Alone in the Crowd: Loneliness, its Correlates and Association to Health Status among

Omani Older Adults

by

Salma Al Yazeedi

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved April 2019 by the
Graduate Supervisory Committee:

Karen Dorman Marek, Chair
Cha-Nam Shin
Pauline Komnenich
Paul Hawkins

ARIZONA STATE UNIVERSITY

May 2019

ABSTRACT

Advances in health care have resulted in an increase in life expectancy causing a rapid growth in the number of older adults at a global level. At the same time, socioeconomic development is transitioning family structures and social relationships. With reduced family engagement, many older adults are more at risk for physical and psychological health issues including loneliness, which is considered a public health issue affecting their quality of life and well-being. This descriptive, exploratory study aims to describe the significance of loneliness in three northern regions of the Sultanate of Oman. The purpose of this study is to examine the prevalence and correlates of loneliness and the relationship of loneliness to health statuses among older Omani adults aged 60 years and above. A demographic data questionnaire, the UCLA loneliness scale and SF-12-v-1 health status instruments were used for data collection. The sample includes 113 Omani older adults, male (n = 36) and female (n = 77), who experienced a mixture from low to high and severe levels of loneliness. Among these older adults, 34.5% perceived low level, 34.5% moderate level, 22.1% high, and 8.8% were severely lonely. The main demographic factors that were associated with the older adults level of loneliness were female gender, older age 80 years and above, living with others who were not a family member, and being unemployed. When controlling for demographic and environmental factors loneliness was a significant predictor ($p < .001$) for lower mental health status but not for physical health status ($p > .05$).

DEDICATION

My PhD dissertation is dedicated to my parents whose lifelong commitment to my education and their prayers inspired me to pursue my doctoral program, providing me with the incentive to strive towards my goal. I would like also to dedicate this dissertation to my wonderful husband, Saeed Al Harthy, and my daughter, Zaina, who were a constant inspiration and continuous support. Without your encouragement, understanding, patience, and unwavering support, this work would not have been possible. Special thanks go to my children, Mohammed, Ahmed, Noor, and to my siblings, friends, and relatives for their encouragement and support.

ACKNOWLEDGMENTS

I would like to express my gratitude to all individuals who supported me during my PhD journey. At first, I would like to express my deepest appreciation and tremendous gratitude to my dissertation committee: Dr. Karen Marek, my committee chair, for her constant help, valuable suggestions, and feedback. I would like to extend my sincere thanks to Dr. Chanam Shin, for sharing her valuable knowledge and guidance and Dr. Pauline Komnenich for her inputs and assistance. I am profoundly thankful to Mr. Paul Hawkins, director of the Applied Research Laboratory (ARL), Indiana University of Pennsylvania (IUP), for his thoughtful guidance, support and help in analyzing my data. A special thanks to my best friend Mikeala for her nurturing care and wisdom.

I would like to thank all of my colleagues who shared in both the struggle and success of the PhD adventure. I appreciate their support and friendship throughout its entirety. My sincere thanks to the college of Nursing and Innovation faculty and administration at the Arizona State University, special thanks to Dr. Bronwynne C. Evans, Director of the Ph.D. program, and Levi Colton, Academic Success Coordinator, for their endless support and cooperation. To the Ministry of Health in Oman, I am especially thankful for their sponsoring of my studies.

Most of all, I would like to acknowledge my parents and family for their endless love, tolerance, encouragement, and support during my fruitful, academic journey.

TABLE OF CONTENT

Page

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

With a global increase in the number of older adults; issues affecting this population's quality of life (QOL) are also rising. More and more older adults are living alone or in living facilities, rather than with their extended families. As a result, they are disconnected from their social networks and support. This aging population encounters physical, psychological, and environmental challenges as they advance in age, which leads to serious health issues including loneliness.

Loneliness, social isolation, depression, and other related quality of life issues are challenges, commonly experienced by older adults (Thomopoulou, Thomopoulou, & Koutsouki, 2010). Loneliness is a major risk factor for depression (Cacioppo et al., 2006) and as the number of older adults increases, loneliness will become even more of an issue to the individual and society (Fowles & Greenberg, 2008). And, uncontrolled loneliness leads to negative outcomes resulting in a significant increase in health care utilization in an already stretched health care system (Gerst-Emerson & Jayawardhana, 2015).

Loneliness is a global problem and more research is needed to better understand the phenomena of loneliness which will lead to the development of interventions to prevent or reduce its occurrence. Research will help health care professionals understand the occurrence of loneliness as a serious health issue that places older adults at risk for major health complications. Accordingly, health care professionals collaborating with policy makers can work to find suitable interventions that promote older adults' sense of connectedness, which in turn will keep them socially involved and protect them against the negative consequences of loneliness.

Background of the Problem

Global, medical and technological advancements have led to improvement in people's health and life expectancy. With biological and social changes, most of older adults are at risk of experiencing changes in their lives such as living with chronic illness, reduced functional abilities, and limitations on enjoying an active social life. These physical and social restrictions increase feelings of loneliness among this population making loneliness a significant public health issue that affects not only older adults' health and quality of life but also leads to higher health care utilization and health care costs (De Jong Gierveld, Van Tilburg, & Dykstra, 2016; Dury, 2014; Gerst-Emerson & Jayawardhana, 2015). A recent study of Medicare claims data in the United States, found that lonely older adults are at risk of poorer health trajectories and additional Medicare spending. This study revealed that of the 30 million older adults aged 65 and older included in the study, 4 million were identified as lonely, and their individual enrollee costs were approximately $1,608 annually more than the socially connected Medicare enrollees (Flowers et al., 2017).

Loneliness is considered an "epidemic" and described as a "silent killer" affecting over one million adults in the United Kingdom (Kar-Purkayastha, 2010; Khaleeli, 2013). Loneliness among older adults is a complex phenomenon entailing various psychosocial factors that can lead to serious negative health outcomes. Loneliness is a risk factor for both physical and psychological health problems including high blood pressure, sleep disturbance, low immunity, decline in cognitive function, and symptoms of depression. Cornwell and Waite (2009) reported a strong correlation between loneliness and decline in mental health. They found that older adults who perceived high levels of social loneliness and disconnectedness are more susceptible to health problems and poorer mental health.

Sultanate of Oman

Sultanate of Oman is an Arab monarchy located in the southeast corner of the Arabian Peninsula. It is bordered on the northwest with the United Arab Emirates, on the west with Saudi Arabia, and by the Republic of Yemen on the southwest side. Oman holds a strategically important position, with an area of approximately 309,500 square kilometers and a coastline that extends about 3165 kilometers. The coast is formed by the Arabian Sea from the east, the Indian Ocean on the southeast, and the Gulf of Oman in the northeast that ends with the Strait Hormuz. Oman's strategic position plays a vital role in its economic development. Administratively, Oman has been divided to 11 governorates, with 61 districts, with Muscat the capital of the country. According to the Omani National Center of Statistics and Information (NCSI) (2017), the total population of Oman according to October 2017 Census is approximately 4,641,466, with 2,533,126 Omani citizens and 2,108,340 expatriates or non-Omanis.

Figure 1. 1 The Administrative and Political Map of Sultanate of Oman's Region.

Prior to 1970, the people of Oman were deprived of quality health care services, with only two hospitals in Muscat to provide health care to Omanis and other residents. In July 1970, Sultan Qaboos rose to power and issued a Royal Decree to establish the Ministry of Health (MOH) in Oman. After 1970, improvements in health care services occurred resulting in an increase in life expectancy of Omani citizens (Hendawy, 2013). The rapid increase in the socio-economic development in Oman significantly decreased the death rate from 13.3 deaths per one thousand citizens in 1980 to 3 in 2009. The Omani population by mid of 2016 reached approximately 2.4 million. Among those almost 150,000 are aged 60 years or more of which 48% are male and 52% female (NCSI, 2017).

By the year 2040, the population in Oman is expected to be around 4.2 million, with over 9% older adults (NCSI, 2017). Notably, life expectancy has increased from 50 years in 1970 to 73.9 years in 2010 and is expected to reach over 80 years by 2050 (MOH, 2012). The pyramid of the Omani population 2010 by the United Nation (UN) (figure-2) and 2050 (figure-3) illustrate the rising trend of the Omanis' population of age 65 and above, which is expected to reach 22.5% in 2050 (UN, 2010).

Population Pyramid, Oman, 2010
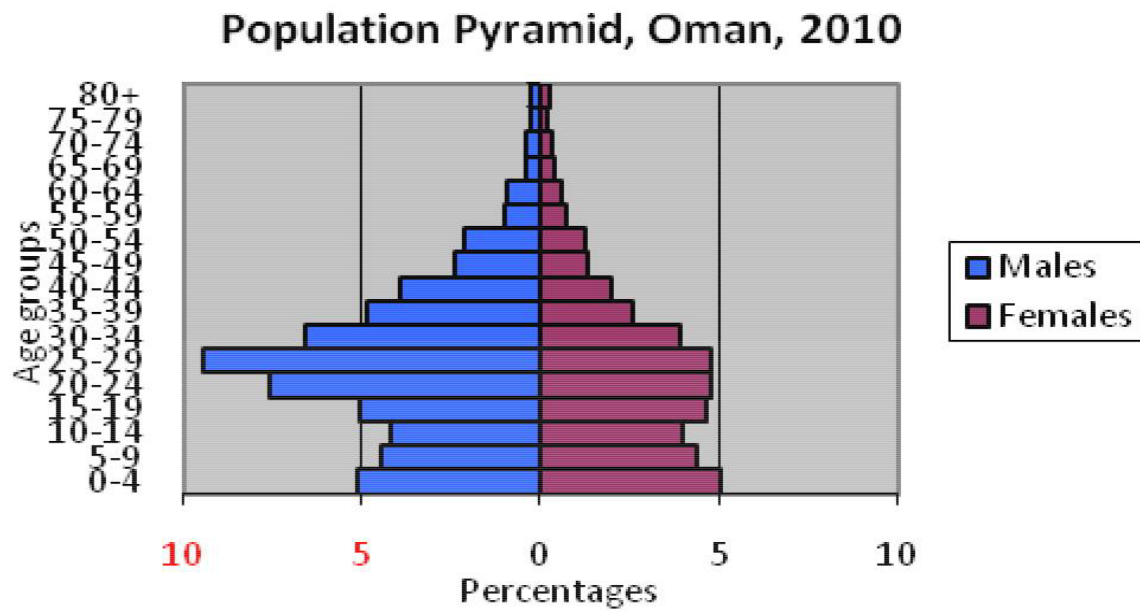
Figure 1. 2. Population pyramid of Oman in 2010 (UN, 2010).

Population Pyramid, Oman, 2050
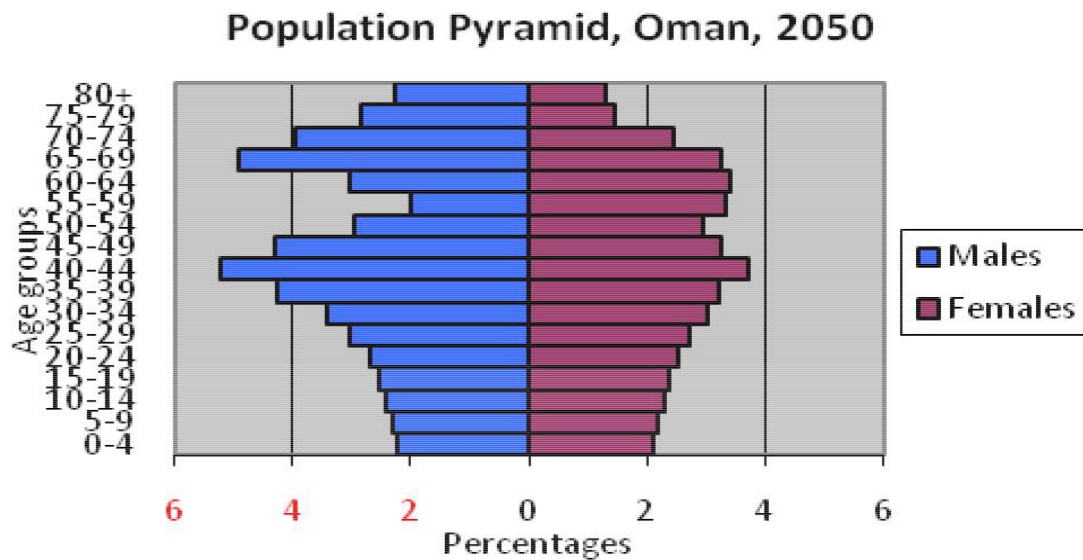
Figure 1. 3. Population pyramid of Oman in 2050 (UN, 2010).

The Impact of Economic and Social Changes on Omani Older Adults

Before the oil era and until 1970s, the extended family was a main feature of the Omani

family. Children lived with their parents, whom they considered a cherished source of wisdom in

5

life issues and leaders in helping them raise grandchildren. With this family cohesion, older adults remained in their homes, surrounded by beloved family members. The oil era in 1970s produced great economic development and rapid modernization in Oman, which made numerous positive, as well as negative changes and transformed peoples' social lives. Some of these alterations challenged the family relationships, with adult children separating from their parents and living independently as nuclear families. In addition, the economic prosperity led to a more sedentary life with the recruitment of house maids, nannies, and drivers (Al-Barwani & Albeely, 2007). The diffusion of Western culture also impacted the traditional Omani social support system (Saxena, 2008) significantly affecting traditional living arrangements. An increase in nuclear living arrangements among the younger generation and the diminishing of the extended family system reduced support to the elderly.

Due to the rapidly increasing older adult population, care of the older adult is now a priority in Oman. Santhosh (2011) argues that "The lengthening shadow of life of our elderly is fast becoming a major challenge for society. This challenge needs to be addressed before it acquires unpleasant proportions. While most advanced countries have some kind of social security mechanism in place, the same is not true for countries like Oman" (p. 4). The current socio-demographic transition in Omani society compels young adults to move from their home town to other larger cities for work or educational purposes. As a result, many older adult citizens are left alone or isolated from their families for extensive periods of time (Vaidya, 2007). Those older adults who are left alone could be healthy, independent or have multiple chronic illness. Sometimes, they live or are left with a caregiver; commonly known as a housemaid. This depends on the family's economic status (Al-Sinawi, Al-Alawi, Al-Lawati, Al-Harrasi, Al-Shafaee, & Al-Adawi, 2012). These maids mainly provide physical care and may not

be able to communicate with the elderly person as they are from foreign countries with different cultures and languages. Meanwhile, police records reveal that a number of Omani's older adults have suffered from abuse when they were left alone with a housemaid (Times of Oman, 2014).

Geriatric Care and Health Status of Omani Older Adults

The MOH in Oman is responsible for providing health care free of cost to all Omani citizens. The introduction of geriatric care is one of the planned objectives highlighted in the visions for health services "Oman 2050 Vision", which aims to sustain achievements and further strengthen Primary Health Care (PHC) in Oman (Health Vision 2050, 2014). The vision includes the development of policy, strategy, and services concerning geriatric health care as a part of its objectives to be achieved by the year 2050. Furthermore, they hope to provide and ensure the availability of geriatric health care clinics in PHC facilities with home care services for patients with chronic illness, terminal illness, or older adults who cannot access health care facilities.

The main health problems among the older adults' population in Oman are osteoarthritis 74%, low vision and blindness 74%, hypertension 66%, obesity and overweight 46%, and diabetes 36% (Al-Riyami et al., 2008). Unfortunately, limited resources are directed to geriatric care and the common health issues in Omani older adults. Santhosh (2011) stated that "exact details on problems such as (mobility disability, incontinence, mental health problems, dementia, etc) faced by the elderly in Oman are not available" p.4. The availability of such information is essential to improve the health services provided to the Omani geriatric population and to impact positively their quality of life.

In August 2003, with the collaboration between MOH and Ministry of Social Development (MOSD), an intensive pilot initiative called the National Elderly Health Survey (NEHS) was set up as a program of care for the older adults in Dakhliya governorate to improve

7

their living standards and reduce the number of extended hospitalizations. Additionally, NEHS was implemented to support families in assisting and caring for older adult relatives. The initiative came as a result of problems in secondary and tertiary care of older adults in hospitals (MOH, 2006). The survey identified a number of social challenges, for instant, a total of 29.7% of the surveyed older adults were widowed. Additionally, 6.8% of the sample were living alone, and 80% were illiterate. Regarding the households, approximately 43% of the sample belonged to the lowest income and lower middle classes. Lastly, 45.5% had five or more moderate to severe health issues (MOH, Oman, 2008). The growing number of Omani older adults creates a challenge to the Omani MOH services. According to MOH 2016 Census, the number of visits by older adults 60 years and over to outpatient clinics in MOH institutions reached 1.4 million (Health Fact, MOH, 2016).

In Oman, 214 primary health care institutions including health centers, polyclinics, and local hospitals are available throughout the eleven Omani governorates to make PHC services accessible to all citizens (MOH, 2012). In 2011, the MOH integrated Elderly Care (EC) into health centers by creating Geriatric Clinics (GC). Unfortunately, geriatric care is not yet developed in Oman and although the GCs are integrated in many PHC institutions, there are staff shortages and specialty staff such as nurses, physiotherapists, geriatricians, social workers with credentials in EC are lacking in all health centers (Santhosh, 2011).

Community Health Nursing (CHN) in Oman is in its infancy with very limited resources, making provision of health care services to older adults in their homes difficult. Al-Zadjali et al. (2014) called to advance the CHN in Oman, through attention and support from the MOH, in regard to policy, research, and preparation of the workforce. The absence of a home care nurses in the Omani health system is worsening the situation, delaying the necessary care for this

vulnerable population, and keeping lonely older adults at risk for complications. A long-term vision with strategies to accommodate the projected increase in the number of older adults in Oman is needed (WHO, 2010).

In Oman, there is only one geriatric care home, the Social Care Home that was opened in the Rustaq region in January 2015 and run by MOSD. Mainly, this social care home was founded to provide care for abandoned older adult citizens who did not have children or relatives to take care of them. The home accommodates 31 older adults (25 males and 6 females) and provides psychological, social and health needs (Ministry of Social Development, 2016).

Dr. Sheikha al Jabri, the head of MOH's National Elderly Care Program, in South Batinah Governorate, reported to Muscat Daily (2013) newspaper that the MOH in collaboration with MOSD plans to assign trained caregivers to provide care for the older adults while in their homes, as an early intervention in hopes of reducing disabilities among the aging population. According to the plan, a comprehensive socio-economic environmental assessment was planned to carry out for the registered older adult citizens. Based on the result, a social worker was expected to collaborate with a professional team of doctors and nurses. Based on the collected data and individual needs, the team was expected to decide the type of interventions required for the older adult patient, whether social, clinical, or physiotherapy (Bhattacharjee, 2013). Although the above-mentioned report was published in 2013, there is no clear evidence of the implementation of this plan into practice. Furthermore, the vast majority of Omanis are not aware of the existing programs and initiatives designed for older adults. This is especially true for the older adults who are frail, disabled and/or living in rural areas.

Hidden Loneliness among Older Adults in the Middle East

Older adults are at risk of experiencing loneliness. Despite the fact that there is no explicit report about social isolation, abuse and violence towards older adults in the Arab region; four to six percentage of older adults have experienced physical, psychological, or financial abuse at home in high-income countries as estimated by WHO (Sethi et al., 2011). In the United Arab Emirates, Dubai Social Affairs reported a dramatic rise in issues of older adults' neglect. It showed that among 8,039 older adults, 14% (568) were living alone in their homes, with improper care, or did not receive any care at all (Al Reyami, 2010). The recent transformation of social life negatively has impacted family relationships and dramatically minimized the time spent by family members with older adults, therefore exposing them to the risk of abuse. Al Ali (2013) explained that "the relationship has worsened as the millennials are busy, have less spare time on their hands, spend less time with older people and have much less time to care for them" (p. 8).

In the Arab country of Tunisia, loneliness, illness, dependence, and being a burden on others are major concerns of older adults. Although the majority of Tunisian elderly are living with others, the feeling of loneliness is common among them (Gouiaa & Sibai, 2013). In general, most of Arab older adults often pray to not be dependent and burdensome on others and hope for peaceful death without suffering (Kronfol, Sibai, & Rizk, 2014).

The Arab community values veneration, respect, and honor towards the aging population. Arab societies admire the role of older adults in preserving family relations and sustaining traditional identities. At the same time, stereotypical perceptions prevail in Arab societies about older adults, ones that include aging as a stage of deterioration of physical and mental health, low financial resources, and a burden on family and society (Kronfol, Sibai, & Rizk, 2014). This

negative image, with less available resources restricts older citizens from being involved as active members in the society.

In reality, treating older adults negatively may occur worldwide in various ways including lack of access to services, limited job opportunities, abuse, neglect and relinquishment as a facet of prejudice and age discrimination against this population (Beard et. Al, 2012). Kronfol, Sibai, and Rizk (2014) claim that while Arab countries are witnessing an increase in their aging population, their plans and policies have no clear inclusive strategy on how to accommodate the needs of older adults to enable them to live independently successful with a high quality of life. To keep Arab older adult citizens involved in their community and living productive lives there is a need for a clear vision and strategies supported with adequate resources to reduce the risk for multiple health issues including loneliness.

The Urgent Need to Study Loneliness among Omani Older Adults

It is noticeable that no attention has been paid to loneliness and its consequences on the health and well-being of Omani older adults. Consequently, the increase in this population, the extent of the complications of loneliness, and the lack of research addressing the prevalence and impact of loneliness in Omani older adults underscores the significance of this study. Considering that the population of older adults in Oman is expected to increase, this study identifies the incidence of loneliness and its relationship to the health of the Omani older adults' population. Identification of the factors that place older adults at risk of loneliness provides direction in establishing strategies to reduce and/or prevent loneliness in older adults. Thus, a broader knowledge of the causative factors is essential to discovering more effective ameliorative and preventive measures that target loneliness and enhance older adults' health and well-being.

This current study will raise health care professionals' awareness of the issue of loneliness among Omani older adults and provides the basis for further investigations to understand the factors that contribute to loneliness among this population. The results of the study can guide decision makers and health strategic planners in addressing strategies to combat the significant consequences of loneliness among the older adults' population.

Statement of the Problem

Loneliness is a serious issue that can negatively affects the health of Omani older adult. No studies were found that examined the prevalence of loneliness in Omani older adults. Research in this area is required, particularly in areas that enable primary health care professionals to identify and reach lonely, socially isolated older adults and discover how to best intervene early to halt loneliness before it becomes a serious health problem.

Purpose of the Study

The purpose of this study was to explore the relationship of personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) to loneliness, mental (MCS) and physical (PCS) components of health status in Omani older adults.

Research Questions

1. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and loneliness in Omani older adults?

2. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and mental health status (MCS) in Omani older adults?

3. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and physical health status (PCS) in Omani older adults?

Hypotheses

      Hypothesis one. Controlling for personal and environmental factors, loneliness is negatively associated with health status mental component (MCS).

      Hypothesis two. Controlling for personal and environmental factors, loneliness is negatively associated with physical health status (PCS).

<div align="center">

Definition of Terms

</div>

Loneliness

      The synonyms of "alone, solitary, lonely, lonesome, desolate" are used to refer to an individual isolated from others (Merriam Webster, 2017). The concept of loneliness is a subjective, negative feeling associated with the individual's own experience of lacking in quantity and quality of meaningful social connections (Fokkema, Gierveld, & Dykstra, 2012; Tomaka, Thompson, & Palacios, 2006). Heylen (2010) considered social loneliness as the feeling of being socially disconnected. O'Luanaigh and Lawlor (2008) distinguished between social loneliness and emotional loneliness. They described social loneliness as results from insufficient social connectedness and that through social integration and by making new contacts, loneliness can be reduced.

Older Adults

      Older adults are defined based on chronological age, changes in physical abilities and social role. In high income nations, such as western countries 65 years and above is the age of an older adult. This age is associated with the age at which a person can retire from paid employment and receive pension benefits. Low-income nations with a shorter life expectancy,

define older people as those who are over 50 years of age (WHO, 2017). Meanwhile, the United Nations generally uses 60 years and above to refer to the elderly citizen (United Nations, 2015). In this study, 60 years and above was used to define older adults.

Theoretical Framework

This study is based on a theoretical framework adapted from a Model of Depression and Loneliness (MODEL) (Figure-4). The original MODEL describes four categories of factors that contribute to loneliness and depression. The factors are (a) environmental factors, (b) health related factors, (c) stressful life situations, and (d) psychological factors.

Environmental factors
- Opportunities for social contacts
- Living alone
- Financial resources

Health factors
- Health
- Mobility difficulties

- Stressful life events

Psychological factors
- Self-efficacy in social situations
- Available social skills
- Past behavior patterns
- Expectation concerning social contacts

Loneliness
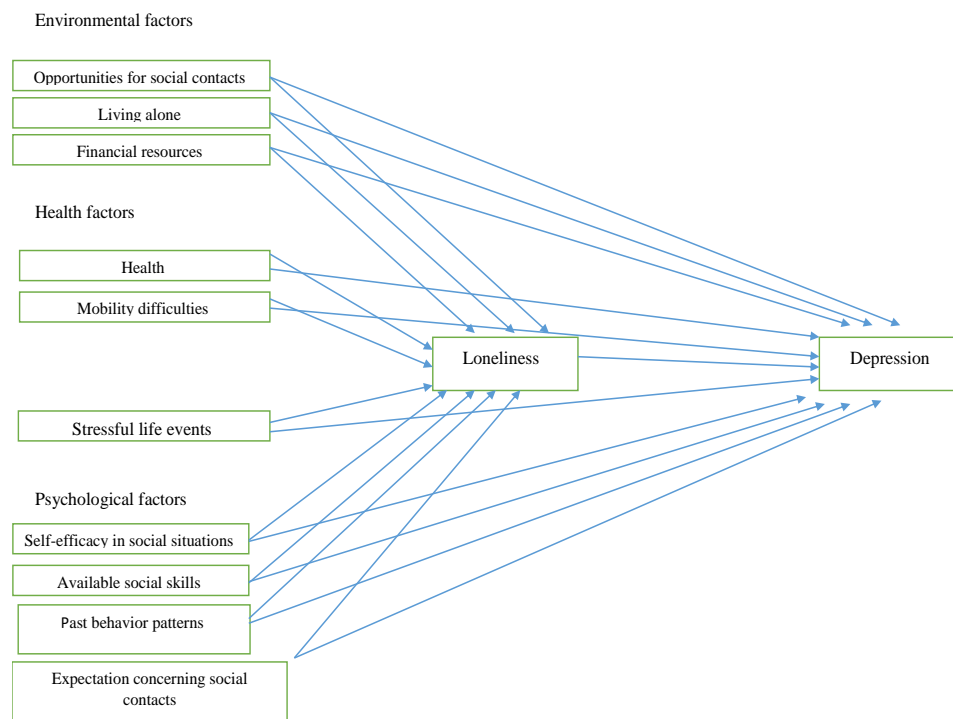
Depression

Figure 1. 4. Model of Depression and Loneliness (MODEL) (Cohen-Mansfield & Parpura- Gill, 2007)

The modified model (Figure-1.5) includes two categories: personal and environmental factors which are considered as predicators of loneliness. Personal factors include age, gender, marital status, number of children, income, working status, and level of education. Environmental factors include District of residence and living arrangement. The below section

14

provides a more comprehensive discussion about each component and how each contributes to loneliness.
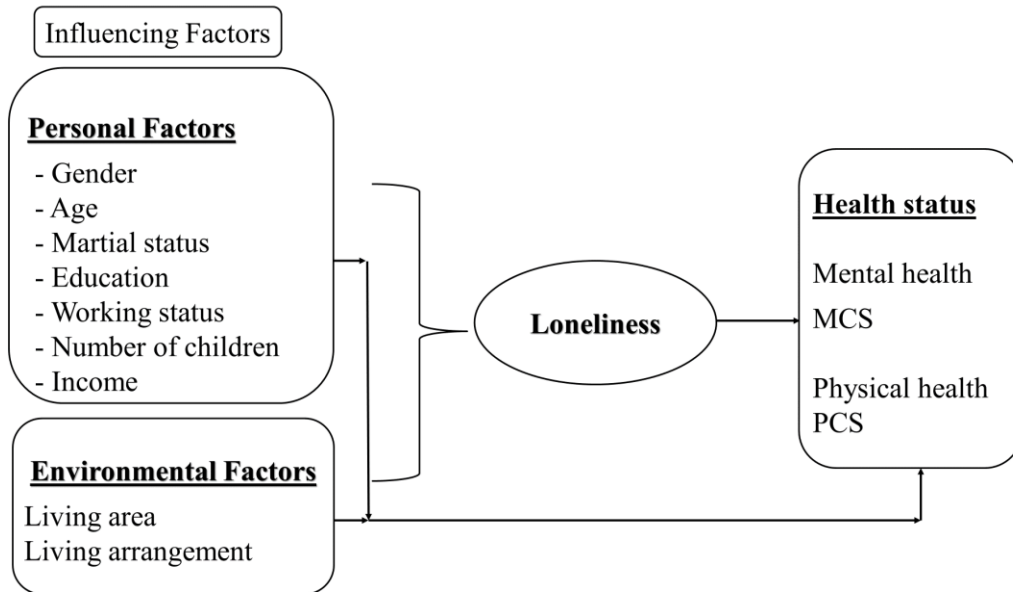
Figure 1. 5. Adapted from MODEL of Loneliness and Depression

Personal Factors

Personal factors or sociodemographic factors such as age, gender, marital status, and educational level play a role in establishing social relations, support or hinder social integration and contribute to the level of loneliness in older adults (Mapoma & Masaiti, 2012; Nzabona, Ntozi & Rutaremwa, 2016; Zoutewelle-Terovan, & Liefbroer, 2018). There is evidence that the socio-economic factors associated with the increased risk of loneliness in older adults include limited educational qualification, insufficient financial resources, and marital status (Ayalon, Shiovitz-Ezra, & Palgi, 2013; Aylaz, Aktürk, Erci, Öztürk, & Aslan, 2012; Hazer & Boylu, 2010). These factors contribute to decreased social connections and social support which in turn increases the likelihood of loneliness and multiple health problems. Additionally, personal factors may have positive or negative effect on older adults' health-related quality of life (HRQoL). Previous literature indicated significant correlations between number of

sociodemographic factors e.g., age, gender, income level, and level of education and physical and mental components of health status (Al-Mandhari, Al-Zakwani, Al-Hasni, & Al-Sumri, 2011; De Belvis et.al., 2008; Faresjö ,& Rahmqvist, 2010). This suggests that examining personal and environmental factors and their relation to health related QOL, may lead to development of effective strategies to enhance older adult physical and mental health and well-being.

Environmental Factors

Environmental factors include living arrangements and living area. According to Cohen-Mansfield and Parpura- Gill (2007), both living alone, and living in a rural area interfere and complicate access to social contacts, therefore increasing the likelihood of loneliness. Based on the model of loneliness, environmental factors such as geographical location and a person's physical environment can interfere and complicate their access to social contacts. As a result, the older adults' ability to attain or maintain desired intimate social relationships is compromised leading to a higher risk of loneliness. Empirical findings show that living in a limited physical environment and living alone negatively influence older adults' physical and mental health (De Belvis et.al., 2008; Molarius, et al., 2006).

Health Status

In the MODEL, environmental factors, health related factors, stressful life events, and psychological factors augment loneliness which leads to depression. The modified model used in this proposed study focuses on the broader impact of loneliness on both physical and mental health. There is growing evidence of the negative impact of loneliness on older adults' health status (Coyle and Dugan, 2012; Gerst-Emerson & Jayawardhana, 2015; Miyawaki, 2015). According to the modified model environmental, and personal factors influence loneliness which

in turn affects health status. However, impairment of physical and psychological health may interfere with the establishment of a social relationships and therefore contribute to loneliness. Older adults who experience loneliness are more susceptible to illness, physical disability, and mental problems such as high blood pressure, sleep disturbance, low immunity, decline in cognitive function, and depression (Hawkley, Thisted, Masi, & Cacioppo, 2010; Jaremka et al., 2014; Kurina et al., 2011). Loneliness is considered a precursor to various chronic illnesses, as many studies reveal loneliness worsening disease symptoms whilst also augmenting the disease's progression (Seo, Yates, Dizona, LaFramboise, & Norman, 2014). Consequently, older adults with high levels of loneliness are more likely to utilize a greater amount of health care resources, physician visits, readmissions, and extended hospital stays (Löfvenmark, Mattiasson, Billing, & Edner, 2009). Cohen-Mansfield, and Parpura-Gill (2007) affirmed that loneliness leads to number of negative outcomes such as a decline in health, a greater usage of health care services and an increased need for admission into nursing homes. According to the modified model loneliness is an influencing factor that may lead to poor health and result in decline in physical and mental health.

Application of the Model of Loneliness Framework to this Study

Identification of the factors that place older adults at risk of loneliness, can offer a clear guide to establish strategies that protect this vulnerable population against loneliness. Thus, a broader knowledge of the causative factors is essential to lead to more ameliorative preventive measures. The modified model of loneliness was chosen to organize this study because it assists in understanding and conceptualizing the risk factors of loneliness. These factors hinder the development of social relationships or can deteriorate the existing social ties leading to an enhanced feeling of loneliness. Based on the modified model, loneliness may lead to decline in physical and mental health.

Significance of the Study

Since the present study is the first research study to address the issue of loneliness among Omani older adults, it provides valuable information to stakeholders and policy makers in the Ministry of health and Ministry of Social Development in Oman about the serious consequences of loneliness amongst older adults. Results may guide funding for research on strategies to improve the quantity and quality of social services and social support for Omani older adults. Availability of rich, evidence-based research helps stakeholders draw clear conclusions on the critical risk of loneliness in older adults' health. Stakeholders will rely on the findings of this study to work collaboratively and establish effective culturally suitable interventions to halt loneliness in Omani older adults.

Moreover, the obvious linkage between loneliness and negative health consequences provides an urgent call to tackle this issue early and minimize the progression of the negative consequences of loneliness. Evidence from this study can guide planning of effective strategies that will enhance the quality of life of lonely isolated older adults.

The focus of this study was to investigate the unexplored phenomena of loneliness and its correlates among Omani older adults. Thus, this will help professional health care providers to be aware of the issue of loneliness as a devastating health issues among this vulnerable population. Accordingly, health care professionals in collaboration with policymakers can work to find suitable interventions that prevent and control loneliness among this population.

This current study may fill the gap in the literature as it aimed to investigate loneliness and its associated factors among the older adult population in Oman. There is limited literature that addresses the contributing factors to loneliness in older adults, such as illness, disability, limited social contacts and lack of social resources (Goll, Charlesworth, Scior, & Stott, 2015).

Summary

Loneliness is not just social issue; researchers consider loneliness as a public health crisis and suggest that lonely older people are at high risk of illness, and premature death (Renzetti, 2013). Distinctive associations exist between loneliness and risk factors for both physical and psychological health problems including: high blood pressure, sleep disturbance, low immunity, cognitive decline, and depressive symptoms (Cacioppo, et al., 2006; Cacioppo, Hawkley, & Thisted, 2010; O' Luanaigh & Lawlor, 2008). There is limited research addressing this health issue among Omani older adults.

An adaption of the MODEL framework (Cohen-Mansfield & Parpura-Gill, 2007) is the theoretical framework for this study. This framework describes the moderating influence of personal and environmental factors on loneliness and health status. Application of this framework guided the understanding of the factors that contribute to loneliness in older adults. Findings from this study will be used to guide effective interventions to reduce the impact of loneliness in the Omani older adult population.

Chapter 2

Literature Review

Elderly people from around the world continue to suffer from physical, psychological, and emotional health issues due to social and emotional loneliness despite scientific research advances in geriatric health care. The purpose of this study was to examine the relationship of personal and environmental factors to loneliness and health status in Omani older adults. Accordingly, this review focused on the most current knowledge related to loneliness, its correlated factors and the association of loneliness to health status in older adults.

A search of various electronic databases revealed more than 1000 articles about loneliness among older adults. However, the volume of literature that centered on the issue of loneliness in Asian and Arab countries is limited. In comparison to other age groups, older adults are particularly vulnerable to loneliness as they experience physical decline, limited social contact, and limited financial resources. Loneliness is a major risk factor for mental and physical illness. The global increase in the population of older adults' makes research in this area especially urgent. Research that helps healthcare professionals gain a deeper understanding of the experience of loneliness and its related factors, will also enable identification of preventive strategies.

Loneliness and its related factors have been widely researched in western countries. However, there is very little research related to loneliness among older adults in Gulf Cooperation Council (GCC) countries. The GCC countries, Oman sister's countries, include a political and economic association of six countries including Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Bahrain, and Oman. They are homogenous in many aspects of origin, culture, traditions, language, geographic characteristics, and economic status (Torstrick & Faier,

2009). On the other hand, just one study was found related to loneliness, and the population studied was college students in (GCC) countries rather than older adults (Al Khatib, 2012).

The high incidence of loneliness in older adults contributes to higher levels of depression which in turn is linked to disability and decline in physical health (Jaremka et al., 2014; Kurina et al., 2011; Cornwell and Waite, 2009). Although no studies related to loneliness in the Omani population were found, a high prevalence of depression, a major consequence of loneliness, was identified in two studies conducted in the Muscat governorate and Nizwa (Al-Salmani et al., 2015; MOH, Oman, 2005). Al-Salmani et al. (2015) found that the depression rate was significantly greater among older adults 50 years and older (OR = 2.23; 95% CI 1.07, 4.22; $p =$ .04) in the Muscat governorate. Additionally, in Nizwa a self-reported survey of adults age 60 and older found that 16% of the respondents reported mild depressive symptoms and 3% had severe depressive symptoms (MOH, Oman, 2005). Therefore, in Oman, it seems timely to conduct research in the area of loneliness among the older adult population, because depression is associated with loneliness in older adults.

Despite this alarming issue of loneliness among older adults, little is known about loneliness in Omani elderly to date. For example, a search for manuscripts using the terms *loneliness* and *Omani elderly* revealed no manuscripts in the past years. Also, a search for review manuscripts focused on loneliness among older adults specific to Arab countries or in the GCC, were limited.

To fulfill the aim of the current review, electronic databases were used for searching the literature including PubMed from the National Library of Medicine that includes peer reviewed medical, nursing, and social sciences literature, and the Cumulative Index of Nursing, Allied Health Literature (CINAHL), and the American Psychological Association (PsycINFO) to find

articles published from January 2007 through November 2017. Because of the large body of

literature related to loneliness, the most recent articles starting from year 2007 were utilized

more predominantly than those published before 2007; however, literature considered seminal

prior to 2007 was also included.

The search terms used are *loneliness, social isolation, older adult, elderly, risk factor,*

and the consequences. Additional keywords were applied such as Middle East and Oman, Arab,

and Muslim to retrieve publications related to loneliness among older adults from the

abovementioned ethnicity groups. However, publications found in the search were limited to

two articles from Israel and nine from Western and Eastern Asian countries and none from Oman

or GCC countries. Inclusion criteria included manuscripts written in English, studies that

examined loneliness and social isolation risk factors and consequences, and targeted older adults

50 years and above. To increase the number of eligible articles, studies focusing on loneliness

and social isolation from around the world were reviewed. Systematic reviews, literature

reviews, meta-analyses, dissertations, and non-peer reviewed articles were excluded. A total of

1,042 manuscripts were screened for eligibility (PubMed n= 489), PsychINFO n= 305) and

CINAHL n= 248). After screening the titles, a total of fifty-two manuscripts were found to be

potentially pertinent, among those, nine articles were excluded. With abstract and full text

review, seven manuscripts were excluded, and thirty-six articles were used in this systematic

review.

Prevalence and Significance of Loneliness among Older Adults

Global medical and technological advancements have contributed to improvements in

people's health and life expectancy. However, as one ages, biological changes put older adults at

greater risk for chronic illness, restrictions in functional abilities, and limitations in maintaining

their social lives. These physical and social restrictions result in increased feelings of loneliness.

Based on a U.S Health and Retirement study, the prevalence of loneliness was 16.9% among a sample of 13,812 older adults (Theeke, 2010). A similar U.S. study that included a nationally representative sample of 1,604 older adult participants, among those 43% reported loneliness (Perissinotto, Cenzer, & Covinsky, 2012). Savikko, Routasalo, Tilvis, Strandberg, and Pitkälä's (2005) found that 10.9% of Finnish older adults reported a high level of loneliness from a sample of 3,915 and 43.6% of reported a medium level of loneliness.

A cross-sectional study in a sample of 5652 older adults conducted in China showed that 78.1% experienced moderate to severe loneliness (Wang et al., 2011). Likewise, a cross-sectional study surveyed a sample of 500 Iranian women from Gonabad, aged 60 years and older and examined the epidemiological pattern of loneliness and its predictors. Among the study participants, 50.4% suffered from a moderate level of loneliness, and 39.4% reported a higher degree (Khosravan, Alaviani, Alami, & Tavakolizadeh, 2014). This study revealed that factors including marital status, socio-economic status, and education were significantly linked to the feelings of loneliness. Recently, a study examined the prevalence of loneliness among 200 older adults aged 60 years and older in Yazd, Iran and found that 29 % of participants felt lonely based on the UCLA loneliness scale (Vakili, Mirzaei, & Modarresi, 2017).

Research related to the impact of social and emotional loneliness on older adults' health and well-being is well documented in the United States and Europe. However, the existing research does not adequately address the phenomenon of loneliness among Arab and Middle-Eastern older adults. An investigation in this phenomenon among this vulnerable population from this part of the world is needed to fill this gap in knowledge related to loneliness. Thus, this study will facilitate early identification of loneliness among Omani older adults to establish evidence-based interventions that can be applied by health care providers, policy makers, and

other stakeholders to protect Omani older adults against loneliness and to support the aging process successfully.

Global Issue of Loneliness

Loneliness is a global health issue and has great negative impact on older adult's health and well-being; this was clearly indicated by the various locations of the included studies for the current review. The highly variant locations of the studies represented in this literature review leads to the conclusion that loneliness is a global health issue and has a great negative impact on older adults' physical and mental health. Among these studies, the majority were conducted in the United States (16 studies) and different areas of Europe (nine) including United Kingdom, Ireland, Finland, Sweden, and Holland. The rest of the reviewed studies were conducted in different areas of western and Eastern Asia; one in Nepal, two each in Iran, India and Israel and four in China.

Definitions of Loneliness and Social Isolation

Loneliness

The studies within this literature review include several different definitions of loneliness. Loneliness arises when there is a perceived deficit of satisfying quality or the quantity of personal and social relationship. Yang and Victor (2011) stated that loneliness "is the perceived gap between the expected and the actual social relations that account for loneliness." (p. 1382). A number of authors viewed loneliness as an unpleasant feeling or distress of feeling socially isolated as a result of the quantity and quality of social relations that do not meet one's expectations and values (Cacioppo & Cacioppo, 2013; Cacioppo & Patrick, 2008). Loneliness can also be described as an unpleasant or unacceptable deficiency in a person's social network (Singh & Misra, 2009). Though loneliness is a very complex concept to be defined, researchers have tried to base their definitions on the following common aspects: unpleasant feelings,

24

subjectivity, and distressing experiences due to a lack of satisfying social relationships or the absence of an intimate figure.

Social Isolation

Social isolation is defined as the deficiency in social relationships with others, the feeling of being socially disconnected, the low level of involvement with others, and the lack of having a social network or having little social interaction (Nicholson, 2009).

The concept of loneliness is closely related with social isolation, social loneliness, or living alone. These terms are found to be used interchangeably to refer to the same concept which is confusing to both the stakeholders and to those seeking to educate themselves on the topic. The findings from this literature reveal that being socially isolated or living alone does not necessarily mean that an elderly person feels lonely. Equally, elderly individuals who live within a large social group still might suffer from loneliness if they feel unsatisfied with their current social relations and/or with a lack of a supportive social network. De Jong-Gierveld, Tilburg, and Dykstra (2006) described social isolation as an individual's evaluation of having deficient social relations, which does not necessitate that the experience of the socially isolated is truly loneliness, nor that socially engaged individuals may feel lonely according to their standard of social relation. Conversely, social isolation is an objective sense that indicates an individual has a lack of meaningful social relations or social network and engages in minimal contact with others. Emotional loneliness reflects the subjective, negative, and unpleasant experience provided by a limited quantity and/or quality of social relationships (Grenade & Boldy, 2008). Additionally, social isolation is objective and can be observed and measured by other people, unlike emotional loneliness, which can only be described by the lonely individual because of its subjective nature.

The concepts of social isolation and loneliness were used to fulfill the aim of this literature review.

<div align="center">**Contributing Factors of Loneliness among Older Adults**</div>

The common causative factors that lead to the experience of loneliness among older adults are presented in the following section. These factors are addressed based on the MODEL framework (Cohen-Mansfield & Parpura- Gill, 2007) in which the authors discussed four instrumental factors of loneliness: environmental factors, health factors, psychological factors, and stressful life events. Of these four, this literature review focused more on environmental and socio-demographic factors were because those were the primary focus of this study. Additionally, the following literature review included psychological factors, comorbidity, and stressful life events which do have an impact and are applicable in certain societies. This review addressed the negative, cyclical impact of loneliness on older adults' physical, psychological, and mental health.

Sociodemographic and Personal Factors

Age. Several studies reveal that there is an increase prevalence of loneliness with old age (Fokkema *et al.*, 2012; Savikko et al., 2005). Equally, another study found a significant relationship between the trends and expectations of loneliness among older adults and the actual self-reported loneliness in their later life (Pikhartova, Bowling, & Victor, 2016). Victor and Yang (2012) investigated the prevalence of reported loneliness among three different age groups of adults including young adults (below 30 years), midlife adults (between 30 and 59 years) and older adults (60 years and more). The result suggested that levels of loneliness are lower for middle-aged adults compared to young adults and older adults who both reported higher levels of loneliness.

In contrast, Khosravan, Alaviani, Alami, and Tavakolizadeh, (2014) reported no significant correlation between loneliness and age. Likewise, Heylen (2010), suggested that a negative relationship exists between older age and social loneliness. Older participants reported more satisfaction with their social relationships while having a greater emphasis on the value and quality of social connections, as well as a higher number of good friends. Sundström, Fransson, Malmberg, and Davey (2009) noticed no significant relationship between social loneliness and old age across European countries, except in Sweden. Cornwell and Waite (2009) posited that loneliness should not be necessarily linked to an increase in age. Many older adults tend to maintain close social connections within their network of friends and enjoy greater social support as they get older (Shaw et al., 2007). Cohen-Mansfield and Parpura- Gill, (2007), concluded that, increased prevalence of loneliness in the aging populations may be interrelated with other factors such as a loss of a social role, a lack of intimate companionship, or a decline in cognitive and physical health.

Gender. Being female and of advanced age are two factors that are positively associated with loneliness (Savikko et al., 2005). Some studies indicated that there is a remarkably higher incidence of loneliness among women in comparison to men (Cohen-Mansfield, Shmotkin, & Goldberg, 2009; Fokkema *et al.*, 2012; Fisher et al., 2014; O'Luanaigh & Lawlor, 2008). Consistent with previous research findings, two different studies showed that older females tend to report higher levels of loneliness than elderly males (Aartsen & Jylhea, 2011; Singh & Kiran, 2013). Likewise, Bhatia, Swami, Thakur, and Bhatia, (2007) found that females reported higher feelings of loneliness (72.8%) compared to male participants (65.6%).

In contrast, others indicated higher rates of loneliness among men when compared to women (Dahlberg & McKee, 2014; Kearns, Whitley, Tannahill, & Ellaway, 2015). The latter

study was conducted in socioeconomically underprivileged communities in Glasgow, UK where women had more social contact and higher involvement with neighbors, which may have alleviated feeling of loneliness (Kearns et al., 2015). From a sample of 314 older adults a total of 30% of the women and 25% of the men reported feelings of loneliness, but no statistically significant difference was found between the two groups (Bekhet & Zauszniewski, 2012). Similarly, Theeke (2009) argued that female gender is not a predictor of loneliness.

Loneliness does, however, appear to be more predominant among elderly women since women, later in life, tend to be widowed and living alone more often than men. Women are more apt to admit their state of loneliness due to those situations being commonly represented among women while men are less likely to report feeling lonely to avoid the stigma associated with loneliness (Bekhet & Zauszniewski, 2012; O'Luanaigh & Lawlor, 2008).

Marital status. Spouses are an essential source for physical and emotional support, particularly among the older population. Several studies showed that being non-married, widowed, divorced, or a change in marital status contributed considerably to loneliness (Fokkema, Gierveld, & Dykstra, 2012; Prieto-Flores, Forjaz, Fernandez-Mayoralas, Rojo-Perez, & Martinez-Martin, 2011; Savikko et al., 2005). Bhatia, Swami, Thakur, and Bhatia (2007) found that loneliness was greater in older adults who were living alone 92.1%, as compared to those who lived with their partner 58.8%. Additionally, loneliness was more prevalent among widows 85.2% and widowers 75.7% in comparison to older adults who lived with a partner. Khosravan, Alaviani, Alami, and Tavakolizadeh, (2014) surveyed a sample of 500 aged 60 and above Iranian women and found married subjects reported less loneliness when compared to widowed subjects.

Ayalon, Shiovitz-Ezra, and Palgi (2013) theorized that marriage provides a protective role to sustain couples' social lives because one partner can positively impact the other one. Therefore, marital support can be a key channel to protect against loneliness among older adults.

Educational level. Low educational achievement was found to increase the level of loneliness in older adults (Khosravan, Alaviani, Alami, & Tavakolizadeh, 2014, Savikko et al., 2005). Kearns et al. (2015) also reported that a low level of education increases the prevalence of loneliness. In a study conducted in Ankara, older adults with lower education reported higher loneliness scores compared to respondents with higher levels of education ($p < 0.05$) (Hazer & Boylu, 2010). Equally, Victor, Scambler, Bowling, and Bond (2005), reported that older adults with limited education were more vulnerable to loneliness. Further, they identified educational qualification as a protective factor against loneliness in later life.

Financial resources. Research has indicated that insufficient income may increase older adults' susceptibility to loneliness (Aylaz, Aktürk, Erci, Öztürk, & Aslan, 2012; Hazer, & Boylu, 2010; Savikko et al., 2005). Hacihasanoğlu, Yildirim, and Karakurt (2012) found that low income level was associated with increased risk of loneliness in an older adult population. Congruently, (Fokkema, De Jong Gierveld, and Dykstra, (2012) found that older adults with low economic status in Poland and the Czech Republic experienced more intense loneliness and social exclusion, in comparison to older adults in other European countries with greater financial resources. Consistent with the result of the previous studies, Liu and Guo (2007) and Wu, Sun, Sun, Zhang, Tao, and Cui, (2010) also detected a negative association between level of loneliness and level of income. On the other hand, Khosravan, Alaviani, Alami, and Tavakolizadeh (2014), found no significant association between level of income and the feeling of loneliness in Iranian older adults. The authors of the latter study explained that the level of

income may not have a great impact on the level of loneliness in Iranian women because culturally they spend most of their time at home, and men are the breadwinners and are expected to support them financially. However, better socio-economic and financial status may contribute to decreased feelings of loneliness, as the older adults with higher income have more opportunities to be socially involved and to participate in social activities.

Environmental Factors

The environmental factors of living arrangements and living area are known to influence the level of loneliness in older adults.

Living arrangements. The older adults' surrounding environment and living arrangements impact the level of loneliness experienced. Predictors of social isolation and loneliness identified in the research literature are widowhood, low income, inadequate resources, physical restrictions, and low interaction with family members and friends (Dahlberg & McKee, 2014; Sundström, Fransson, Malmberg, & Davey, 2009). Equally, living alone was found to amplify the sense of loneliness (Bhatia, Swami, Thakur, & Bhatia, 2007; Jakobsson & Hallberg, 2005). A study conducted in China of empty nest older adults and non-empty nest older adults found that the empty nest group exhibited higher scores of loneliness in comparison to the group of the non-empty nests (Wu, Sun, Sun, Zhang, Tao, & Cui, 2010).

Living area (district). Older adults residing in a rural area report more feelings of loneliness, compared to those living in urban areas who experienced less loneliness (Routasalo, Savikko, Tilvis, Strandberg, & Pitkälä, 2006; Vakili, Mirzaei, & Modarresi, 2017). Similarly, a study reported that residing in deprived rural communities with limited leisure facilities is found to amplify the risk of feeling lonely among older adults (Burholt & Scharf, 2013). In contrast,

another study identified living in urban areas as a predicator of loneliness among the older adult

population (Nzabona, Ntozi, & Rutaremwa, 2016).

Additional Factors that Contribute to Loneliness among Older Adults

Psychological factors, health conditions or comorbidity, and stressful life events are

determinants of loneliness addressed by the MODEL framework (Cohen-Mansfield & Parpura-

Gill, 2007).

Psychological Factors

Perceived social relationships. The perception of social disconnectedness augments the

feeling of loneliness (Cornwell & Waite, 2009). There is an agreement that deficient social

contact particularly with friends and family members uniquely correlate with loneliness

(Dahlberg & McKee, 2014; Liu and Guo, 2007; Wu, Sun, Sun, Zhang, Tao, & Cui, 2010).

Additionally, perceived low social integration and deficient social support were found to explain

loneliness in the older population (Dahlberg & McKee, 2014; Singh & Misra, 2009; Tiikkainen

& Heikkinen, 2005). Similarly, the perception of having deficient opportunities to meet people

and having infrequent contact was reported to enhance feelings of loneliness (Ayalon, Shiovitz-

Ezra, & Palgi, 2013; Cohen-Mansfield & Parpura-Gill, 2007; Fokkema, De Jong Gierveld, &

Dykstra, (2012).

Self-esteem and self-efficacy. Poor self-esteem or self-efficacy exhibited by older adults

in social situations is found to predicate loneliness (Cacioppo, Hawkley, & Thisted, 2010;

Cohen-Mansfield & Parpura-Gill, 2007). Likewise, Hensley, Martin, Margrett, MacDonald,

Siegler, and Poon (2012) investigated the association between personality and loneliness, found

that a lower perceived competence and self-esteem among the elderly participants were linked to

a higher score of loneliness. Several factors that led to low social self-efficacy among older

adults include "self-deprecation resulting from the physical changes that come with age, loss of previous social roles, and lack of practice in initiating or developing new social connections" (Cohen-Mansfield & Parpura-Gill, 2007, p. 289). These factors affect older adults' ability to initiate new social relations and maintenance of satisfying social ties, which are attributed to loneliness.

Health Conditions and Comorbidity

Deterioration of older adults' health and comorbidity intensify social isolation and loneliness (Fokkema, De Jong Gierveld, & Dykstra, 2012). Empirical evidence showed that loneliness not only has a negative effect on older adults' health and well-being, but the causative association may happen in the opposite direction (Burholt & Scharf, 2013; Jakobsson & Hallberg, 2005; Sundström, Fransson, Malmberg, & Davey, 2009). Theeke (2009) indicated that older adults with chronic illness and functional disabilities are at increased risk of experiencing loneliness. Across European countries, poor subjective health was found to be negatively associated with loneliness (Fokkema, De Jong Gierveld, & Dykstra, 2012).

Additionally, people living alone with poor health were found to have a higher incidence of feeling lonely versus individuals with good health and that live with a spouse (Sundström, Fransson, Malmberg, & Davey, 2009). Cohen-Mansfield, Shmotkin, and Goldberg (2009) and Heylen (2010) demonstrated that older adults living with chronic illness and being in poor health had higher levels of loneliness. Cohen-Mansfield and Parpura-Gill (2007) and Theeke (2010) suggested that, as a result of poor health, doctor visits are found to be greater among older adults with higher levels of loneliness. In contrast, two studies found no significant association between health conditions and loneliness in older adults (Khosravan, Alaviani, Alami, and Tavakolizadeh, 2014; Vakili, Mirzaei, and Modarresi, 2017). Both studies were conducted in Iran and the

32

findings may be related to cultural, socioeconomic and geographical discrepancy, which need deeper investigation.

Stressful Life Events

Literature revealed that the loss of a partner or an intimate person during the older years was associated with loneliness (Aartsen & Jylhä, 2011; Chipperfield & Havens, 2001). Moving to new housing and/or geographical location correlates to loneliness in older adults (Locher et al., 2005). A positive correlation is found between loneliness and living in a nursing home (Prieto-Flores et al., 2011; Savikko et al., 2005). Similarly, earlier negative life events were identified as potent source of loneliness (Cohen-Mansfield, Shmotkin, & Goldberg, 2009; Hensley et al., 2012).

Moreover, death of a spouse, close relative, or child and not having anyone to communicate with correlated to increased risks in experiencing loneliness (Eloranta, Pirkko, & Seija, 2008). Stressful, age-related life events may lead to a deficiency in social networks and in intimate relationships. Subsequently, an increase of social support is urgently needed to re-establish and strengthen social networks among older adults to combat feelings of loneliness.

Impact of Loneliness on Older Adults' Health and Well-being

The following section addresses variety of negative health conditions associated with loneliness including physical, psychological, and mental illness that indicated by the literature as consequences of loneliness in older adults. Multiple research studies report findings that greater levels of reported loneliness are associated with a higher incidence of poor, subjective health (Fisher et al., 2014).

Physical Health

Cardiovascular disease. Thurston and Kubzansky (2009) examined the association between loneliness and the risk of Coronary Heart Disease (CHD). They found that a high level

of loneliness correlated to an increase in the prevalence of CHD among women. In another study by Hawkley, Thisted, Masi, & Cacioppo (2010) of older adults over a 4-year period, found that higher levels of loneliness were significantly associated with higher systolic blood pressure in the study participants ($p < .05$).

Urinary and fecal incontinence. In a study of older women assessing the relationship between social isolation and urinary and fecal incontinence, results showed a significant association between feeling isolated and daily urinary incontinence. Fecal incontinence was found not to be related to perceived social isolation (Yip, Dick, McPencow, Martin, Ciarleglio, & Erekson, 2013).

Sleep disorder. A cross-sectional study of 95 elderly persons showed that individuals who had higher loneliness scores perceived themselves as disconnected, reporting higher levels of fragmented sleep (Kurina et al., 2011). Although feelings of loneliness were not associated with the quantity of sleep, loneliness was found to be associated with poor sleep quality and daily dysfunction among a sample of older adults ages 50 to 68 (Hawkley, Preacher, & Cacioppo, 2010). Hawkley and Cacioppo (2010) reported that lonely feelings impair the quality of sleep but not its duration. The linkage between loneliness and poor sleep quality may be that individuals who perceive themselves as being socially isolated and lonely are also more vigilant and distressed when sleeping. Cacioppo, Norris, Decety, Monteleone, and Nusbaum (2009) claimed that this perception provokes feelings of potential threats which leads to poor sleep efficiency.

Psychological and Mental Health

In a study by Kearns et al. (2015) participants scoring high on loneliness were five times more likely to report deteriorated mental health compared to low scoring participants. Consistent

with previous findings, very lonely older adults reported a significantly higher incidence of pain ($p < 0.001$), fatigue ($p < .000$), and depressive symptoms ($p < .001$) in comparison to less lonely individuals (Jaremka et al., 2014). Consistent with the previous result, Liu and Guo (2007) indicated that loneliness was significantly correlated with impairment of physical and psychosocial quality of life in empty nest and non-empty nest older adults, and that participants with greater levels of loneliness had worse physical and mental health. Similarly, Bekhet and Zauszniewski (2012) demonstrated a strong, positive correlation between anxiety, depressive symptoms and loneliness. Surprisingly, they report no significant association between loneliness and the decline in functional status or the number of chronic diseases in older adults.

Chalise (2010) explored social support and its association with loneliness and subjective well-being in Nepal among two different ethnic groups composed of 137 participants from Chhetri and 195 from Newar. Participants in both ethnicities who received high levels of social support reported less loneliness and higher subjective well-being than those without social support. This study concluded that loneliness is inversely correlated with subjective well-being in the Chhetri sample and in participants from Newar ($p < .001$). A qualitative study was conducted by Heravi-Karimooi, Anoosheh, Foroughan, Sheykhi, and Hajizadeh (2010) reported negative outcomes of loneliness. Lonely older adults expressed a variety of negative consequences as they experienced the sense of loneliness. These outcomes included painful, unpleasant feelings of being alone, insufficient social connections and support, a lack of social rights and privileges, feelings of neglect and abuse, and a lack of intimate relations with relatives and friends.

Loneliness and Depression

Earlier studies ascertained that loneliness is a major predictor of depressive symptoms (Barg et al., 2006; Caccioppo et al., 2006; Holvast et al., 2015; Stek, et al., 2005). Moreover, depression was found to be correlated with dissatisfaction with the quality of a person's social relationship with others (Wilson, Motram, & Sixsmith, 2007). Similarly, Cohn-Mansfield and Parpura-Gill (2007) argued that a higher incidence of loneliness and depression was linked to deficient social connections and poor social ties. Likewise, a study carried out in Delhi, the capital of India, explored the association between loneliness, depression, and sociability among a sample of 55 Indian older adults of both genders, ages 60 to 80. The association between loneliness and depression was found to be significantly positive at the (p < 0.01) level. A negative, yet insignificant correlation, was found between sociability and loneliness (Singh & Misra, 2009). Additionally, several studies reported the association between older adults' loneliness and an increase in depressive symptoms amongst older adults, independent of social isolation, perceived social support or stress (Bekhet & Zauszniewski, 2012; Cacioppo, Hughes,Waite, Hawkley, & Thisted, 2006; Cacioppo, Hawkley, & Thisted, 2010; Wang, Hu, Xiao, & Zhou, 2017).

Loneliness and Mortality

In a seven-year longitudinal survey of older adults, perceived social isolation and loneliness were identified as significant predictors of higher rates of mortality ($p < .001$) (Steptoe, Shankar, Demakakos, & Wardle, 2013). Luo and Waite (2014) examined the association between loneliness and mortality rates among a national representative sample of 14,072 Chinese older adults aged 65 and more between 2002 and 2008. The results revealed an increase in the level of loneliness between 2002 and 2008 ($p < 0.001$), a gradual increase in

36

functional limitation ($p < .001$), and a decline in emotional and self-reported health ($p < .001$).

Additionally, the results showed that, among 14,072 older adults, a total of 6,848 died between 2002 and 2008. This result indicates that older adults who reported higher levels of loneliness had an increased risk of early mortality. The author determined that loneliness is positively associated with mortality. To elaborate, this correlation explains that the negative consequences of loneliness on both social and health behaviors, including a person's health overall, escalates the risk of mortality among lonely, elderly individuals.

Similarly, Perissinotto, Cenzer, and Covinsky (2012) confirmed the negative effect of loneliness on functional decline and high morbidity rates. Luo, Hawkley, Waite, and Cacioppo (2012) used cross-lagged models to examine the mechanisms clarifying the effect of loneliness on mortality over a six-year period. They found that, loneliness was associated with higher depressive symptoms, higher functional limitations, and a decline in physical health among the study participants. Consequently, the aforementioned factors increased the risk of mortality.

Loneliness and physical activity. Loneliness was found to have a compellingly negative correlation with physical activity among older adults ($p < .001$) (Luo & Waite, 2014; Netz et al., 2013). A longitudinal study that included 1,000 community-dwelling older adults over 12 years found a greater decline in motor function among lonely, disconnected elderly individuals (Buchman et al., 2010). Similarly, Hawkley, Thisted, and Cacioppo (2009) identified loneliness and social isolation as risk factors for physical inactivity and increased sedentary life behaviors among older adults, which, in turn, led to negative health outcomes. Equally, Netz, Goldsmith, Shimony, Arnon, and Zeev (2013) examined loneliness as a risk factor for sedentary life among a sample of 799 men and 864 women aged 65 and over, including both Jewish and Arab sectors. The results indicate that feelings of loneliness were significantly higher among women (44.6%)

($p < 0.001$) in comparison to men 24.5%. Also, 45% of the Arab group reported greater

loneliness while only 32.7% of the Jewish participants reported the same. In conjunction with

these reports, loneliness significantly acted as a barrier to physical activity among the subgroups

in this study ($p < .001$). Hawkley et al. (2009) posited that lonely older adults lack the motivation

and support to engage in-sufficient physical activity.

Literature Synthesis

Loneliness among older adults appears to be a complex phenomenon entailing various

psychosocial factors that can lead to serious negative health outcomes. Overall, the literature

identified the important factors associated with loneliness which include low level of education,

limited financial resources, and poor health status (Cohen-Mansfield, Shmotkin, & Goldberg,

2009; Dahlberg & McKee, 2014; Heylen, 2010; Sundström, Fransson, Malmberg, & Davey,

2009). Additionally, evidence supports the factors of gender (female), older age, co-morbidity,

low social participation, and inadequate social support as significant predicators of loneliness in

older adults (Aartsen & Jylhea, 2011; Liu & Guo, 2007; Pikhartova, Bowling, & Victor, 2016;

Singh & Kiran, 2013).

There is strong evidence that loneliness is associated with both physical and mental

health problems including: high blood pressure, sleep disturbance, low immunity, a decline in

cognitive function, and symptoms of depression (Jaremka et al., 2014, Kurina et al., 2011;

O'Luanaigh & Lawlor, 2008). Cornwell and Waite (2009) supported the strong correlation

between loneliness and decline in mental health. They suggested that older adults who perceive

high levels of social loneliness and disconnectedness are more susceptible to health problems

and have remarkably worse mental health.

The obvious linkage between loneliness and health outcomes provides an urgent call to

tackle this issue early in order to minimize the progression of the negative consequences of

loneliness. Moreover, loneliness is a multifaceted phenomenon that needs to be investigated more in-depth with respect to different settings and cultural contexts. Thus, health care providers and policy makers, need to work collaboratively to direct their attention and resources to address loneliness among the elderly population.

Loneliness is a serious issue affecting the quality of life of many older adults worldwide. Loneliness, with its causes and serious consequences, has been underestimated by the research community and by health care professionals (Gerst-Emerson & Jayawardhana, 2015). More attention must be paid to the study of loneliness among older adults so that effective interventions targeting prevention of loneliness among this population can be designed. Holt-Lunstad, Smith, and Layton (2010) ascertained that further research is needed to seriously acknowledge how social engagement factors such as loneliness influence the health and well-being of adults. The researchers urged that this issue should be taken as seriously by public policy initiatives as other risk factors including smoking, diet and inactivity that affect mortality.

Although there is a significant amount of literature that addresses loneliness among older adults, there is still more research needed to explore the phenomena of loneliness in older adults, especially in countries like Oman. Furthermore, the majority of studies address loneliness among older adults in western countries which reveals that there is a gap and a lack of research related to this phenomenon in Middle-Eastern countries. Therefore, it is imperative to conduct more studies regarding loneliness in older adults in various Middle-Eastern countries and to determine factors contributing to this issue. This will allow identification of effective strategies to control and prevent loneliness among elderly population.

Summary

The review of the literature in this chapter included articles from both the Western and Eastern countries, comprises a description of the significance of loneliness as a global issue and its impact on older adults' health and well-being. In addition, the selected studies addressed some components of loneliness, such as definitions, risk factors, and negative outcomes associated with loneliness among older adults.

Chapter 3

Methodology

The purpose of this study was to examine the relationship of personal and environmental factors to loneliness and health status in Omani older adults. This chapter describes the research design, sample, settings and instrumentations, protection of the rights of human participants, and data collection and analysis procedures.

Research Design

To answer the main research questions of this study, a cross-sectional research design was applied to evaluate the relationship of personal and environmental factors to loneliness and health status in Omani older adults. "Cross-sectional studies are appropriate for describing the status of phenomena at a fixed point in time" (Polit & Beck, 2010, p. 184). Moreover, a cross-sectional desgin is appropriate to identify correlations and direct future research (Habib, Johargy, Mahmood, Humma, 2014). This design was appropriate for this study as it aimed to generate knowledge about the phenomenon of loneliness in an Omani population where this area has not been examined previously.

Setting

The study took place in Alshaqiya North Governorate in the Sultanate of Oman. This governorate has six rural districts and the sample for this study was recruited from three districts named Ibra, Alqabil, and Bideya. Table (1) shows the distribution of registered older adults in the three districts where there are total of five HCs. No statistical data by area specifically related to older adult health status or disease conditions are available. All the five HCs in Ibra, Al Qabil, and Badyia were considered for recruitment to enhance enrollment of older adults with anticipated loneliness.

Table 3.1

Total Registered older adults 60 years and above by end of June 2017 in the three States (MOH, Oman, 2017)

States	HC	M	F	Total
Ibra	Ibra HC	530	696	1226
Al Qabil	Al Qabil H.C.	158	201	675
	W. Naam H.C.	148	168	
Badyia	Bidiya H.C.	199	301	676
	Dhahir H.C.	86	90	
Total in the three				2577

Note. *(MOH, Oman, 2017)*

Sample

One hundred sixteen Omani older adults ages 60 years and over voluntarily participated in this study. These participants were selected via convenience sampling from three districts of the Sharqiyah north Governorate in the Sultanate of Oman. The inclusion criteria for admission to the study were: 1) Omani citizen, 2) Arabic speaker, 3) registered patient in Geriatric Clinic (GC), 4) aged 60 years and over, 5) Able to answer questions, and 6) living in their home whether alone, with family, with spouse, or caregiver.

Three recent studies of older adults and loneliness were used to estimate sample size. In a study by Bekhet and Zauszniewski (2012) gender differences and the association between loneliness and overall health were examined among 314 older adults. Results revealed that, gender was not associated to loneliness, and there was no significant correlation between loneliness and physical health. However, a significant main effect was found between loneliness and mental health consequences (F $(3, 310) = 5.42$, $p < .001$). Another study by Kurina et al. (2011) found that loneliness was significantly correlated to sleep fragmentation among 95 participants ($\beta = 0.073$, $t = 2.55$, $p = 0.01$). A recent study conducted by Wang, Hu, Xiao, and Zhou (2017), included 814 older adults in China found that higher loneliness scores reported by empty-nest older adults compared to not-empty-nest ($p < 0.05$, Cohen's d=0.97). To calculate the

desired total participants for this study, G.Power 3.1 (2017) was used. Based on the studies above, a medium effect size was chosen to use in determining sample size for this study. For this study, statistical power was set at .80, medium effect size of .50, and two-tail $p \leq .05$. A power of .80 means that there is an 80% chance of rejecting a false null hypothesis. Using the G power program and the above parameters, a sample size of 120 participants was targeted.

Procedures

Recruitment of Participants

After the IRB approval from ASU (Appendix- F) and Omani MOH (Appendix- G). The researcher met with the head of the nursing department in the Sharqiyah region to facilitate the recruitment process and organize the logistics for data collection. The head of the nursing department informed GNs in the three districts about the study and encouraged them to collaborate with the researcher. The researcher conducted a one-week workshop for the appointed GNs to provide a detailed explanation about the study purpose, instruments, and their expected role in assisting the researcher on selecting eligible older adults as well as, distributing and collecting completed questionnaires.

Participants were identified by clinic GNs based on the inclusion criteria. The GNs communicated with the identified older adults, explained the purpose of the study via phone and obtained their verbal permission to participate and informed them of the place and time to complete the questionnaires. Only 116 were able to complete the survey either alone or with assistance from the researcher or the GNs. Vehicles were arranged for participants who did not have transportation. Additionally, home visits were arranged to collect the data from the participants who had physical limitations and were not able to attend the study venues, based on their convenience.

Data Collection

The researcher and trained GNs presented the study with its purpose to the eligible

participants in the assigned venues of PHCs in the three districts before administering the study

instruments to the participants. The researcher distributed the questionnaire and was available to

clarify any queries. The GNs helped in the process of distributing and collecting the

questionnaires. Approximately 30 to 40 minutes was required to complete the three

questionnaires. Participants were informed to place completed questionnaires into an envelope

that they sealed before submitting it to the researcher. The researcher and the GNs collected the

sealed envelopes from the participants after completion. Study data were collected over a three

weeks periods, a week in each district, Sunday through Thursday morning in PHCs, five to eight

clients assigned each day. Home visits were carried out in the evening after agreement with the

time between the researcher and the participant.

Protection of the Rights of Human Subjects

Two approved Institutional Review Board (IRB) protocols were obtained from the

Arizona State University (U.S) (IRB Study number 00007943) and the Ministry of Health in

Oman ((IRB Study number 18/8708). These IRBs allowed the researcher to carry out the study in

the three regions in the Sharqiya North Governorate through the Health Directorate. To ensure

the participants understood the nature of their contribution into this study, the researcher met

with the participants and introduced the research topic and the methods that were used for

collecting the data at the beginning of the survey. Participants were informed that in case they

were not able to read the statements, the researcher or a trained GN were ready to assist them in

completion of the questionnaire and that may take about 30-40 minutes to complete. Participants

were informed that there were no tangible benefits from participation in the study, but the results of this study will be presented to policy makers to improve services to Omani older adults.

Risks. There were only minimal risks to the participants. There may was a potential for loss of privacy that may result in embarrassment or some psychological distress. To minimize the expected risks and to ensure the privacy and confidentiality of the participants all participant data were kept anonymous and participation in the study was voluntary. All participants' personal information obtained during the study was available only to the researcher and it was secured with the researcher in a locked cabinet. All data retained for at least three years in compliance with federal regulations in a secure cabinet.

Benefits. There is no expected direct benefit to participants in this study. However, the study may help increase the awareness of policy officials and stakeholders in Oman about the issue of loneliness. In addition, the results of the study may help in identifying strategies to halt loneliness and its consequences among Omani older adults.

Confidentiality. The questionnaires were coded for identification of the location of data collection. No personal identifiers were collected that would identify participants. The researcher with the help of GNs distributed and collected the questionnaires from the participants. In addition, the researcher and GNs were available to clarify any questions or concerns. To prevent identification of the participants, each participant was asked to keep the completed questionnaire in an envelope and to seal it before handing it to the researcher.

Informed consent. All participation in this study were entirely voluntary participated and signed a consent form (Appendix-H). However, an informational letter was provided to the participants to assure them that their participation was anonymous. The letter included a

45

description related to the study aim and purpose, benefits and potential risks. In addition to the right of participants to leave the study at any time

Data storage. All questionnaires were kept in a confidential, locked file cabinet, and the key was with the researcher kept in a secured place. All raw data entered into the researcher's personal laptop that was protected by a password. Only the researcher had access to the raw data. All data analysis procedures were completed by the researcher with the help of assigned statistician. All the collected raw data questionnaires will be destroyed by shredding one year after the completion of the study. All anonymous raw data in the electronic SPSS files will be retained indefinitely.

Research Instruments

Three instruments were used to collect data for this study, including a Demographic Data Questionnaire (Appendix-A), the University of California Loneliness scale (UCLA) English version (Appendix-B) and the 12-item Short Form health survey (SF-12) English version (Appendix-D). The majority of the participants were not able to read or understand the questionnaires in English so the Arabic version of both scales (UCLA loneliness scale Arabic version (Appendix-C) and Short Form health survey (SF-12) Arabic version (Appendix-E) were used. The researcher and the GNs read the surveys questions for the 63 participants who were not able to read the Arabic version. Table 3.2 shows the variables and measures that were used in the study.

Table 3.2

Variables and their Measures

Concept	Measure	Psychometric testing
Personal Factors	Demographic questionnaire	NA
Age		
Gender		
Marital Status		
Educational Level		
Working Status		
Financial resources		
Environmental Factors	Demographic questionnaire	NA
Living area / District		
Living arrangements		
Loneliness	UCLA Loneliness Scale	Cronbach's alpha (.96)
Health Status	SF-12 Health Survey	Cronbach's alpha (.88)

Demographic Data Questionnaire

A Demographic Data Questionnaire was used for the older adults' participants. The questionnaire included eight multiple choice items. The items included the personal factors of gender, age, marital status, level of education, income level, and working status, as well as the environmental factors of living area (district) and with whom the older adult participant is residing.

University of California Loneliness Scale (UCLA)

Loneliness was measured through the revised version of the UCLA Loneliness scale (Russell, 1996). This scale includes 20-items designed to measure both emotional as well as social loneliness, using nine positively and eleven negatively worded items. This scale is a well-documented and commonly used instrument across various age ranges. Analysis of this scale reveals high reliability with a Cronbach's alpha range between (.89 and .94) in terms of internal consistency, and correlation of $(r = .73)$ in test-retest reliability over one-year period (Russell,

1996). Velarde-Mayol, Fragua-Gil, and García-de-Cecilia, (2016) examined construct validity

and discriminant validity of UCLA loneliness scale in a sample of older population. They found

that this tool has construct validity, and highly correlated with other loneliness instruments such

as the NYU loneliness scale and Differential Loneliness Scale (DLS) (Russell, 1996).

Al Khatib, (2012) translated UCLA loneliness scale to Arabic language after obtaining

the permission from its original author. The Arabic UCLA loneliness scale was used to

investigate the relationship between loneliness, self-esteem and self-efficacy among college

students in United Arab Emirates (Al Khatib, 2012). An Arabic copy of the UCLA loneliness

scale and a copy right permission was obtained from the above author to use the translated

Arabic version of UCLA loneliness scale in the current study.

The UCLA Loneliness Scale was translated to Arabic language, and validation studies

support the use of the Arabic version in Arabic speaking sample with different culture (Al

Khatib, 2012; Alnajjar & Dodeen, 2017). Reliability of the Arabic version of the UCLA

Loneliness Scale is high with Cronbach's alpha (0.91), test-retest reliability also found to be high

with coefficient was (.89) (Al Khatib, 2012). To validate Arabic version of UCLA scale, Alnajjar

and Dodeen (2017) conducted a study in United Arab Emirates (UAE), in a sample of 2374

participants including both sex of teenagers and older adults. The validity of the outcome was

ascertained through Confirmatory Factor Analysis (CFA). The scale was internally reliable for

both groups as Cronbach's alpha was .84 for the teenagers and .88 for the older adults, as well as,

in both gender male and female (.90 and .88) respectively. A similar result was found by Dodeen

(2015), that showed the Arabic adapted version of the UCLA loneliness scale was internally

reliable with a Cronbach's alpha of .89 and confirmed to fit the Arabic speaking sample of 1,429

students from the UAE University.

Based on UCLA loneliness scale, participants were asked to respond to each question on a 1 to 4 Likert- type scale, ranged from "never" to "often" with possible points from 20 to 80. The degree of loneliness was classified by total points in the following groups: 1) severe, score 61 to 80, 2) high, score 50 to 60, 3) moderate, score 35 to 49, and 4) low, score 20 to 34 (Adams, Sanders, & Auth, 2004).

Health Status

The health status was assessed via the SF-12- version 1, health survey (Haywood, Garratt, & Fitzpatrick, 2005). The 12-tem survey is a valid, shorter alternative to the SF-36 health survey and its shorter length reduces respondent burden (Lacson, Xu, Lin, Dean, Lazarus, & Hakim, 2010). The SF-12 measured physical and mental health and covered the eight dimensions of health included in the original MOS-36: General Health Perceptions (GH) (one item), Physical Function (PF) (two items), Role Physical Function (RP) (two items), Bodily Pain (BP) (one item), Vitality (VT) (one item), Social Function (SF) (one item), Role Emotional Function (RE) (two items), and Mental Health (MH) (two items).

The SF-12 has acceptable psychometric properties, with high internal consistency and test-retest reliability values (0.78-0.85) and is responsive in assessment of population health and health related quality of life within a wide range of ages and health conditions (Jakobsson, 2007; Jakobsson, Westergren, Lindskov, & Hagell, 2012). Moreover, it was adapted and translated into multiple languages including Arabic (Obtel, El Rhazi, Elhold, Benjelloune, Gnatiuc, & Nejjari, 2013; Younsi & Chakroun, 2014; Younsi, 2015).

Obtel and colleagues (2013), carried out a study in Morocco aimed to assess the psychometric properties and validity of SF-12 Arabic version. This study evaluated the internal consistency and construct validity of the SF-12 in 141 Moroccan adults who attended Fez

49

University hospital for a diagnostic procedure. The result supported the construct validity and sensitivity of the SF-12 health survey Arabic version to measure health status. Additionally, it demonstrated acceptable internal consistency and supported the reliability of the Arabic version of the SF-12 with (alpha coefficients of 0.80 and 0.79, respectively) (Obtel, El Rhazi, Elhold, Benjelloune, Gnatiuc, & Nejjari, 2013).

For the current study, the Arabic version of SF-12 was translated from the original English version of SF-12 by the academic translator in King Fahd University Hospital Medical Education Center (Al-Shehri, Taha, Bahnassy, & Salah, 2008). The authors had the authorization from the original author of the SF-12 (www.qualitymetric.com). The researcher of the present study obtained a copy the translated Arabic version of SF-12 from the author, who used the SF-12 in a study aimed to measure the health-related quality of life in type-II diabetic patients, in Al-Kobar, in Saudi Arabia (Al-Shehri, Taha, Bahnassy, & Salah, 2008).

Data Analysis

In this study, data were analyzed using the Statistical Package for the Social Science (SPSS) for Windows version 25.0. Data analyses included descriptive statistics, bivariate correlations, and hierarchical regression analyses.

Personal and Environmental Factors

Study variables included the personal factors of age (categorized to three groups 60 – 74, 75- 84, 85 and over), gender (Male, Female), Marital Status (Single, Married, Widowed, Divorced), working status (no job, retired- pensioned), and level of education (illiterate, Quran education, adult education). Financial resources were represented on categorical variables based on monthly income of Omani Rail (500+, 300-499, 100-299, 1-99). The categorical variables representing environmental factors included Region/ district (Ibra, Al Qabil, Badiyah), lives with (alone, with spouse, with spouse and children, children, and others- caregiver-housemaid).

50

Loneliness

Loneliness was measured by UCLA loneliness scale. Four groups of ordinal categorical variable for level of loneliness were proposed (low level of loneliness (20 to 34), moderate level of loneliness (35 to 49), high level of loneliness (50 to 60), severe loneliness level (61 to 80).

Health Status

The SF-12 health survey was analyzed based on two summary scores; the Physical Component Summary (PCS) and Mental Component Summary (MCS). The PCS includes subscales of Physical Function (PF), Role Physical Function (RF), Bodily Pain (BP), and General Health Perceptions (GH) and MCS with subscales of Vitality (VT), Social Function (SF), Role Emotional Function (RE), and Mental Health (MH). Scoring of SF-12 health survey is based on a standardized algorithm (Ware, Keller & Kosinski, 1998).

Descriptive statistics were computed on all categorical and ordinal level variables. This included measures of central tendency (mean, median) and dispersion (range, standard deviation) for interval/ratio level variables, frequencies and percentages.

Research Questions

Research question one. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and loneliness in Omani older adults?

The Point-Biserial correlation coefficient for binary variables (gender and working status), Spearman correlation coefficient for categorical variables (age, income, education, number of children, marital status and the environmental variables of district and living arrangements), and Pearson correlation coefficient for the ratio level variable (loneliness) were

calculated to examine the relationship among the personal and environmental factors and the dependent variable of loneliness.

Research question two. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and mental health status (MCS) in Omani older adults?

To examine health status the SF-12 provides two separate scores; one for the mental component (MCS) and one for the physical component (PCS) of health status. Question two examines the relationship of personal and environmental factors to the mental component of health status (MCS). The Point-Biserial correlation coefficient for binary variables (gender and working status), Spearman correlation coefficient for categorical variables (age, income, education, number of children, marital status and the environmental variables of district and living arrangements) and Pearson correlation coefficient for ratio variable (MCS) were measured to examine the relationship among the personal and the environmental variables with the dependent variable of MCS.

Research question three. What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and physical health status (PCS) in Omani older adults?

The Point-Biserial correlation coefficient for dichotomous variables (gender and working status), Spearman correlation coefficient for categorical variables (age, income, education, number of children, marital status and the environmental variables of district and living arrangements), and Pearson correlation coefficient for (PCS) were calculated to examine the relationship among the personal and the environmental variables and the dependent variable of PCS.

Hypotheses

  Hypothesis one. Controlling for personal and environmental factors, loneliness will be negatively associated with mental health status (MCS) in Omani older adults.

  Hypothesis two. Controlling for personal and environmental factors, loneliness is negatively associated with physical health status (PCS).

  To test this study's hypotheses three step hierarchical regressions were performed, one with MCS as the dependent variable, and one with PCS. Personal factors were loaded first followed by environmental factors in the second stage and the loneliness score in the third step to determine the association between loneliness and (MCS and PCS) while controlling for environmental and personal variables.

Summary

  This descriptive, cross-sectional study examined the relationship of personal and environmental factors to loneliness and health status in Omani older adults. A convenience sample of older adults was recruited from four geriatric clinics. Participants completed a demographic questionnaire, the UCLA loneliness scale and the SF-12. This chapter included a discussion of the methods, design, and the instruments used to collect data for this study. Finally, this chapter described the procedures that were followed for data collection, data analysis, and protection of the rights of human participants.

Chapter 4

Findings

Loneliness among older adults is an emerging health issue in Oman. With its perilous complications, research is needed to understand the problem and guide the development of effective interventions to treat it. This study examined the relationship of personal and environmental factors to loneliness and health status in Omani older adults. This chapter includes the descriptive statistics of the study's variables and inferential statistics to address the research questions and test the hypotheses.

Descriptive Statistics of the Research Variables

The four research concepts addressed in the present study were personal factors, environmental factors, loneliness, and health status (MCS and PCS). The Statistical Package for the Social Science (SPSS) windows version 25.0 was used to compute the data analysis. Variables with small counts were excluded (one case in elementary education category, two cases were single in marital status category, and no cases in employee category). As a result, statistical analyses were conducted on a sample of 113. Moreover, all categorical variables were dummy coded. Continuous variables of age, number of children, and income level were grouped in categories and dummy coded. For example, age was categorized into the groups of 60-74, 75-84, and 85+. Number of children categorized into four groups including 0, 1-3, 4-7, and 8+. In the same way, income level was clustered into four categories 500+, 300-499.100-299, and 1-99.

Sample

A sample of 116 older adults participated in this study, however three participants were removed due to missing data for a final sample of 113. The majority of the sample, 68.1% were female and 31.9% were male. Approximately 50% of the participants were from the 60-74 years age group. The majority of the participants were married 40.7%. Over half of the participants

were illiterate 55.8%, while 31% attended Quran school, which would have enabled them to read

and write, only 16.8% attained adult education. The majority of the sample 43.4% had 4 to 7

children and 6.2% had no children. Most of the sample 70.8% had no job and 29.2% were

retired. Half of the older adults 50.4% reported earning a monthly income ranging between 100

and 299 Omani Rial (OMR), which is equivalent to $260 to $777 U.S. dollars (Table 4.1).

Table 4. 1

Description of the Sample Personal Characteristics of 113 Omani Older Adults (N=113)

Characteristics	N	%
Gender		
Male	36	31.9
Female	77	68.1
Age		
60-74	57	50.4
75-84	35	31.0
85+	21	18.6
Marital Status		
Married	46	40.7
Widow	45	39.8
Divorced	22	19.5
Education Level		
Illiterate	63	55.8
Adult Education	19	16.8
Quran School	31	27.4
Working Status		
No Jobs	80	70.8
Retired	33	29.2
Number of Children		
Zero	7	6.2
1-3	26	23.0
4-7	49	43.4
8+	29	25.7
Income		
500+	4	3.5
300-499	16	14.2
100-299	57	50.4
1-99	36	31.9

Approximately 38.1 % of the participants were from the Ibra region, 33.6% were from

Al-Qabil, and 28.3% were from Badiyah. The majority of participants lived with their children

and spouse or with children only 41.6%, while 21.2% lived alone. Regarding living

arrangements, 16.8% of the participants lived with a caregiver (housemaid). Table 4.2 presents

the sample's environmental characteristics.

Table 4. 2

Description of the participant Environmental Characteristics of 113 Omani Older Adults (N=113).

Characteristics	N	%
District		
Ibra	43	38.1
AlQabil	38	33.6
Badiyah	32	28.3
Living		
Alone	24	21.2
With Spouse	23	20.4
With Spouse & Children	23	20.4
With Children	24	21.2
With Others	19	16.8

Loneliness

Loneliness was measured through the UCLA loneliness scale. For this study, this scale

was tested for internal reliability and the Cronbach's alpha was found to be (.96). Loneliness

scores were categorized into four levels: severe (61 to 80), high (50 to 60), moderate (35 to 49),

and low level of loneliness (20 to 34). Participants reported loneliness scores ranging from 20-

74, with a mean of 41.09 (SD =14.09). Majority of the participants reported a low or moderate

level of loneliness 69 %. While, over 30 % of the participants reported a high or severe level of

loneliness.

Health Status

The SF-12 version 1 was completed by the participants. For the current study, internal reliability for SF-12 was tested and Cronbach's alpha result was (.88). Health status was measured by the summary scores of Physical Health Components (PCS) and Mental Health Components (MCS). Scoring of SF-12 survey was conducted based on the Ware and colleagues scoring system. For the analysis of the SF-12 v-1, a special algorithm was applied (Ware, Keller & Kosinski,1998). Each item of the MCS and PCS in the SF-12 survey was given a weighted number. Then, the means for MCS and PCS were derived based on specific calculations. Subsequently, these means were used as measures of both PCS and MCS components of health status. The descriptive statistical analysis showed that for this sample, the MCS had the higher mean of (46.95, SD = 13.98) and a range between (18-68), in comparison to PCS (mean 36.50, SD = 8.61) and a range between (19-59) (Table 4.3).

Table 4. 3

Means of MCS-12 and PCS-12 (N=113).

Variables	N	Mean	SD	Range
MCS-12	113	46.95	13.98	18-68
PCS-12	113	36.50	8.61	19- 59

Analysis of the Research Questions

Question One

What is the relationship between personal (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and loneliness in Omani older adults?

Correlation coefficient tests were calculated to examine the relationship among the personal factors of gender, age, income, education, working status, number of children, marital status and the environmental variables of district and living arrangements with the dependent variable of loneliness. The results revealed that among the personal factors, age and gender were correlated significantly with loneliness levels. Specifically, loneliness was significantly correlated with the older age of 80 years and more ($r = .156$, $p = .050$). Noticeably, loneliness was also significantly correlated with female gender ($r = .258$, $p = .003$). Similarly, the analysis showed that working status ($r = .189$, $p = .045$) was correlated with higher loneliness levels mainly, no job status was positively correlated to loneliness ($r = .189$, $p = .023$). There was no statistically significant correlation with level of loneliness and the variables of marital status, level of education, income level, and number of children.

Regarding the environmental variables, correlation analysis showed that living arrangements were significantly correlated with loneliness levels. Results showed a significant negative correlation between loneliness and living with children ($r = -.171$, $p = .035$). Furthermore, living with others (housemaid) was positively associated with loneliness ($r = .265$, $p = .002$). Older adults who were living with children were less likely to experience loneliness compared to older adults who were residing with others, specifically living with housemaids, who reported higher levels of loneliness. Table 4.4 presents a correlation between loneliness and each personal and environmental variable.

Table 4. 4

Correlations of Personal and Environmental factors with Loneliness.

Variables	Loneliness		Variables	Loneliness	
Personal factors	*r*	*p*	**Environmental factors**	*r*	*p*
Gender Female	.258	.003	District Al Qabil	-.062	.258
Age 75-84	.077	.209	District Badyia	-.011	.454
Age 85+	.156	.050	Living with spouse	-.119	.105
Marital status-Widow	.108	.126	Living with spouse &children	-.048	.306
Marital status- Divorced	.093	.163	Living with children	-.171	.035
Working status (no job)	.189	.023	Living with others	.265	.002
Adult Education	-.129	.086			
Quran Education	-.015	.438			
Number of children (0)	.017	.428			
Number of children 1-3	-.017	.430			
Number of children 4-7	-.075	.215			
Income 500+	.019	.420			
Income 300-499	.026	.394			
Income 100-299	-.137	.074			

Question Two

What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and health status (MCS) in Omani older adults?

To examine health status the SF-12 provides two separate scores; one for the mental component (MCS) and one for the physical component (PCS) of health status. Question two examines the relationship of personal and environmental factors to the mental component of health status (MCS). Correlation coefficient tests revealed that among personal factors female gender, age 80 years and older, being unemployed, adult education, and income were

significantly linked to MCS. The results indicated that the female gender was negatively correlated significantly with MSC ($r = -.289$, $p = .011$). Likewise, the category of age 85+ years was also negatively correlated with the MCS ($r = -.166$, $p = .040$). Adult education was positively correlated to MCS ($r = .223$, $p = .009$). Working status specifically, the no job group was found to significantly associate with lower MCS ($r = -.193$, $p = .020$). Similarly, level of income 100-299 Omani Rail was positively linked with MCS at a level of ($r = .174$, $p = .033$). No significant correlations were found between marital status and number of children of the personal variables and MCS. Among the environmental factors, the results showed that living with a spouse positively correlated with MCS ($r = .157$, $p = .049$). Whereas, living with others (housemaid) was negatively correlated with MCS ($r = -.255$, $p = .008$). No significant correlation between district and MCS was identified. Table 4.5 shows the correlations between personal and environmental factors and MCS.

Table 4.5

Correlations of Personal and Environmental factors with Health Status (MCS).

Variables	MCS		Variables	MCS	
Personal factors	*r*	*p*	**Environmental factors**	*r*	*p*
Female gender	- .289	.001	District Qabil	.036	.354
Age 75-84	-.001	.498	District Badyia	.001	.498
Age 85+	-.166	.040	Living with spouse	.157	.049
Marital status-Widow	-.126	.091	Living with spouse &children	.051	.296
Marital status-Divorced	-.088	.177	Living with children	-.015	.436
Working status (no job)	-.193	.020	Living with others	-.255	.008
Adult Education	.223	.009			
Quran Education	.056	.278			
Number of children (0)	-.083	.194			
Number of children 1-3	.028	.387			
Number of children 4-7	.062	.259			
Income 500+	-.030	.374			
Income 300-499	.046	.315			
Income 100-299	.174	.033			

Question Three

What is the relationship between personal factors (gender, age, income, education, working status, number of children and marital status) and environmental factors (district and living arrangements) and health status (PCS) in Omani older adults?

Two age groups 74 to 84 ($r = -.184$, $p = .026$) and 80 years and older ($r = -.244$, $p = .005$) were negatively correlated with PCS. In addition, having no job group was negatively correlated with PCS ($r = -.242$, $p = .005$). However, gender, marital status, education level, number of children and income were not significantly correlated with PCS, as well as all the environmental

factors. Table. 4.6 presents the correlation between personal and environmental factors with PCS

component of health status.

Table 4.6

Correlations of Personal and Environmental factors with Health Status (PCS).

Variables	PCS		Variables	PCS	
Personal factors	*r*	*p*	**Environmental factors**	*r*	*p*
Gender Female	.006	.475	District Al Qbil	.153	.053
Age 75-84	-.184	.026	District Badyia	.111	.120
Age 85+	-.244	.005	Living with spouse	.032	.370
Marital status-Widow	-.003	.488	Living with spouse & children	-.108	.128
Marital status-Divorced	.106	.132	Living with children	-.039	.341
Working status (no job)	-.242	.005	Living with others	-.062	.257
Adult Education	-.038	.343			
Quran Education	-.028	.386			
Number of children (0)	.072	.227			
Number of children 1-3	-.080	.201			
Number of children 4-7	-.021	.413			
Income 500+	.091	.168			
Income 300-499	-.054	.286			
Income 100-299	-.088	.178			

Hypothesis One

   Controlling for personal and environmental factors, loneliness is negatively associated

with health status mental component (MCS).

   To test hypothesis one, hierarchical multiple regression was conducted. The regression

analysis was used to assess the association of loneliness to MCS, after controlling for personal

and environmental factors. To ensure the assumptions of normality were not violated, linearity, multicollinearity and homoscedasticity, and preliminary analyses were conducted. Personal and environmental factors that were significantly correlated with loneliness and/or MCS at ($p = 0.05$) were used as predictor variables in the regression models.

Loneliness and MCS. A three-step hierarchical multiple regression was conducted to examine the impact of loneliness on mental health status (MCS), while controlling for personal and environmental factors. The eight predictor variables found to be significantly correlated to either MCS and/or loneliness were used as predicator variables. Of the personal variables, female gender was a negative predictor while adult education was a positive predictor of MCS accounting for 17.2% of the variance in the criterion variable (MCS). None of the environmental variables were significant predictors, accounting for only 2% of the variance in MCS. Finally, loneliness was a significantly negative predictor of MCS accounting for 26.8% of the criterion variable. Overall the model explained 46.1% of the variance in the MCS with loneliness accounting for the largest amount of variance (Table 4.7).

Table 4.7

Hierarchal Regression: The Relationship between Loneliness and MCS while Controlling for Personal and Environmental Factors.

Variable	Model 1			Model 2			Model 3		
	B	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*B*
Personal									
Age 85+	-2.47	3.30	-.069	-2.93	3.33	-.082	-.362	2.76	-.010
Female Gender	-10.91	4.09	-.365**	-9.75	4.4	-.327*	-5.13	3.67	-.172
Adult Education	8.24	3.33	.221*	7.97	3.34	.214*	5.50	2.77	.148*
No Job	-3.42	4.21	-.112	-2.198	4.28	-.072	-2.97	3.52	-.097
Income (100-299)	4.33	2.57	.155	3.43	2.65	.123	2.29	2.18	.082
Environmental									
Living with spouse				2.99	3.37	.086	.563	2.79	.016
Living with children				2.82	3.63	.083	-3.13	3.09	-.092
Living with others				-2.73	3.94	-.073	-1.43	3.24	-.038
Loneliness							-.575	.080	-.58***
Model R^2	. 172			.192			.461		
Change R^2	.172			.020			.268		
p value R^2 change	<.001			.458			<.001		

*$p < .05$, **$p \leq .01$, ***$p \leq .001$

Hypothesis Two

Controlling for personal and environmental factors, loneliness is negatively associated with physical health status (PCS).

Loneliness and PCS. To test hypothesis two, hierarchical regression was used to assess the association of loneliness to PCS, while controlling for personal and environmental factors. A total of four personal variables that were significantly correlated to loneliness and /or to PCS including (age groups of 75 to 84 and 85 years and older, female gender, and no job) were regressed with the criterion variable PCS. All four personal factors were significant predictors of

PCS, accounting for 22.5% of the variance in the criterion variable. Both age groups and no job were negative predictors while female gender was a positive predictor for PCS. Neither of the environmental factors of living with children or living with others were significant predictors of PCS, explaining only .03% of the variance in PCS. Loneliness was not a significant predictor of PCS, adding .3% to explaining the variance in the criterion variable. The model explained a total of 25.6 % of the total variance in PCS (table 4.8).

Table 4.8

Hierarchal Regression: The Relationship between Loneliness and PCS while Controlling for Personal and Environmental Factors

Variable	Model 1			Model 2			Model 3		
	B	*SE B*	B	B	*SE B*	β	B	*SE B*	B
Personal									
Age (75-84)	-5.23	1.69	-.28**	-5.08	1.73	-.274**	-4.40	1.74	-.24*
Age 85+	-6.09	2.02	-2.77**	-5.93	2.05	-.269**	-5.08	2.07	-.23*
Female Gender	6.21	2.37	.338*	5.69	2.56	.309*	4.82	2.56	.26
No Job	-8.40	2.38	-.45***	-8.52	2.41	-.45***	-8.85	2.39	-.47***
Environmental									
Living with children				-1.32	2.04	-.063	-2.38	2.09	-.11
Living with others				-.962	2.24	-.042	-.59	2.21	-.04
Loneliness							-.113	.058	-.19
Model R²	. 225			.229			.256		
Change R²	.225***			.003			.027		
p value R² change	<.001			.794			.053		

*p < .05, **p ≤.01, ***p ≤ .001

The two models illustrated that various personal and environmental variables were significant predicators of both PCS and MCS. Nevertheless, when the aforesaid variables were

controlled, the result indicated that loneliness was a strong predicator of lower MCS, but not a predicator for the PCS components of health.

Summary

This chapter provided details of the results of the current study. General descriptive results related to the older adults' personal and environmental characteristics, and the study outcomes of loneliness, PCS, and MCS were addressed. Furthermore, this chapter showed the result of bivariate analysis testing the association between personal and environmental factors and the study outcomes: loneliness and health status (MCS and PCS). Moreover, the result of regression analysis predicting the relation of loneliness to MCS and PCS were also provided.

Chapter 5

Discussion

Oman and other Arab countries expect the older adult population to escalate. The majority of Middle Eastern countries give little devotion to the issue of ageing (Hussein & Ismail, 2017). As with most of the Arab countries, Oman is experiencing a demographical evolution that includes a decrease in mortality and fertility rates and an increase in life expectancy which contributes to a growing older adults population at risk for experiencing loneliness. The focus of this study was to investigate the factors that contribute to loneliness in Omani older adults and the association between loneliness and the health status of Omani older adults.

Loneliness

In the current study, over two thirds 67% of the participants reported moderate to higher levels of loneliness with almost 10% at severe levels. These results were consistent with those of other studies conducted in Western countries. For example, a study performed in the northeastern United States examined the association between loneliness and depression among 216 older adults aged 55 and older and found that one of every three participants reported a sense of loneliness (Gonyea, Curley, Melekis, Levine, & Lee, 2018). Similarly, another study that was conducted in Missouri, USA of older adults found that loneliness was reported in 70% of the participants, and 26.6% were classified as severe (Taylor, Wang, & Morrow-Howell, 2018). In addition to these Western assessments, studies in developing countries have also indicated that loneliness among older adults is high. For example, in Uganda, a cross sectional study of 605 older adults, aged 60 years and older, found that almost seven in ten older adults reported a feeling of loneliness (Nzabona, Ntozi, & Rutaremwa, 2016).

The loneliness experienced by Omani older adults may be related to limited opportunities for older people to be socially active. In Oman, like other developing countries, there are limited active aging programs when compared to developed countries. Moreover, social changes in the Gulf countries and the transition from traditional family values to modern values have resulted in the vanishing role of older adults in daily society (El Haddad, 2006).

Mental Health Status (MCS)

In this study, the mean value of the SF-12 MCS component for Omani older adults' participants was (46.95). There was no data on SF-12 or SF-36 MCS OR PCS available to compare populations. However, a study conducted in Saudia Arabia (Al-Shehri et al., 2008) used the SF-12 was used to measure health status in Type-II diabetic patients with a mean age of 50 years. The mean of the MCS was 47.8, which is similar to the present study's results. In another study of Malaysians older adults aged 60 years and above a mean value of 51.51 for the MCS (Ibrahim et al., 2013). The sample in the Malaysian study scored a higher MCS than the Omani older adults in the current study. This may be due to the high level of social support the participants in the Malaysian's study received which had a positive impact on the Malaysian older adults' mental health (MCS).

Physical Health Status (PCS)

In the present study, the mean of the PCS score was 36.5. In the Al-Shehri et al. (2008) study the mean of PCS was 41.3. This indicates a slightly higher PCS than the current study's participants, which may be expected as the current study's participants are older in age than the sample in the Saudi study. Likewise, Hawton, et al. (2011) assessed the relationship between loneliness and the health related quality of life in older adults, sample aged 50 years and above, in the UK. Their findings were consistent with the present study regarding the mean score of

PCS was 35.7 for lonely older adults. However, the Malaysian study of older adults found a higher rating mean of physical health status (PCS) at 74.4 suggesting that the sample in this study had a lower physical health status when compared to older adults in comparable studies (Ibrahim et al., 2013).

Question One

The first research question was to assess the relationship between personal and environmental factors and loneliness in Omani older adults.

The findings of the study revealed that the personal factors of the age 85+, gender, having no job, and living with others were the main factors that correlated with loneliness while living with family. These factors were positively correlated with loneliness.

Age. The findings revealed that the level of loneliness was higher in older age 85 years and above ($p < 0.01$) compared to younger age groups. This finding is congruent with Mapoma and Masaiti (2012) who found that age correlated positively with level of loneliness. They assessed predicators of loneliness and social isolation amongst 690 older adults, aged 60 years and older, in Zambia. The study found that loneliness was more prevalent in older adults aged 80 years and older 67% compared to those aged 70 to 79 years (Mapoma & Masaiti, 2012). Unlike the current study, two studies reported non-significant correlation between the increase in age and loneliness (Heylen, 2010; Khosravan et al., 2014).

There are two possible explanations for the finding of the present study. The first could be related to an increase in health challenges as a person grows older. Thus, more disabilities in older adults may limit their social network and decrease their involvement in society, which enhances the sense of loneliness. Another explanation is that it is difficult to build new

69

friendships and engage in new trends when friends and relatives die, leading to shrinking social relations and keeping them isolated and lonelier.

Gender. This study suggested that there is a significant positive relationship ($p < 0.05$) between the female gender and loneliness level. The result showed that the majority of Omani female older adults classified as having a moderate level of loneliness 36.7% with 38% reporting high to severe levels of loneliness. A study conducted in Zambia showed similar results as more than half of the female respondents experienced a higher sense of loneliness 55% compared to the male counterpart 47% (Mapoma & Masaiti, 2012). Likewise, Nzabona, Ntozi and Rutaremwa (2016) conducted a study in Uganda where a greater number of female participants 74% reported a feeling lonely compared to male older adults 59%. Another study examined loneliness in a cross-cultural context by surveying a total of 176 Egyptian and Dutch women. The result showed that loneliness among Egyptian women was significantly higher than the Dutch. Women in Oman and Egypt have similar cultural backgrounds, as both are from developing Arab and Muslim countries. The expectation is that with the Islamic culture, family ties and support are stronger, lessening the sense of loneliness.

To explain the result of higher loneliness among females: the majority of the Omani female participants were illiterate and housewives (do not work outside of the home), which may contribute to this result. Accordingly, they spend their time at home with limited time outdoors. Another reason in relation to higher rates of loneliness is that there has been a high incidence of widowed females in Oman, which increases the likelihood that a female will live alone or with a housemaid as they advance in age.

Living arrangement. In this study, older adults who were living with others (housemaid) reported greater loneliness compared to those who were living with their partner, or with

children and a partner. In line with the present results, two studies reported that loneliness was higher in older adults who had no partner, were living with relatives or were living alone, as compared to those living with a partner or children or residing close to their children (Hazer & Boylu, 2010; Steed, Boldy, Grenade, & Iredell, 2007). Similarly, a study that included 12 different nations reported that older adults who lack children and lack partners were severely lonely compared to their counterparts (Zoutewelle-Terovan, & Liefbroer, 2018). However, a study conducted in Turkey of a large older adult population, found that living alone or living with others had no correlation to the sense of loneliness (Arslantaş, Adana, Ergin, Kayar, & Acar, 2015).

Until recently in Oman, residing with extended family was common, and living apart from one's own parents was rare. Thus, older adults tended to live in a family-oriented culture, expected strong family ties and were more socially integrated. However, loneliness is expected to rise among Arab and Muslim older adults as a result of modernization and its effect on living arrangements. Trends of social changes in Middle-Eastern countries include a decline in the older adults' living with their extended family; instead increasing the propensities to live alone or with unrelated caregivers (Yount & Khadr, 2008). In a study conducted in Israel, Arab older adults reported a decline in family relationships, cohesion, attention, and insufficient care from their family members (Ayalon, 2018). Oman is comparable to other Arab countries; modernization has led to a number of Omani older adults left to a housemaid or a stranger as their care provider, so their expectations of being cared for by their children or close family members are not met, increasing their sense of loneliness. For the majority of Omani older adults, the expectation that they will be surrounded, supported and receive attention from their

children, husbands, or family members has not materialized and resulted in an increased sense of loneliness.

Working status. This study's results showed a negative and significant relationship between loneliness and no job (p =.023). Parallel to this result, a study investigated the contributing factors of loneliness in Malaysia and Chinese older adults found that the likelihood of feeling lonely was greater among older adults who were not employed and had limited sources of income (Teh, Tey, & Ng, 2014).

A probable explanation for this could be that older adults who were employed would be engaged in their work and have a greater quality and quantity of social relations with coworkers. As a result, they would receive better social support which makes them less vulnerable to loneliness. In contrast, unemployed older adults are expected to have inadequate social ties, less social support, and more economic limitations and, as a result, they may be socially isolated and experience a higher level of loneliness.

Question Two

The second research question aimed to examine the relationship between personal and environmental factors and mental health status (MCS) in Omani older adults.

This current study found a significant relationship between the personal factors of gender, older age and no job were negatively correlated with the mental component (MCS) of health status, while level of education and income level were positively correlated. The personal factors of marital status and number of children were not significant predictors of MCS. In regard to environmental factors, the results showed that living with a spouse was positively correlated to MCS while living with others (housemaid) was negatively correlated. However, living area (District) was not significantly correlated to MCS.

72

Gender. In regard to gender, this study indicated the female participants had poorer

mental health status compared to male. Al-Mandhari et al. (2011) assessed perceived physical

and mental components of quality of life via SF-12 health survey, in a sample of 450 Omani with

a mean age of 54 years. They found that female participants had lower scores on the MCS, which

is consistent to the present study result. Comparable to the current study, a study in Saudi Arabia

was conducted in a similar context that used the SF-12 showed that females scored significantly

lower in the health-related quality of life as compared to male participants.

In Oman, older females spend most of their time at home. They are rarely involved in

physical or social activities and most are not formally educated. Consequently, they are at a

higher risk for emotional distress and decline in mental health as compared to their male

counterparts.

Age. The current study result showed a significant negative correlation between age and

MCS. This finding was consistent with De Belvis et.al., (2008) who reported that older adults 75

years or more scored poorer MCS scores in HRQL compared to older adults aged 60 to 74 years.

The negative relationship of age to mental health status may be explained by the dramatic

social changes in recent years that have occurred in Oman as well as other Middle-Eastern

countries, leading to a decrease in family support of the older adults. As a result, older adults live

alone or with a housemaid, away from extended family, with less emotional and psychological

support, leading to a negative relationship to older adults' mental status.

Working status. This study's results revealed that older adults with no job were

negatively correlated with MCS, consistent with previous studies. For example, several studies

found that older adults who were employed or involved in economic activity had higher

psychological and mental health (Molarius et. al., 2006; Teerawichitchainan, Pothisiri, & Long,

2015). Being employed can reflect a higher socioeconomic status which can provide more secure financial resources and more social interactions and better mental and psychological health.

Level of income. In the current study, older adults with a middle income scored significantly higher MCS than those with a low income. This result is consistent with De Belvis et.al. (2008) who found that older adults with low incomes scored a significantly lower means of MCS than those with a higher income. A possible explanation to this result is that older adults with a mid-range income have good financial resources and a better socioeconomic status which enabled them to have access to higher quality health care services.

Level of education. Examining educational level as a predicator to older adults' MCS, the result showed that older adults with a higher educational level had statistically significant higher scores of MCS compared to those with lower educational level. This finding is congruent with other studies who reported that older adults with a higher educational level had better MCS scores (De Belvis et.al., 2008; Faresjö & Rahmqvist, 2010).

The possible explanation for this result is that a higher educational level is considered a critical element and strong predictor for a better health status. Older adults with a higher education level may be more knowledgeable of strategies to enhance their mental health status.

Living arrangements. In the present study, the result revealed that living with a spouse was found to be positively correlated with higher MCS. De Belvis and colleagues (2008) assessed the relationships between social links and health related quality of life among Italian older adults aged 60 years and older and found, similar to this study, that being married and living with a spouse were significantly correlated with a higher mental health status measured by MCS. Living with a spouse increases the opportunity to have more social ties and relationships.

Participants living with a housemaid have less time with family members and less family support, which may contribute to lower MCS.

Question Three

The third research question examined the relationship between personal and environmental factors and physical health status (PCS) in Omani older adults.

Older age and not working were negatively related to physical health status (PCS). However, gender, marital status, education level, number of children and income were not significantly correlated with PCS, as well as all the environmental factors. Dissimilar to this study, Al-Mandhari et al. (2011) found that male gender, being married, well educated, and higher income were significantly linked to higher PCS.

Age. Age was found to be negatively correlated to lower PCS. This is similar to a study done by Al-Mandhari et al. (2011) in which they found that age was negatively associated with PCS. This result is self-explanatory as a normal trajectory of advance in age, most people experience a decline in physical health.

Working Status. In terms of working status, the result of the current study revealed that having no job has a stronger negative effect on older adults' physical health status (PCS). This finding is similar to the Karen and colleagues (2015) study result where they found that employment was a strong positive predicator of older adults' physical health. The likely explanation for the result of the negative influence of being without a job in regard to their physical health, is that this result reflects the fact that older adults who are employed are physically active which would have a positive impact on their physical health.

Hypothesis One

Hypothesis one focused on examining the relationship between loneliness and mental health status (MCS) while controlling for personal and environmental factors.

The findings of the present study indicated a stronger association between loneliness level and MCS ($p \leq .001$). In agreement with the present study findings, several studies have found loneliness to be a strong trigger to mental health deterioration and allied it to greater depressive symptoms (Hu, Xiao, & Zhou, 2017; Jaremka et al., 2014; Kearns et al., 2015). Moreover, a recent Swedish study found that older adults with higher levels of loneliness were more likely to report severe psychological disorders (Dahlberg, Agahi & Lennartsson, 2018).

Hypothesis Two

Hypothesis two aimed to assess the relationship between loneliness and physical health status (PCS) while controlling for personal and environmental factors.

The current study findings revealed that no significant association between loneliness and physical health status (PCS) ($p = .053$). This finding was not concordant with previous studies which indicated that loneliness increases the likelihood of deterioration in different aspects of physical health and leads to greater co-morbidites (Hawkley et al. 2010; Jaremka et al., 2014; Perissinotto, Cenzer, & Covinsky, 2012).

The result of the present study's hypotheses indicates that older adults with higher levels of loneliness are more likely to have a lower mental health status, but physical health status was not associated with loneliness. This result is inconsistent with other studies which demonstrated loneliness as a significant predictor of both mental and physical health problems (Hawton et al., 2011; Nzabona, Ntozi, & Rutaremwa, 2016). However, this current study's result is in line with the Hawton et al. (2011) study which revealed a significant independent association between

loneliness and worse mental health, but no association with physical health scores. Another study revealed a similar finding that the older adults with higher loneliness levels significantly reported various mental health disorders but no significant association between loneliness and older adults' physical health (Bekhet & Zauszniewski, 2012).

Gerontologic literature has consistently purported the negative effect of loneliness on the health and well-being of older adults (Dahlberg, Agahi, & Lennartsson, 2018; Luo, Hawkley, Waite, Cacioppo, 2012, Musich, Wang, Hawkins, 2015). Meanwhile, studies argued that quality social relations and societal support may play a crucial role in enhancing older adults' well-being, reducing loneliness, and protecting them against mental disorders (Cruwys et al., 2013; Ibrahim et al., 2013; Santini, et al., 2016).

There is no proven clear direct connection between loneliness and physical health disorders. Yet, a negative link between loneliness and mental health suggests that lonely older adults are at high risk for depression, which can influence this population's physical health (MacLeod et al., 2018). A plausible explanation for the finding is that lonely older adults live with a decreased role in society, and this decline can aggravate the feeling of loneliness. Consequently, this negative feeling leads to a poor quality of life and emotional distress which acts as a psychological pathway that deteriorates the older adults' mental health. In regard to the negative association between loneliness and physical health, a possible explanation is that lonely older adults feel disconnected due to limited social support and the death of their friends, and are more likely to live a sedentary life or be demotivated to participate and engage in physical activities. Consequently, this increases the risk of developing chronic illness or a worsening health status if they are already diagnosed with age-related diseases.

Theoretical Framework

The modified model originated from the Model of Depression and Loneliness (MODEL) by Cohen-Mansfield and Parpura- Gill (2007) and was used as a theoretical framework to guide this study. Corresponding to the MODEL framework, the result of the present study ascertained that the personal factors of gender, age, and working status as well as the environmental factors of living arrangements influence loneliness in older adults. These elements contributed to the sense of loneliness among this population.

Additionally, the MODEL framework determined the linkage between loneliness and health status. Specifically, loneliness was found to be negatively associated with older adults' mental health but not with physical health. The application of MODEL was an appropriate framework to guide the current study. This model described some key personal and environmental predicators of loneliness in older adults. In addition, it addressed the expected impact of loneliness on the health status of older adults. This foundation can be utilized to create effective intervention measures to address factors for loneliness and to improve older adults' health and well-being.
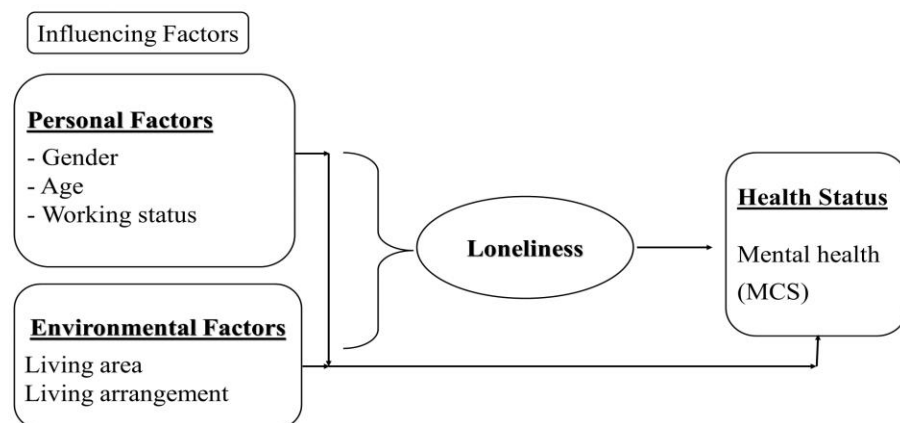
Figure 5.1. Study findings in relation to the MODEL framework.

Implications to Nursing

Nursing Practice and Research

Understanding the influence of loneliness on older adults' mental and physical health is an important area for nursing practice. Early identification of loneliness can have great benefits for both the healthcare system and for the affected population of lonely older adults. It is noteworthy that Omani older adults are the greatest consumers of healthcare (Osman, 2012). This study findings support the use of screening, assessment, and education of older adults and their families about the issue of loneliness. The risk factors for loneliness identified in this study provide the first step to enable identification of at-risk older adults. Healthcare professionals, particularly clinicians and nurses, play a vital role in early identification of older adults who are at high risk of loneliness through comprehensive assessment in both primary and geriatric healthcare clinics.

Additionally, programs are needed to address the problem of social isolation and loneliness in older adults and to find suitable interventions to promote older adults' sense of connectedness, which in turn, keeps them socially involved and protects them against the negative consequences of loneliness.

The findings of this study provide factors of loneliness that predict loneliness in in older adults and highlight the association of loneliness to deterioration of older adults' mental health. Accordingly, it draws a strong foundation for further examination of these risk factors to guide establishment of suitable preventive measures. Furthermore, this study can be utilized to guide future research to explore health issues that are threatening Omani older adults' well-being and help to optimize geriatric health in Oman.

Nursing Education

Al Majhdri (2008) recommends several strategies to formulate proper care for older adults in Oman; one of those is to introduce the concept of active ageing and geriatric care in the curriculum of various health care professionals. In addition, provision of continuing education of these core concepts is needed.

Nurse educators in Oman, as well as in neighboring Gulf countries who share similar cultures and education, may use the findings of the present study to emphasize the importance of integrating more content related to loneliness and older adults in the nursing curriculum. This early exposure will enhance students' critical thinking to proper assessment and early identification of potential health issues threatening older adults. In addition, they can boost the implementation of holistic care when working with older adults and find strategies to foster well-being and productive lives.

<div align="center">

Recommendation for Future Research

</div>

The recommendations for future research are based on the findings of this study: including a larger representative sample from other regions in Oman and from other Gulf countries would provide more definite conclusions to generalize the findings. Future research on loneliness among Omani older adults with longitudinal designs are also needed to better explain more aspects of loneliness in Omani older adults. Additional studies related to loneliness and physical health are suggested as well.

A study to examine the nature and the mechanisms underlying the negative association between loneliness and physical and mental health is required. Further, a qualitative study is suggested to provide a more in-depth understanding about the loneliness phenomena among Omani older adults. Another study is needed to explore various perceptions of healthcare professionals, families, and Omani older adults regarding establishment of "elderly day care

centers" in Oman. These centers would allow for Omani older adults to be socially involved, enlarge their social network, and have better social support to defeat loneliness.

Limitations of the Study

There are some limitations in this study. The study was a cross-sectional with a convenience sample of 113 older adults participated in the study. The sample represents only three regions in the northern part of Oman. Therefore, the generalizability of the study findings is limited to the study sample and specifically to older adults who reside in the geographical area included in this study. Since the current study is considered the first study to examine loneliness among Omani older adults, there was a risk of response bias. Also, UCLA loneliness scale and SF-12 instruments were self-reported and filled out by older adults and some with the help of the researcher and GNs, which represents another risk for response bias.

Summary

The findings of the present study indicated that a large segment of Omani older adults are suffering from loneliness or are at risk for loneliness. Thus, this issue must be considered and given urgent attention from stakeholders in the Ministry of Health and other policymakers. Future study is needed to examine loneliness among Omani older adults in a nationally representative sample. However, the current findings address the potential impact of loneliness on Omani older adults' health and call for prompt actions to tackle loneliness in early stages with culturally relevant interventions.

Although, Omani families value the care of their older adult kin as a religious and cultural obligation, the current societal transition makes it challenging to maintain traditional family structure and values. Therefore, Oman and other Arab countries must recognize the future challenges and plan better services for the ageing population. Accordingly, the result of this study is not surprising, and if no action is taken to control loneliness among this vulnerable

population, Omani older adults are at risk for more serious health issues linked to loneliness. It is crucial to establish suitable services and facilities to provide dignified care for Omani older adults. Eventually, research must find approaches to integrate Omani older adults into social activities whether with their peers or a young generation, employing their skills and experience, which will enhance their physical and psychological health and protect them against loneliness.

References

Al-Mandhari, A., Al-Zakwani, I., Al-Hasni, A., & Al-Sumri, N. (2011). Assessment of perceived health status in hypertensive and diabetes mellitus patients at primary health centers in Oman. *International journal of preventive medicine*, *2*(4), 256.

Aartsen, M., & Jylh€a, M. (2011). Onset of loneliness in older adults: Results of a 28 year prospective study. *European Journal of Ageing*, *8*, 31–38.

Adams, K. B., Sanders, S., & Auth, E. A. (2004). Loneliness and depression in independent living retirement communities: Risk and resilience factors. *Aging & Mental Health*, *8*(6), 475-485.

Al Ali., A. (2013). Aging in the UAE and services available for the elderly: Structured interviews with experts in the field. Dubai School of Government Policy Brief: 34. 1:12. Retrieved from: http://www.mbrsg.ae/getattachment/91a79863-e776-4b22-ae2c-9a7449b99f80/Aging-in-the-UAE-and-Services-Available-for-the-El.

Al-Barwani, T. A., & Albeely, T. S. (2007). The Omani family: Strengths and challenges. *Marriage & Family Review*, *41*(1-2), 119-142.

Al Khatib, S. A. (2012). Exploring the relationship among loneliness, self-esteem, self-efficacy and gender in United Arab Emirates college students. *Europe's Journal of Psychology*, 8(1), 159-181.

Al Reyami, S. (2010). Funds to help elderly people. Emirates Today Newspaper. Retrieved from: http://www.emaratalyoum.com/opinion/2010-10-24-1.307993.

Al- Riyami., A, Mahmoud Attia, Sanjay J, Magdi M, Hilal A, & Waleed A (2008). *National elderly health survey*. Ministry of Health Muscat, Sultanate of Oman.

Al-Salmani, A., Juma, T., Al-Noobi, A., Al-Farsi, Y., Jaafar, N., Al-Mamari, K., & Al-Adawi, S. (2015). Characterization of depression among patients at urban primary healthcare centers in Oman. *The International Journal of Psychiatry in Medicine*, *49*(1), 1-18.

Al-Shehri, A. H., Taha, A. Z., Bahnassy, A. A., & Salah, M. (2008). Health-related quality of life in type 2 diabetic patients. *Annals of Saudi medicine*, *28*(5), 352-360.

Al-Sinawi, H., Al-Alawi, M., Al-Lawati, R., Al-Harrasi, A., Al-Shafaee, M., & Al-Adawi, S. (2012). Emerging burden of frail young and elderly persons in Oman: For whom the bell tolls?. *Sultan Qaboos University Medical Journal*, *12*(2), 169-176.

Al-Zadjali M., Sinawi F., Sheeba M., Al Busaidi M., Al Jabri, S., & Silbermann M. (2014). Community health nursing in Oman. *Health Care Current Reviews, 2:128.* Retrieved from*:* https://www.omicsonline.org/open-access/community-health-nursing-in-oman.hccr.1000128.php?aid=40382.

Ayalon, L., Shiovitz-Ezra, S., & Palgi, Y. (2013). Associations of loneliness in older married men and women. *Aging & Mental Health*, *17*(1), 33-39.

Aylaz, R., Aktürk, Ü., Erci, B., Öztürk, H., & Aslan, H. (2012). Relationship between depression and loneliness in elderly and examination of influential factors. *Archives of Gerontology and Geriatrics*, *55*(3), 548-554.

Azam, W. M., Yunus, W. M., Din, N. C., Ahmad, M., Ghazali, S. E., Ibrahim, N., & Maniam, T. (2013). Loneliness and depression among the elderly in an agricultural settlement: Mediating effects of social support. *Asia-Pacific Psychiatry*, 5(S1), 134-139.

Barg, F. K., Huss-Ashmore, R., Wittink, M. N., Murray, G. F., Bogner, H. R., & Gallo, J. J. (2006). A mixed-methods approach to understanding loneliness and depression in older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *61*(6), S329-S339.

Beard, J. R., Biggs S, Bloom, D. R., Fried, L. P, Hogan P, Kalache A, and Olshansky, S. J. (2012). Global Population Ageing: Peril or Promise? PGDA Working Paper No. 89. *Program on the Global Demography of Aging.* Retrieved from: http://www.hsph.harvard.edu/pgda/WorkingPapers/2012/PGDA_WP_89.pdf.

Bekhet, A. K., & Zauszniewski, J. A. (2012). Mental health of elders in retirement communities: Is loneliness a key factor? *Archives of Psychiatric Nursing*, *26*(3), 214-224.

Bhatia, S., Swami, H., Thakur, J., & Bhatia, V. (2007). A study of health problems and loneliness among the elderly in Chandigarh. *Indian Journal of Community Medicine*, *32*(4), 255-258.

Bhattacharjee, M. (2013). Oman Ministry of Health working on plan to provide elderly with care-givers. *Muscat Daily*. Retrieved from: http://www.muscatdaily.com/Archive/Oman/Oman-s-Ministry-of-Health-working-on-plan-to-provide-elderly-with-care-givers-2hnb.

Buchman, A.S., Boyle, P. A., Wilson, R. S., James, B. D., Leurgans, S. E., Arnold, S. E., & Bennett, D. A. (2010). Loneliness and the rate of motor decline in old age: The rush memory and aging project, a community-based cohort study. *BMC Geriatrics*, *10*(1), 1-8.

Burholt, V., & Scharf, T. (2013). Poor health and loneliness in later life: The role of depressive symptoms, social resources, and rural environments. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 69(2), 311-324.

Cacioppo, J. T., Hawkley, L. C., & Thisted, R.A. (2010). Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychology and Aging*, 25(2), 453-463.

Cacioppo J.T., Hughes M. E., Waite L.J., Hawkley L.C., & Thisted R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: Cross-sectional and longitudinal analyses. *Psychol Aging*. 21, 140–151.

Cacioppo, J. T., Norris, C. J., Decety, J., Monteleone, G., & Nusbaum, H. (2009). In the eye of the beholder: Individual differences in perceived social isolation predict regional brain activation to social stimuli. *Journal of Cognitive Neuroscience*, 21(1), 83-92.

Chalise, H.(2010). Social Support and its Correlation with Loneliness and Subjective Well-being: A Cross-cultural Study of Older Nepalese Adults. *Asian Social Work and Policy Review*, *4*(1), 1-25.

Chen, Y., Hicks, A., & While, A. E. (2014). Loneliness and social support of older people in China: a systematic literature review. *Health & Social Care in the Community*, *22*(2), 113-123.

Chipperfield, J. G. & Havens, B. (2001). Gender differences in the relationship between marital status transitions and life satisfaction in later life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *56*(3), 176-186.

Cohen-Mansfield, J., & Parpura-Gill, A. (2007). Loneliness in older persons a theoretical model and empirical findings. *Journal of International Psycho-geriatrics*, 19, 279-294.

Cohen-Mansfield, J., Shmotkin, D., & Goldberg, S. (2009). Loneliness in old age: Longitudinal changes and their determinants in an Israeli sample. *International Psycho-Geriatrics*, *21*(6), 1160-1170.

Cornwell, E.Y., & Waite, L. J.(2009). Social disconnectedness, perceived isolation, and health among older adults. *Journal of Health and Social Behavior*, 50(1), 31-48.

Coyle, C. E., & Dugan, E. (2012). Social isolation, loneliness and health among older adults. *Journal of Aging and Health*, *24*(8), 1346-1363.

Cruwys, T., Dingle, G. A., Haslam, C., Haslam, S. A., Jetten, J., & Morton, T. A. (2013). Social group memberships protect against future depression, alleviate depression symptoms and prevent depression relapse. *Social Science & Medicine*, *98*, 179-186.

Dahlberg, L., & McKee, K. J. (2014). Correlates of social and emotional loneliness in older people: Evidence from an English community study. *Aging & Mental Health*, *18*(4), 504-514.

De Belvis, A. G., Avolio, M., Spagnolo, A., Damiani, G., Sicuro, L., Cicchetti, A., ... & Rosano, A. (2008). Factors associated with health-related quality of life: The role of social relationships among the elderly in an Italian region. *Public health*, *122*(8), 784-793.

De Jong Gierveld, J. D., Van Tilburg T. G., & Dykstra, P. A. (2006). Loneliness and social

isolation. In: Vangelisti A, Perlman D (eds), The Cambridge handbook of personal relationships. Cambridge University Press, New York, pp 485–499.

De Jong Gierveld, J. D., Van Tilburg, T. G., & Dykstra, P. A. (2016). New Ways of Theorizing and Conducting Research in the Field of Loneliness and Social Isolation. In A. L. Vangelisti & D. Perlman (Eds.), Cambridge Handbook of Personal Relationships, 2nd revised edition. Cambridge, New York: Cambridge University Press.

El Haddad, Y. (2006). Major trends affecting Families in the Gulf countries. *Major Trends Affecting Families: A background document*. United Nations. Geneva, United Nations Department of Economic and Social Affairs, 222-234.

El-Mansoury, T. M., Taal, E., Abdel-Nasser, A. M., Riemsma, R. P., Mahfouz, R., Mahmoud, J. A., & Rasker, J. J. (2008). Loneliness among women with rheumatoid arthritis: A cross-cultural study in the Netherlands and Egypt. *Clinical rheumatology*, *27*(9), 1109-1118.

Eloranta, S., Routasalo, P., & Arve, S. (2008). Personal resources supporting living at home as described by older home care clients. *International Journal of Nursing Practice*, *14*(4), 308-314.

Fisher, F. D., Reitzel, L. R., Nguyen, N., Savoy, E. J., Advani, P. S., Cuevas, A. G., & McNeill, L. H. (2014). Loneliness and self-rated health among church-attending African Americans. *American Journal of Health Behavior*, *38*(4), 481-491.

Flowers, L., Claire, A., Noel-Miller, Shaw, J., Bhattacharya, J., Schoemaker, L., & Farid, M. (2017). Medicare Spends More on Socially Isolated Older Adults. *AARP Public Policy Institute,* 125, 1-15.

Fokkema, T., De Jong Gierveld, J., & Dykstra, P. A. (2012). Cross-national differences in older adult loneliness. *The Journal of psychology*, 146(1-2), 201-228.

Fowles & Greenberg (2008). A profile of older Americans: 2005. Administration on Aging U.S. Department of Health and Human Services. Retrieved from: http://assets.aarp.org/rgcenter/general/profile_2005.pdf

Fredriksen-Goldsen, K. I., Kim, H. J., Shiu, C., Goldsen, J., & Emlet, C. A. (2014). Successful aging among LGBT older adults: Physical and mental health-related quality of life by age group. *The Gerontologist*, *55*(1), 154-168.

Gerst-Emerson, K. & Jayawardhana, J. (2015). Loneliness as a public health issue: The impact of loneliness on health care utilization among older adults. *American Journal of Public Health*, 105(5), 1013-1019.

Goll, J. C., Charlesworth, G., Scior, K., & Stott, J. (2015). Barriers to social participation among lonely older adults: The influence of social fears and identity. *PloS one,* 10(2), 1-17.

Gonyea, J. G., Curley, A., Melekis, K., Levine, N., & Lee, Y. (2018). Loneliness and depression among older adults in urban subsidized housing. *Journal of Aging and Health*, 30(3), 458– 474.

Gouiaa, R., & Sibai, A. M. (2013). Ageing in Tunisia. *Ageing in the Mediterranean*. Policy Press at the University of Bristol.

Grenade, L., & Boldy, D. (2008). Social isolation and loneliness among older people: Issues and future challenges in community and residential settings. *Australian Health Review*, *32*(3), 468-478.

Habib, A., Johargy, A., Mahmood, K., Humma, (2014). Design and Determination of The Sample Size in Medical Research. *Journal of Dental and Medical Sciences*. 13 (5), 21-31.

Hacihasanoğlu, R., Yildirim, A., & Karakurt, P. (2012). Loneliness in elderly individuals, level of dependence in activities of daily living (ADL) and influential factors. *Archives of Gerontology and Geriatrics*, *54*(1), 61-66.

Hadidi, M. S., & Al Khateeb, J. M. (2013). Loneliness among students with blindness and sighted students in Jordan: A brief report. *International Journal of Disability, Development and Education*, *60*(2), 167-172.

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine, 40*(2), 218-227.

Hawkley, L. C., Preacher, K. J., & Cacioppo, J. T. (2010). Loneliness impairs daytime functioning but not sleep duration. *Health Psychology*, *29*(2), 124.

Hawkley, L. C., Thisted, R. A., & Cacioppo, J. T. (2009). Loneliness predicts reduced physical activity: Cross-sectional & longitudinal analyses. *Health Psychology*, *28*(3), 354-363.

Hawkley, L. C., Thisted, R. A., Masi, C. M., & Cacioppo, J. T. (2010). Loneliness predicts increased blood pressure: 5-year cross-lagged analyses in middle-aged and older adults. *Psychology and Aging*, *25*(1), 132.

Hawton, A., Green, C., Dickens, A. P., Richards, S. H., Taylor, R. S., Edwards, R., & Campbell, J. L. (2011). The impact of social isolation on the health status and health-related quality of life of older people. *Quality of Life Research*, *20*(1), 57-67.

Haywood, K. L., Garratt, A. M., & Fitzpatrick, R. (2005). Quality of life in older people: A structured review of generic self-assessed health instruments. *Quality of life Research*, 14(7), 1651-1668.

Hazer, O., & Boylu, A. A. (2010). The examination of the factors affecting the feeling of

of the elderly. *Procedia-Social and Behavioral Sciences*, *9*, 2083-2089.

Health Facts, MOH, (2016). Chapter Seven: Utilization of Health Services, 1-129. Retrieved from: https://www.moh.gov.om/documents/274609/1624207/

Hendawy, G, (2013). Social Changes and Their Impact on the Demographics of the Population of the Sultanate of Oman. A Paper presented & published in The Geography and Contemporary Global Changes Conference, College of Arts and Humanities, Taibah University, Almadinah Almunawwarah, KSA.

Hensley, B., Martin, P., Margrett, J. A., MacDonald, M., Siegler, I. C., & Poon, L. W., (2012). Life events and personality predicting loneliness among centenarians: Findings from the Georgia Centenarian Study. *The Journal of Psychology*, *146*(1-2), 173-188.

Heravi-Karimooi, M., Anoosheh, M., Foroughan, M., Sheykhi, M. T., & Hajizadeh, E. (2010). Understanding loneliness in the lived experiences of Iranian elders. *Scandinavian Journal of Caring Sciences*, *24*(2), 274-280.

Heylen, L. (2010). The older, the lonelier? Risk factors for social loneliness in old age. *Ageing and Society*, *30*(07), 1177-1196.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, *7*(7), 1-20.

Holvast, F., Burger, H., de Waal, M. M., van Marwijk, H. W., Comijs, H. C., & Verhaak, P. F. (2015). Loneliness is associated with poor prognosis in late-life depression: Longitudinal analysis of the Netherlands study of depression in older persons. *Journal of Affective Disorders*, *185*, 1-7.

Hussein, S., & Ismail, M. (2017). Ageing and Elderly Care in the Arab Region: Policy Challenges and Opportunities. *Ageing International, 42*(3), 274-289.

Ibrahim, N., Din, N. C., Ahmad, M., Ghazali, S. E., Said, Z., Shahar, S. & Razali, R. (2013). Relationships between social support and depression, and quality of life of the elderly in a rural community in Malaysia. *Asia-Pacific Psychiatry*, *5*, 59-66.

Jakobsson, U., & Hallberg, I. R. (2005). Loneliness, fear, and quality of life among elderly in Sweden. *Aging Clin Exp Res*, *17*(6), 494-501.

Jakobsson, U. (2007). Using the 12-item Short Form health survey (SF-12) to measure quality of life among older people. *Aging Clinical and Experimental Research*, 19(6), 457-464.

Jakobsson, U., Westergren, A., Lindskov, S., & Hagell, P. (2012). Construct validity of the SF-12 in three different samples. *Journal of Evaluation in Clinical Practice*, 18(3), 560-566.

Jaremka, L. M., Andridge, R. R., Fagundes, C. P., Alfano, C. M., Povoski, S. P., Lipari, A. M., &

Carson III, W. E. (2014). Pain, depression, and fatigue: Loneliness as a longitudinal risk factor. *Health Psychology*, *33*(9), 948.

Kang, Park, & Wallace. (2018). The impact of perceived social support, loneliness, and physical activity on quality of life in South Korean older adults. *Journal of Sport and Health Science, 7*(2), 237-244.

Kar-Purkayastha I (2010). An epidemic of loneliness. *Lancet, 376* (9758), 2114:2115.

Khaleeli H. (2013, Janury). Britain‟s loneliness epidemic. The Guardian. Retrieved from: https://www.theguardian.com/society/2013/jan/22/the-loneliness-epidemic.

Kearns, A., Whitley, E., Tannahill, C., & Ellaway, A. (2015). Loneliness, social relations and health and well-being in deprived communities. *Psychology, Health & Medicine*, *20*(3), 332-344.

Khosravan, S. H., Alaviani, M., Alami, A., & Tavakolizadeh, J. (2014). Epidemiology of loneliness in elderly women. *Journal of Research & Health*, *4 (4)*, 871-877.

Kronfol N, Sibai A, and Rizk A., (2014). Ageing in The Arab Region: Trends, Implications and Policy Options. Economic and Social Commission for Western Asia (Escwa). The Center for Studies on Aging (CSA), Beirut, Lebanon. Retrieved from http://www.csa.org.lb/cms/assets/csa%20publications/unfpa%20escwa%20regional%20ageing%20overview_full_reduced.pdf

Kurina, L. M., Knutson, K. L., Hawkley, L. C., Cacioppo, J. T., Lauderdale, D. S., & Ober, C. (2011). Loneliness is associated with sleep fragmentation in a communal society. *Sleep*, *34*(11), 1519-1526.

Liu, L. J., & Guo, Q. (2007). Loneliness and health-related quality of life for the empty nest elderly in the rural area of a mountainous county in China. *Quality of Life Research*, *16*(8), 1275-1280.

Locher, J. L., Ritchie, C. S., Roth, D. L., Baker, P. S., Bodner, E. V., & Allman, R. M. (2005). Social isolation, support, and capital and nutritional risk in an older sample: Ethnic and gender differences. *Social Science & Medicine*, *60*(4), 747-761.

Lacson, E., Xu, J., Lin, S. F., Dean, S. G., Lazarus, J. M., & Hakim, R. M. (2010). A comparison of SF-36 and SF-12 composite scores and subsequent hospitalization and mortality risks in long-term dialysis patients. *Clinical Journal of the American Society of Nephrology*, 5(2), 252-260.

Löfvenmark, C., Mattiasson, A. C., Billing, E., & Edner, M. (2009). Perceived loneliness and social support in patients with chronic heart failure. *European Journal of Cardiovascular Nursing*, *8*(4), 251-258.

Luo, Y., Hawkley, L. C., Waite, L. J., & Cacioppo, J. T. (2012). Loneliness, health, and mortality in old age: A national longitudinal study. *Social Science & Medicine*, *74*(6), 907-914.

Luo, Y., & Waite, L. J. (2014). Loneliness and mortality among older adults in China. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, gbu007, 1-13.

MacLeod, S., Musich, S., Parikh, R. B., Hawkins, K., Keown, K., & Yeh, C. S. (2018). Examining Approaches to Address Loneliness and Social Isolation among Older Adults. *Journal of Aging and Geriatric Medicine*.

Mapoma, C. C., & Masaiti, G. (2012). Social isolation and aging in Zambia: examining the possible predictors. *Journal of Aging Research*, *1-6*. doi:10.1155/2012/537467.

Merriam Webster. Definition of Loneliness. Retrieved from: https://www.merriam-webster.com/dictionary/lonely.

Ministry of Health, (2017). Healthcare Facilities. Retrieved from: https://www.moh.gov.om/en_US/web/directorate-general-health-services-north-sharqiya/facilities**.**

Ministry of Health, Sultanate of Oman, (2008). Department of Research and Studies**.** *National Elderly Health Survey.* Study Report.

Ministry of Health, Sultanate of Oman. (2014). Health Vision 2050, Quality Care, Sustained Health. Retrieved from: https://www.moh.gov.om/en/web/directorate-general-of-planning/resources.

Ministry of Health, Oman. (2012). *National health report.* Oman, Muscat. MOH.

Ministry of Health, Oman. (2005). Study of the Elderly Profile and Needs in Ad Dakhliyah Region, Sultanate of Oman.

Ministry of Social Development, Oman, (2006). The Elderly's Affairs. Retrieved from: https://www.mosd.gov.om/index.php/en/special-care/elderly

Miyawaki, C. E. (2015). Association of social isolation and health across different racial and ethnic groups of older Americans. *Ageing & Society*, *35*(10), 2201-2228.

Molarius, A., Berglund, K., Eriksson, C., Lambe, M., Nordström, E., Eriksson, H. G., & Feldman, I. (2006). Socioeconomic conditions, lifestyle factors, and self-rated health among men and women in Sweden. *The European Journal of Public Health*, *17*(2), 125-133.

Mols, F., Pelle, A. J., & Kupper, N. (2009). Normative data of the SF-12 health survey with

validation using post-myocardial infarction patients in the Dutch population. *Quality of Life Research*, *18*(4), 403-414.

Montazeri, A., Vahdaninia, M., Mousavi, S. J., & Omidvari, S. (2009). The Iranian version of 12-item Short Form Health Survey (SF-12): Factor structure, internal consistency and construct validity. *BMC Public Health*, *9*(1), 341.

Musich S, Wang SS, Hawkins K, Yeh CS (2015). The Impact of Loneliness on Quality of Life and Patient Satisfaction Among Older, Sicker Adults. Gerontol Geriatr Med: 1-9.

National Center of Statistics and Information. (2017). The Reality of Elderly 2016. Retrieved From https://www.ncsi.gov.om/Elibrary/Pages/LibraryContentDetails.aspx?ItemID=T4d3%2f DR1U%2bEz%2fAGiP%2fYmKw%3d%3d

National Center of Statistics and Information (NCSI), Oman, (2017). The Reality of Elderly 2016. Retrieved from: https://www.ncsi.gov.om/Elibrary/LibraryContentDoc/bar_Nov%202017_cb168604-0d1c-45b6-b3b9-60382f811b54.pdf.

Nayak, B, K., (2010). Understanding the relevance of sample size calculation. *Indian Journal of Ophthalmology*, 58 (6): 469-470.

Netz, Y., Goldsmith, R., Shimony, T., Arnon, M., & Zeev, A., (2013). Loneliness is associated with an increased risk of sedentary life in older Israelis. *Aging & Mental Health*, *17*(1), 40-47.

Nicholson, N. R. (2009). Social isolation in older adults: An evolutionary concept analysis. *Journal of Advanced Nursing*, *65*(6),1342-1352.

Nzabona, A., Ntozi, J., & Rutaremwa, G. (2016). Loneliness among older persons in Uganda: Examining social, economic and demographic risk factors. *Ageing & Society*, *36*(4), 860-888.

Obtel, M., El Rhazi, K., Elhold, S., Benjelloune, M., Gnatiuc, L., & Nejjari, C. (2013). Cross-cultural adaptation of the 12-Item Short-Form survey instrument in a Moroccan representative survey. *Southern African Journal of Epidemiology and Infection*, 28(3), 166-171.

O'Luanaigh, C. O., & Lawlor, B. A. (2008). Loneliness and the health of older people. *International Journal of Geriatric Psychiatry*, 23(12), 1213-1221.

Perissinotto, C. M., Cenzer, I. S., & Covinsky, K. A. (2012). Loneliness in older persons: A predictor of functional decline and death. *Archives of Internal Medicine*, *172*(14), 1078-1084.

Pikhartova, J., Bowling, A., & Victor, C. (2016). Is loneliness in later life a self-fulfilling prophecy? *Aging & Mental Health*, *20*(5), 543-549.

Polit, D. F., & Beck, C. T. (2010). *Nursing research: Generating and assessing evidence for nursing practice*. Lippincott Williams & Wilkins.

Prieto-Flores, M. E., Forjaz, M. J., Fernandez-Mayoralas, G., Rojo-Perez, F., & Martinez-Martin, P. (2011). Factors associated with loneliness of noninstitutionalized and institutionalized older adults. *Journal of Aging and Health*, *23*(1), 177-194.

Renzetti, E. (2013). Life of solitude: A loneliness crisis is looming. Global and Mail. Retrieved from https://www.theglobeandmail.com/life/life-of-solitude-a-loneliness-crisis-is-looming/article15573187/.

Robert, S. A., Cherepanov, D., Palta, M., Dunham, N. C., Feeny, D., & Fryback, D. G. (2009). Socioeconomic status and age variations in health-related quality of life: Results from the national health measurement study. *Journals of Gerontology: Series B*, *64*(3), 378-389.

Routasalo, P. E., Savikko, N., Tilvis, R. S., Strandberg, T. E., & Pitkälä, K. H. (2006). Social contacts and their relationship to loneliness among aged people–a population-based study. *Gerontology*, *52*(3), 181-187.

Russell, D. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66(1), 20-40.

Santhosh, M. K. (2011). Do we need care homes for the elderly? Department of Public Relations and Information, Sultan Qaboos University, Muscat, *Horizon*, 214, 4.

Santini, Z. I., Fiori, K. L., Feeney, J., Tyrovolas, S., Haro, J. M., & Koyanagi, A. (2016). Social relationships, loneliness, and mental health among older men and women in Ireland: A prospective community-based study. *Journal of affective disorders*, *204*, 59-69.

Savikko, N., Routasalo, P., Tilvis, R. S., Strandberg, T. E., & Pitkälä, K. H. (2005). Predictors and subjective causes of loneliness in an aged population. *Archives of Gerontology and Geriatrics*, *41*(3), 223-233.

Saxena, P. C. (2008). Ageing and age-structural transition in the Arab countries: Regional variations, socioeconomic consequences and social security. *Genus*, 37-74.

Seo, Y., Yates, B., Dizona, P., LaFramboise, L., & Norman, J. (2014). Predictors of cognitive/ affective and somatic depression in heart failure patients. *Clinical Nursing Research*, *23*(3), 259-280.

Sethi D, Wood S, Mitis F, Bellis M, Penhale B, Marmolejo SI, Lowenstein A, Manthorpe G and Karki FU (2011). European report on preventing elder maltreatment. *Regional Office for World Health Organization, Europe*. Retrieved from: http://www.euro.who.int/en/what-

we-do/health-topics/Lifestages/healthy-ageing/publications/2011/european-report-on-preventing-elder-maltreatment.

Shaw, B. A., Krause, N., Liang, J., & Bennett, J. (2007). Tracking Changes in Social Relations Through-out Late Life. *Journal of Gerontology: Social Sciences, 62*B: S90–S99.

Singh, B., & Kiran, U.V. (2013). Loneliness among elderly women. *International Journal of Humanities and Social Science Invention*, *2*(2), 10-14.

Singh, A., & Misra, N. (2009). Loneliness, depression and sociability in old age. *Industrial Psychiatry Journal*, *18*(1), 51-55.

Steed, L., Boldy, D., Grenade, L., & Iredell, H. (2007). The demographics of loneliness among older people in Perth, Western Australia. *Australasian Journal on Ageing*, *26*(2), 81-86.

Taylor, H. O., Wang, Y., & Morrow-Howell, N. (2018). Loneliness in senior housing communities. *Journal of gerontological social work*, 1-17.

Stek, M. L., Vinkers, D. J., Gussekloo, J., Beekman, A. T., van der Mast, R. C., & Westendorp, R. G. (2005). Is depression in old age fatal only when people feel lonely? *American Journal of Psychiatry*, *162*(1), 178-180.

Steptoe, A., Shankar, A., Demakakos, P., & Wardle, J. (2013). Social isolation, loneliness, and all-cause mortality in older men and women. *Proceedings of the National Academy of Sciences*, *110*(15), 5797-5801.

Stephanie A. Robert, Dasha Cherepanov, Mari Palta, Nancy Cross Dunham, David Feeny, Dennis G. Fryback; Socioeconomic Status and Age Variations in Health-Related Quality of Life: Results From the National Health Measurement Study, *The Journals of Gerontology,* 64B(3), 378–389. Retrieved from https://doi.org/10.1093/geronb/gbp012.

Sundström, G., Fransson, E., Malmberg, B., & Davey, A. (2009). Loneliness among older Europeans. *European Journal of Ageing*, *6*(4), 267-275.

Teerawichitchainan, B. P., Knodel, J., & Pothisiri, W. (2015). What does living alone really mean for older persons? A comparative study of Myanmar, Vietnam, and Thailand. *Demographic Research*, *32*(1), 1329.

Teh, J. K. L., Tey, N. P., & Ng, S. T. (2014). Family support and loneliness among older persons in multiethnic Malaysia. *The scientific world journal*, *1-12*. Retrieved from http://dx.doi.org/10.1155/2014/654382

The Center of Statistics and Information, (2017). Statistical Year Book, 45, 1-447. Retrieved from:https://www.ncsi.gov.om/Elibrary/LibraryContentDoc/bar_Statistical%20Year%20Book%202017_c2111831-e13a-4075-bf7b-c4b5516e1028.pdf

Theeke, L. A. (2009). Predictors of loneliness in US adults over age sixty-five. *Archives of Psychiatric Nursing*, *23*(5), 387-396.

Theeke, L. A. (2010). Socio-demographic and health-related risks for loneliness and outcome differences by loneliness status in a sample of US older adults. *Research in Gerontological Nursing*, *3*(2), 113-125.

Thomopoulou I., Thomopoulou D., Koutsouki D. (2010). The difference at quality of life and loneliness between elderly people. *Biol Exerc.* 6(2), 13–28.

Thurston, R. C., & Kubzansky, L. D. (2009). Women, loneliness, and incident coronary heart disease. *Psychosomatic Medicine*, *71*(8), 1-14.

Tiikkainen, P., & Heikkinen, R. L. (2005). Associations between loneliness, depressive symptoms and perceived togetherness in older people. *Aging & Mental Health*, *9*(6), 526-534.

Times of Oman (2014, August 23). We need nursing homes in Oman with full medical care for elderly. Retrieved from: http://timesofoman.com/article/39099/Oman/Sunday-beat.

Tomaka, J., Thompson, S., & Palacios, R. (2006). The relation of social isolation, loneliness, and social support to disease outcomes among the elderly. *Journal of Aging and Health*, 18(3), 359-384.

Torstrick, R. L., & Faier, E. (2009). Culture and customs of the Arab Gulf States: ABC-CLIO. Retrieved from https://books.google.com.om/books?id=Jwp6D51NB34C&printsec=frontcover&source=gbs_ViewAPI&redir_esc=y#v=onepage&q&f=false

United Nations, Department of Economic and Social Affairs, Population Division. (2015). World Population Ageing 2015 retrieved from http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf

Vaidya., S., K., (2007). State steps in to take care of elderly in Oman. Gulf News. Retrieved from http://gulfnews.com/news/gulf/oman/state-steps-in-to-take-care-of-elderly-in-oman-1.206123

Vakili, M., Mirzaei, M., & Modarresi, M. (2017). Loneliness and Its Related Factors among Elderly People in Yazd. *Elderly Health Journal*, *3*(1), 10-15.

Velarde-Mayol, C., Fragua-Gil, S., & García-de-Cecilia, J. M. (2016). Validation of the UCLA loneliness scale in an elderly population that live alone. *Semergen/Sociedad Espanola de Medicine Ruraly Generalista*, 42(3), 177-183.

Victor, C. R., Scambler, S. J., Bowling, A. N. N., & Bond, J. (2005). The prevalence of, and risk

factors for, loneliness in later life: A survey of older people in Great Britain. *Ageing & Society*, *25*(6), 357-375.

Victor, C. R., & Yang, K. (2012). The prevalence of loneliness among adults: A case study of the United Kingdom. *The Journal of Psychology*, *146*(1-2), 85-104.

Wang, G., Hu, M., Xiao, S. Y., & Zhou, L. (2017). Loneliness and depression among rural empty-nest elderly adults in Liuyang, China: A cross-sectional study. *BMJ open*, *7*(10), 1-8.

Wang, G., Zhang, X., Wang, K., Li, Y., Shen, Q., Ge, X., & Hang, W. (2011). Loneliness among the rural older people in Anhui, China: Prevalence and associated factors. *International Journal of Geriatric Psychiatry*, *26*(11), 1162-1168.

Ware, J. E., Keller, S. D., & Kosinski, M. (1998). *SF-12: How to score the SF-12 physical and mental health summary scales (2nd ed)*. Health Institute, New England Medical Center.

Ware, J., Kosinski, M., & Keller, S. (1995). How to score the SF-12 physical and mental health summary scales. Boston: The Health Institute, New England Medical Center.

Wilson, K., Mottram, P., & Sixsmith, A. (2007). Depressive symptoms in the very old living alone: Prevalence, incidence and risk factors. *International Journal of Geriatric Psychiatry*, 22, 361-366.

World Health Organization, (2017). Proposed working definition of an older person in Africa for the MDS Project. Retrieved from: http://www.who.int/healthinfo/survey/ageingdefnolder/en/

Wu, Z. Q., Sun, L., Sun, Y. H., Zhang, X. J., Tao, F. B., & Cui, G.H. (2010). Correlation between loneliness and social relationship among empty nest elderly in Anhui rural area, China. *Aging and Mental Health*, *14*(1), 108-112.

Yang, K., & Victor, C. R. (2011). Age and loneliness in 25 European nations. *Ageing & Society*, *31*(8), 1368-1388.

Yip, S.O., Dick, M.A., McPencow, A. M., Martin, D. K., Ciarleglio, M. M., & Erekson, E. A. (2013). The association between urinary and fecal incontinence and social isolation in older women. *American Journal of Obstetrics and Gynecology*, *208*(2), 146.e1-7.

Younsi, M. (2015). Health-related quality-of-life measures: Evidence from Tunisian population using the SF-12 Health Survey. *Value in Health Regional Issues*, 7, 54-66.

Younsi, M., & Chakroun, M. (2014). Measuring health-related quality of life: Psychometric evaluation of the Tunisian version of the SF-12 health survey. *Quality of Life Research*, 23(7), 2047-2054.

Yount, K., & Khadr, M. (2008). Gender, Social Change, and Living Arrangements Among Older Egyptians during the 1990s. *Population Research and Policy Review, 27*(2), 201-225.

Zoutewelle-Terovan, M., & Liefbroer, A. (2018). Swimming against the Stream: Non-normative Family Transitions and Loneliness in Later Life across 12 Nations. *The Gerontologist, 58*(6), 1096-1108.

Appendix A
Socio-Demographic Questionnaire

Social-demographic characteristics		Check the appropriate answer
Region/State	Ibra	
	Al Qabil	
	Badiyah	
Gender	Male	
	Female	
Age	60 – 74	
	75 – 84	
	85 and over	
Marital Status	Single	
	Married	
	Widowed	
	Divorced	
Educational level	Illiterate	
	Elementary to Preparatory	
	Secondary and more	
The number of children	0	
	1-3 child	
	4-7 child	
	8 and over	
Lives	Alone	
	With wife/husband	
	With wife/husband and children	
	With children	
	Other	
The level of income	50-299 Omani Rail	
	300-499	
	500 – 1000	
	More than 1000	

Appendix B

UCLA Loneliness Scale

UCLA Loneliness Scale (English Version)

N	Statement	Never	Rarely	Sometimes	Often
1	I feel in tune with the people around me	1	2	3	4
2	I lack companionship	1	2	3	4
3	There is no one I can turn to	1	2	3	4
4	I do feel alone	1	2	3	4
5	I feel part of a group of friends	1	2	3	4
6	I have a lot in common with the people around me	1	2	3	4
7	I am no longer close to anyone	1	2	3	4
8	My interests and ideas are not shared by those around me	1	2	3	4
9	I am an outgoing person	1	2	3	4
10	There are people I feel close to	1	2	3	4
11	I feel left out	1	2	3	4
12	My social relationships are superficial	1	2	3	4
13	None really knows me well	1	2	3	4
14	I feel isolated from others	1	2	3	4
15	I can find companionship when I want it	1	2	3	4
16	There are people who really understand me	1	2	3	4
17	I am unhappy being so withdrawn	1	2	3	4
18	People are around me but not with me	1	2	3	4
19	There are people I can talk to	1	2	3	4
20	There are people I can turn to	1	2	3	4

Appendix C

UCLA Loneliness Scale (Arabic Version)

الوالد العزيز / الوالدة العزيزة،

يعرض عليك فيما يلي مجموعة من العبارات التي تعبر عما قد تشعر به، ويوجد أمام كل عبارة أربعة اختيارات هـــــي: **أبدا – نادرا – أحيانا – دائما**. يرجى قراءة كل عبارة من هذه العبارات بدقة ثم وضع علامة **دائرة** (0) أمام كل عبارة وفي الخانة التي تنطبق عليك وتعبر عن ما تشعر به. لا توجد إجابات صحيحة وأخرى خاطئة، والإجابة تعد صحيحة فقط طالما أنها تعبر عن حقيقة شعورك تجاه المعنى الذي تحمله العبارة وانطباقها على حالتك. ونؤكد لك أن هذه البيانات سوف تستخدم في البحث العلمي فقط وسوف تعامل إجابتك بسرية تامة ولن تعرف شخصية أو بيانات مستكمل الاستبيان.

شـــكرا لتـــعاونك.

الباحثة: سالمة بنت عبدالله بن صالح اليزيدية

الرقم	العبــــــــــــــــارة	الإجــــــابـــة			
		أبداً	نادرا	أحيانا	دائما
1	أشعر بأني على وفاق مع الناس من حولي	أبداً	نادرا	أحيانا	دائما
2	أشعر بأني أفتقد الصحبة	أبداً	نادرا	أحيانا	دائما
3	أشعر بأنه لا يوجد شخص أستطيع أن ألجأ إليه عند الحاجة	أبداً	نادرا	أحيانا	دائما
4	أشعر بأني وحيد	أبداً	نادرا	أحيانا	دائما
5	أشعر بأني أنتمي لمجموعة من الأصدقاء	أبداً	نادرا	أحيانا	دائما
6	أشعر بأن لديي الكثير من الأمور المشتركة مع من حولي	أبداً	نادرا	أحيانا	دائما
7	أشعر بأني لم أعد قريبا من أحد	أبداً	نادرا	أحيانا	دائما
8	أشعر بأن الآخرين من حولي لا يشاركوني نفس الاهتمامات والأفكار	أبداً	نادرا	أحيانا	دائما
9	أشعر بأني شخص اجتماعي و ودود	أبداً	نادرا	أحيانا	دائما
10	أشعر بأني قريب من الآخرين	أبداً	نادرا	أحيانا	دائما
11	أشعر بأني مهمل ومنبوذ	أبداً	نادرا	أحيانا	دائما
12	أشعر بأن علاقاتي الاجتماعية مع الآخرين لا قيمة لها	أبداً	نادرا	أحيانا	دائما
13	أشعر بأنه لا يوجد شخص يفهمني جيدا	أبداً	نادرا	أحيانا	دائما
14	أشعر بأني في عزلة عن الآخرين	أبداً	نادرا	أحيانا	دائما
15	أشعر بأني تستطيع أن أجد أصدقاء عندما أريد	أبداً	نادرا	أحيانا	دائما

99

دائما	أحيانا	نادرا	أبداً	أشعر بأن هناك أناسا يفهموني جيدا	16
دائما	أحيانا	نادرا	أبداً	أشعر بالخجل من الآخرين	17
دائما	أحيانا	نادرا	أبداً	أشعر بأن الناس من حولي ولكنهم لا يشعرون بي	18
دائما	أحيانا	نادرا	أبداً	أشعر بأن يوجد أناس يمكنني التحدث معهم	19
دائما	أحيانا	نادرا	أبداً	أشعر بأنه يوجد أناس يمكنني أن ألجأ إليهم عند الحاجة	20

وشكـــــــرا جزيــــــلا لـــــك

Appendix D

SF-12 Health Survey (English Version)

SF-12 Health Survey

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. **Answer each question by choosing just one answer.** If you are unsure how to answer a question, please give the best answer you can.

1. In general, would you say your health is:

☐₁ Excellent ☐₂ Very good ☐₃ Good ☐₄ Fair ☐₅ Poor

The following questions are about activities you might do during a typical day. Does <u>your health now limit you</u> in these activities? If so, how much?

	YES, limited a lot	YES, limited a little	NO, not limited at all
2. Moderate activities such as moving a table, pushing a vacuum cleaner, bowling, or playing golf.	☐₁	☐₂	☐₃
3. Climbing **several** flights of stairs.	☐₁	☐₂	☐₃

During the <u>past 4 weeks</u>, have you had any of the following problems with your work or other regular daily activities <u>as a result of your physical health</u>?

	YES	NO
4. **Accomplished less** than you would like.	☐₁	☐₂
5. Were limited in the **kind** of work or other activities.	☐₁	☐₂

During the <u>past 4 weeks</u>, have you had any of the following problems with your work or other regular daily activities <u>as a result of any emotional problems</u> (such as feeling depressed or anxious)?

	YES	NO
6. **Accomplished less** than you would like.	☐₁	☐₂
7. Did work or activities **less carefully** than usual.	☐₁	☐₂

8. During the <u>past 4 weeks</u>, how much <u>did pain interfere</u> with your normal work (including work outside the home and housework)?

☐₁ Not at all ☐₂ A little bit ☐₃ Moderately ☐₄ Quite a bit ☐₅ Extremely

These questions are about how you have been feeling during the <u>past 4 weeks</u>.
For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the <u>past 4 weeks</u>...

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time
9. Have you felt calm & peaceful?	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆
10. Did you have a lot of energy?	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆
11. Have you felt down-hearted and blue?	☐₁	☐₂	☐₃	☐₄	☐₅	☐₆

12. During the <u>past 4 weeks</u>, how much of the time has your <u>physical health or emotional problems</u> interfered with your social activities (like visiting friends, relatives, etc.)?

☐₁ All of the time ☐₂ Most of the time ☐₃ Some of the time ☐₄ A little of the time ☐₅ None of the time

Patient name:		Date:		PCS:	MCS:

Visit type (circle one)
Preop 6 week 3 month 6 month 12 month 24 month Other: _____

101

Appendix E

SF-12 Health Survey

يدور هذا الاستبيان حول عدد من الأسئله والاستفسارات حول صحتك وتساعدك هذه المعلومات في متابعة حالتك الصحيه ومدى قدرتك على القيام بأنشطتك العادية.

الرجاء الاجابه على كل سؤال وذلك من خلال اختيار الاجابه المناسبة كما هة مبين بوضع علامة (√) , واذا لم تكن متأكد حول اجابة سؤال ما, فالرجاء اعطاء الاجابة الأقرب للصحيح ما أمكن ذلك.

1. بصفة عامة يمكنك القول بأن صحتك (حالتك الصحيه):

ضعيفة	حسنه لا بأس	جيدة	جيدة جدا	ممتازة

أسئلة التالية تدور حول الأنشطة التي يمكنك القيام بعملها في يومك العادي هل تجد حالتك الصحية الأن من هذه الأنشطة؟

اذا كانت الأجابة بنعم, الى أي مدى؟

الأنشطة المعتدلة مثل :

لا تجدها مطلقا	نعم تجدها قليلا	نعم محدودة كثيرا	
			2- تحريك طاولة و دفع الة ، تنظيف بمكنسة كهربائيه ، تنظيف حديقة المنزل والعناية بها
			3- صعود عدة عتبات من الدرج

خلال الأربع أسابيع الماضيه هل واجهت أي من المشاكل التالية في عملك أوفي أي من نشاطاتك اليومية المنتظمة الأخرى نتيجة لحالتك الصحية:

لا	نعم	
		4- انجزت في عملك أقل مماكنت تصبو البه (أو تريده)
		5- كانت محددوه في نوعية العمل أو أنشطة أخرى

خلال الأربع أسابيع الماضية, هل واجهت أي من المشاكل التالية في عملك أو أنشطتك اليومية المعتادة الأخرى نتيجة لأي مشاكل نفسية (أو مشاكل عاطفية مؤثرة) مثل (الشعور بالاكتئاب أو القلق)

لا	نعم	
		6- أنجزت أقل مما كنت تصبو اليه أو (تريده أو توده)
		7- لم أقم بالعمل أو أنشطة أخرى بدقة (باهتمام وحذر) كالمعتاد

8- خلال الأربع أسابيع الماضيه, الى أي مدى أثر ما ماتشعر به من ألم في عملك اليومي (بما في ذلك عملك خارج وداخل المنزل)

لا أبدا	قليلا جدا	بصورة متوسطة	كثيرا ما	كثيرا جدا

9- الأسئلة التالية تتعلق بشعورك وكيف كانت تبدو لك الأشياء خلال الأربع أسابيع الأخيرة, الرجاء أعطاء الاجابة الأقرب لما كانت تشعر به: كم هي المدة الزمنية خلال الأربع أسابيع الماضية التي شعرت فيها بالهدوء والأمن :؟

كل الوقت	معظم الوقت	كثيرا من الوقت	بعض الوقت	قليلا من الوقت	لا شيء من الوقت

10- لديك كثيرا من الطاقة

كل الوقت	معظم الوقت	كثيرا من الوقت	بعض الوقت	قليلا من الوقت	لا شيء من الوقت

11- هل شعرت بأي أحباط أو انكسار؟

كل الوقت	معظم الوقت	كثيرا من الوقت	بعض الوقت	قليلا من الوقت	لا شيء من الوقت

12- خلال الأربع أسابيع الأخيرة, الى أي مدى أثرت حالتك الصحيه أو النفسية في أنشطتك الاجتماعيه (مثل زيارة الأقارب أو الأصدقاء الخ...)

كل الوقت	معظم الوقت	بعض الوقت	قليلا من الوقت	لا شيء من الوقت

لك بالغ الشكر على استكمال الاستبيان وأتمنى لك يوم مبارك

103

Appendix F

Arizona State University (IRB)

ASU Knowledge Enterprise Development

EXEMPTION GRANTED

Karen Marek
CONHI: Research Faculty and Staff
-
Karen.Marek@asu.edu

Dear Karen Marek:

On 4/5/2018 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Alone in the Crowd: Loneliness, its Correlates and Association to Health Status among Omani Older Adults
Investigator:	Karen Marek
IRB ID:	STUDY00007943
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	• UCLA loneliness scale Arabic version, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Modified TEMPLATE PROTOCOL.docx, Category: IRB Protocol; • SF-12 Arabic Version, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment Flyer Arabic Version , Category: Recruitment Materials; • SF-12 English Version, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment Flyer, Category: Recruitment Materials; • Demographic Questinair, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Signed Translation Certificate , Category:

Sultanate of Oman
Ministry of Health
Directorate General of Planning and Studies

سلطنة عمان
وزارة الصحة
المديرية العامة للتخطيط والدراسات

MoH/DGPS/CSR/PROPOSAL_ APPROVED/22/2018

Ref. :

Date : 09.09.2018

الرقم :

التاريخ :

الموافق :

Salma Al Yazeedi
Principal Investigator

Study Title : Alone in the Crowd: Loneliness, its Correlates and Association to Health Status among Omani Older Adults.

Proposal ID: MOH/CSR/18/8708

After compliments,

We are pleased to inform you that your research proposal " Alone in the Crowd: Loneliness, its Correlates and Association to Health Status among Omani Older Adults" has been approved by the Research and Ethical Review & Approval Committee, Ministry of Health.

On completion of the study, you are required to provide a copy of the final report within 2 months to the Centre of Studies and Research.

Regards,

Dr. Ahmed Mohamed Al-Qasmi
Director General of Planning and Studies
Chairman, Research and Ethical Review & Approval Committee
Ministry of Health, Sultanate of Oman.

Cc
Day file

Appendix H

Consent Form

استمارة الموافقة على المشاركة في دراسة بحثية

عنوان الدراسة: وحيد في الزحمة: *الوحدة والعزلة الاجتماعية مسبباتها وعلاقتها بالحالة الصحية فيما بين المسنين العمانيين*

أنا طالبة دكتوراه تحت اشراف الدكتورة كارين مارك في كلية التمريض في جامعة اريزونا بالولايات المتحدة الأمريكية. أقوم

حاليا بتنفيذ دراسة لدراسة وجود الوحدة والعزلة الاجتماعية عند العمانيين البالغين من العمر 60 سنة وما فوق.

لذلك أدعوك للمشاركة في هذه الدراسة التي تتضمن اكمال ثلاثة استبيانات والتي قد تستغرق بين 30 – 40 دقيقة من وقتك.

أنت لست مطالب بتزويدنا بأي بيانات شخصية تعريفية عنك وكل المعلومات التي سيتم تجميعها ستضل سرية وستستخدم

لأغراض بحثية فقط. المعلومات التي ستقدمها في الاستبيان ستكون متاحة للباحثة فقط ولن يطلع عليها الاخرين. لديك الحق في

عدم الاجابة عن الاستبيانات والتوقف عن المشاركة متى رغبت في ذلك. مشاركتك هذه تعتبر تطوعية ولك الانسحاب متى

قررت ذلك ولن يترتب على انسحابك أية مسئولية.

قد لا تكون هناك فائدة مباشرة لك من مشاركتك في هذه الدراسة. الا أن الدراسة سوف تساعد في تطوير الرعاية الصحية

للمسنين في عمان. على ضوء ذلك، قد تتخذ خطوات لاقتراح تطوير جودة الخدمات المقدمة للمسنين واضافة ذلك في مناهج

التمريض بالسلطنة. كمشارك لن تتعرض لأي مخاطر نتيجة مشاركتك في هذه الدراسة. هناك احتمالية ضعيفة جدا لفقدان

الخصوصية للمشارك في الاستبيان التي قد تؤدي لبعض الاحراج الشخصي. الا أن الباحثة سوف تتخذ خطوات لتقليل هذه

المخاطر والتأكد من وجود الخصوصية والسرية لبياناتك الشخصية.

مشاركتك سوف لن تحمل اسمك واذا ما تم نشر نتائج هذه الدراسة أو تقديمها في مؤتمر علمي فان اسمك وبياناتك الشخصية لن

تستخدم مطلقا. اذا كان لديك أي استفسار حول الدراسة الرجاء التواصل مع فريق الدراسة على أحد البريدين الألكترنيين

التاليين:

salyazee@asu.edu   الباحثة سالمة بنت عبدالله اليزيدية

االمشرفين على البحث

karen.marek@asu.edu   الدكتورة: كارين ماريك.
Cha-nam.shin@asu.edu   الدكتورة: تشانام شين
paulina@asu.edu   الدكتورة: بولين كومينيش
كما أنه اذا كان لديك أي استفسار حول حقوق المشاركة في هذه الدراسة أو أحسست أنك قد تتعرض لأي مخاطر فيمكن

الاتصال بمكتب رئيس حقوق المشاركين في جامعة اريزونا على الرقم 0014809656788.

لتأكيد رغبتك في المشاركة في هذه الدراسة الرجاء التوقيع بالموافقة في الأسفل

الباحثة: سالمة بنت عبدالله اليزيدي   salyazee@asu.edu

توقيع المشارك: _____