list of things that other caregivers have found to be difficult. Please tick the columns that apply to you.

Sr. No.	Items	Yes, On a regular Basis=2	Yes, Sometimes =1	Never=0
1	My sleep is disturbed			
2	Caregiving is convenient			
3	Caregiving is a physical strain			
4	Caregiving is confining			
5	There have been family adjustments			
6	There have been changes in personal plans			
7	There have been other demands on my time			
8	There have been emotional adjustments			
9	There have been work adjustments			
10	I feel completely overwhelmed			



UUM
Universiti Utara Malaysia