

Duquesne University

## Duquesne Scholarship Collection

---

Electronic Theses and Dissertations

---

Fall 12-17-2021

# Loneliness, Interpersonal Goals, Life Satisfaction, and Subjective Well-being in Older Adults

Francesca C. Ezeokonkwo

Follow this and additional works at: <https://dsc.duq.edu/etd>



Part of the [Geriatric Nursing Commons](#)

---

### Recommended Citation

Ezeokonkwo, F. C. (2021). Loneliness, Interpersonal Goals, Life Satisfaction, and Subjective Well-being in Older Adults (Doctoral dissertation, Duquesne University). Retrieved from <https://dsc.duq.edu/etd/2118>

This One-year Embargo is brought to you for free and open access by Duquesne Scholarship Collection. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Duquesne Scholarship Collection.

LONELINESS, INTERPERSONAL GOALS, LIFE SATISFACTION, AND  
SUBJECTIVE WELL-BEING IN OLDER ADULTS

A Dissertation

Submitted to the School of Nursing

Duquesne University

In partial fulfillment of the requirements for  
the degree of Doctor of Philosophy

By

Francesca C. Ezeokonkwo

December 2021

Copyright by  
Francesca C. Ezeokonkwo

2021

LONELINESS, INTERPERSONAL GOALS, LIFE SATISFACTION, AND  
SUBJECTIVE WELL-BEING IN OLDER ADULTS

By

Francesca C. Ezeokonkwo

Approved November 8, 2021

---

Kathleen Sekula, PhD, PMHCNS, FAAN  
Professor of Nursing  
(Committee Chair)

---

Laurie Theeke, PhD, FNP-BC, GCNS-  
BC, FAAN  
Professor of Nursing  
(Committee Member)

---

Rick Zoucha, PhD, PMHCNS-BC, CTN-  
A, FAAN  
Professor of Nursing  
(Committee Member)

---

Meredith Troutman-Jordan, PhD,  
PMHCNS-BC  
Associate Professor of Nursing  
(Committee Member)

---

Mary Ellen Glasgow, PhD, RN, ANEF,  
FAAN  
Dean, School Name  
Professor of Nursing

---

Jeffrey Stokes, PhD  
Assistant Professor of Gerontology  
(Committee Member)

## ABSTRACT

### LONELINESS, INTERPERSONAL GOALS, LIFE SATISFACTION, AND SUBJECTIVE WELL-BEING IN OLDER ADULTS

By

Francesca C. Ezeokonkwo

December 17, 2021

Dissertation supervised by Dr. Kathleen Sekula

**Background:** Loneliness is detrimental to health and is linked to numerous physiological and psychological problems. People across the age spectrum can be affected by loneliness at one point or another in their lives; however, older adults are disproportionately affected.

**Aims:** This study investigated the effect of interpersonal goals (compassionate and self-image goals), life satisfaction, and subjective well-being on loneliness in older adults and the influence of demographics and social support. The Ecosystem-Egosystem Theory of Social Motivation served as the theoretical framework.

**Design and Method:** This descriptive cross-sectional correlational study used the 2016 Health and Retirement Study. Participants were 65 years of age or older, community-dwelling, and able to complete the interview themselves. Multiple linear regression analyses were conducted to examine the association between dependent and independent variables.

**Findings:** Interpersonal goals, subjective well-being, and life satisfaction were significantly related to loneliness. Higher compassionate and self-image goals reported less loneliness.

**Conclusion:** These results add to understanding the effect of interpersonal goals on loneliness in older adults. Initial findings warrant further exploration. Existing loneliness interventions for older adults may benefit from the outcomes of the study.

## DEDICATION

This dissertation is dedicated to the memories of my parents: Eugene and Mary Ezeokonkwo, whose resilience, faith, hope, kindness, and the quest for knowledge remain an inspiration. May they rest in peace.

## ACKNOWLEDGEMENT

This dissertation is only possible with God, who gave me the wisdom and passion for embarking on this project. I express a deep appreciation to my mentor and committee chair, Dr. Kathleen Sekula, for her guidance over the last four years. I am profoundly grateful to my dedicated committee members: Dr. Laurie Theeke, whose experience in loneliness research was vital in completing this study; Dr. Jeffrey Stokes for his expertise with HRS datasets; and Drs. Rick Zoucha and Meredith Troutman-Jordan who generously gave their time, expertise, and thoughtful feedback to strengthen this project. My deep gratitude to all the faculty and staff at Duquesne University School of Nursing and my doctoral student colleagues for their suggestions and words of encouragement. I acknowledge Dr. Gary Yu for the invaluable statistical expertise he provided me. I thank Dr. Nalini Jairath, Dr. Sonya Koontz, and Mrs. Nancy Moulton, who motivated me to pursue graduate studies. My deep appreciation to Dr. Aniedi Okure for his mentorship and guidance throughout this journey. I am grateful to my religious sisters and friends who prayed, supported, and walked with me along this journey. I am indebted to Harry, my gracious 94-year-old neighbor, who prays for me every day upon learning of my interest in working with “Seniors.” Finally, I thank all the older adults who participated in the preliminary mini-study for this dissertation, HRS participants, and the researchers at the University of Michigan who collected and maintained the Health and Retirement Study data. Their hard work and dedication made this research possible.



## TABLE OF CONTENTS

	Page
<a href="#"><u>Abstract</u></a> .....	iv
<a href="#"><u>Dedication</u></a> .....	vi
<a href="#"><u>Acknowledgement</u></a> .....	vii
<a href="#"><u>List of Tables</u></a> -----	ix
<a href="#"><u>List of Figures</u></a> .....	x
<a href="#"><u>Chapter 1: Introduction and Background</u></a> .....	11
<a href="#"><u>Chapter 2: Integrative Review of Literature Manuscript</u></a> .....	13
<a href="#"><u>Chapter 3: NIH Style Proposal</u></a> .....	55
<a href="#"><u>Chapter 4: Data Analysis and Research Findings</u></a> .....	79
<a href="#"><u>Chapter 5: Results Manuscript</u></a> .....	87

## LIST OF TABLES

	Page
Table 1: Frequencies and Percentages for Categorical Variables.....	97
Table 2: Descriptive Statistics for Continuous Variables.....	99
Table 3: Multiple Linear Regression with Compassionate Goals Predicting Loneliness	100
Table 4: Multiple Linear Regression with Self-Image Goals Predicting Loneliness.....	102
Table 5: Multiple Linear Regression with Life Satisfaction Predicting Loneliness.....	104
Table 6: Multiple Linear Regression with Subjective Well-Being Predicting Loneliness.....	105

## LIST OF FIGURES

	Page
Figure 1: Regression Model of the Study Variables .....	95

## Chapter 1

### Introduction

Over the last years, advances in science and technology have increased life expectancy contributing to the rapid growth of the older adult population. According to the Administration on Aging (AoA, 2018), 15.6 percent or one out of every seven Americans is an older adult. Furthermore, the number of older individuals aged 65 and over has increased rapidly since 2010, owing to the aging of Baby Boomers born between 1946 and 1964 (Ortman et al., 2014). The aging population has far-reaching societal ramifications, including severe health-related effects.

Older individuals are more likely to develop various chronic illnesses and disorders, which have both direct and indirect economic and social consequences. Loneliness is one of the most prevalent problems affecting older adults, and the public health impact of loneliness in the aging population was further exacerbated during the COVID-19 pandemic lockdown.

Research about loneliness and loneliness interventions is ongoing. Many research studies have investigated loneliness in older adults and highlighted its health problems (Beutel et al., 2017; Gum et al., 2017; Yin et al., 2019), and several loneliness interventions have been developed to address loneliness in the aging population (Krause-Parello, 2012; Lindsay et al., 2019; Tarugu et al., 2019). However, the nature of loneliness as a subjective phenomenon that affects people differently makes it challenging to use a one-size-fits-all approach that minimizes these strategies' effects. To improve the effectiveness of loneliness interventions, Yanguas et al. (2018) suggest adapting programs to participants' cultural orientation and individuality. It is hoped that the findings from this study will provide information that will aid in developing targeted interventions to help lonely older adults.

The goals of this study were to explore the relationship between loneliness, interpersonal goals, life satisfaction, and subjective well-being. The specific aim is to investigate the influence of interpersonal goals (compassionate and self-image), life satisfaction, and subjective well-being on loneliness in older adults. The research addresses the question: How is loneliness in older adults affected by interpersonal goals (compassionate goals and self-image goals), life satisfaction, and subjective well-being? The hypotheses are as follows: Hypothesis 1a: Loneliness is negatively influenced by compassionate goals. Hypothesis 1b: Loneliness is positively influenced by self-image goals. Hypothesis 2: Loneliness is negatively influenced by higher levels of life satisfaction. Hypothesis 3: Loneliness is influenced by a person's satisfaction scores on the eight subjective well-being variables.

This program of study's objective is to add to the body of knowledge regarding the impact of interpersonal goals on loneliness in older adults to provide the opportunity to use the information in ongoing efforts to reduce loneliness in older adults. Information about the relationship between interpersonal goals and loneliness may lead to increased efforts towards preventing loneliness in older adults.

## Chapter 2

*Ezeokonkwo, F., Sekula, K., Theeke, L. Loneliness in homebound older adults:*

*Integrative Literature Review. Journal of Gerontological Nursing, 47(8), 13-20.*

### Loneliness in Homebound Older Adults: Integrative Literature Review

The original submission of the manuscript to the journal for consideration is included here with the permission of the journal editor. The manuscript has been published.

## **Loneliness in Older Adults who are Homebound: An Integrative Review of the Literature**

### **Abstract**

Loneliness affects people of ages at one point or another in their lives; however, older adults ages 65 and older are disproportionately affected due to age-related losses. Most research on loneliness has focused on older adults in general. Older adults who are homebound tend to have more disabilities and associated complications than older adults in the general population and face unique challenges. The current review examined and synthesized knowledge about loneliness among older adults who are homebound using Whitemore and Knafl's (2005) analysis process. Fourteen studies published from 1999 to 2020 met the inclusion criteria. The analysis resulted in four themes: *characteristics of loneliness in older adults who are homebound, risks for homebound in older adults, location of older adults who are homebound, and coping strategies and methods to reduce loneliness in this population*. The implications for nursing practice and recommendations for future research are discussed.

## **Loneliness in Older Adults who are Homebound: An Integrative Review of the Literature**

Loneliness and social isolation are often interpreted as being the same; however, there are key differences between the two concepts. Loneliness is the subjective feeling of being isolated, whereas social isolation is an objective lack of social contact with other people (National Academies of Sciences Engineering and Medicine [NASEM], 2020). It is important to note that a person can suffer from loneliness, even when surrounded by many people (Savikko et al., 2005).

### **Background**

Loneliness is a growing epidemic at both national and international levels, and it has been linked to depression, hopelessness, substance abuse, cognitive impairment, malnutrition, hypertension, disruptive sleep, and higher mortality (Aanes et al., 2011; Boss et al., 2015; Cacioppo et al., 2002; Teguo et al., 2016; Yu et al., 2016). This growing epidemic of loneliness prompted the appointment of a Minister of Loneliness in the UK to help combat loneliness among the entire population of the UK (66.65 million people), of which 14% of the whole population (9.33 million) reported feeling lonely (Geggel, 2018). In a survey by Cigna (2018), the UCLA Loneliness Scale was used in an online survey. A population of 20,000 US adults 18 and older were surveyed to document loneliness. The study revealed that 46 percent of Americans reported feeling lonely. Moreover, even more recently, loneliness was explicated as a global epidemic and health priority for older adults in the report by the National Academies of Sciences (National Academies of Sciences Engineering and Medicine [NASEM], 2020).

While the earliest nursing publication on loneliness was in 1955 (Peplau, 1955), research on loneliness originated in 1933 at the University of North Carolina with a publication about the relation of spatial isolation to psychosis (Brooks, 1933). Studies on loneliness show that it affects people across the life spectrum. Luhmann and Hawkley (2016) reported that loneliness increases



with age. However, Qualter et al. (2015) found that feelings of loneliness rise in young adulthood, decrease in middle age, and increase gradually again in older adult years (80 years of age and over). Loneliness in older age is confounded by a greater prevalence of risk factors such as chronic illnesses, disability, and loss of relationships (Penninx et al., 1997; Tjihuis et al., 1999). While a plethora of empirical literature exists regarding loneliness in older adults, few studies have examined only older adults who are homebound. This review will include only the 14 articles related to older adults who are homebound.

### **Purpose**

The purpose of this review was to search, extract, appraise, and synthesize what is known in empirical literature relating to loneliness among older adults who are homebound to identify areas for future research. The integrated review aims to answer the following questions: (a) What are the characteristics of studies that have investigated loneliness among older adults who are homebound? (b) What are the risk factors for homebound in older adults, and (c) What coping strategies and methods used to ameliorate loneliness were reported in these studies?

### **Method**

#### **Analytical Approach**

This integrative review was based on the process outlined by Whitemore and Knafl (2005). It involved identifying the problem, conducting a structured literature search, appraising the quality of the data, extracting and analyzing data, and synthesizing and presenting the findings. This integrative review method allows for the inclusion of experimental and non-experimental studies and the analysis of diverse methodologies to capture the context, processes, and subjective elements of the identified problem to help readers fully grasp the phenomenon under study (Whitemore & Knafl, 2005).

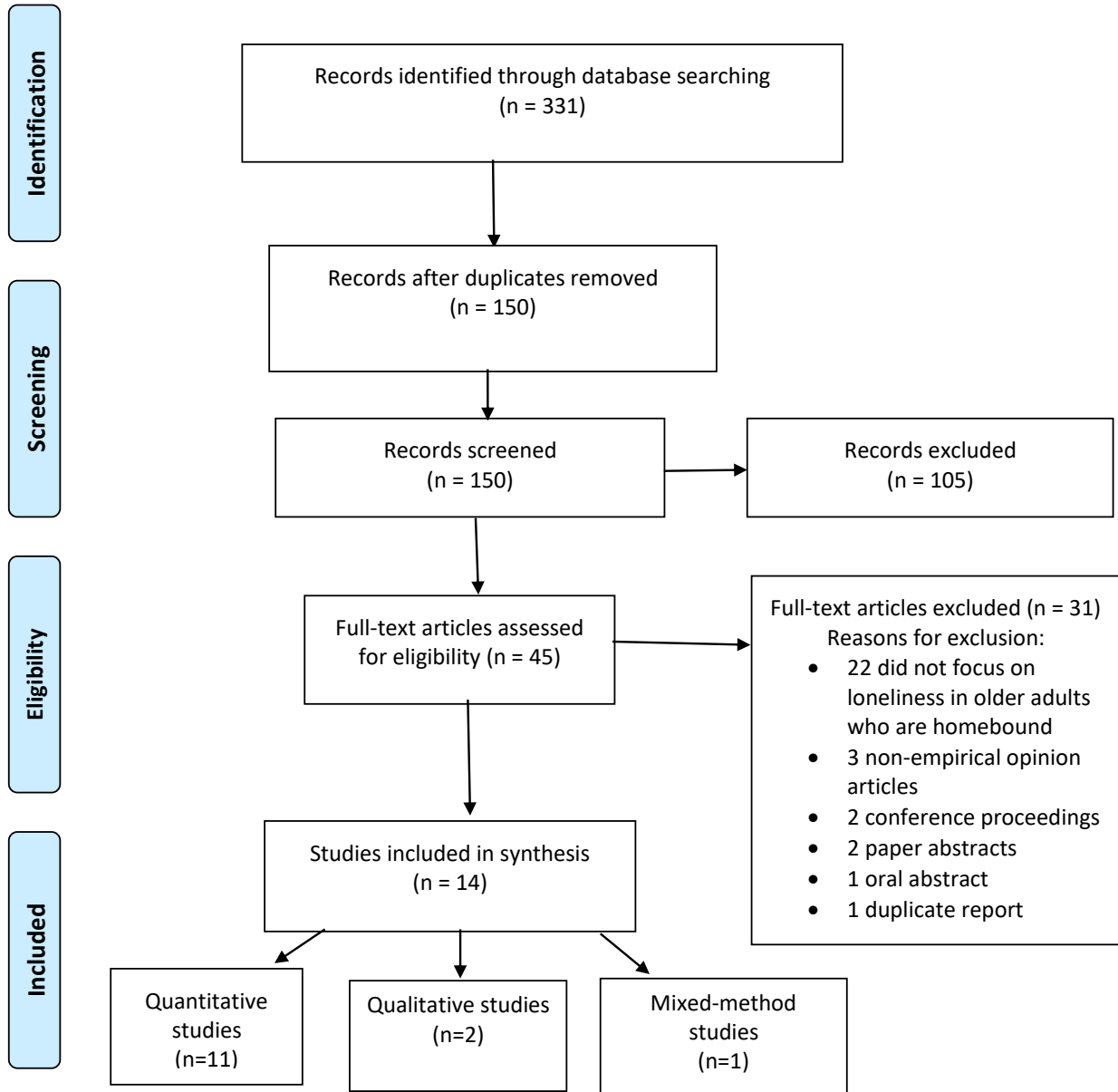
## **Literature Search and Study Selection**

To assess publications related to loneliness in older adults who are homebound, published research articles were identified using electronic databases CINAHL, PubMed, PsycINFO, Scopus, and Embase with the assistance of a health sciences librarian. Search terms included *elderly, old age, older adults, older people, senior citizens, seniors, homebound, housebound, shut-in, loneliness, lonesome, alone, and lonely*. Truncations were used to include different spellings or associated terms. No restrictions were placed on publication date to have a full selection of articles related to the topic. Articles incorporated in the review included those identified and retrieved using the search engine databases.

The articles were included if they met the following criteria: (a) focused on older adults who are homebound; (b) aimed at describing or examining aspects of being lonely or loneliness; and (c) published in English. For this review, the following definitions were used: “older adult” refers to individuals 65 years of age and older; “homebound” is defined as going out of the house once a week or less (Cohen-Mansfield et al., 2012). Articles in foreign languages, articles that were not primary research, and articles that did not discuss homebound older adults were excluded from this review. All relevant articles were exported to Endnote X9, a reference software tool, and then to Covidence, an online systematic reviews management software. Figure 1 (Moher et al., 2009) illustrates the process used to identify and review articles. Three hundred thirty-one articles were identified through the databases using the search terms.



## PRISMA 2009 Flow Diagram



From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit [www.prisma-statement.org](http://www.prisma-statement.org).

Of the 331 articles, 181 duplicates were removed, 150 titles and abstracts were screened, and 105 articles were excluded as not meeting the inclusion criteria. Forty-five full-text articles were assessed for eligibility, and 31 articles were eliminated. Articles were excluded if they were duplicates, conference proceedings, or expert opinions. One oral abstract and two paper abstracts were excluded because they did not have follow-up articles. This left 14 articles appropriate for inclusion in the review.

### **Quality Appraisal**

The 14 articles were screened by two researchers and checked against inclusion criteria by the third researcher. The methodological rigor of each of the 14 studies was independently appraised by the first author using a nine-item standardized appraisal tool devised by Hawker et al. (2002). The second and third authors iteratively reviewed the first reviewer's assessment and result for accuracy. This tool was constructed to systematically and objectively assess research with disparate data and different paradigms (Hawker et al., 2002). The appraisal tool includes nine items: abstract and title; introduction and aims; method and data; sampling; data analysis; ethics and bias; results; transferability or generalizability; and implications and usefulness. Each of these sections was scored by four values: good (4); fair (3); poor (2); and very poor (1). An article could receive a maximum score of 36 points (very good study) and a minimum score of 9 points (very poor study). The 14 sample studies' minimum score was 29, and the maximum score was 36 (Table 1). Therefore, all studies ranged from *fair* to *good*. No article was excluded following data evaluation.

**Table 1***Description of Studies Included in Alphabetical Order (N=14)*

Author/ Year/ Location	Aim/ Purpose	Design/ Sample	Key Outcomes/Results	Limitations/ Future Directions	*Quality Appraisal
Arnaert and Delesie (2007)  Belgium	To develop change measures in the functioning and identify the characteristics of groups of homebound older adults whose functioning is improved with video-telephone nursing care.	Quantitative N= 71 Mean age 72 Female 60.5% Widow/live alone 70.4%	Men under age 70 who had low social activity levels showed significant changes in the measure <i>change in emotional loneliness</i> .  For the measure <i>change in social loneliness</i> , significant improvement was noted for a subgroup who frequently needed nursing care and home help and had strong feelings of emotional loneliness.	Additional descriptive and experimental studies are needed in other localities, cultures, and healthcare systems to identify patients who could benefit from telenursing care.	29
Beck et al. (2009)  Indiana, USA	To describe a 7-year experience in building and sustaining a physician home visit program that aims to provide medical care at home to frail older adults who have difficulty accessing medical care due to physical or psychiatric disabilities.	Quantitative longitudinal N=486 Mean age 80 Female 78% Home/apartment 98% Black 63.5%	The program showed improved quality in preventive health services, recognition of geriatric syndromes, and increased patient satisfaction.	RCT is recommended to provide more conclusive evidence about the program's effectiveness on patient outcomes and costs.	34

Bedard-Thomas et al. (2019)  Ohio, USA	To explore the perspectives and experiences of loneliness and social isolation in homebound patients receiving home-based primary care.	Mixed-method Pilot study N = 8 Age 55 - 96 Participants' homes	Patients denied feelings of loneliness but acknowledged being socially isolated. The most-reported barrier affecting social isolation in the study was mobility issues.	A small convenience sample prevents a generalizable conclusion. Research with a larger sample size across multiple sites is needed to further examine homebound patients' experience of loneliness and social isolation.	29
Boss et al. (2016)  Texas, USA	To examine relationships of religious coping, psychosocial factors (stress, depression, loneliness), salivary biomarkers (cortisol, C-reactive protein (CRP), Interleukin-1 $\beta$ ), and executive function	Quantitative Cross-sectional N = 88 Age 60-95 Female 66% Caucasian 94%	Positive religious coping has a negative correlation with depression and loneliness  Greater loneliness predicted greater CRP.	Future research is needed to consider additional psychosocial and biobehavioral variables in larger samples of diverse and vulnerable populations.	36
Choi et al. (2020)  Texas, USA	To test the acceptability and effectiveness of a lay-coach-facilitated, video conferenced, short-term behavioral activation (Tele-BA) intervention for improving social connectedness among homebound older adults.	Quantitative RCT N = 89 Mean age 74 Female 62% Lived alone 68% Non-Hispanic Black 18% Hispanic 15%	Using lay-coach facilitated short-term behavioral video conferencing (Tele-BA) was associated with more significant social connectedness than customary friendly-visit videoconferencing (Tele-FV).  Tele BA participants reported more social interactions, satisfaction with social support, and a more substantial reduction in loneliness.	More research is needed to solidify the clinical evidence base, cost-effectiveness, and short-term Tele-BA intervention sustainability.	36

Cohen-Mansfield et al. (2012)  Tel-Aviv, Israel	To examine the prevalence and correlates of homebound status, aiming to elucidate the predictors and implications of being homebound.	Cross-sectional and longitudinal Cohort study N=1,609 (CALAS 1191, IMAS 418) Age 75-94	The study authors found homebound prevalence rates of 17.7% -19.5%.  Homebound participants tended to be older, female, have obese or underweight body mass index (BMI), poorer health, lower functional status, less income, higher depressed affect, and more likely to have stairs and no elevators than their counterparts  Homebound persons were more significantly lonelier in the CALAS cohort. In the IMAS cohort, the difference in loneliness did not reach significance.	Future research is needed to explore further the meaning of 'home' and 'homebound' for older persons and their effects on behavior.	36
Cotterill and Taylor (2001)  England	To present findings from a qualitative sociological study of an Ageing Well project for housebound older adults regarding two health promotion policy goals: the provision of useful quality information and encouraging greater social participation	Qualitative N=47 Mean age 83 Female 83% Living alone 86% White 100%	Most participants revealed that their loneliness was deep-seated and difficult to remedy because its root cause was a spouse's death, lack of mobility, or long-term ill-health.  The most common strategies for coping with loneliness were watching television or listening to the radio.	The AW study suggests that a peer group can help reduce loneliness and enhance well-being. Future research is needed to explore further the effectiveness of this intervention in different localities and its costs.	34
Han and Richards (2010)	To examine the use of spirituality as an internal resource and coping strategy to mitigate depression and loneliness among	Quantitative Cross-sectional N= 40 Mean age 76.23	Loneliness and depression were significantly related and significantly associated with homebound older adults.	Future research is needed to examine the interrelationships between loneliness, depression, and spirituality using longitudinal research	35

Ohio, USA	homebound older adults.	Female 72.5% Caucasian 55% African American 45%	Spirituality mitigated the strength of this association to some extent.	methods and broader, more representative samples.	
Jing et al. (2018)  China	To investigate the effectiveness of <i>Baduanjin qigong</i> combined with cognitive-behavior therapy (CBT) on housebound older adults' physical fitness and psychological health.	Quantitative RCT N=120 Age 60-84 Female 70%	Physical and psychological statuses of older adults who are housebound improved with Baduanjin training combined with CBT. The effect of the combined intervention exceeded that of CBT or Baduanjin alone.  Activities of daily living (ADL), self-evaluated loneliness, and level of depression were significantly lowered ( $P<.05$ ) in the group receiving joint Baduanjin and CBT intervention at three months and six months, as compared to the Baduanjin only group or the CBT only group.	Future research is needed to investigate this intervention in multi-center settings.	34
Jing et al. (2017)  China	To assess the occurrence of and factors influencing homebound older adults in Chinese communities and provide a basis for effective intervention and prevention of homebound.	Quantitative Cross-sectional N= 2180 Age 60-101	Homebound older adults often felt lonely (9.2%) compared to non-homebound (3.1%). Homebound older adults sometimes felt lonely (32.2%) compared to non-homebound (16.9%).  Risk factors for homebound: Poor ADL, depressive symptoms, hearing impairment, being old, no exercise, and low social support, and loneliness	More appropriate measures based on the specific influencing factor is crucial in preventing homebound, improving older adults' quality of life, and alleviating stress on their family and society.	33



MacIntyre et al. (1999) Ontario Canada	To evaluate the effectiveness of a friendly visitor in a volunteer program.	Quantitative Pilot study RCT N= 22 Mean age 80	There were statistically significant improvements in life satisfaction and social support in the lonely participants who received friendly volunteer visitors.	More extensive research is needed to verify the program's effectiveness.	29
Szeman (2014) Hungary	To examine whether internet-illiterate older adults receiving long-term care at home would cease to feel lonely if they could learn to use Skype.	Qualitative N=15 Over 75 yrs. Mean age 82	The use of Skype encouraged expanding the interpersonal network, strengthened family and interpersonal relations, and improved the older persons' mental state.  Skype use stimulated the participants to learn to send an email, chat, and browse the web for topics of interest, thereby decreasing their loneliness level.	Future research is needed to explore the new pattern of relationships' role in eliminating the multiple disadvantages of regional inequalities, lack of education, and the housing situation.	32
Thomas et al. (2016) USA	To evaluate the extent to which the home-delivered meals program, and the type of delivery model, reduces homebound older adults' feelings of loneliness.	Quantitative RCT N= 626 Mean age 76 White 55% Black 38%	Participants who received daily-delivered meals experienced the most significant improvements in their self-reported feelings of loneliness.  A home-delivered meal program not only provides nutrition but it improves the recipient's quality of life.	Future research should include individuals identified to be most in need and who are already enrolled in the program to understand better the impact that different food delivery methods can have on client health, health care use, and quality of life to feelings of loneliness.	36
Xiang et al. (2019) China	To examine the trajectories of homebound status in older adults and to investigate the risk factors in shaping the pattern of these trajectories.	Quantitative N = 7,607 Age 65+ White 80.6% Black 8.1%	Changes in homebound status among community-dwelling older adults follow three distinct trajectories over seven years.  Social isolation is an important and potentially modifiable risk factor for progressing to a homebound state.	Future study is needed to examine further the role of social isolation and social support and their relationship with outdoor mobility.	36

## **Data Extraction and Analysis**

The articles were read in their entirety several times to obtain an overall picture of their content.

Related findings and major themes were highlighted, extracted, and clustered together. The

clusters were then organized by categories, which led to identifying four major themes:

*loneliness in older adults, risk factors for homebound in older adults, location of older adults who are homebound, and methods to reduce loneliness in older adults who are homebound.* Data were extracted by the primary author and summarized into the final matrix table that outlined the aims, design, sample, key outcomes, and limitations from each study (Table 1). Data synthesis occurred through categorizing, summarizing, comparing, and interpreting findings within and across articles to provide a comprehensive summary (Whittemore & Knafl, 2005).

## **Demographic of the Studies**

The 14 qualifying studies (one mixed-method, two qualitative, and 11 quantitative) were published from 1999 to 2020 and summarized in Table 1. The countries of origin for the studies include one from Belgium (Arnaert & Delesie, 2007), one from Canada (MacIntyre et al., 1999), three from China (Jing et al., 2018; Jing et al., 2017; Xiang et al., 2019), one from Hungary (Széman, 2014), one from Israel (Cohen-Mansfield et al., 2012), one from United Kingdom (Cotterill & Taylor, 2001) and six from the United States (Beck et al., 2009; Bedard-Thomas et al., 2019; Boss et al., 2016; Choi et al., 2020; Han & Richardson, 2010; Thomas et al., 2016). Most of the studies (n = 7) used surveys in descriptive and cross-sectional designs, and four quantitative studies were randomized controlled trials (RCT) (Choi et al., 2020; Jing et al., 2018; MacIntyre et al., 1999; Thomas et al., 2016).

## **Research Population**

The sample populations of the 14 studies ranged from eight participants interviewed in their homes in a pilot study to 7,607 older adults drawn from a national health database. As demonstrated in Table 1, demographic characteristics, including gender, age, and ethnicity/race varied among the studies. Both male and female participants were included in all the studies; however, most participants were female ranging from 56.6% to 83% across all 14 studies. Six studies reported mean ages of 72 to 83 years, while other studies reported a diverse age range between 55 and 101. Only seven studies reported the participants' race/ethnicity.

## **Results**

### **Characteristics of Loneliness in Older Adults who are Homebound**

In the articles reviewed that documented loneliness rates in older adults who are homebound, the rates range from 17.7% (IMAS cohort) to 19.5% (CALAS cohort) in Cohen-Mansfield et al. (2012) study. In the study by Jing and colleagues (2017), 41.4% of the study population of older adults who were homebound reported being lonely (often felt lonely or sometimes felt lonely). Older adults who are homebound have more loneliness risk factors than those who are non-homebound. Many older adults who are homebound have evidence of depression (Boss et al., 2016; Han & Richardson, 2010), low morale (Boss et al., 2016), and limited functional abilities (Bedard-Thomas et al., 2019; Jing et al., 2017). Boss et al. (2016) study focused on the relationships of religious coping, psychosocial factors (stress, depression, loneliness), salivary biomarkers (cortisol, C-reactive protein (CRP), Interleukin-1 $\beta$ ), and executive function. This study found that greater C-reactive protein (CRP) correlates with greater loneliness, negative religious coping positively correlates with stress and depression. In contrast, positive religious coping negatively correlates with depression and loneliness. Han and Richardson (2010) explored the role of spirituality and found that spirituality significantly moderated the association

between depression and loneliness; however, changes in the relationship pattern varied according to the level of spirituality. For example, the positive relationship between loneliness and depression was weaker among older adults who reported higher spirituality measures.

### **Risks for Homebound in Older Adults**

Researchers identified the risk factors regarding homebound in four studies (Bedard-Thomas et al., 2019; Cohen-Mansfield et al., 2012; Jing et al., 2017; Xiang et al., 2019). In two studies, limited functional status and activity limitation influenced homebound occurrence (Bedard-Thomas et al., 2019; Jing et al., 2017). Participants' perspectives highlighted the importance of getting out of their homes or visiting friends/family (Bedard-Thomas et al., 2019). Other factors that influence homebound occurrence include depressive symptoms, hearing impairment, being old, lack of exercise, and low social support (Jing et al., 2017). A large study (n=7,607) that followed participants over seven years found that the progression of homebound status among community-dwelling older adults followed three distinct trajectories: the "never" group (65.5%) who remained non-homebound; the "chronic" group who were persistently homebound (8.3%); and the "onset" group (26.2%) who had a rapid increase in their risk of being homebound (Xiang et al., 2019). According to this study, the factors that increased the risk for being in the "onset" and "chronic" groups include older age, Hispanic ethnicity, social isolation, past or current smoking, limitations in activities of daily living, probable dementia, and use of a walker or wheelchair. Another large study by Cohen-Mansfield et al. (2012) examined the prevalence and correlates of homebound status in 1,609 older Jewish population and found that participants who were homebound, when compared to those non-homebound, tended to be older, female, have obese or underweight body mass index (BMI), poorer health, lower functional status, less income, higher depressed affect, and are more likely to have stairs and no elevators than their

counterparts. While these studies highlighted the risks that are known regarding older adults who are homebound, the question remains ‘what are the descriptions of the settings in which older adults who are homebound live’?

### **Location of Older Adults who are Homebound**

Study settings described in 13 of the review articles were in the participant’s homes, and one was in a daycare center. However, participants’ living arrangements varied across studies. In one study, 70.4% of the participants were widowed and lived alone (Arnaert & Delesie, 2007). In the study by Choi et al. (2020), Thomas et al. (2016), and Xiang et al. (2019), 68%, 58.8%, and 29.9% of participants, respectively, lived alone. In the Beck et al. (2009) study, 98% of participants lived at home or in an apartment, and 0.2% lived at an assisted living community; in the Cotterill and Taylor (2001) study, 86% of participants reported living alone, 10% lived with a family, and 2% lived with a spouse. Fifty percent of the Han and Richardson (2010) study participants lived in a house, and 50% lived in a senior apartment. The participants in Jing et al. (2017) study lived in urban communities.

### **Methods to Reduce Loneliness in Older Adults who are Homebound**

Ten of the studies included in this review explored methods to reduce loneliness in older adults who are homebound. These methods included home visits, technology, physical and mental health interventions, and personal religious beliefs. Thomas et al. (2016) examined the effect of home-delivered meals on levels of loneliness of 626 older adults on waiting lists at eight Meals on Wheels programs in the United States. These study participants were randomly assigned to receive daily meal delivery, frozen once-weekly meals delivery, or remain on the waiting list. The participants who remained on the waiting list had the highest loneliness score. Among the groups that received delivered meals, the group receiving daily-delivered meals experienced less

loneliness than those who received once-weekly delivered meals. The Meals on Wheels program was not intentionally designed as a loneliness intervention; however, some participants had decreased loneliness.

The same can be said for physician home visit programs. Beck et al. (2009) examined the effect of a physician home visit program and found that the House Calls for Seniors program demonstrated improved quality in preventive health services, recognition of geriatric syndromes, and patient satisfaction. For instance, during the 2007/08 influenza season, of the 179 patients in the program, 94% were offered the influenza vaccine; 23% of them refused, and 72% accepted. The authors also reported an improvement in the pneumococcal vaccination rate of 82% compared to the national average of eight percent. Beck et al. (2009) reported an increase in the discussion about advance directives and care goals. The study also showed that the annual risk for fall assessments improved from 60% in 2006 to 97% in July 2008. The authors also reported increased care coordination, which resulted in as many as 69% of patients having at least one new geriatric syndrome diagnosis. Another outcome of the House Calls for Seniors program, according to the authors, was improved patient satisfaction.

In accord with previous studies that explored the effects of visiting services, MacIntyre et al. (1999) examined the impact of volunteer visitors on life satisfaction and social support among 26 older adults in a pilot study. The authors randomized study participants into two groups: those who received friendly volunteer visitors and those who did not. The authors found statistically significant improvements in life satisfaction and social support of the participants who received friendly volunteer visitors. Two social support measures were: worth and social integration. “Worth” meant having a greater feeling of value, while “social integration” implied that the participants had people with whom to share activities.

Further studies on loneliness in older adults showed that when physical visits are not possible, technology can substitute for physical, social interaction. A Hungarian study examined whether the loneliness and depression of 15 older adults receiving long-term care would improve if they learned to use Skype (Széman, 2014). This study reported that Skype's use improved the participants' communications and mental states and strengthened their family and interpersonal relations. Like Széman (2014), who explored the use of Skype, Arnaert and Delesie (2007) examined video telephone nursing care's effect on 71 older adults. The findings were similar to the findings of Széman (2014) and showed improvement in loneliness. However, unlike the previous researcher, Arnaert and Delesie (2007) grouped participants according to age range and observed social and emotional loneliness changes. According to these authors, males under 70 years of age who had low levels of social activity ( $N = 8$ ,  $\gamma = 0.56$ ,  $p \leq 0.005$ ), moderate physical limitations ( $N = 11$ ,  $\gamma = 0.79$ ,  $p \leq 0.014$ ), or severe physical pain ( $N = 16$ ,  $\gamma = 0.58$ ,  $p \leq 0.03$ ) showed significant changes in emotional loneliness with the use of video telephone nursing care. Also, participants who were older, widowed, lived alone, had financial problems, and used several health services and social services showed positive changes in feelings of social loneliness.

Similarly, in a recent study, Choi et al. (2020) examined the effectiveness of videoconference interventions for improving social connectedness for lonely older adults. These interventions took either the form of a lay coach with a goal of short-term behavioral activation (Tele-BA) or a videoconferenced friendly visit (Tele-FV). The study results showed no difference between the groups at baseline. However, at a 6-week follow-up, Tele-BA participants reported more social interaction and less loneliness and depression than Tele-FV participants. Also, at 12 weeks follow-up, depression scores were lower for Tele-BA participants than Tele-FV participants.

As in the previous study, other research finds that behavioral therapy combined with physical activity can also reduce loneliness and depression among older adults who are homebound. Jing et al. (2018) examined whether Baduanjin training combined with Cognitive Behavioral Therapy (CBT) improved psychological status in 120 older adults who were homebound. *Baduanjin qigong* is a traditional Chinese exercise that combines “physical activity with breathing regulation and psychological adjustment” (Jing et al., 2018, p. 2). This study's participants were randomized into three groups: Baduanjin training group, CBT group, and Baduanjin training combined with CBT group. The authors compared pre-intervention scores with post-intervention scores measured at three months and six months. The result showed that the combined intervention effect, i.e., Baduanjin training and CBT, was superior to CBT or Baduanjin interventions alone. In the group receiving joint Baduanjin and CBT intervention, activities of daily living (ADL), self-assessed loneliness, and depression levels were significantly reduced ( $p < 0.05$ ) at three months and six months compared to the Baduanjin only group or the CBT only group.

Even though therapeutic interventions are proven to decrease loneliness and depression in older adults who are homebound, other research demonstrates these methods' alternatives. Cotterill and Taylor (2001) reported the findings from a qualitative sociological study of an Ageing Well project for older adults who are homebound. This program's activities ranged from quizzes and games to low impact exercise and reminiscence sessions. Sixty percent of the 47 participants stated that they sometimes felt lonely, and 30% said they would like to ‘see more people.’ The authors also reported that almost half of the participants (49%) said they did not want to ‘see more people.’ This is an interesting finding as it supports the major difference between loneliness (a perceived deficit in the quality of relationship) and social isolation (the



number of social relationships). Additionally, the authors found that in terms of coping with loneliness, substitutes for social contact like watching television or listening to the radio were the most common strategies among the participants.

While the previous studies have investigated the relationship between feelings of loneliness and depression, other researchers have explored the connection between spirituality and religion. Han and Richardson (2010), using cross-sectional analysis, examined the interrelationships between loneliness, depression, and spirituality among 40 older adults who were homebound and lived alone in urban areas in Ohio. The authors found a statistically significant relationship between loneliness and depression. They observed that the positive relationship between loneliness and depression was weaker among older persons who reported higher spirituality measures.

According to the authors, this finding suggests that spirituality might buffer loneliness and depression. Like Han and Richardson (2010), which identified spirituality as a method of coping with loneliness and depression, Boss (2016) found that the positive relationship between loneliness and depression was weaker among the older persons who reported higher scores on the spirituality measure. According to this study, positive religious coping had negative correlation with depression ( $r = -0.29, p \leq 0.006$ ) and with loneliness ( $r = -0.23, p \leq 0.03$ ) while negative religious coping had positive correlation with depression, and loneliness ( $r = 0.21, r = 0.47, p \leq 0.05$  for both).

## **Discussion**

The current review revealed a range of interventions and coping strategies utilized to reduce loneliness and improve health outcomes in older adults who are homebound. These interventions range from video telephone, Skype, video conference to in-person contact through meal delivery, friendly visits, exercise, and group activities. Although the authors had different theories about

the targeted factors, they reported reduced loneliness through these interventions. The finding regarding the use of technology is in line with the review by Gardiner et al. (2018), which highlights the potential for improving social connectedness with technology.

There were variations in loneliness assessment tools used in the studies. One study (Cohen-Mansfield et al., 2012) measured loneliness using the 1-item loneliness measure. Arnaert and Delesie (2007) utilized the 12-item Loneliness Scale. Boss et al. (2016) used the 20-item University of California Los Angeles (UCLA) Loneliness Scale. Two studies (Bedard-Thomas et al., 2019; Han & Richardson, 2010) used the 6-item De Jong Gierveld Loneliness Scale, and four studies (Choi et al., 2020; Jing et al., 2018; Jing et al., 2017; Thomas et al., 2016) measured loneliness using the 3-item Loneliness Scale. The lack of uniformity of measuring tools poses a challenge in comparing studies and may have contributed to inconsistencies in the study results. Even though all the studies referred to older adults who were homebound, the homebound definition was not clearly stated in most studies. Only five studies operationally defined homebound (Boss et al., 2016; Cohen-Mansfield et al., 2012; Jing et al., 2018; Jing et al., 2017; Xiang et al., 2019), and the definitions provided were not uniform. Additionally, the participants' baseline health status was unclear, making it difficult to gauge whether their baseline health status was comparable across all studies. For instance, one study's inclusionary criterion was "not diagnosed with a neurodegenerative disease" (Boss et al., 2016), and another was "not cognitively impaired" (MacIntyre et al., 1999). One inclusion criteria in Choi et al. (2020) study was having a confirmation of loneliness score of  $\geq 6$  and no depressive symptoms versus being lonely and/or depressed (Széman, 2014). Other inclusionary criteria were having limited outdoor mobility (Széman, 2014), defined as being homebound (Beck et al., 2009), and meeting the international criteria for being housebound (left the House once per week or fewer over at least

six months) (Jing et al., 2018). These differences in inclusionary criteria may have contributed to variation in reported rates and correlates of loneliness.

Two studies (Boss et al., 2016; Thomas et al., 2016) made reference to the use of a theoretical framework, and Xiang et al. (2019) referenced a conceptual framework. However, Hawker et al. (2002) Appraising the Evidence Tool does not include a score for a theoretical or conceptual framework. There was a lack of theory underpinning the other 11 studies. Most of the studies provided a sampling method description; however, only two out of the eleven quantitative studies provided the Power calculation for sample size (Boss et al., 2016; Cohen-Mansfield et al., 2012). Power analysis of the sample size is also not scored in the Hawker et al. (2002) Appraising the Evidence Tool. The final scoring for all of the studies ranged between 29 and 36, meaning that they were *fair to good* (Table 2).

**Table 2***Quality Assessment Grade of the Reviewed Studies (N=14)*

Author/ Year	Abstract and Title	Introduction and Aims	Methods and Data	Sampling	Data Analysis	Ethics and Bias	Findings /Results	Transferability/ Generalizability	Implication and Usefulness	Total Score
Arnaert and Delesie (2007)	4	2	3	3	4	4	3	3	3	29
Beck et al. (2009)	4	4	3	3	4	4	4	4	4	34
Bedard- Thomas et al. (2019)	4	4	3	3	3	4	3	2	3	29
Boss et al. (2016)	4	4	4	4	4	4	4	4	4	36
Choi et al. (2020)	4	4	4	4	4	4	4	4	4	36
Cohen- Mansfield et al. (2012)	4	4	4	4	4	4	4	4	4	36
Cotterill and Taylor (2001)	3	4	4	4	3	4	4	4	4	34
Han and Richardson (2010)	4	4	4	3	4	4	4	4	4	35
Jing et al. (2018)	4	4	4	4	4	4	4	3	3	34
Jing et al. (2017)	4	4	4	4	4	4	3	3	3	33

MacIntyre et al. (1999)	4	3	4	3	3	3	3	3	3	29
Szeman (2014)	3	4	3	3	4	4	3	4	4	32
Thomas et al. (2016)	4	4	4	4	4	4	4	4	4	36
Xiang et al. (2019)	4	4	4	4	4	4	4	4	4	36

The study participants in the reviewed studies lived in various settings. For example, in one study, participants lived in the community. They were receiving home care (physical or/and mental care such as personal hygiene, basic nursing, shopping, medication, delivering or giving food, etc.) (Széman, 2014). In some studies, participants lived in rural (Boss et al., 2016) and urban (Jing et al., 2017) settings. Given that the studies were conducted in various regions, most of them recruited participants from the local settings. For example, Jing et al. (2017) recruited older Chinese adults who lived in rural China, and Cohen-Mansfield et al.'s (2012) study participants were older Jewish population from Israel. Local data limits the findings' generalizability as they may not represent the cultural influences and coping behaviors of people with a different ethnic and religious profile.

### **Limitations**

This review has limitations. With the recent increase in research on loneliness due to COVID-19, it is likely that more manuscripts were in the process of publication, and therefore not located.

The concepts of loneliness and social isolation are sometimes used interchangeably in the literature; therefore, some studies may have been unintentionally excluded. The studies reviewed were conducted in various regions, as shown in Table 1, and the meaning of loneliness may vary by culture. The review was restricted to English-only articles; thus, studies published in other languages may have been omitted. The definition of homebound, participants' baseline health status, and loneliness measurement tools used in the studies were inconsistent, limiting the comparison of findings. Additionally, Hawker et al. (2002) Appraising the Evidence Tool did not give a score for using a theoretical or conceptual framework and power calculation for sample size.

### **Implications for Future Research and Practice**

This review adds to the growing body of evidence about loneliness in older adults who are homebound, and several research gaps were identified. There is substantial variation in loneliness measures in the reviewed studies and inconsistencies in the homebound definition. Future research should use a standardized loneliness measurement tool and a uniform definition of homebound status to address this. This is particularly important as multidisciplinary healthcare providers with different skill sets may conduct loneliness assessments in the home settings. The need to identify successful strategies to reduce loneliness in older adults who are homebound has become increasingly urgent in the wake of the COVID-19 crisis. The use of technology is promising for reducing loneliness in older adults who are homebound. Research utilizing rigorous experimental design is necessary to explore this potential benefit of technology further and add to the body of knowledge in this area. Programs designed to address loneliness in older adults who are homebound should be tailored to meet their physical abilities in addition to meeting their psychosocial needs. Additionally, further research is needed to explore the direct role of spirituality and religiosity in coping with this population's loneliness.

Recommendations of the National Academies of Sciences Engineering and Medicine [NASEM] (2020, pp. 143-144) for healthcare providers when caring for older adults who are currently socially isolated or lonely (or at an elevated risk for social isolation or loneliness) include that clinicians should:

- periodically perform an assessment using one or more validated tools to identify older adults experiencing social isolation and loneliness in order to initiate potential preventive interventions after having identified individuals who are at an elevated risk due to life events (e.g., loss of a significant relationship, geographic move, relevant health conditions),

- discuss the adverse health outcomes associated with social isolation and loneliness with these older adults and their legally appointed representatives,
- make appropriate efforts to connect isolated or lonely older adults with needed social care, and
- attempt to determine the underlying causes and use evidence-based practices tailored to appropriately address those causes (e.g., hearing loss, mobility limitations).

### **Conclusion**

Research about loneliness in older adults who are homebound is limited. The current article represents the only review of loneliness in older adults who are homebound to the authors' knowledge. Despite the different sample sizes, different loneliness measuring tools, and the various countries in which the reviewed studies were conducted, results show that loneliness is detrimental to the health of older adults who are homebound. With the increasing aging population, the number of older adults who are homebound will also continue to rise. The growing prevalence of loneliness in this population, compounded by the changing landscape brought on by COVID-19 restrictions, presents a growing public health concern. Raising awareness about the increasing epidemic of loneliness in older adults who are homebound, incorporating its assessment in their plan of care, and developing programs to alleviate it is critical.



## References

- Aanes, M., Hetland, J., Pallesen, S., & Mittelmark, M. (2011). Does loneliness mediate the stress-sleep quality relation? The Hordaland health study. *International Psychogeriatrics*, 23(6), 994-1002. <https://doi.org/10.1017/S1041610211000111>
- Administration on Aging (AoA). (2018). *2018 profile of older Americans*. <https://acl.gov/aging-and-disability-in-america/data-and-research/profile-older-americans>
- Alaviani, M., Khosravan, S., Alami, A., & Moshki, M. (2015). The effect of a multi-strategy program on developing social behaviors based on Pender's health promotion model to prevent loneliness of old women referred to gonabad urban health centers. *International Journal of Community Based Nursing & Midwifery*, 3(2), 132.
- Anderson, G. O., & Thayer, C. E. (2018). Loneliness and social connections: A national survey of adults 45 and older. *Washington, DC: AARP Foundation*.  
<https://doi.org/10.26419/res.00246.001>
- Arnaert, A., & Delesie, L. (2007). Effectiveness of video-telephone nursing care for the homebound elderly. *Canadian Journal of Nursing Research*, 39(1), 20-36.
- Beck, R., Arizmendi, A., Purnell, C., Fultz, B., & Callahan, C. (2009). House calls for seniors: Building and sustaining a model of care for homebound seniors [corrected] [published erratum appears in J AM GERIATR SOC 2010 Nov;58(11):2258]. *Journal of the American Geriatrics Society*, 57(6), 1103-1109. <https://doi.org/10.1111/j.1532-5415.2009.02278.x>
- Bedard-Thomas, J., Gausvik, C., Wessels, J., Regan, S., Goodnow, K., & Goroncy, A. (2019). I live alone but don't feel alone: Social isolation and loneliness from the patient

- perspective. *Journal of Patient-Centered Research and Reviews*, 6(4), 262-266.  
<https://doi.org/10.17294/2330-0698.1715>
- Beutel, M. E., Klein, E. M., Brähler, E., Reiner, I., Jünger, C., Michal, M., Wiltink, J., Wild, P. S., Münzel, T., & Lackner, K. J. (2017). Loneliness in the general population: Prevalence, determinants and relations to mental health. *BMC Psychiatry*, 17(1), 97.  
<https://doi.org/10.1186/s12888-017-1262-x>
- Boss, L., Branson, S., Cron, S., & Kang, D. (2016). Biobehavioral examination of religious coping, psychosocial factors, and executive function in homebound older adults. *Religions*, 7(5). <https://doi.org/10.3390/rel7050042>
- Boss, L., Kang, D., & Branson, S. (2015). Loneliness and cognitive function in the older adult: A systematic review. *International Psychogeriatrics*, 27(4), 541-553.  
<https://doi.org/10.1017/s1041610214002749>
- Brooke, J., & Jackson, D. (2020). Older people and COVID-19: Isolation, risk and ageism. *Journal of Clinical Nursing*, 2044-2046. <https://doi.org/10.1111/jocn.15274>
- Brooks, L. (1933). The relation of spatial isolation to psychosis. *The Journal of Abnormal and Social Psychology*, 27(4), 375.
- Cacioppo, J., & Cacioppo, S. (2018). The growing problem of loneliness. *The Lancet*, 391, 426.  
[https://doi.org/10.1016/S0140-6736\(18\)30142-9](https://doi.org/10.1016/S0140-6736(18)30142-9)
- Cacioppo, J., Hawkley, L., Crawford, L., Ernst, J., Burleson, M., Kowalewski, R., Malarkey, W., Van Cauter, E., & Berntson, G. (2002). Loneliness and health: Potential mechanisms. *Psychosomatic Medicine*, 64(3), 407-417.
- Canevello, A., & Crocker, J. (2010). Creating good relationships: responsiveness, relationship quality, and interpersonal goals. *Journal of Personality and Social Psychology*, 99(1), 78.

- Canevello, A., & Crocker, J. (2017). Compassionate goals and affect in social situations. *Motiv Emot*, 41(2), 158-179. <https://doi.org/10.1007/s11031-016-9599-x>
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54(3), 165.
- Choi, N., Pepin, R., Marti, C., Stevens, C., & Bruce, M. (2020). Improving social connectedness for homebound older adults: Randomized controlled trial of tele-delivered behavioral activation versus tele-delivered friendly visits. *American Journal of Geriatric Psychiatry*, 28(7), 698-708. <https://doi.org/10.1016/j.jagp.2020.02.008>
- Cigna. (2018). *Cigna U. S Loneliness Index: Survey of 20,000 Americans examining behaviors driving loneliness in the United States*.  
[https://www.multivu.com/players/English/8294451-cigna-us-loneliness-survey/docs/IndexReport\\_1524069371598-173525450.pdf](https://www.multivu.com/players/English/8294451-cigna-us-loneliness-survey/docs/IndexReport_1524069371598-173525450.pdf)
- Cohen-Mansfield, J., Hazan, H., Lerman, Y., & Shalom, V. (2016). Correlates and predictors of loneliness in older adults: A review of quantitative results informed by qualitative insights. *International Psychogeriatrics*, 28(4), 557-576.  
<https://doi.org/http://dx.doi.org/10.1017/S1041610215001532>
- Cohen-Mansfield, J., Shmotkin, D., & Hazan, H. (2012). Homebound older persons: Prevalence, characteristics, and longitudinal predictors. *Archives of Gerontology and Geriatrics*, 54(1), 55-60. <https://doi.org/10.1016/j.archger.2011.02.016>
- Cotterill, L., & Taylor, D. (2001). Promoting mental health and wellbeing amongst housebound older people. *Quality in Ageing*, 2(3), 32-46.
- Crocker, J. (2008). From egosystem to ecosystem: Implications for relationships, learning, and well-being. In H. A. Wayment & J. J. Bauer (Eds.), *Transcending self-interest:*

- Psychological explorations of the quiet ego* (pp. 63-72). American Psychological Association. <https://doi.org/10.1037/11771-006>
- Crocker, J., & Canevello, A. (2008). Creating and undermining social support in communal relationships: The role of compassionate and self-image goals. *Journal of Personality and Social Psychology, 95*(3), 555-575. <https://doi.org/10.1037/0022-3514.95.3.555>
- Crocker, J., & Canevello, A. (2015). Relationships and the self: Egosystem and ecosystem. In M. Mikulincer, P. R. Shaver, J. A. Simpson, & J. F. Dovidio (Eds.), *APA handbook of personality and social psychology* (Vol. 3, pp. 93-116). American Psychological Association. <https://doi.org/10.1037/14344-004>
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment, 49*(1), 71-75.
- DiJulio, B., Hamel, L., Muñana, C., & Brodie, M. (2018). Loneliness and social isolation in the United States, the United Kingdom, and Japan: An international survey. *The Economist & Kaiser Family Foundation*.
- Duarte, J., & Pinto-Gouveia, J. (2015). Focusing on self or others has different consequences for psychological well-being: A longitudinal study of the effects of distinct interpersonal goals. *Journal of Social and Clinical Psychology, 34*(9), 809-825.  
<https://doi.org/10.1521/jscp.2015.34.9.809>
- Dykstra, P. A., van Tilburg, T. G., & Gierveld, J. D. (2005). Changes in older adult loneliness: Results from a seven-year longitudinal study. *Research on Aging, 27*(6), 725-747.
- Eskelinen, K., Hartikainen, S., & Nykänen, I. (2016). Is loneliness associated with malnutrition in older people? *International Journal of Gerontology, 10*(1), 43-45.  
<https://doi.org/10.1016/j.ijge.2015.09.001>

- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G\*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149-1160.
- Gardiner, C., Geldenhuys, G., & Gott, M. (2018). Interventions to reduce social isolation and loneliness among older people: An integrative review. *Health & Social Care in the Community*, *26*(2), 147-157. <https://doi.org/10.1111/hsc.12367>
- Geggel, L. (2018). *Why the UK just appointed a Minister of Loneliness*. Retrieved November 25 from <https://www.livescience.com/61466-ministry-of-loneliness.html>
- 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.
- Giorgi, A. (2012). The descriptive phenomenological psychological method. *Journal of Phenomenological Psychology*, *43*(1), 3-12.
- Gum, A. M., Shiovitz-Ezra, S., & Ayalon, L. (2017). Longitudinal associations of hopelessness and loneliness in older adults: Results from the US health and retirement study. *International Psychogeriatrics*, *29*(9), 1451-1459. <https://doi.org/10.1017/S1041610217000904>
- Han, J., & Richardson, V. (2010). The relationship between depression and loneliness among homebound older persons: does spirituality moderate this relationship? *Journal of Religion & Spirituality in Social Work*, *29*(3), 218-236. <https://doi.org/10.1080/15426432.2010.495610>

- Hawker, S., Payne, S., Kerr, C., Hardey, M., & Powell, J. (2002). Pearls, pith, and provocation. Appraising the evidence: Reviewing disparate data systematically. *Qualitative Health Research, 12*(9), 1284-1299. <https://doi.org/10.1177/1049732302238251>
- Hawkey, L., Hughes, M., Waite, L., Masi, C., Thisted, R., & Cacioppo, J. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago health, aging, and social relations study. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences, 63*(6), S375-384. <https://doi.org/10.1093/geronb/63.6.s375>
- Hawkey, L., Thisted, R., & Cacioppo, J. (2009). Loneliness predicts reduced physical activity: Cross-sectional & longitudinal analyses. *Health Psychology, 28*(3), 354-363. <https://doi.org/10.1037/a0014400>
- Hawkey, 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. <https://doi.org/10.1007/s12160-010-9210-8>
- Hawkey, L. C., Preacher, K. J., & Cacioppo, J. T. (2010). Loneliness impairs daytime functioning but not sleep duration. *Health Psychology, 29*(2), 124.
- Hawkey, L. C., Wroblewski, K., Kaiser, T., Luhmann, M., & Schumm, L. P. (2019). Are US older adults getting lonelier? Age, period, and cohort differences. *Psychology and Aging, 34*(8), 1144. <https://doi.org/10.1037/pag0000365>
- Henning-Smith, C., Moscovice, I., & Kozhimannil, K. (2019, Sep). Differences in Social Isolation and Its Relationship to Health by Rurality. *Journal of Rural Health, 35*(4), 540-549. <https://doi.org/10.1111/jrh.12344>

- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science, 10*(2), 227-237.
- HRS. (2019). *Health and Retirement Study: 2016 Tracker Early Data Description and Usage. Version 3.0.*
- Hughes, M. E., Waite, L. J., Hawkey, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging, 26*(6), 655-672.
- Hulley, S., Cummings, S., Browner, W., Grady, D., & Newman, T. (2013). *Designing clinical research* (4th, Ed.). Lippincott Williams & Wilkins.
- Iecovich, E., & Biderman, A. (2012). Attendance in adult day care centers and its relation to loneliness among frail older adults. *International Psychogeriatrics, 24*(3), 439-448. <https://doi.org/10.1017/s1041610211001840>
- Jing, L., Jin, Y., Zhang, X., Wang, F., Song, Y., & Xing, F. (2018). The effect of Baduanjin qigong combined with CBT on physical fitness and psychological health of elderly housebound. *Medicine 97*(51), 1-7. <https://doi.org/10.1097/md.00000000000013654>
- Jing, L., Wang, F., Zhang, X., Yao, T., & Xing, F. (2017). Occurrence of and factors influencing elderly homebound in Chinese urban community: A cross-sectional study. *Medicine 96*(26), 1-6. <https://doi.org/10.1097/MD.00000000000007207>
- Kelly, D., Steiner, A., Mazzei, M., & Baker, R. (2019). Filling a void? The role of social enterprise in addressing social isolation and loneliness in rural communities. *Journal of Rural Studies, 70*, 225-236.

- Kemperman, A., van den Berg, P., Weijs-Perrée, M., & Uijtdewillegen, K. (2019). Loneliness of older adults: Social network and the living environment. *International Journal of Environmental Research and Public Health*, 16(3), 406.
- Kharicha, K., Iliffe, S., Harari, D., Swift, C., Gillmann, G., & Stuck, A. E. (2007). Health risk appraisal in older people 1: Are older people living alone an 'at-risk' group? *British Journal of General Practice*, 57(537), 271-276.
- Krause-Parello, C. A. (2012). Pet ownership and older women: The relationships among loneliness, pet attachment support, human social support, and depressed mood. *Geriatric Nursing*, 33(3), 194-203.
- Lee, E., Depp, C., Palmer, B., Glorioso, D., Daly, R., Liu, J., Tu, X., Kim, H., Tarr, P., Yamada, Y., & Jeste, D. V. (2018). High prevalence and adverse health effects of loneliness in community-dwelling adults across the lifespan: Role of wisdom as a protective factor. *International Psychogeriatrics*, 1-16. <https://doi.org/10.1017/s1041610218002120>
- Lindsay, E. K., Young, S., Brown, K. W., Smyth, J. M., & Creswell, J. D. (2019). Mindfulness training reduces loneliness and increases social contact in a randomized controlled trial. *Proceedings of the National Academy of Sciences of the United States of America*, 116(9), 3488-3493. <https://doi.org/10.1073/pnas.1813588116>
- Luhmann, M., & Hawkley, L. (2016). Age differences in loneliness from late adolescence to oldest old age. *Developmental Psychology*, 52(6), 943. <https://doi.org/10.1037/dev0000117>
- MacIntyre, I., Corradetti, P., Roberts, J., Browne, G., Watt, S., & Lane, A. (1999). Pilot study of a visitor volunteer programme for community elderly people receiving home health care.



*Health Soc Care Community*, 7(3), 225-232. <https://doi.org/10.1046/j.1365-2524.1999.00178.x>

MacNeill, L., DiTommaso, E., & Brunelle, C. (2016). Coping style as a moderator of chronic loneliness and substance use in emerging adults. *Journal of Depression and Anxiety*, 5(215), 2167-1044.1000215.

Mather, M., Jacobsen, L., & Pollard, K. (2015). Aging in the United States. *Population Bulletin*, 70(2). <https://www.prb.org/wp-content/uploads/2016/01/aging-us-population-bulletin-1.pdf>

Miller, E. (2020). Protecting and improving the lives of older adults in the COVID-19 era. *Journal of Aging and Social Policy*, 32(4-5), 297-309. <https://doi.org/10.1080/08959420.2020.1780104>

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine*, 151(4), 264-269.

Moorer, P., & Suurmeijer, T. P. (2001). The effects of neighbourhoods on size of social network of the elderly and loneliness: A multilevel approach. *Urban Studies*, 38(1), 105-118.

Morgan, T., Wiles, J., Moeke-Maxwell, T., Black, S., Park, H. J., Dewes, O., Williams, L. A., & Gott, M. (2019). 'People haven't got that close connection': Meanings of loneliness and social isolation to culturally diverse older people. *Aging Mental Health*, 1-9. <https://doi.org/10.1080/13607863.2019.1633619>

Musich, S., Wang, S. S., Hawkins, K., & Yeh, C. S. (2015). The impact of loneliness on quality of life and patient satisfaction among older, sicker adults. *Gerontology and Geriatric Medicine*, 1, 1-9.

- Nathans, L., Oswald, F., & Nimon, K. (2012). Interpreting multiple linear regression: A guidebook of variable importance. *Practical Assessment, Research & Evaluation, 17*(9), 1-19. <https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1265&context=pars>
- National Academies of Sciences Engineering and Medicine [NASEM]. (2020). *Social isolation and loneliness in older adults: Opportunities for the health care system*. <https://www.nationalacademies.org/our-work/the-health-and-medical-dimensions-of-social-isolation-and-loneliness-in-older-adults>
- Ortman, J., Velkoff, V., & Hogan, H. (2014). *An aging nation: The older population in the United States*. <https://www.census.gov/content/dam/Census/library/publications/2014/demo/p25-1140.pdf>
- Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5*(2), 164-172.
- Penninx, B., Van Tilburg, T., Kriegsman, D., Deeg, D., Boeke, A., & van Eijk, J. (1997). Effects of social support and personal coping resources on mortality in older age: The longitudinal aging study Amsterdam. *American Journal of Epidemiology, 146*(6), 510-519.
- Peplau, H. (1955). Loneliness. *The American Journal of Nursing, 55*(12), 1476-1481. <https://doi.org/10.2307/3469548>
- Perissinotto, C. M., Cenzer, I. S., & Covinsky, K. E. (2012). Loneliness in older persons: A predictor of functional decline and death. *Archives of Internal Medicine, 172*(14), 1078-1084.

- Petitte, T., Mallow, J., Barnes, E., Petrone, A., Barr, T., & Theeke, L. (2015). A systematic review of loneliness and common chronic physical conditions in adults. *Open Psychol J*, 8(Suppl 2), 113.
- Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., Maes, M., & Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science*, 10(2), 250-264. <https://doi.org/10.1177/1745691615568999>
- Rico-Uribe, L. A., Caballero, F. F., Martín-María, N., Cabello, M., Ayuso-Mateos, J. L., & Miret, M. (2018). Association of loneliness with all-cause mortality: A meta-analysis. *PloS One*, 13(1), e0190033.
- Rokach, A. M. I., & Bacanlı, H. (2001). Perceived causes of loneliness: A cross-cultural comparison. *Social Behavior & Personality: an international journal*, 29(2), 169-182.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor Structure. *Journal of Personality Assessment*, 66(1), 20.
- Saito, T., Kai, I., & Takizawa, A. (2012). Effects of a program to prevent social isolation on loneliness, depression, and subjective well-being of older adults: A randomized trial among older migrants in Japan. *Archives of Gerontology and Geriatrics*, 55(3), 539-547.
- Savikko, N., Routasalo, P., Tilvis, R., Strandberg, T., & Pitkälä, K. (2005). Predictors and subjective causes of loneliness in an aged population. *Archives of Gerontology and Geriatrics*, 41(3), 223-233. <https://doi.org/10.1016/j.archger.2005.03.002>
- Segel-Karpas, D., Ayalon, L., & Lachman, M. E. (2018). Loneliness and depressive symptoms: The moderating role of the transition into retirement. *Aging & Mental Health*, 22(1), 135-140.

- Servais, M. A. (2010). *Overview of HRS public data files for cross-sectional and longitudinal analysis.*
- Shovestul, B., Han, J., Germine, L., & Dodell-Feder, D. (2020). Risk factors for loneliness: The high relative importance of age versus other factors. *PloS One*, *15*(2), 1-18.  
<https://doi.org/10.1371/journal.pone.0229087>
- Smith, J., Ryan, L., Fisher, G., Sonnega, A., & Weir, D. (2017). *Psychosocial and Lifestyle Questionnaire 2006 - 2016: Documentation Report.*
- Széman, Z. (2014). A new pattern in long-term care in Hungary: Skype and youth volunteers. *Anthropological Notebooks*, *20*(1), 105-117.
- Tang, F., & Lee, Y. (2011). Social support networks and expectations for aging in place and moving. *Research on Aging*, *33*, 444-464. <https://doi.org/10.1177/0164027511400631>
- Tarugu, J., Pavithra, R., Vinothchandar, S., Basu, A., Chaudhuri, S., & John, K. (2019). Effectiveness of structured group reminiscence therapy in decreasing the feelings of loneliness, depressive symptoms and anxiety among inmates of a residential home for the elderly in Chittoor district. *International Journal of Community Medicine and Public Health*, *6*(2), 847.
- Teguo, M., Simo-Tabue, N., Stoykova, R., Meillon, C., Cogne, M., Amiéva, H., & Dartigues, J.-F. (2016). Feelings of loneliness and living alone as predictors of mortality in the elderly: The PAQUID study. *Psychosomatic Medicine*, *78*(8), 904-909.  
<https://doi.org/10.1097/PSY.0000000000000386>
- Theeke. (2010). Sociodemographic 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.

- Theeke, L. (2009). Predictors of loneliness in U.S. adults over age sixty-five. *Archives of Psychiatric Nursing*, 23(5), 387-396. <https://doi.org/10.1016/j.apnu.2008.11.002>
- Theeke, L., & Mallow, J. (2013). Loneliness and quality of life in chronically ill rural older adults. *American Journal of Nursing*, 113(9), 28-38. <https://doi.org/10.1097/01.NAJ.0000434169.53750.14>
- Thomas, K., Akobundu, U., & Dosa, D. (2016). More than a meal? A randomized control trial comparing the effects of home-delivered meals programs on participants' feelings of loneliness. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, 71(6), 1049-1058. <https://doi.org/10.1093/geronb/gbv111>
- Tijhuis, M., De Jong-Gierveld, J., Feskens, E., & Kromhout, D. (1999). Changes in and factors related to loneliness in older men: The Zutphen elderly study. *Age and Ageing*, 28(5), 491-495.
- Tse, M. M., Lai, C., Lui, J. Y., Kwong, E., & Yeung, S. Y. (2016). Frailty, pain and psychological variables among older adults living in Hong Kong nursing homes: Can we do better to address multimorbidities? *Journal of Psychiatric and Mental Health Nursing*, 23(5), 303-311. <https://doi.org/10.1111/jpm.12303>
- U. S. Census Bureau. (2018). *The population 65 years and older in the United States*. <https://www.census.gov/content/dam/Census/library/publications/2018/acs/ACS-38.pdf>
- Weijs-Perrée, M., van den Berg, P., Arentze, T., & Kemperman, A. (2015). Factors influencing social satisfaction and loneliness: A path analysis. *Journal of Transport Geography*, 45, 24-31. <https://doi.org/10.1016/j.jtrangeo.2015.04.004>
- Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, 52(5), 546-553.

- Wilson, C., & Moulton, B. (2010). Loneliness among older adults: A national survey of adults 45+. *Washington, DC: AARP*. [https://www.aarp.org/research/topics/life/info-2014/loneliness\\_2010.html](https://www.aarp.org/research/topics/life/info-2014/loneliness_2010.html)
- World Health Organization. (2017). *Mental health of older adults*. <https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults>
- World Health Organization. (2018). *Ageing and health: Key facts*. <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
- Wrzus, C., Hanel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: a meta-analysis. *Psychological Bulletin*, 139(1), 53-80. <https://doi.org/10.1037/a0028601>
- Xiang, X., Chen, J., & Kim, M. (2019). Trajectories of homebound status in Medicare beneficiaries aged 65 and older. *Gerontologist*. <https://doi.org/10.1093/geront/gnz023>
- Yanguas, J., Pinazo-Henandis, S., & Tarazona-Santabalbina, F. J. (2018). The complexity of loneliness. *Acta Bio Medica: Atenei Parmensis*, 89(2), 302.
- Yin, J., Lassale, C., Steptoe, A., & Cadar, D. (2019). Exploring the bidirectional associations between loneliness and cognitive functioning over 10 years: The English longitudinal study of ageing. *International Journal of Epidemiology*. <https://doi.org/10.1093/ije/dyz085>
- Yu, J., Lam, C., & Lee, T. (2016). Perceived loneliness among older adults with mild cognitive impairment. *International Psychogeriatrics*, 28(10), 1681-1685. <https://doi.org/10.1017/S1041610216000430>

## Chapter 3

### Study Proposal

The following proposal was submitted for the proposal defense at Duquesne University. The proposal was successfully defended on November 12, 2020.

#### **Specific Aims**

Loneliness, the distress resulting from a discrepancy between actual and desired social relationships, occurs when a person's desired level of social relationships is not met (Hawkley & Cacioppo, 2010). Loneliness is a rising problem at both national and international levels (Cacioppo & Cacioppo, 2018). It has been linked to numerous psychological and physiological health problems, including depression and suicidal ideation (Beutel et al., 2017), hopelessness (Gum et al., 2017), substance abuse (MacNeill et al., 2016), cognitive impairment (Boss et al., 2015; Eskelinen et al., 2016; Yin et al., 2019), malnutrition (Eskelinen et al., 2016), hypertension (Cacioppo et al., 2002), disruptive sleep (Aanes et al., 2011), and mortality (Teguo et al., 2016). The high incidence of loneliness in the United Kingdom prompted the appointment of a Minister of Loneliness charged with combating loneliness among the 9 million people, 14% of the entire population, who reported feeling lonely (Geggel, 2018).

In a sample of the United States population in 2018, the Cigna Loneliness Index (n = 20,000) revealed that 46 percent of Americans report feeling lonely (Cigna, 2018). In that same year, survey studies by the AARP Foundation (Anderson & Thayer, 2018) and the Kaiser Family Foundation (DiJulio et al., 2018) found that more than one-third of adults aged 45 and older (35 percent) and more than a fifth of adults aged 18 and older (22 percent) report feeling lonely respectively. Loneliness affects people across the age spectrum; however, older adults are disproportionately affected due to declining physical health and loss of family and friends (Lee et

al., 2018). To combat loneliness and social isolation in older Americans, the National Academies of Sciences created the Social Isolation and Loneliness in Older Adults Committee in 2020, charged with identifying and recommending strategies to help reduce the incidence and adverse health effects of loneliness and social isolation (National Academies of Sciences Engineering and Medicine [NASEM], 2020).

A plethora of empirical literature exists regarding loneliness in older adults (Cohen-Mansfield et al., 2016; Kemperman et al., 2019), and the importance of race/ethnicity as it relates to loneliness has been documented (Hawkley et al., 2008; Hawkley et al., 2009; Henning-Smith et al., 2019; Morgan et al., 2019; Rokach & Bacanli, 2001). Rokach and Bacanli (2001) examined the antecedents of loneliness in a population (n = 1164) of people with diverse cultural backgrounds, religious beliefs, norms, and values from Argentina, Turkey, and Canada. The study showed that the experience of loneliness varies depending on the individual's cultural background. In another study with a diverse group of older adults, Hawkley et al. (2008) found that Hispanics and Blacks tended to be lonelier than Whites. In Hawkley et al. (2008), education and income were negatively associated with loneliness and explained racial/ethnic differences in loneliness. Loneliness was also associated with ethnicity in a 3-year longitudinal research study (Hawkley et al., 2009). Morgan et al. (2019) explored the experience of loneliness in four ethnically diverse groups of older adults in New Zealand (Maori, Pacific, Asian, and NZ European). They noted that the participants' experiences of loneliness and social isolation were "heavily mediated" by their cultural backgrounds (p. 7). Henning-Smith et al. (2019) conducted a secondary analysis of 3,377 non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanics that showed that non-Hispanic blacks had a greater likelihood of reporting feelings of loneliness. These studies highlight the significance of race/ethnicity as it relates to loneliness.



However, research has not documented the association between research variables of interpersonal goals (compassionate goals and self-image goals) and loneliness in older adults.

*Compassionate goals* focus on supporting others, not for self-gain, but out of consideration for others' well-being. *Self-image goals* involve constructing, maintaining, and defending a desired public or private image to gain or obtain something for the self (Crocker & Canevello, 2008). Current research suggests that interpersonal goals - compassionate and self-image - have strong implications for creating or undermining interpersonal relationships (Canevello & Crocker, 2017; Duarte & Pinto-Gouveia, 2015). Research has investigated and demonstrated the effect of compassionate and self-image goals on loneliness in younger adults. Compassionate goals are linked with feelings of clarity, connectedness and closeness to others, less interpersonal conflicts, and high positive emotions, while self-image goals are related to feelings of fear and confusion, loneliness, interpersonal conflicts, and low positive emotions (Duarte & Pinto-Gouveia, 2015). Published literature has also found that compassionate goals foster social support and trust while self-image goals undermine them (Crocker & Canevello, 2008). However, to date, research has not illuminated the effect of compassionate goals and self-image goals on loneliness in older adults. As many older adults face loneliness and there is limited literature in this area, it is appropriate to conduct further research so that health professionals can understand how these variables affect loneliness in this population. The present study will fill this knowledge gap by addressing the direct relationship between loneliness, compassionate and self-image goals, life satisfaction, and subjective well-being in older adults. Understanding how these variables relate to loneliness might help health care providers develop targeted interventions for decreasing loneliness in populations of older adults.

## **Purpose**

The purpose of the research study is to investigate the influence of interpersonal goals (compassionate and self-image goals), life satisfaction, and subjective well-being on loneliness in older adults.

## **Measures**

In the HRS dataset, variables were measured using the following tools:

1. Interpersonal goals (compassionate and self-image) were measured by the 6-item measure of Compassionate and Self-image Goals derived from Crocker and Canevello (2008) and Canevello and Crocker (2010).
2. Loneliness was measured using an 11-item scale designed for large surveys such as the HRS and based on a 3-item UCLA Loneliness Scale (Hughes et al., 2004).
3. Life satisfaction in older adults was measured by Diener's Scale of Life Satisfaction (Diener et al., 1985).
4. Subjective well-being as measured by scores on the eight variables (housing, city, daily activities, family life, financial situation, total household income, health, and overall life satisfaction) within the HRS database.

## **Specific Aims**

The aims of the proposed study are to:

1. Investigate the influence of interpersonal goals (compassionate and self-image) on loneliness in older adults.
2. Investigate the influence of life satisfaction on loneliness in older adults.
3. Explore the relationship between subjective well-being and loneliness in older adults.

## **Research Question and Hypothesis**

The research question and hypothesis that will guide the study are as follows:

Research Question: How is loneliness in older adults affected by interpersonal goals (compassionate goals and self-image goals), life satisfaction, and subjective well-being?

Hypothesis 1a: Loneliness is negatively influenced by compassionate goals.

Hypothesis 1b: Loneliness is positively influenced by self-image goals.

Hypothesis 2: Loneliness is negatively influenced by higher levels of life satisfaction.

Hypothesis 3: Loneliness is influenced by a person's satisfaction scores on the eight subjective well-being variables.

By gaining a deeper understanding of how interpersonal goals relate to loneliness in older adults, we may ultimately be able to develop more specific interventions to help older adults who are lonely.

## **Significance**

### **The Problem of Loneliness**

Research through the years has shown that loneliness has both physiological and emotional effects and has been linked to morbidity (Yanguas et al., 2018) and mortality (Holt-Lunstad et al., 2015; Rico-Urbe et al., 2018; Yanguas et al., 2018). The reported prevalence of loneliness in the United States general population ranges from 17% to 57%, with higher rates in people with physical and mental illnesses, including heart disease, depression, anxiety, and dementia (Musich et al., 2015). People who are lonely have also been reported to have greater healthcare utilization (Gerst-Emerson & Jayawardhana, 2015).

### **Risk Factors for Loneliness**

Living alone is one of the major risk factors for loneliness (Kharicha et al., 2007), along with mobility impairment (Kemperman et al., 2019), sensory impairment, and major life transitions (Hawkey et al., 2019). Household income is also associated with loneliness, such that

higher income correlates with less loneliness (Shovestul et al., 2020). Low levels of social engagement (Luhmann & Hawkley, 2016), poor mental health (Cohen-Mansfield et al., 2016), and poor physical health (Cacioppo & Cacioppo, 2018) are also loneliness risk factors. Thus, these factors should be monitored by clinicians in older adults when talking with patients about loneliness.

### **Rapid Growth in the Population of Older Adults**

The pace of population aging is much faster than in the past years (World Health Organization, 2018). Between 2015 and 2050, the proportion of the world's population over 60 years will nearly double from 12% to 22% (WHO, 2018). Consistent with the global trend, the United States' older adult population is also rapidly growing. Older Americans, including people aged 65 and over, are the fastest growing sector of society. This group comprises almost 15% of the entire population (U. S. Census Bureau, 2015). The 2016 American Community Survey (ACS) estimated the number of people in the United States aged 65 and over as 49.2 million (U. S. Census Bureau, 2018). Between 2020 and 2030 alone, the older American population is projected to increase by 18 million (Mather et al., 2015). As the older adult population continues to grow, so will the problem of loneliness. The rapid population growth of older adults and their susceptibility to loneliness underscores the urgent need to focus our attention on ways to ameliorate health issues affecting older adults, such as loneliness.

### **The Problem of Loneliness in Older Adults**

The loneliness data trajectory suggests that it rises in young adulthood and declines through middle adulthood before gradually increasing again in the very elderly years (Shovestul et al., 2020). Luhmann and Hawkley (2016) noted considerable variation in loneliness over the life course with peaks and troughs after age 19 and an increase after age 70.

Loneliness has been described as a significant public health concern among older adults (Cacioppo & Cacioppo, 2018; Gerst-Emerson & Jayawardhana, 2015; Theeke, 2009), as it has a significant impact on their quality of life (Theeke, 2009; Theeke & Mallow, 2013). Loneliness in old age is associated with multiple factors such as deterioration in health and or loss of spouse (Dykstra et al., 2005) and increased morbidity (Hawkley & Cacioppo, 2010). Chronically lonely older adults report less exercise, more tobacco use, a greater number of chronic illnesses, higher levels of depression, and a greater average number of nursing home stays than those who are not lonely (Theeke, 2010). Additionally, loneliness is associated with diminished sleep related to shorter sleep duration, lower sleep efficiency, greater daytime fatigue in later adulthood, and predicts decrements in subjective sleep quality (Hawkley et al., 2010).

The prevalence of loneliness among older individuals varies across studies. For example, using a 2002 Health and Retirement Study (n = 8,932), Theeke (2009) estimated 19.3% of noninstitutionalized or community-dwelling United States adults over 65 reported feeling lonely. Perissinotto et al. (2012) reported that 29% of respondents aged 75 years or older were lonely, and a study by the American Association of Retired Persons (AARP) found that 25% of community-dwelling US respondents over the age of 70 years were lonely (Wilson & Moulton, 2010). A recent study by Hawkley et al. (2019) found that loneliness increased beyond age 75, suggesting that the lonely older adults may be expected to increase as the Baby Boomers reach their late 70s and 80s. This points out why it is essential to monitor for loneliness in older adults.

### **Risk Factors for Loneliness in Older Adults**

Multiple risk factors for mental health disorders may occur at any stage in one's life. Although older adults may experience life stressors common to all people, some stressors, such as a decline in functional ability, are more common in later life (World Health Organization,

2017). Older adults may also experience reduced mobility (Kemperman et al., 2019), chronic pain, frailty, or other health problems (Tse et al., 2016).

### *Age-Related Losses*

Older adults' social participation and integration are key aspects of healthy aging. In general, however, older persons have fewer social networks than their younger counterparts due to changes in their life cycle, such as retirement or age-related losses, along with declining health and increasing mobility limitations (Kemperman et al., 2019). Loneliness is influenced by the size of an individual's social network. Individuals with fewer social networks are more likely to feel lonely than people who have a large social network (Moorer & Suurmeijer, 2001). Previous studies show that older adults have fewer social interactions and a smaller social network than younger adults (Tang & Lee, 2011; Weijs-Perrée et al., 2015). The decrease of the social network size in older adulthood is primarily because of life events such as retirement or the loss of relatives, friends, and neighbors (Segel-Karpas et al., 2018; Wrzus et al., 2013).

In addition to unintentional age-related network losses, intentional and active network size declines as people progress in age. Socioemotional selectivity theory (SST; Carstensen et al., 1999), one of the models used to explain emotional functioning in older adults, posits that two distinct goals are prioritized based on time perception: knowledge-related and emotional goals (Carstensen et al., 1999). As people age, they become increasingly aware that time is "running out" (p. 165). Perceived limitations on time lead to reorganizations of goal hierarchies such that goals related to deriving emotional meaning from life are prioritized over knowledge goals. As people realize they are approaching the end of life and running out of time, increasing social contacts feels superficial and a waste of time. Rather than expanding their social network, older

adults choose to retain and deepen the existing close relationships that offer high emotional quality.

### ***Changes in Health Status***

As people age, there is a decline in their physical and mental abilities. Older adults may have more chronic morbidities, which could impact their hearing and mobility. Cohen-Mansfield et al. (2016) found that poor self-reported health, poor functional status, poor mental health, and cognitive deficits were related to loneliness. Previous studies show that loneliness is associated with poor subjective health status (Cohen-Mansfield et al., 2016; Hawkey & Cacioppo, 2010; Petite et al., 2015). Thus, hearing and mobility issues may decrease social interaction opportunities and lead to increased feelings of loneliness.

### **Theoretical Framework**

The Ecosystem-Egosystem Theory of Social Motivation (Crocker & Canevello, 2008) will be used as an overarching framework for this study. According to this theory, Ecosystem motivation promotes close, mutually supportive relationships by energizing behaviors intended to be constructive and supportive. People with compassionate goals view others as interconnected and feel caring and concerned for others' well-being (Crocker & Canevello, 2015). People in the ecosystem perspective see their own needs and desires as having equal importance to those of others; therefore, they treat their own needs and others' needs and desires as equal with the understanding that they are part of a larger whole (Crocker & Canevello, 2015). When interacting with others, people with an ecosystem perspective tend to form compassionate goals or the desire to be supportive and constructive out of care for others' well-being (Crocker, 2008; Crocker & Canevello, 2015).

On the contrary, ego-system motivation is focused on the self. In this perspective, people are more concerned with getting their own needs and desires met and are not concerned with others' well-being (Crocker & Canevello, 2015). People in the ego-system perspective prioritize their own needs over others and do not consider how their behavior affects others. People with ego-system views tend to have self-image goals, which may lead to loneliness by diminishing the social report received from others (Crocker, 2008).

The current study's rationale is that the research evidence on the association between compassionate and self-image goals, life satisfaction, subjective well-being, and loneliness in diverse older adults has not been documented. There is a dearth of information on how to help these older adults become less lonely. Loneliness is a complex phenomenon that can have different causes. Numerous interventions have been developed to help people with loneliness. These interventions range from social facilitation interventions using group-based activities such as daycare centers (Iecovich & Biderman, 2012) and friendship enrichment programs (Alaviani et al., 2015), psychological therapeutic approaches such as mindfulness and stress reduction (Lindsay et al., 2019), reminiscence group therapy (Tarugu et al., 2019), cognitive and social support interventions (Saito et al., 2012), and animal interventions (Krause-Parello, 2012). The nature of loneliness as a subjective experience, with different correlates for different people, creates a significant challenge for generating an effective intervention. Most interventions resulted in only modest improvement in feelings of loneliness (Gardiner et al., 2018). Kelly et al. (2019) suggest that a lack of an effective intervention is due to the complex nature of loneliness itself, making it difficult to use a one-size-fits-all approach.

### **Significance to Nursing**



Research to date has demonstrated that the number of older adults is skyrocketing due to increasing population aging. One in every seven, or 15.6% of the population, is an older American (Administration on Aging (AoA), 2018). Consequently, the number of multicultural older adults also continues to rise. Racial and ethnic minority populations have increased from 7.2 million in 2007 (19% of the older adult population) to 11.8 million in 2017 (23% of older adults). They are projected to increase to 27.7 million in 2040 (34% of older adults) (Administration on Aging (AoA), 2018). Numerous studies have been done about loneliness in older adults; however, this work has mostly been restricted to older adults in general. Only a limited number of studies have researched loneliness in relation to older adults' ethnic backgrounds. By including diverse older adults: Black, Hispanic, and White, this study will advance the nursing knowledge and provide fundamental new knowledge about how compassionate and self-image goals relate to loneliness in a diverse population of older adults. The knowledge gained from this study will contribute to the body of literature in gerontology through assessment, treatment, and evaluation of lonely older adults. Loneliness is a serious problem, especially among older adults. Therefore, nurses who work in public health with older adults need to find interventions that they can use to help their patients.

### **Innovation**

The status quo about the research on loneliness in older adults is that it has focused on studying older adults in general. Although this approach has provided the field with essential insights into the effects of loneliness on this vulnerable population, the question about how compassionate and self-image goals relate to loneliness in a diverse group of older adults has not been answered. By contrast, the proposed study departs from this status quo by examining the association between compassionate and self-image goals, life satisfaction, and subjective well-

being in older adults using a previously unconsidered theoretical framework. In turn, this approach is expected to open new research horizons in the study of loneliness, specifically the ability to understand the association of interpersonal goals and loneliness on diverse groups of older adults.

This study is innovative in several ways. First, this study will be the first to examine the association of compassionate and self-image goals with loneliness in a diverse group of older adults. Gaining this knowledge will advance our understanding of how genuinely caring and reaching out to others could help reduce feelings of loneliness and improve overall health.

Second, this study will be the first to examine the association of compassionate goals and self-image goals using a nationally representative dataset, the Health and Retirement Study (HRS), the largest dataset available with detailed information on aging America's physical and mental health.

Lastly, the need to identify successful strategies to mitigate loneliness in older adults has become increasingly urgent in the wake of COVID-19. Although the pandemic affected everyone directly or indirectly, older adults are disproportionately impacted and are dying in higher numbers (Miller, 2020). This vulnerable population who are already disproportionately affected by loneliness and social isolation are further disadvantaged by enhanced economic risk, revealed ageism, and delayed medical treatment (Miller, 2020), as well as the actions that are taken to mitigate the spread of the virus, such as removal of social contacts (friends and family), inability to do grocery shopping and attend community or religious activities (Brooke & Jackson, 2020). This study is timely and will move nursing science forward by providing valuable information healthcare providers, policymakers, researchers, and educators need to be better

positioned to propose and design programs and interventions to minimize or reduce feelings of loneliness in older adults.

## **Approach**

### **Preliminary Work**

Using a descriptive phenomenological approach, the PI conducted a pilot study to explore the meaning of well-being in older adults. The PI collected data through face-to-face, semi-structured interviews with four older adults in their homes. The participants' age ranged from 72 to 76 and included a single female (never married), a widower, and a married couple (interviewed separately). Data collected through voice recorded interviews were transcribed verbatim, coded with NVivo12 qualitative data manager, and analyzed using Giorgi's (2012) methodology for data analyses. The three themes that emerged from the participants' description of well-being were: living a healthy and fulfilled life, being involved with family and friends, and having a relationship with God. This mini-study results, which took a snapshot of well-being in older adults, generated insights into areas that can benefit from further research.

Although this preliminary work was helpful, it cannot be generalized to the larger population as only four older adults participated in the mini-study. The PI will examine the association of loneliness, compassionate and self-image goals, life satisfaction, and subjective well-being in older adults in the proposed study. The results of this maxi study could shed more light on the themes that emerged from the mini-study.

### **Research Design**

The purpose of this cross-sectional, quantitative analysis is to examine compassionate and self-image goals, life satisfaction, and subjective well-being as correlates of loneliness in older adults. A cross-sectional design is adequate for this study, as it will allow the researcher to

measure and describe the research variables at the same point in time without any follow-up (Hulley et al., 2013). To accomplish this, the public-use HRS datasets will be utilized.

The HRS dataset is a nationally representative survey of older Americans, designed to follow individuals aged 50 and over and their spouses or partners as they transition from the active worker into retirement (Servais, 2010). The dataset was launched in 1992 and is produced and managed by the University of Michigan with funding from the National Institute on Aging and the Social Security Administration (grant number NIA U01AG009740). The HRS surveys more than 22,000 Americans over age 50 and is conducted every two years, with a new cohort added every six years (Servais, 2010). The respondents' information includes health and financial status, work history, respondent employment, insurance coverage, housing, family support systems, disability, and retirement plans (Servais, 2010). To be eligible, respondents must be noninstitutionalized at baseline and live in a household. However, respondents are followed longitudinally into nursing homes if needed (HRS, 2019). The HRS datasets are available to researchers without cost and can be accessed through the investigator's registration at the HRS website: <http://hrsonline.isr.umich.edu>. This dataset is highly suited for this study because of its richness of detail on health, economic, and psychosocial information and its oversampling of minority respondents. The HRS website also requires that publications be registered with the HRS for inclusion in an online bibliography.

This study will utilize survey data from two HRS components: RAND data files and the Psychosocial and Lifestyle Questionnaire. These surveys were both administered to the 2016 cohort. RAND data file is a clean, streamlined version of the HRS dataset produced by the RAND Center for the Study of Aging from the HRS data's public-use version. The RAND data file that will be utilized is Version 2, released in April 2020. Assessment of psychosocial issues

in aging was not part of the initial focus of the HRS survey. The Psychosocial and Lifestyle Questionnaire is a "leave behind" psychosocial self-assessment survey designed to collect additional information from respondents without adding to the interview length. The participants complete and return the questionnaire by mail in a pre-paid envelope to the main field office at the University of Michigan (Smith et al., 2017). The Psychosocial and Lifestyle Questionnaire, found in HRS 2016 Core, Final Version, released in December 2019, will be used.

### **Setting and Sample**

HRS data was obtained through phone interviews until 2004, when a face-to-face interview was initiated. Upon entry into the study, participants complete a baseline face-to-face interview at their homes. They are given the psychosocial and lifestyle questionnaire to be completed and mailed to the research institute's field office. In 2006 and 2008, respondents who had not returned the questionnaire after a second reminder notice were offered the option of completing the questionnaire by telephone; however, this practice was discontinued after 2008 (Smith et al., 2017). Questionnaire and face-to-face follow-ups are conducted every four years with a telephone survey in the 2-year midway interval, and proxy surveys are conducted when older adult participants cannot answer interviews personally and after the participant's death.

### **Sampling Procedure and Power**

HRS sample is a multi-stage probability sample of the United States (HRS, 2019). The sample is composed of males and females, and the participants in the study are aged 50 and over. Spouses of the respondents are also included in the survey and do not have any age requirement. The research sample is obtained by screening and recruiting participants until the cohort's target sample size is reached. HRS exclusively collects data from community-dwelling older adults, but, as previously stated, respondents are followed longitudinally into nursing facilities if

necessary (HRS, 2019). From 2004, HRS introduced an enhanced face-to-face interview process to collect physical performance measures and biomarker tests from respondents (HRS, 2019). In 2006, the Psychosocial and Lifestyle Questionnaire was integrated into the enhanced face-to-face interview. The survey sample is structured so that half of the respondents receive the enhanced interview each wave. For instance, a random one-half of the sample, designated subsample A, received the enhanced face-face- interview in 2006, 2010, and 2014 while the other 50%, designated subsample B, received the enhanced face-to-face interview in 2008, 2012, and 2016 (Smith et al., 2017).

A power analysis conducted using G\*Power 3.1 software (Faul et al., 2009) indicated that 159 participants would be required to obtain a medium effect size of ( $f = 0.25$ ), with a standard power of 0.80 and a standard alpha of 0.05. HRS, a large dataset, will provide an adequate sample size to establish statistically significant differences and relationships between the variables.

Participants for this study will be selected according to the following inclusion criteria: 1) adults 65 years of age or older, 2) community-dwelling 3) interview completed by the respondent, not by a proxy, 4) completed both HRS survey and Psychosocial and Lifestyle Questionnaire, 5) answered the loneliness question, 6) completed data on the independent variables of interest.

### **Recruitment and Consent**

Participation in the HRS study is voluntary. Respondents have a participants' page on the HRS website, and they may discontinue participation in the study at any time. The University of Michigan maintains an ongoing IRB approval to administer the survey to participants. The HRS public-use dataset for the analysis is de-identified and available to researchers over a secure

website. Researchers are required to register for data access and downloads and agree not to attempt to identify participants. The PI will not attempt to identify participants. The de-identified HRS public use files qualify for exempt IRB status. Duquesne University IRB protocol exempt notification was obtained for the study.

## **Measures**

### ***Dependent Variable***

The outcome (dependent) variable for this study is loneliness. The independent (predictor) variables are interpersonal goals (compassionate and self-image), life satisfaction, and subjective well-being. Other variables of interest include sociodemographic variables (age, gender, race, marital status, number of people in household), socioeconomic variables (education, income, employment status), health-related variables (self-report of health, functional status, use of home care, depression), Lifestyle ( composition of social network, closeness to partner, number of close relationships, contact with social network, social participation, religiosity/spirituality).

In the dataset, loneliness is assessed using an 11-item scale designed for large surveys such as the HRS and based on a 3-item UCLA Loneliness Scale (Hughes et al., 2004), which is derived from the 20-item University of California Los Angeles (UCLA) Loneliness Scale Version 3 (Russell, 1996). Respondents are asked, “How much of the time do you feel...Do you lack companionship? Left out? Isolated from others? In tune with the people around you? Alone? That there are people you can talk to? That there are people you can turn to? That there are people who really understand you? That there are people you feel close to? Feel part of a group of friends? and That you have a lot in common with the people around you?” Scores are recoded such that 1 = often, 2 = some of the time, 3 = hardly ever. The three-item is adequately correlated

with the 20-item full-length version of UCLA. The 3-item scale shows appropriate convergent and discriminant validity with measures such as depression, stress, enjoyment, energy, and motivation. It has a high correlation with the full-length UCLA at  $r = .82$  and  $p < .001$  (Hughes et al., 2004).

### ***Independent Variables***

The independent (predictor) variables are interpersonal goals (compassionate and self-image), life satisfaction, and subjective well-being. Compassionate and self-image goals are operationalized in the dataset with six items derived from Crocker and Canevello (2008) and Canevello and Crocker (2010). Three items each measure compassionate and self-image goals. The respondents are asked, “The next items describe goals you may have in your relationships with other people. Please indicate how much each goal describes you. How much do you want to try to...?” Have compassion for others’ mistakes and weaknesses? Avoid appearing unattractive, unlovable, or undesirable? Be supportive of others? Get others to see your positive qualities? Avoid being selfish or self-centered? Get others to respect or admire you? The responses range from 1 = Not at all to 5 = Extremely. Responses will be reverse coded, and means will be calculated. Research on compassionate and self-image goals has focused mainly on young populations. Compassionate goals and self-image goals were included in the HRS survey for the first time in 2016 to test how reliable the measurements are in older adults, how they relate to older adults’ health and well-being, and how they affect different age groups of older adults (Smith et al., 2017).

Life satisfaction is measured with Diener’s Scale of Life Satisfaction (Diener et al., 1985), a well-established measure of self-evaluated life quality. The respondents are asked to rate their responses to the following five items using a seven-point Likert scale: In most ways,



my life is close to ideal; The conditions of my life are excellent; I am satisfied with my life; So far, I have gotten the important things I want in life, If I could live my life again, I would change almost nothing. The Likert scale range from 1 = Strongly disagree to 7 = Strongly agree. The scale is the sum of the five items, with those missing three or more coded as missing. Diener's Life Satisfaction Scale has been used extensively in research studies and has demonstrated good psychometric characteristics (Pavot & Diener, 1993). The scale has high internal consistency with coefficient alpha ranging from 0.79 to 0.89 (Pavot & Diener, 1993).

Subjective well-being will be measured with eight items that capture important life domains: housing, city, nonwork, family life, financial situation, health, and overall life satisfaction. Respondents are asked, "Please think about your life and satisfaction right now and state how satisfied are you with ..." the condition of the place where you live (house or apartment)? The city or town you live in? Your daily life and leisure activities? Your family life? Your present financial situation? The total income of your household? Your health? Your life as a whole these days? (this question was only asked in 2008, 2010 & 2012 and excluded in 2014 & 2016). Responses range from 1 = Completely satisfied to 5 = Not at all satisfied.

### ***Control Variables (Covariates)***

Control variables for this study include Age (years); gender (male, female); race (White/Caucasian, Black/African American, Other; Hispanic, non-Hispanic); education (high school, GED, high school graduate, some college, college and above); income (total household income); marital status (married, married with spouse absent, partnered, separated, or divorced, widowed, or never married); and living arrangement (total number of people living in the household); employment status (currently employed or not currently employed); self-rated health (excellent, very good, good, fair, or poor); functional impairment (self-report of difficulty with

five diverse activities of daily living (ADLs): bathing, dressing, eating, getting out of bed, and walking); use of homecare (use of homecare in the past two years); depression, religiosity/spirituality, and social integration/engagement.

Depression is operationalized with an 8-item version of the CES-D. Respondents are asked if in the past week they felt depressed, if they felt as if everything was an effort, if their sleep was restless, if they were happy, if they were lonely, if they enjoyed life, if they felt sad, and if they could not get going.

Social integration is measured with the question about the composition of the social network, the number of close social relationships, and contact with the social network. For the social network composition: participants were asked four questions: Do you have a husband, wife, or partner with whom you live? Do you have any living children? Do you have any other immediate family, for example, any brothers or sisters, parents, cousins, or grandchildren? And Do you have any friends? The questions for the number of close relationships were: How close is your relationship with your spouse or partner? How many of your children would you say you have a close relationship with? How many of these family members would you say you have a close relationship with? and How many of your friends would you say you have a close relationship with? For contact with the social network, participants were asked: How often they meet up, speak on the phone, and write/email with three different groups: children, other family (besides spouse), and friends?

In the dataset, social participation/engagement, a reflection of whether or not participants are socially isolated, was assessed with 20 items. The participants were asked: Please tell us how often you do each of the following activities: Care for a sick or disabled adult? Do activities with grandchildren, nieces/nephews, or neighborhood children? Do volunteer work with children or

young people? Do any other volunteer or charity work? Attend an educational or training course? Go to a sport, social, or other club? Attend meetings of non-religious organizations, such as political, community, or other interest groups? Pray privately in places other than a church or synagogue? Read books, magazines, or newspapers? Watch television? Do word games such as crossword puzzles or Scrabble? Play cards or games such as chess? Do writing (such as letters, stories, or journal entries)? Use a computer for email, Internet, or other tasks? Do home or car maintenance or gardening? Bake or cook something special? Make clothes, knit, embroider, etc.? Work on a hobby or project? Play sports or exercise? Walk for 20 minutes or more? Participate in a local community arts group such as a choir, dance, photography, theatre, or music group? Responses range from 1 = Daily, 2 = Several times a week, 3 = Once a week, 4 = Several times a month, 5 = At least once a month, 6 = Not in the last month, 7 = Never/Not Relevant.

Four items in the dataset assess religious beliefs, meaning, and values. Participants were asked: Please say how much you agree or disagree with each of the following statements: I believe in a God who watches over me; The events in my life unfold according to a divine or greater plan; I try hard to carry my religious beliefs over into all my other dealings in life; I find strength and comfort in my religion. The responses range from 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Slightly disagree, 4 = Slightly agree, 5 = Somewhat agree, 6 = Strongly agree.

### **Data Collection**

The HRS survey data is collected by the Survey Research Center (SRC) of the Institute for Social Research (ISR) of the University of Michigan (Servais, 2010). The HRS is collected through a combination of face-to-face, telephone, and mail-in surveys. The participants participate in a face-to-face interview at baseline with follow-up interviews as needed. The

participants also complete self-administered Psychosocial and Lifestyle Questionnaires that collect more detailed information in six substantive areas: subjective well-being, lifestyle and experience of stress, quality of social ties, personality traits, work-related beliefs, and self-related beliefs (Smith et al., 2017). Once enrolled in the survey, respondents are followed until death or withdrawal from the study. Post-exit interviews are conducted with proxies upon the respondent's death. The HRS data files downloaded for this study will be stored in a password-protected computer.

### **Plan for Data Analysis**

Data will be analyzed using IBM SPSS Statistics Version 27. Downloaded HRS data will be assessed for coding errors and missing values. If missing data are found, they will be deleted or handled using pairwise exclusion or multiple imputations. Descriptive statistics will be imputed for all study variables to inspect the data for missing values and normal distribution. Frequencies and percentages will be calculated for all categorical variables, whereas means, ranges, and standard deviations will describe continuous variables.

Multiple regression statistical analysis is most suitable for describing the relationship between one dependent variable and more than one independent variable (Nathans et al., 2012). The data will be analyzed through a series of regression analyses between the single dependent and multiple independent variables to establish their predictive relationship. Categorical variables will be examined in terms of the frequency of response levels to ensure sufficient analysis variability. Continuous variables will be examined for the assumption of normality using histogram, quantile-quantile plots, and the Shapiro-Wilks test for adherence to a normal distribution. Homoscedasticity will be tested by visual inspection of scatterplots of residuals versus predicted values. Multicollinearity will be tested by calculating variance inflation factors.

The significance level will be set at ( $p < .05$ ) for all statistical tests. Data will be analyzed according to the aims of the study.

**Aim #1.** The first aim of this study is to investigate the influence of interpersonal goals (compassionate and self-image) on loneliness in older adults. *Hypothesis 1a:* Loneliness is negatively influenced by compassionate goals. *Hypothesis 1b:* Loneliness is positively influenced by self-image goals. This aim will be evaluated using multiple linear regression. Assumptions of normality, homoscedasticity, and multicollinearity will be tested.

**Aim #2.** The second aim is to investigate the influence of life satisfaction on loneliness in older adults. *Hypothesis 2:* Loneliness is negatively influenced by higher levels of life satisfaction. This aim will be evaluated using multiple linear regression analysis. Assumptions of normality, homoscedasticity, and multicollinearity will be tested.

**Aim #3.** The third aim is to explore the relationship between subjective well-being and loneliness in older adults. *Hypothesis 3:* Loneliness is influenced by a person's satisfaction scores on the eight subjective well-being variables. This aim will be evaluated using multiple linear regression analysis. Assumptions of normality, homoscedasticity, and multicollinearity will be tested.

### **Study Limitations**

The major limitation of this study is that a secondary data set will be used. As a result, the study will depend on the available data and the method used to collect it. Although researchers from a reputable organization collected HRS data, there might be measurement or other data collection issues that the PI might not be aware of as the variables to be examined will be limited to those collected by the HRS researchers. Second, the HRS data is rich; however, the data was not specifically collected for this research study; thus, some research variables might not be well

represented in the dataset. Lastly, there is a potential for bias due to variation in participants' reports about loneliness and other self-reported research variables that may be interpreted differently. Also, the variables may have been inaccurate due to the respondents' over-reporting or under-reporting of information.

### **Potential Barriers and Strategies to Address Them**

The HRS dataset is large and requires technical expertise and skillsets. As a novice researcher, the PI may feel overwhelmed with the enormous amount of information. The PI will devote adequate time to reading and understanding the data collection methods, the research instruments used, and coding and reading the codebooks and the guides. She will also be guided by her chair/committee members and a statistician. The second potential problem is that analyzing a large secondary data will require a significant amount of time and energy. For time management, the PI will develop a schedule and timeline to complete the different sections of the study analysis.

## Chapter 4

### Data Analysis and Research Findings

The purpose of the research study was to investigate the influence of interpersonal goals (compassionate and self-image goals), life satisfaction, and subjective well-being on loneliness in older adults. This chapter contains information not included in the final manuscript, but this researcher felt that it was important to include other researchers who may want additional information to the final manuscript. This chapter consists of the analysis results of the findings, including a presentation of descriptive and inferential statistics to address the research question and hypotheses. This chapter also includes a discussion of the analysis procedures and results of the analyses.

#### **Procedure**

The 2016 RAND and the 2016 psychosocial datasets were combined into one file with a total of 42052 responses. The data were screened based on the study inclusion criteria. First, 40552 cases were removed because they did not meet the age criterion (65 years or older). Twelve additional cases were removed because the respondents lived in a nursing home. No responses were removed due to the completion of the survey by proxy. Seventy-three cases were removed because they were missing values for all items corresponding to at least one of the following study variables: loneliness, compassionate goals, self-image goals, life satisfaction, or subjective well-being. A final total of 1415 cases were included in the analyses. All remaining missing values for variables used in the regression analyses were handled using multiple imputations; the reported regression results are based on the pooled estimates across five imputed datasets.

## Results

### Sample Demographics

After removing incomplete cases, a total of 1415 individuals between the ages of 65 and 106 were included in the final dataset. The participants' age was reported as follows: 65-74 years old (15.2%); 75-84 years old (70%); 85-94 years old (13.9%); and 95-106 years old (1.0%). Most participants were between 75-84 years of age ( $n = 990$ , 70.0%). Majority of the participants, approximately two-thirds of the sample were female ( $n = 872$ , 61.6%), most were not Hispanic ( $n = 1304$ , 92.2%), and most identified their race as White ( $n = 1231$ , 87.0%). The most common level of education among participants was high school graduates ( $n = 507$ , 35.8%). Most participants were married ( $n = 883$ , 62.4%), and most were retired or not in the labor force ( $n = 1207$ , 85.3%). The largest proportion of participants rated their health as "good" ( $n = 552$ , 39.0%), most had not used homecare in the past two years ( $n = 1275$ , 90.1%), and most did not have a functional impairment ( $n = 1220$ , 86.2%) which was defined as self-reported difficulty in bathing, getting in or out of bed, dressing, eating, or walking. The descriptive statistics for the categorical variables in the study (age, gender, ethnicity, race, education, marital status, employment, health status, homecare use, and functional impairment) are listed in Table 1.

The average income of the participants was \$13,563.33 ( $SD = 57096.94$ ). The average number of people in the household was 2.01 ( $SD = 0.95$ ). The average level of depression (as measured by the CESD) was 1.11 ( $SD = 1.67$ ). Composition of social network was measured by the sum of four questions asking if the participant lived with a spouse or partner, had any children, had any other immediate family, or had any friends; on average, participants had 3.23 ( $SD = 0.80$ ) out of these four social connections.



Closeness to partner was coded from 1 (*not at all close*) to 4 (*very close*) with participants coded as zero if they did not have a partner; the sample average on this scale was 2.35 ( $SD = 1.76$ ). Number of close relationships was measured by summing the reported number of close relationships with children, other family members, and friends; participants had 11.16 close relationships on average ( $SD = 31.14$ ). Contact with social network was measured by computing the average of the items asking participants to rate how often they meet up with, speak with, or exchange letters/e-mail with their children, other family members, and friends with each item ranging from 1 (*less than once a year or never*) to 6 (*three or more times a week*); the average contact score was 3.65 ( $SD = 0.80$ ). Social participation was measured by computing the average of the items asking participants how often they engaged in various activities, with each item ranging from 1 (*never*) to 7 (*daily*); the average participation score was 3.15 ( $SD = 0.73$ ).

Religiosity/spirituality was measured by the average of four items rated on a Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*); the average score for this variable was 5.10 ( $SD = 1.35$ ). Loneliness was defined by the average of 11 items that were rated on a 3-point Likert scale; the average loneliness score was 1.50 ( $SD = 0.40$ ). Compassionate and self-image goals were each measured by three items that were rated on a 5-point Likert scale; the average scores for these variables were 3.74 ( $SD = 0.71$ ) and 3.26 ( $SD = 0.86$ ) respectively. Subjective well-being was measured by averaging seven items that were rated on a 5-point Likert scale; the average score was 3.79 ( $SD = 0.69$ ). Life satisfaction was measured by averaging five items that were rated on a 7-point Likert scale; the average score was 5.25 ( $SD = 1.38$ ). The descriptive statistics for the continuous variables in the study (income, number of people in household, depression (CESD score), composition of social network, closeness to partner, number of close relationships, contact with social network, social participation, religiosity/spirituality, loneliness,

compassionate goals, self-image goals, subjective well-being, and life satisfaction) are listed in Table 2.

### **Hypothesis 1a**

Hypothesis 1a stated that loneliness is negatively influenced by compassionate goals. To test this hypothesis, a multiple linear regression analysis was conducted. The dependent variable in this analysis was loneliness. The independent variable was compassionate goals. Control variables included in the analysis were age, gender, race, education, income, marital status, people in household, employment status, self-rated health, functional impairment, homecare, depression, composition of social network, closeness to partner, number of close relationships, contact with social network, social participation, and religiosity/spirituality. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 3 displays the results of the regression. Compassionate goals was a significant negative predictor in Step 1 ( $B = -0.17, p < .001$ ) and in Step 2 ( $B = -0.12, p < .001$ ), indicating that compassionate goals was significantly negatively related to loneliness after controlling for

other factors. The hypothesis that loneliness would be negatively influenced by compassionate goals was supported.

### **Hypothesis 1b**

Hypothesis 1b stated that loneliness is positively influenced by self-image goals. To test this hypothesis, a multiple linear regression analysis was conducted. The dependent variable in this analysis was loneliness. The independent variable was self-image goals. The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 4 displays the results of the regression. Self-image goals was a significant negative predictor in Step 1 ( $B = -0.09, p < .001$ ) and in Step 2 ( $B = -0.06, p < .001$ ), indicating that self-image goals was significantly negatively related to loneliness after controlling for other factors. The hypothesis that loneliness would be positively influenced by self-image goals was not supported.

### **Hypothesis 2**

Hypothesis 2 stated that loneliness is negatively influenced by higher levels of life satisfaction. To test this hypothesis, a multiple linear regression analysis was conducted. The dependent variable in this analysis was loneliness. The independent variable was life satisfaction. The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 5 displays the results of the regression. Life satisfaction was a significant negative predictor in Step 1 ( $B = -0.11, p < .001$ ) and in Step 2 ( $B = -0.06, p < .001$ ), indicating that life satisfaction was significantly negatively related to loneliness after controlling for other factors. The hypothesis that loneliness would be negatively influenced by life satisfaction was supported.

### **Hypothesis 3**

Hypothesis 3 stated that loneliness is influenced by a person's subjective well-being. To test this hypothesis, a multiple linear regression analysis was conducted. The dependent variable in this analysis was loneliness. The independent variable was subjective well-being. The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 6 displays the results of the regression. Subjective well-being was a significant negative predictor in Step 1 ( $B = -0.25, p < .001$ ) and in Step 2 ( $B = -0.18, p < .001$ ), indicating that subjective well-being was significantly negatively related to loneliness after controlling for other factors. The hypothesis that loneliness would be influenced by subjective well-being was supported.

Subsequent to the proposal defense, IRB approval for Duquesne University was received. See below:

**Attachments:**

- Exemption Notification - IRB ID: 2021/01/1.pdf



*Duquesne University IRB*

*Protocol Exemption Notification*

To: Francesca Ezeokonkwo  
From: David Delmonico, IRB Chair  
Subject: Protocol #2021/01/1  
Date: 01/07/2021

The protocol **2021/01/1. Loneliness, Interpersonal Goals, Life Satisfaction, and Subjective Well-Being in Older Adults** has been verified by the Institutional Review Board as **Exempt** according to 45CFR46.101(b)(4): (4) Secondary Research Uses of Data or Specimens on 01/07/2021.

If applicable, the consent form and/or recruitment flier have been stamped and are attached to this email or are accessible via Mentor. Please use these stamped versions to distribute or display.

Exempt status means there is no specific expiration date, and you are not required to file annual reviews or termination reports. However, any unanticipated problems, adverse effects on subjects, or protocol deviations must be immediately reported to the IRB Chair before proceeding with the study.

Further, any changes to your study requires the filing of an amendment and is subject to the approval of the IRB Chair. You must wait for approval before implementing any changes to the original protocol. Changes to your protocol may affect the exempt status of your research.

Please contact me if you have any questions regarding this study.

Best wishes in your research,

David Delmonico, Ph.D.  
Institutional Review Board, Chair  
irb@duq.edu

## Chapter 5

### Results Manuscript

This chapter is presented as a results manuscript that will be submitted for publication. The chapter has been formatted for journal submission, and the following categories are addressed: Abstract, background, theoretical framework, aims, methods, measurements, results, discussion, strengths, limitations and future work, and conclusion.

## **Abstract**

**Background:** Loneliness is detrimental to health and is linked to numerous physiological and psychological problems. People can be affected by loneliness at any point in their lives; however, older adults are disproportionately affected.

**Aims:** This study investigated the effect of interpersonal goals, life satisfaction, and subjective well-being on loneliness in older adults and the influence of demographics and social support. The Ecosystem-Egosystem Theory of Social Motivation served as the theoretical framework.

**Design and Method:** This descriptive cross-sectional correlational study used the 2016 Health and Retirement Study. Participants were 65 years of age or older and community-dwelling. Multiple linear regression analyses were conducted to examine the association between dependent and independent variables.

**Findings:** Interpersonal goals, subjective well-being, and life satisfaction were significantly related to loneliness. Higher compassionate and self-image goals reported less loneliness.

**Conclusion:** Results add to understanding the effect of interpersonal goals on loneliness in older adults. Initial findings warrant further exploration. Existing loneliness interventions for older adults may benefit from the outcomes of the study.

**Keywords:** Loneliness, interpersonal goals, compassionate goals, self-image goals, life satisfaction, subjective well-being.



# **LONELINESS, INTERPERSONAL GOALS, LIFE SATISFACTION, AND SUBJECTIVE WELL-BEING IN OLDER ADULTS**

## **Background**

Loneliness affects people across the age spectrum at one point or another in their lives and has a detrimental effect on health. In a sample of the United States population in 2018, the Cigna Loneliness Index (n = 20,000) revealed that 46 percent of Americans report feeling lonely (Cigna, 2018). In that same year, survey studies by the AARP Foundation (Anderson & Thayer, 2018) and the Kaiser Family Foundation (DiJulio et al., 2018) found that more than one-third of adults aged 45 and older (35 percent) and more than a fifth of adults aged 18 and older (22 percent) report feeling lonely, respectively.

Research through the years has shown that loneliness has both physiological and emotional effects and has been linked to morbidity (Yanguas et al., 2018) and mortality (Holt-Lunstad et al., 2015; Rico-Uribe et al., 2018; Yanguas et al., 2018). The reported prevalence of loneliness in the United States general population ranges from 17% to 57%, with higher rates in people with physical and mental illnesses, including heart disease, depression, anxiety, and dementia (Musich et al., 2015). People who are lonely have also been reported to have greater healthcare utilization (Gerst-Emerson & Jayawardhana, 2015).

Although loneliness can affect people at any point in their lives, older adults are disproportionately affected due to declining physical health and loss of family and friends (Lee et al., 2018). To combat loneliness and social isolation in older Americans, the National Academies of Sciences created the Social Isolation and Loneliness in Older Adults Committee in 2020, charged with identifying and recommending strategies to help reduce the incidence and adverse

health effects of loneliness and social isolation (National Academies of Sciences Engineering and Medicine [NASEM], 2020).

The loneliness data trajectory suggests that it rises in young adulthood and declines through middle adulthood before gradually increasing again in the very elderly years (Shoestul et al., 2020). Luhmann and Hawkley (2016) noted considerable variation in loneliness over the life course with peaks and troughs after age 19 and an increase after age 70.

Loneliness has been described as a significant public health concern among older adults (Cacioppo & Cacioppo, 2018; Gerst-Emerson & Jayawardhana, 2015; Theeke, 2009), as it has a significant impact on their quality of life (Theeke, 2009; Theeke & Mallow, 2013). Loneliness in old age is associated with multiple factors such as deterioration in health and or loss of spouse (Dykstra et al., 2005) and increased morbidity (Hawkley & Cacioppo, 2010). Chronically lonely older adults report less exercise, more tobacco use, a greater number of chronic illnesses, higher levels of depression, and a greater average number of nursing home stays than those who are not lonely (Theeke, 2010). Additionally, loneliness is associated with diminished sleep related to shorter sleep duration, lower sleep efficiency, greater daytime fatigue in later adulthood, and predicts decrements in subjective sleep quality (Hawkley et al., 2010).

According to research, *compassionate goals* involve focusing on supporting others, not for self-gain, but out of consideration for others' well-being. *Self-image goals* involve constructing, maintaining, and defending a desired public or private image of the self to gain or obtain something for the self (Crocker & Canevello, 2008). Current research suggests that interpersonal goals - compassionate and self-image - have strong implications for creating or undermining interpersonal relationships (Canevello & Crocker, 2017; Duarte & Pinto-Gouveia, 2015). Research has investigated and demonstrated the effect of compassionate and self-image

goals on loneliness in younger adults. Compassionate goals are linked to feelings of clarity, connectedness and closeness to others, less interpersonal conflicts, and high positive emotions, while self-image goals are related to feelings of fear and confusion, loneliness, interpersonal conflicts, and low positive emotions (Duarte & Pinto-Gouveia, 2015). Published literature has also found that compassionate goals foster social support and trust while self-image goals undermine them (Crocker & Canevello, 2008).

A plethora of empirical literature exists regarding loneliness in older adults (Cohen-Mansfield et al., 2016; Kemperman et al., 2019). However, to date, research has not illuminated the effect of compassionate goals and self-image goals on loneliness in older adults. As many older adults face loneliness and there is limited literature in this area, it is appropriate to conduct further research so that health professionals can understand how these variables affect loneliness in this population. The present study filled this knowledge gap by addressing the direct relationship between loneliness, compassionate and self-image goals, life satisfaction, and subjective well-being in older adults. Having a better understanding of how these variables relate to loneliness might help health care providers to develop targeted interventions for decreasing loneliness in populations of older adults.

### **Theoretical Framework**

The Ecosystem-Egosystem Theory of Social Motivation (Crocker & Canevello, 2008) guided this study. Ecosystem motivation promotes close, mutually supportive relationships by energizing behaviors intended to be constructive and supportive. People with compassionate goals view others as interconnected and feel caring and concerned for others' well-being (Crocker & Canevello, 2015). People in the ecosystem perspective see their own needs and desires as having equal importance to those of others; therefore, they treat their own needs and

others' needs and desires as equal with the understanding that they are part of a larger whole (Crocker & Canevello, 2015). When interacting with others, people with an ecosystem perspective tend to form compassionate goals or the desire to be supportive and constructive out of care for others' well-being (Crocker & Canevello, 2008, 2015).

## **Aims**

The primary aims of this study were to:

4. Investigate the influence of interpersonal goals (compassionate and self-image) on loneliness in older adults.
5. Investigate the influence of life satisfaction on loneliness in older adults.
6. Explore the relationship between subjective well-being and loneliness in older adults.

## **Method**

### ***Setting and Sample***

This descriptive cross-sectional, correlational secondary data analysis used the 2016 HRS RAND Longitudinal data file and the Psychosocial and Lifestyle Questionnaire. HRS study participants completed a baseline face-to-face interview at their homes, were given the Psychosocial and Lifestyle Questionnaire to be completed and mailed to the research institute's field office. Questionnaire and face-face follow-up interviews are conducted every four years, and there is a telephone survey in the 2-year midway interval. Proxy surveys are conducted when older adult participants could not answer interviews personally and after the participant's death.

For this study, participants were selected according to the following inclusion criteria: 1) adults 65 years of age or older, 2) community-dwelling 3) interview completed by the respondent, not by a proxy, 4) completed both HRS survey and Psychosocial and Lifestyle

Questionnaire, 5) answered the loneliness question, 6) completed data on the independent variables of interest.

### ***Recruitment and Consent***

Participation in the HRS study is voluntary, and respondents may discontinue participation in the study at any time. The University of Michigan maintains ongoing Institutional Review Board (IRB) approval to administer the survey to participants. The HRS public-use dataset for the analysis was de-identified and qualified for exempt IRB status. Duquesne University IRB provided consent for this secondary data analysis.

### **Measurements**

#### ***Dependent and Independent Variables***

The outcome (dependent) variable for this study was loneliness. The independent (predictor) variables were interpersonal goals (compassionate and self-image), life satisfaction, and subjective well-being. Other variables of interest include sociodemographic variables (age, gender, race, marital status, living arrangement), socioeconomic variables (education, income, employment status), and health-related variables (self-report of health, functional status, use of home care).

#### ***Measures***

In the HRS dataset, dependent and independent variables were measured using the following tools:

5. Interpersonal goals (compassionate and self-image) were measured by the 6-item measure of Compassionate and Self-image Goals derived from Crocker and Canevello (2008) and Canevello and Crocker (2010).

6. Loneliness was measured using an 11-item scale designed for large surveys such as the HRS and based on a 3-item UCLA Loneliness Scale (Hughes et al., 2004), which is derived from the 20-item University of California Los Angeles (UCLA) Loneliness Scale Version 3 (Russell, 1996).
7. Life satisfaction in older adults was measured by Diener's Scale of Life Satisfaction (Diener et al., 1985).
8. Subjective well-being was measured by scores on the eight variables (housing, city, daily activities, family life, financial situation, total household income, health, and overall life satisfaction) within the HRS database.

### ***Control Variables (Covariates)***

The control variables included in the study were age (years); gender (male, female); race (White/Caucasian, Black/African American, Other; Hispanic, non-Hispanic); education (high school, GED, high school graduate, some college, college and above); income (total household income); marital status (married, married with spouse absent, partnered, separated, or divorced, widowed, or never married); and living arrangement (total number of people living in the household); employment status (currently employed or not currently employed); self-rated health (excellent, very good, good, fair, or poor); functional impairment (self-report of difficulty with five diverse activities of daily living (ADLs): bathing, dressing, eating, getting out of bed, and walking); use of homecare (use of homecare in the past two years); and depression. Depression was operationalized with an 8-item version of the CES-D. Figure 1 shows the regression model of the study variables.

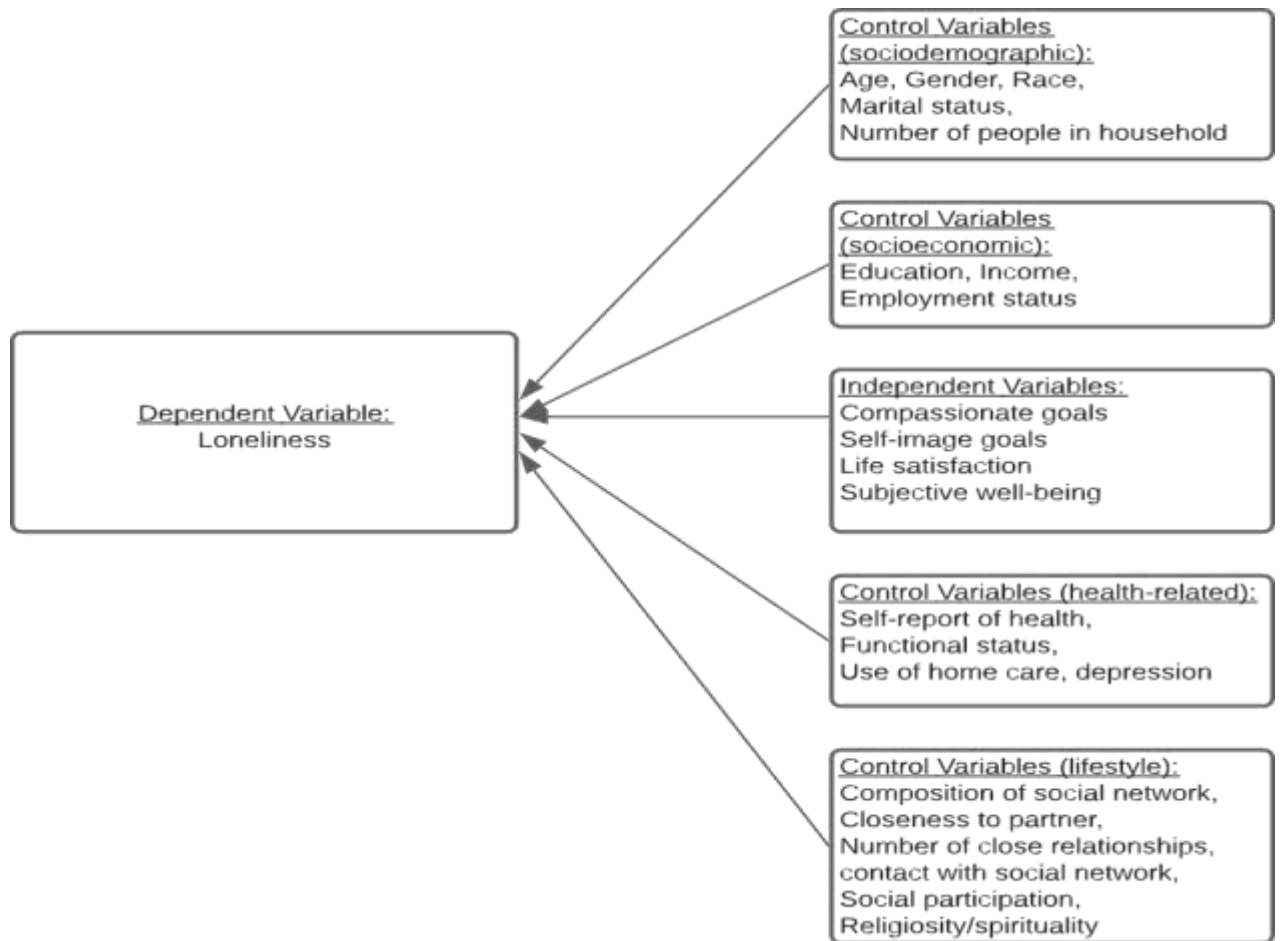


Figure 1: Regression Model of the study variables

### ***Sampling Procedure and Power***

HRS sample is a multi-stage probability sample of the United States (HRS, 2019). The sample is composed of males and females, and the participants are aged 50 and over. This study included participants over the age of 65. A power analysis was conducted using G\*Power 3.1 software (Faul et al., 2009). Power analysis indicated that 159 participants would be required to obtain a medium effect size of ( $f = 0.25$ ), with a standard power of 0.80 and a standard alpha of 0.05.

### ***Procedure and Data Analysis***

The 2016 RAND and the 2016 psychosocial datasets were combined into one file with a total of 42,052 responses. The data were screened based on the study inclusion criteria. First, 40,552 cases were removed because they did not meet the age criterion (65 years or older). Twelve additional cases were removed because the respondents lived in a nursing home. No responses were removed due to the completion of the survey by proxy. Seventy-three cases were removed because they were missing values for all items corresponding to at least one of the following study variables: loneliness, compassionate goals, self-image goals, life satisfaction, or subjective well-being. A final total of 1,415 cases were included in the analyses. All remaining missing values for variables used in the regression analyses were handled using multiple imputations; the reported regression results are based on the pooled estimates across five imputed datasets.

## **Results**

### ***Sample Demographics***

After removing incomplete cases, a total of 1,415 individuals between the ages of 65 and 106 were included in the final dataset. The participants' age was reported as follows: 65-74 years old (15.2%); 75-84 years old (70%); 85-94 years old (13.9%); and 95-106 years old (1.0%). Most participants were between 75-84 years of age ( $n = 990$ , 70.0%). Majority of the participants, approximately two-thirds of the sample were female ( $n = 872$ , 61.6%), most were not Hispanic ( $n = 1304$ , 92.2%), and most identified their race as White ( $n = 1231$ , 87.0%). The most common level of education among participants was high school graduates ( $n = 507$ , 35.8%). Most participants were married ( $n = 883$ , 62.4%), and most were retired or not in the labor force ( $n = 1207$ , 85.3%). The largest proportion of participants rated their health as "good" ( $n = 552$ , 39.0%), most had not used homecare in the past two years ( $n = 1,275$ , 90.1%), and



most did not have a functional impairment ( $n = 1220, 86.2\%$ ) which was defined as self-reported difficulty in bathing, getting in or out of bed, dressing, eating, or walking. The descriptive statistics for the categorical variables in the study (age, gender, ethnicity, race, education, marital status, employment, health status, homecare use, and functional impairment) are listed in Table 1.

**Table 1**

*Frequencies and Percentages for Categorical Variables*

Variable	Frequency	Percent
<b>Age</b>		
65-74	215	15.2
75-84	990	70.0
85-94	196	13.9
95-106	14	1.0
<b>Gender</b>		
Male	543	38.4
Female	872	61.6
<b>Ethnicity</b>		
Not Hispanic	1304	92.2
Hispanic	111	7.8
<b>Race</b>		
White/Caucasian	1231	87.0
Black/African American	137	9.7
Other	47	3.3
<b>Education</b>		
Less than high-school	226	16.0
GED	71	5.0
High-school graduate	507	35.8
Some college	318	22.5
College and above	293	20.7
<b>Marital Status</b>		
Married	883	62.4
Married, spouse absent	8	0.6
Partnered	27	1.9

Separated	5	0.4
Divorced	56	4.0
Widowed	431	30.5
Never married	5	0.4
Employment		
Employed	201	14.2
Unemployed	7	0.5
Retired or not in labor force	1207	85.3
Self-report of health		
Excellent	92	6.5
Very good	416	29.4
Good	552	39.0
Fair	274	19.4
Poor	80	5.7
Missing or N/A	1	0.1
Home health care		
No	1275	90.1
Yes	140	9.9
Functional impairment		
No	1220	86.2
Yes	195	13.8

The average income of the participants was \$13,563.33 ( $SD = 57096.94$ ). The average number of people in the household was 2.01 ( $SD = 0.95$ ). The average level of depression (as measured by the CESD) was 1.11 ( $SD = 1.67$ ). Composition of social network was measured by the sum of four questions asking if the participant lived with a spouse or partner, had any children, had any other immediate family, or had any friends; on average, participants had 3.23 ( $SD = 0.80$ ) out of these four social connections.

Religiosity/spirituality was measured by the average of four items rated on a Likert scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*); the average score for this variable was 5.10 ( $SD = 1.35$ ). Loneliness was defined by the average of 11 items that were rated on a 3-point

Likert scale; the average loneliness score was 1.50 ( $SD = 0.40$ ). Compassionate and self-image goals were each measured by three items that were rated on a 5-point Likert scale; the average scores for these variables were 3.74 ( $SD = 0.71$ ) and 3.26 ( $SD = 0.86$ ) respectively. Subjective well-being was measured by averaging seven items that were rated on a 5-point Likert scale; the average score was 3.79 ( $SD = 0.69$ ). Life satisfaction was measured by averaging five items that were rated on a 7-point Likert scale; the average score was 5.25 ( $SD = 1.38$ ). The descriptive statistics for the continuous variables in the study (income, number of people in household, depression (CESD score), composition of social network, closeness to partner, number of close relationships, contact with social network, social participation, religiosity/spirituality, loneliness, compassionate goals, self-image goals, subjective well-being, and life satisfaction) are listed in Table 2.

**Table 2**

*Descriptive Statistics for Continuous Variables*

Variable	Min	Max	Mean	Std. Deviation
Income	0.00	960000.00	13563.33	57096.94
Number of people in household	1.00	8.00	2.01	0.95
Depression (CESD score)	0.00	8.00	1.11	1.67
Composition of social network	0.00	4.00	3.23	0.80
Closeness to partner	0.00	4.00	2.35	1.76
Number of close relationships	0.00	1113.00	11.16	31.14
Contact with social network	1.22	6.00	3.65	0.80
Social participation	1.00	5.67	3.15	0.73
Religiosity/spirituality	1.00	6.00	5.10	1.34
Loneliness	1.00	2.91	1.50	0.40
Compassionate goals	1.00	5.00	3.74	0.71
Self-image goals	1.00	5.00	3.26	0.86
Subjective well-being	1.29	5.00	3.79	0.69
Life satisfaction	1.00	7.00	5.25	1.38

A multiple linear regression analysis was conducted to test the hypothesis that compassionate goals negatively influence loneliness. The dependent variable in this analysis was

loneliness. The independent variable was compassionate goals. Control variables included in the analysis were age, gender, race, education, income, marital status, people in household, employment status, self-rated health, functional impairment, homecare, depression, composition of social network, closeness to partner, number of close relationships, contact with social network, social participation, and religiosity/spirituality. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 3 displays the results of the regression. Compassionate goals was a significant negative predictor in Step 1 ( $B = -0.17, p < .001$ ) and in Step 2 ( $B = -0.12, p < .001$ ), indicating that high scores on compassionate goals decreased levels of loneliness after controlling for other factors. The hypothesis that loneliness would be negatively influenced by compassionate goals was supported.

**Table 3**

*Multiple Linear Regression with Compassionate Goals Predicting Loneliness*

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Lower	Upper
Step 1						
Compassionate goals	-0.17	0.01	-11.40	< .001	0.14	0.19

Step 2						
Compassionate goals	-0.12	0.01	-8.19	< .001	0.09	0.15
Age [75-84]	0.02	0.03	0.83	.405	-0.03	0.08
Age [85-94]	0.00	0.04	0.11	.910	-0.07	0.08
Age [95-106]	-0.01	0.10	-0.08	.935	-0.20	0.19
Gender [Male]	-0.01	0.02	-0.41	.683	-0.06	0.04
Race [White/Caucasian]	0.01	0.05	0.25	.800	-0.09	0.12
Race [Black/African American]	0.01	0.06	0.09	.931	-0.12	0.13
Race [Hispanic]	-0.04	0.04	-1.06	.288	-0.11	0.03
Education [GED]	0.10	0.05	1.99	.047	0.00	0.19
Education [High-school graduate]	0.08	0.03	2.70	.007	0.02	0.14
Education [Some college]	0.12	0.03	3.58	< .001	0.05	0.18
Education [College and above]	0.07	0.04	2.04	.042	0.00	0.14
Income	0.00	0.00	-0.27	.789	0.00	0.00
Number of people in household	-0.01	0.01	-0.76	.450	-0.03	0.01
Employment [Employed]	0.06	0.03	2.09	.036	0.00	0.11
Employment [Unemployed]	0.00	0.13	0.00	.997	-0.26	0.26
Self-report of health	0.03	0.01	2.44	.015	0.01	0.05
Functional impairment [Yes]	-0.01	0.03	-0.19	.848	-0.06	0.05
Home health care [Yes]	0.05	0.03	1.40	.161	-0.02	0.11
Depression	0.07	0.01	10.98	< .001	0.06	0.08
Composition of social network	-0.03	0.02	-1.96	.054	-0.07	0.00
Closeness to partner	-0.02	0.01	-3.30	.001	-0.04	-0.01
Number of close relationships	0.00	0.00	0.51	.610	0.00	0.00
Contact with social network	-0.11	0.02	-7.11	< .001	-0.14	-0.08
Social participation	0.00	0.02	-0.01	.993	-0.03	0.03
Religiosity/spirituality	-0.02	0.01	-2.17	.030	-0.03	0.00

A multiple linear regression analysis was conducted to test the hypothesis that self-image goals increase loneliness. The dependent variable in this analysis was loneliness, and the independent variable was self-image goals. People with self-image goals focus on maintaining their self-image rather than how their behavior affects others (Crocker & Canevello, 2008). The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of

normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 4 displays the results of the regression. Self-image goals was a significant negative predictor in Step 1 ( $B = -0.09, p < .001$ ) and in Step 2 ( $B = -0.06, p < .001$ ), indicating that higher levels of self-image goals decreased loneliness after controlling for other factors. The hypothesis that loneliness would be positively influenced by self-image goals was not supported.

**Table 4**

*Multiple Linear Regression with Self-Image Goals Predicting Loneliness*

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Lower	Upper
Step 1						
Self-image goals	-0.09	0.01	-7.34	< .001	-0.12	-0.07
Step 2						
Self-image goals	-0.06	0.01	-4.76	< .001	-0.08	-0.03
Age [75-84]	0.02	0.03	0.69	.491	-0.04	0.08
Age [85-94]	0.00	0.04	0.11	.910	-0.07	0.08
Age [95-106]	0.02	0.10	0.16	.870	-0.18	0.21
Gender [Male]	0.01	0.02	0.34	.737	-0.04	0.05
Race [White/Caucasian]	0.00	0.06	-0.01	.994	-0.11	0.11
Race [Black/African American]	-0.02	0.06	-0.28	.783	-0.14	0.11
Race [Hispanic]	-0.01	0.04	-0.32	.750	-0.09	0.06
Education [GED]	0.07	0.05	1.51	.130	-0.02	0.17
Education [High-school graduate]	0.07	0.03	2.39	.017	0.01	0.13
Education [Some college]	0.10	0.03	3.03	.002	0.04	0.17
Education [College and above]	0.05	0.04	1.50	.134	-0.02	0.12
Income	0.00	0.00	-0.35	.728	0.00	0.00
Number of people in household	-0.01	0.01	-1.07	.283	-0.03	0.01
Employment [Employed]	0.06	0.03	2.10	.036	0.00	0.11
Employment [Unemployed]	-0.02	0.14	-0.16	.871	-0.29	0.25

Self-report of health	0.03	0.01	2.80	.005	0.01	0.06
Functional impairment [Yes]	-0.01	0.03	-0.26	.794	-0.07	0.05
Home health care [Yes]	0.04	0.03	1.14	.255	-0.03	0.10
Depression	0.07	0.01	11.14	< .001	0.06	0.08
Composition of social network	-0.03	0.02	-1.85	.071	-0.07	0.00
Closeness to partner	-0.02	0.01	-3.18	.002	-0.04	-0.01
Number of close relationships	0.00	0.00	0.50	.615	0.00	0.00
Contact with social network	-0.12	0.02	-7.51	< .001	-0.15	-0.09
Social participation	0.00	0.02	-0.24	.812	-0.04	0.03
Religiosity/spirituality	-0.02	0.01	-3.12	.002	-0.04	-0.01

A multiple linear regression analysis was conducted to test the hypothesis that loneliness is negatively influenced by higher levels of life satisfaction. The dependent variable in this analysis was loneliness, and the independent variable was life satisfaction. The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 5 displays the results of the regression analysis. Life satisfaction was a significant negative predictor in Step 1 ( $B = -0.11, p < .001$ ) and in Step 2 ( $B = -0.06, p < .001$ ), indicating that higher scores on life satisfaction was related to lower levels on loneliness after controlling

for other factors. The hypothesis that loneliness would be negatively influenced by life satisfaction was supported.

**Table 5**

*Multiple Linear Regression with Life Satisfaction Predicting Loneliness*

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Lower	Upper
<b>Step 1</b>						
Life Satisfaction	-0.11	0.01	-14.90	< .001	-0.12	-0.09
<b>Step 2</b>						
Life Satisfaction	-0.06	0.01	-8.08	< .001	-0.08	-0.05
Age [75-84]	0.03	0.03	0.97	.331	-0.03	0.08
Age [85-94]	0.03	0.04	0.75	.453	-0.05	0.10
Age [95-106]	0.02	0.10	0.22	.830	-0.17	0.22
Gender [Male]	0.02	0.02	0.94	.346	-0.02	0.07
Race [White/Caucasian]	0.00	0.05	-0.03	.980	-0.11	0.11
Race [Black/African American]	-0.03	0.06	-0.50	.616	-0.15	0.09
Race [Hispanic]	0.02	0.04	0.44	.658	-0.06	0.09
Education [GED]	0.08	0.05	1.70	.089	-0.01	0.18
Education [High-school graduate]	0.08	0.03	2.66	.008	0.02	0.14
Education [Some college]	0.10	0.03	3.03	.002	0.04	0.16
Education [College and above]	0.06	0.04	1.57	.116	-0.01	0.12
Income	0.00	0.00	0.16	.873	0.00	0.00
Number of people in household	-0.01	0.01	-1.01	.312	-0.03	0.01
Employment [Employed]	0.04	0.03	1.51	.131	-0.01	0.09
Employment [Unemployed]	-0.05	0.14	-0.39	.694	-0.32	0.21
Self-report of health	0.02	0.01	1.72	.085	0.00	0.04
Functional impairment [Yes]	-0.03	0.03	-0.87	.386	-0.08	0.03
Home health care [Yes]	0.01	0.03	0.21	.832	-0.06	0.07
Depression	0.06	0.01	9.61	< .001	0.05	0.08
Composition of social network	-0.03	0.02	-1.65	.104	-0.06	0.01
Closeness to partner	-0.02	0.01	-2.47	.014	-0.03	0.00
Number of close relationships	0.00	0.00	0.91	.364	0.00	0.00
Contact with social network	-0.11	0.02	-7.06	< .001	-0.14	-0.08
Social participation	-0.01	0.02	-0.50	.616	-0.04	0.02
Religiosity/spirituality	-0.02	0.01	-2.27	.024	-0.03	0.00

A multiple linear regression analysis was conducted to test the hypothesis that loneliness is influenced by a person's subjective well-being. The dependent variable in this analysis was



loneliness. The independent variable was subjective well-being. The control variables were the same as the previous regression. The independent and control variables were entered in separate steps.

Before interpreting the regression results, the assumptions of normality, homoscedasticity, and multicollinearity were tested. Normality was tested by visual inspection of normal P-P plots of the regression residuals; a slight deviation from the normal line indicated that the assumption was met. Homoscedasticity was tested by visual inspection of scatterplots of residuals versus predicted values; the data were approximately randomly distributed around zero, indicating the assumption was met. Multicollinearity was assessed by calculating variance inflation factors. Marital status had variance inflation factor values greater than 10, indicating severe multicollinearity; this variable was removed from the regression.

Table 6 displays the results of the regression analysis. Subjective well-being was a significant negative predictor in Step 1 ( $B = -0.25, p < .001$ ) and in Step 2 ( $B = -0.18, p < .001$ ), indicating that higher scores on subjective well-being predicted decreased levels of loneliness after controlling for other factors. The hypothesis that loneliness would be influenced by subjective well-being was supported. Those who experienced more subjective well-being were less lonely.

**Table 6**

*Multiple Linear Regression with Subjective Well-Being Predicting Loneliness*

Variable	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Lower	Upper
Step 1						
Subjective well-being	-0.25	0.01	-18.12	< .001	-0.28	-0.23
Step 2						
Subjective well-being	-0.18	0.02	-11.72	< .001	-0.21	-0.15
Age [75-84]	0.03	0.03	0.91	.365	-0.03	0.08
Age [85-94]	0.03	0.04	0.88	.381	-0.04	0.11

Age [95-106]	0.00	0.10	0.01	.990	-0.19	0.19
Gender [Male]	0.04	0.02	1.81	.070	0.00	0.08
Race [White/Caucasian]	0.00	0.05	-0.01	.991	-0.10	0.10
Race [Black/African American]	-0.04	0.06	-0.70	.487	-0.16	0.08
Race [Hispanic]	0.03	0.04	0.71	.475	-0.05	0.10
Education [GED]	0.04	0.05	0.88	.381	-0.05	0.13
Education [High-school graduate]	0.04	0.03	1.45	.148	-0.02	0.10
Education [Some college]	0.06	0.03	1.83	.067	0.00	0.12
Education [College and above]	0.01	0.03	0.32	.748	-0.06	0.08
Income	0.00	0.00	0.63	.531	0.00	0.00
Number of people in household	-0.02	0.01	-2.00	.045	-0.04	0.00
Employment [Employed]	0.02	0.03	0.59	.556	-0.04	0.07
Employment [Unemployed]	-0.13	0.13	-0.96	.337	-0.38	0.13
Self-report of health	0.00	0.01	0.13	.899	-0.02	0.02
Functional impairment [Yes]	-0.02	0.03	-0.80	.422	-0.08	0.03
Home health care [Yes]	0.01	0.03	0.40	.692	-0.05	0.08
Depression	0.06	0.01	9.26	< .001	0.05	0.07
Composition of social network	-0.04	0.02	-2.20	.031	-0.07	0.00
Closeness to partner	-0.02	0.01	-2.24	.025	-0.03	0.00
Number of close relationships	0.00	0.00	0.91	.365	0.00	0.00
Contact with social network	-0.09	0.02	-6.09	< .001	-0.12	-0.06
Social participation	-0.01	0.02	-0.63	.532	-0.04	0.02
Religiosity/spirituality	-0.02	0.01	-2.42	.016	-0.03	0.00

## Discussion

Loneliness is prevalent among the older adult population. This secondary data analysis is the first study that explores the effect of interpersonal goals on loneliness in older adults. These factors, to our knowledge, have not been previously examined in relation to loneliness in older adults. We also looked at a subset of factors implicated in loneliness, such as life satisfaction and subjective well-being. Other risk factors that have been previously examined concerning loneliness (e.g., age, gender, race/ethnicity, education, income, number of people in household, employment status, self-report of health, functional impairment, use of home care, depression, composition of social network, closeness to partner, number of close relationships, contact with

social network, social participation, and religiosity/spirituality) were also included to assess the replicability of these findings.

The use of secondary data for this study was feasible and cost-effective given that the pandemic restrictions affected the active recruitment of study participants. The study addressed the question of how loneliness in older adults is affected by interpersonal goals (compassionate goals and self-image goals), life satisfaction, and subjective well-being. Using the combined HRS RAND and the psychosocial datasets, multiple linear regression was conducted to explore the effects of the predictor variables on the outcome variable while controlling for the covariates. The choice of the variables included in the model stems from a review of current literature about loneliness.

The research findings demonstrate that as interpersonal goals (compassionate and self-image), life satisfaction, and subjective well-being increase, loneliness decreases. As the first study exploring the effect of interpersonal goals on older adults, this study was built on a research study by Crocker and Canevello (2008), who promoted interpersonal goals through their Ecosystem-Egosystem Theory of Social Motivation. Compassionate goals were designed to measure the extent to which people have compassion for others, are supportive, constructive, and avoid harming others; self-image goals measure how much people want to or try to do things to get others to recognize their positive qualities and avoid showing their weaknesses (Crocker & Canevello, 2012).

According to the results of the study, the responses to the study hypotheses were mixed. The first, third, and fourth hypotheses, which stated that loneliness is negatively influenced by compassionate goals, life satisfaction, and subjective well-being were confirmed. These findings are consistent with what has been found in other studies (Crocker & Canevello, 2008; Szcześniak

et al., 2020; VanderWeele et al., 2012; Windle & Woods, 2004). However, the second hypothesis that loneliness is positively influenced by self-image goals was not supported. This study found that a strong negative association exists between self-image goals and loneliness. These results were contrary to what was in the literature. Self-image goals predicted greater loneliness in college students (Crocker & Canevello, 2008; Duarte & Pinto-Gouveia, 2015). The comparative studies' participants were a younger population. Therefore, this finding could be attributed to the fact that college students and older adults have different priorities. Unlike the older adults who might be satisfied with their life accomplishments, college students may feel the need for competition based on a sense of scarcity and fear that their needs will not be met in collaboration with others.

For the overall regression model, for higher scores on interpersonal goals (compassionate and self-image), subjective well-being and life satisfaction were significantly related to decreased loneliness as well as religiosity/spirituality, contact with social network, closeness to partner, depression. Lower levels of loneliness were reported by those with higher levels of compassionate goals, self-image goals, life satisfaction, subjective well-being, religiosity/spirituality, closeness to partner, contact with social network, and lower depression scores. However, there were also notable significant and non-significant associations within the subgroups. For example, the regression model for compassionate goals, self-image goals, and life satisfaction showed that having some college-level education decreased loneliness ( $p < .001$ ;  $p = .002$ ,  $p = .002$ ), respectively. The regression model for compassionate and self-image goals showed that being employed ( $p = .036$ ) and high scores on self-report of health were related to decreased loneliness ( $p = .015$ ;  $p = .005$ ). Additionally, the regression model for subjective well-

being showed that higher composition of social networks was associated with decreased loneliness ( $p = .031$ ).

This study found no significant differences between male and female gender and the different older adult age groups with regards to loneliness. Some previous studies have found that female gender and oldest-old are more likely to experience elevated loneliness (Ayalon & Shiovitz-Ezra, 2011; Pinguart & Sorensen, 2001; Vozikaki et al., 2018). However, similar to the findings of the HRS secondary analysis study by Theeke (2009), a meta-analysis by Maes et al. (2019), and a recent study by Sunwoo (2020), this study found no significant association between gender and age differences in loneliness in older adults. In addition to age and gender, this study also found that race, income, number of people in the household, unemployment, functional impairment, frequency of home care use, number of close relationships, and social participation were not significant predictors of loneliness.

### **Strengths**

A key strength of this study is using a population-based nationally representative survey, which makes this study replicable. HRS dataset is a part of an international consortium of aging studies. This study could be replicated using data from international studies to provide a meaningful comparison from a cultural standpoint. Second, the study focused on interpersonal goals and opened more doors for scholars to explore further the effects of interpersonal goals in older adults. The results provide a good foundation for testing the association of loneliness and interpersonal goals in older adults to develop targeted interventions for loneliness. Finally, results from this study will add to the body of nursing knowledge about loneliness in older adults.

### **Limitations**

There were several limitations in this study. First, the data was obtained from a secondary source; as a result, only the variables available in the dataset were used in this study. Second, because of the study's cross-sectional nature, it is impossible to prove cause and effect. Third, many participants were under age 65, which necessitated multiple imputations and pooled results. Fourth, this study's primary focus was to provide a broad, general look at the effect of interpersonal goals on loneliness in older adults. While many of the findings were consistent with previous studies, this was the first exploration of interpersonal goals in older adults; therefore, study results cannot be compared to previous studies. Fifth, Blacks and Hispanics were underrepresented in the sample. Thus, the study results cannot be generalized beyond those races/ethnicities included in the present investigation. Lastly, the HRS survey is based on self-reported data, which is subject to response bias that may directly or indirectly affect the outcomes of this study.

### **Implications and Future Research**

Despite the limitations of this study, the findings are meaningful and provide a good foundation for future work. The first endeavor stemming from this research is the inclusion of interpersonal goals (compassionate and self-image) in loneliness interventions for older adults. Disseminating these findings on the associations of interpersonal goals, subjective well-being, life satisfaction, religiosity/spirituality, contact with social network, closeness to partner, and depression which is strongly correlated with loneliness via continuing education offerings and professional publications, will be helpful for public health policymakers and healthcare workers. As discussed previously, loneliness prevention efforts are ongoing and tremendous improvements have been made. However, the role of interpersonal goals and spirituality/religiosity is still lacking in loneliness research with older adults. This study implies

that including interpersonal goals in loneliness interventions for older adults may decrease their feelings of loneliness.

The results of this study have implications for nursing research and practice. Nurses should assess older adults for loneliness with every encounter. This is especially important for community health and home healthcare nurses who often visit older adults in their homes, especially if they are homebound. Nurses should pay particular attention and conduct thorough loneliness assessments using a standardized tool. If signs of loneliness are noted, then nurses should document them accordingly and arrange for follow-up evaluations and treatment as needed. As this is the first study to examine the effects of interpersonal goals on loneliness on older adults, there is a need for more studies on the impact of interpersonal goals on loneliness on older adults from different cultural and religious backgrounds. Studies must also provide representative samples of people from various ethnicities to draw adequate conclusions regarding interpersonal goals in these populations.

## **Conclusion**

The findings from this study provide evidence that interpersonal goals (compassionate and self-image), subjective well-being, and life satisfaction were significantly related to loneliness, as were religiosity/spirituality, contact with social network, closeness to partner, and depression. Loneliness has significant detrimental effects on health, and the importance of loneliness reduction in older adults is imperative to both their life satisfaction and well-being. Older adults often face physical and psychosocial difficulties as they age. Reducing loneliness in this population can enhance their outlook on life as they face the challenges of aging. Nurses are in an important position to assess for and recognize loneliness and ensure that patients receive appropriate care and treatment.

## References

- Aanes, M., Hetland, J., Pallesen, S., & Mittelmark, M. (2011). Does loneliness mediate the stress-sleep quality relation? The Hordaland health study. *International Psychogeriatrics*, 23(6), 994-1002. <https://doi.org/10.1017/S1041610211000111>
- Administration on Aging (AoA). (2018). *2018 profile of older Americans*. <https://acl.gov/aging-and-disability-in-america/data-and-research/profile-older-americans>
- Alaviani, M., Khosravan, S., Alami, A., & Moshki, M. (2015). The effect of a multi-strategy program on developing social behaviors based on Pender's health promotion model to prevent loneliness of old women referred to gonabad urban health centers. *International Journal of Community Based Nursing & Midwifery*, 3(2), 132.
- Anderson, G. O., & Thayer, C. E. (2018). Loneliness and social connections: A national survey of adults 45 and older. *Washington, DC: AARP Foundation*. <https://doi.org/10.26419/res.00246.001>
- Arnaert, A., & Delesie, L. (2007). Effectiveness of video-telephone nursing care for the homebound elderly. *Canadian Journal of Nursing Research*, 39(1), 20-36.
- Ayalon, L., & Shiovitz-Ezra, S. (2011). The relationship between loneliness and passive death wishes in the second half of life. *International Psychogeriatrics*, 23(10), 1677-1685.
- Beck, R., Arizmendi, A., Purnell, C., Fultz, B., & Callahan, C. (2009). House calls for seniors: Building and sustaining a model of care for homebound seniors [corrected] [published erratum appears in J AM GERIATR SOC 2010



- Nov;58(11):2258]. *Journal of the American Geriatrics Society*, 57(6), 1103-1109.  
<https://doi.org/10.1111/j.1532-5415.2009.02278.x>
- Bedard-Thomas, J., Gausvik, C., Wessels, J., Regan, S., Goodnow, K., & Goroncy, A. (2019). I live alone but don't feel alone: Social isolation and loneliness from the patient perspective. *Journal of Patient-Centered Research and Reviews*, 6(4), 262-266. <https://doi.org/10.17294/2330-0698.1715>
- Beutel, M. E., Klein, E. M., Brähler, E., Reiner, I., Jünger, C., Michal, M., Wiltink, J., Wild, P. S., Münzel, T., & Lackner, K. J. (2017). Loneliness in the general population: Prevalence, determinants and relations to mental health. *BMC Psychiatry*, 17(1), 97. <https://doi.org/10.1186/s12888-017-1262-x>
- Boss, L., Branson, S., Cron, S., & Kang, D. (2016). Biobehavioral examination of religious coping, psychosocial factors, and executive function in homebound older adults. *Religions*, 7(5). <https://doi.org/10.3390/rel7050042>
- Boss, L., Kang, D., & Branson, S. (2015). Loneliness and cognitive function in the older adult: A systematic review. *International Psychogeriatrics*, 27(4), 541-553.  
<https://doi.org/10.1017/s1041610214002749>
- Brooke, J., & Jackson, D. (2020). Older people and COVID-19: Isolation, risk and ageism. *Journal of Clinical Nursing*, 2044-2046.  
<https://doi.org/10.1111/jocn.15274>
- Brooks, L. (1933). The relation of spatial isolation to psychosis. *The Journal of Abnormal and Social Psychology*, 27(4), 375.
- Cacioppo, J., & Cacioppo, S. (2018). The growing problem of loneliness. *The Lancet*, 391, 426. [https://doi.org/10.1016/S0140-6736\(18\)30142-9](https://doi.org/10.1016/S0140-6736(18)30142-9)

- Cacioppo, J., Hawkley, L., Crawford, L., Ernst, J., Burleson, M., Kowalewski, R., Malarkey, W., Van Cauter, E., & Berntson, G. (2002). Loneliness and health: Potential mechanisms. *Psychosomatic Medicine*, 64(3), 407-417.
- Canevello, A., & Crocker, J. (2010). Creating good relationships: Responsiveness, relationship quality, and interpersonal goals. *Journal of Personality and Social Psychology*, 99(1), 78. <https://doi.org/10.1037/a0018186>.
- Canevello, A., & Crocker, J. (2017). Compassionate goals and affect in social situations. *Motiv Emot*, 41(2), 158-179. <https://doi.org/10.1007/s11031-016-9599-x>
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54(3), 165.
- Choi, N., Pepin, R., Marti, C., Stevens, C., & Bruce, M. (2020). Improving social connectedness for homebound older adults: Randomized controlled trial of tele-delivered behavioral activation versus tele-delivered friendly visits. *American Journal of Geriatric Psychiatry*, 28(7), 698-708. <https://doi.org/10.1016/j.jagp.2020.02.008>
- Cigna. (2018). *Cigna U. S Loneliness Index: Survey of 20,000 Americans examining behaviors driving loneliness in the United States*. [https://www.multivu.com/players/English/8294451-cigna-us-loneliness-survey/docs/IndexReport\\_1524069371598-173525450.pdf](https://www.multivu.com/players/English/8294451-cigna-us-loneliness-survey/docs/IndexReport_1524069371598-173525450.pdf)
- Cohen-Mansfield, J., Hazan, H., Lerman, Y., & Shalom, V. (2016). Correlates and predictors of loneliness in older adults: A review of quantitative results informed by qualitative insights. *International Psychogeriatrics*, 28(4), 557-576. <https://doi.org/http://dx.doi.org/10.1017/S1041610215001532>

- Cohen-Mansfield, J., Shmotkin, D., & Hazan, H. (2012). Homebound older persons: Prevalence, characteristics, and longitudinal predictors. *Archives of Gerontology and Geriatrics*, 54(1), 55-60. <https://doi.org/10.1016/j.archger.2011.02.016>
- Cotterill, L., & Taylor, D. (2001). Promoting mental health and wellbeing amongst housebound older people. *Quality in Ageing*, 2(3), 32-46.
- Crocker, J. (2008). From egosystem to ecosystem: Implications for relationships, learning, and well-being. In H. A. Wayment & J. J. Bauer (Eds.), *Transcending self-interest: Psychological explorations of the quiet ego* (pp. 63-72). American Psychological Association. <https://doi.org/10.1037/11771-006>
- Crocker, J., & Canevello, A. (2008). Creating and undermining social support in communal relationships: The role of compassionate and self-image goals. *Journal of Personality and Social Psychology*, 95(3), 555-575. <https://doi.org/10.1037/0022-3514.95.3.555>
- Crocker, J., & Canevello, A. (2012). Consequences of self-image and compassionate goals. In P. G. Devine & E. A. Plant (Eds.), *Advances in Experimental Social Psychology* (Vol. 45, pp. 229-277). Elsevier.
- Crocker, J., & Canevello, A. (2015). Relationships and the self: Egosystem and ecosystem. In M. Mikulincer, P. R. Shaver, J. A. Simpson, & J. F. Dovidio (Eds.), *APA handbook of personality and social psychology* (Vol. 3, pp. 93-116). American Psychological Association. <https://doi.org/10.1037/14344-004>
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49(1), 71-75.

- DiJulio, B., Hamel, L., Muñana, C., & Brodie, M. (2018). Loneliness and social isolation in the United States, the United Kingdom, and Japan: An international survey. *The Economist & Kaiser Family Foundation*.
- Duarte, J., & Pinto-Gouveia, J. (2015). Focusing on self or others has different consequences for psychological well-being: A longitudinal study of the effects of distinct interpersonal goals. *Journal of Social and Clinical Psychology, 34*(9), 809-825. <https://doi.org/10.1521/jscp.2015.34.9.809>
- Dykstra, P. A., van Tilburg, T. G., & Gierveld, J. D. (2005). Changes in older adult loneliness: Results from a seven-year longitudinal study. *Research on Aging, 27*(6), 725-747.
- Eskelinen, K., Hartikainen, S., & Nykänen, I. (2016). Is loneliness associated with malnutrition in older people? *International Journal of Gerontology, 10*(1), 43-45. <https://doi.org/10.1016/j.ijge.2015.09.001>
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G\* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160.
- Gardiner, C., Geldenhuys, G., & Gott, M. (2018). Interventions to reduce social isolation and loneliness among older people: An integrative review. *Health & Social Care in the Community, 26*(2), 147-157. <https://doi.org/10.1111/hsc.12367>
- Geggel, L. (2018). *Why the UK just appointed a Minister of Loneliness*. Retrieved November 25 from <https://www.livescience.com/61466-ministry-of-loneliness.html>

- 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.
- Giorgi, A. (2012). The descriptive phenomenological psychological method. *Journal of Phenomenological psychology, 43*(1), 3-12.
- Gum, A. M., Shiovitz-Ezra, S., & Ayalon, L. (2017). Longitudinal associations of hopelessness and loneliness in older adults: Results from the US health and retirement study. *International Psychogeriatrics, 29*(9), 1451-1459.  
<https://doi.org/10.1017/S1041610217000904>
- Han, J., & Richardson, V. (2010). The relationship between depression and loneliness among homebound older persons: does spirituality moderate this relationship? *Journal of Religion & Spirituality in Social Work, 29*(3), 218-236.  
<https://doi.org/10.1080/15426432.2010.495610>
- Hawker, S., Payne, S., Kerr, C., Hardey, M., & Powell, J. (2002). Pearls, pith, and provocation. Appraising the evidence: Reviewing disparate data systematically. *Qualitative Health Research, 12*(9), 1284-1299.  
<https://doi.org/10.1177/1049732302238251>
- Hawkey, L., Hughes, M., Waite, L., Masi, C., Thisted, R., & Cacioppo, J. (2008). From social structural factors to perceptions of relationship quality and loneliness: The Chicago health, aging, and social relations study. *Journals of Gerontology. Series B: Psychological Sciences and Social Sciences, 63*(6), S375-384.  
<https://doi.org/10.1093/geronb/63.6.s375>

- Hawkley, L., Thisted, R., & Cacioppo, J. (2009). Loneliness predicts reduced physical activity: Cross-sectional & longitudinal analyses. *Health Psychology, 28*(3), 354-363. <https://doi.org/10.1037/a0014400>
- 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. <https://doi.org/10.1007/s12160-010-9210-8>
- 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., Wroblewski, K., Kaiser, T., Luhmann, M., & Schumm, L. P. (2019). Are US older adults getting lonelier? Age, period, and cohort differences. *Psychology and Aging, 34*(8), 1144. <https://doi.org/10.1037/pag0000365>
- Henning-Smith, C., Moscovice, I., & Kozhimannil, K. (2019, Sep). Differences in Social Isolation and Its Relationship to Health by Rurality. *Journal of Rural Health, 35*(4), 540-549. <https://doi.org/10.1111/jrh.12344>
- Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science, 10*(2), 227-237.
- HRS. (2019). *Health and Retirement Study: 2016 Tracker Early Data Description and Usage. Version 3.0.*
- Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging, 26*(6), 655-672.

- Hulley, S., Cummings, S., Browner, W., Grady, D., & Newman, T. (2013). *Designing clinical research* (4th, Ed.). Lippincott Williams & Wilkins.
- Iecovich, E., & Biderman, A. (2012). Attendance in adult day care centers and its relation to loneliness among frail older adults. *International Psychogeriatrics*, 24(3), 439-448. <https://doi.org/10.1017/s1041610211001840>
- Jing, L., Jin, Y., Zhang, X., Wang, F., Song, Y., & Xing, F. (2018). The effect of Baduanjin qigong combined with CBT on physical fitness and psychological health of elderly housebound. *Medicine* 97(51), 1-7. <https://doi.org/10.1097/md.00000000000013654>
- Jing, L., Wang, F., Zhang, X., Yao, T., & Xing, F. (2017). Occurrence of and factors influencing elderly homebound in Chinese urban community: A cross-sectional study. *Medicine* 96(26), 1-6. <https://doi.org/10.1097/MD.00000000000007207>
- Kelly, D., Steiner, A., Mazzei, M., & Baker, R. (2019). Filling a void? The role of social enterprise in addressing social isolation and loneliness in rural communities. *Journal of Rural Studies*, 70, 225-236.
- Kemperman, A., van den Berg, P., Weijs-Perrée, M., & Uijtdewillegen, K. (2019). Loneliness of older adults: Social network and the living environment. *International Journal of Environmental Research and Public Health*, 16(3), 406.
- Kharicha, K., Iliffe, S., Harari, D., Swift, C., Gillmann, G., & Stuck, A. E. (2007). Health risk appraisal in older people 1: Are older people living alone an 'at-risk' group? *British Journal of General Practice*, 57(537), 271-276.

- Krause-Parello, C. A. (2012). Pet ownership and older women: The relationships among loneliness, pet attachment support, human social support, and depressed mood. *Geriatric Nursing, 33*(3), 194-203.
- Lee, E., Depp, C., Palmer, B., Glorioso, D., Daly, R., Liu, J., Tu, X., Kim, H., Tarr, P., Yamada, Y., & Jeste, D. V. (2018). High prevalence and adverse health effects of loneliness in community-dwelling adults across the lifespan: Role of wisdom as a protective factor. *International Psychogeriatrics, 1*-16.  
<https://doi.org/10.1017/s1041610218002120>
- Lindsay, E. K., Young, S., Brown, K. W., Smyth, J. M., & Creswell, J. D. (2019). Mindfulness training reduces loneliness and increases social contact in a randomized controlled trial. *Proceedings of the National Academy of Sciences of the United States of America, 116*(9), 3488-3493.  
<https://doi.org/10.1073/pnas.1813588116>
- Luhmann, M., & Hawkey, L. (2016). Age differences in loneliness from late adolescence to oldest old age. *Developmental Psychology, 52*(6), 943.  
<https://doi.org/10.1037/dev0000117>
- MacIntyre, I., Corradetti, P., Roberts, J., Browne, G., Watt, S., & Lane, A. (1999). Pilot study of a visitor volunteer programme for community elderly people receiving home health care. *Health Soc Care Community, 7*(3), 225-232.  
<https://doi.org/10.1046/j.1365-2524.1999.00178.x>
- MacNeill, L., DiTommaso, E., & Brunelle, C. (2016). Coping style as a moderator of chronic loneliness and substance use in emerging adults. *Journal of Depression and Anxiety, 5*(215), 2167-1044.1000215.



- Maes, M., Qualter, P., Vanhalst, J., Van den Noortgate, W., & Goossens, L. (2019). Gender differences in loneliness across the lifespan: A meta-analysis. *European Journal of Personality, 33*(6), 642-654.
- Mather, M., Jacobsen, L., & Pollard, K. (2015). Aging in the United States. *Population Bulletin, 70*(2). <https://www.prb.org/wp-content/uploads/2016/01/aging-us-population-bulletin-1.pdf>
- Miller, E. (2020). Protecting and improving the lives of older adults in the COVID-19 era. *Journal of Aging and Social Policy, 32*(4-5), 297-309. <https://doi.org/10.1080/08959420.2020.1780104>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine, 151*(4), 264-269.
- Moorer, P., & Suurmeijer, T. P. (2001). The effects of neighbourhoods on size of social network of the elderly and loneliness: A multilevel approach. *Urban Studies, 38*(1), 105-118.
- Morgan, T., Wiles, J., Moeke-Maxwell, T., Black, S., Park, H. J., Dewes, O., Williams, L. A., & Gott, M. (2019). 'People haven't got that close connection': Meanings of loneliness and social isolation to culturally diverse older people. *Aging Mental Health, 1-9*. <https://doi.org/10.1080/13607863.2019.1633619>
- Musich, S., Wang, S. S., Hawkins, K., & Yeh, C. S. (2015). The impact of loneliness on quality of life and patient satisfaction among older, sicker adults. *Gerontology and Geriatric Medicine, 1*, 1-9.

- Nathans, L., Oswald, F., & Nimon, K. (2012). Interpreting multiple linear regression: A guidebook of variable importance. *Practical Assessment, Research & Evaluation, 17*(9), 1-19.  
<https://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1265&context=pars>
- National Academies of Sciences Engineering and Medicine [NASEM]. (2020). *Social isolation and loneliness in older adults: Opportunities for the health care system*.  
<https://www.nationalacademies.org/our-work/the-health-and-medical-dimensions-of-social-isolation-and-loneliness-in-older-adults>
- Ortman, J., Velkoff, V., & Hogan, H. (2014). *An aging nation: The older population in the United States*.  
<https://www.census.gov/content/dam/Census/library/publications/2014/demo/p25-1140.pdf>
- Pavot, W., & Diener, E. (1993). Review of the Satisfaction with Life Scale. *Psychological Assessment, 5*(2), 164-172.
- Penninx, B., Van Tilburg, T., Kriegsman, D., Deeg, D., Boeke, A., & van Eijk, J. (1997). Effects of social support and personal coping resources on mortality in older age: The longitudinal aging study Amsterdam. *American Journal of Epidemiology, 146*(6), 510-519.
- Peplau, H. (1955). Loneliness. *The American Journal of Nursing, 55*(12), 1476-1481.  
<https://doi.org/10.2307/3469548>
- Perissinotto, C. M., Cenzer, I. S., & Covinsky, K. E. (2012). Loneliness in older persons: A predictor of functional decline and death. *Archives of Internal Medicine, 172*(14), 1078-1084.

- Petitte, T., Mallow, J., Barnes, E., Petrone, A., Barr, T., & Theeke, L. (2015). A systematic review of loneliness and common chronic physical conditions in adults. *Open Psychol J*, 8(Suppl 2), 113.
- Pinquart, M., & Sorensen, S. (2001). Influences on loneliness in older adults: A meta-analysis. *Basic and Applied Social Psychology*, 23(4), 245-266.
- Qualter, P., Vanhalst, J., Harris, R., Van Roekel, E., Lodder, G., Bangee, M., Maes, M., & Verhagen, M. (2015). Loneliness across the life span. *Perspectives on Psychological Science*, 10(2), 250-264.  
<https://doi.org/10.1177/17456916155568999>
- Rico-Urbe, L. A., Caballero, F. F., Martín-María, N., Cabello, M., Ayuso-Mateos, J. L., & Miret, M. (2018). Association of loneliness with all-cause mortality: A meta-analysis. *PloS One*, 13(1), e0190033.
- Rokach, A. M. I., & Bacanli, H. (2001). Perceived causes of loneliness: A cross-cultural comparison. *Social Behavior & Personality: an international journal*, 29(2), 169-182.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor Structure. *Journal of Personality Assessment*, 66(1), 20.
- Saito, T., Kai, I., & Takizawa, A. (2012). Effects of a program to prevent social isolation on loneliness, depression, and subjective well-being of older adults: A randomized trial among older migrants in Japan. *Archives of Gerontology and Geriatrics*, 55(3), 539-547.

- Savikko, N., Routasalo, P., Tilvis, R., Strandberg, T., & Pitkälä, K. (2005). Predictors and subjective causes of loneliness in an aged population. *Archives of Gerontology and Geriatrics*, 41(3), 223-233. <https://doi.org/10.1016/j.archger.2005.03.002>
- Segel-Karpas, D., Ayalon, L., & Lachman, M. E. (2018). Loneliness and depressive symptoms: The moderating role of the transition into retirement. *Aging & Mental Health*, 22(1), 135-140.
- Servais, M. A. (2010). *Overview of HRS public data files for cross-sectional and longitudinal analysis*.
- Shoestul, B., Han, J., Germine, L., & Dodell-Feder, D. (2020). Risk factors for loneliness: The high relative importance of age versus other factors. *PloS One*, 15(2), 1-18. <https://doi.org/10.1371/journal.pone.0229087>
- Smith, J., Ryan, L., Fisher, G., Sonnega, A., & Weir, D. (2017). *Psychosocial and Lifestyle Questionnaire 2006 - 2016: Documentation Report*.
- Sunwoo, L. (2020). Loneliness among older adults in the Czech Republic: A socio-demographic, health, and psychosocial profile. *Archives of Gerontology and Geriatrics*, 90, 104068.
- Szcześniak, M., Bielecka, G., Madej, D., Pieńkowska, E., & Rodzeń, W. (2020). The role of self-esteem in the relationship between loneliness and life satisfaction in late adulthood: Evidence from Poland. *Psychology Research and Behavior Management*, 13, 1201.
- Széman, Z. (2014). A new pattern in long-term care in Hungary: Skype and youth volunteers [Article]. *Anthropological Notebooks*, 20(1), 105-117.

- <https://www.scopus.com/inward/record.uri?eid=2-s2.0-84908887558&partnerID=40&md5=185e22c243cb9b5dda6628bafde20e9e>
- Tang, F., & Lee, Y. (2011). Social support networks and expectations for aging in place and moving. *Research on Aging*, 33, 444-464.
- <https://doi.org/10.1177/0164027511400631>
- Tarugu, J., Pavithra, R., Vinothchandar, S., Basu, A., Chaudhuri, S., & John, K. (2019). Effectiveness of structured group reminiscence therapy in decreasing the feelings of loneliness, depressive symptoms and anxiety among inmates of a residential home for the elderly in Chittoor district. *International Journal of Community Medicine and Public Health*, 6(2), 847.
- Teguo, M., Simo-Tabue, N., Stoykova, R., Meillon, C., Cogne, M., Amiéva, H., & Dartigues, J.-F. (2016). Feelings of loneliness and living alone as predictors of mortality in the elderly: The PAQUID study. *Psychosomatic Medicine*, 78(8), 904-909. <https://doi.org/10.1097/PSY.0000000000000386>
- Theeke. (2010). Sociodemographic 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.
- Theeke, L. (2009). Predictors of loneliness in U.S. adults over age sixty-five. *Archives of Psychiatric Nursing*, 23(5), 387-396. <https://doi.org/10.1016/j.apnu.2008.11.002>
- Theeke, L., & Mallow, J. (2013). Loneliness and quality of life in chronically ill rural older adults. *American Journal of Nursing*, 113(9), 28-38.
- <https://doi.org/10.1097/01.NAJ.0000434169.53750.14>

- Thomas, K., Akobundu, U., & Dosa, D. (2016). More than a meal? A randomized control trial comparing the effects of home-delivered meals programs on participants' feelings of loneliness. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, 71(6), 1049-1058. <https://doi.org/10.1093/geronb/gbv111>
- Tijhuis, M., De Jong-Gierveld, J., Feskens, E., & Kromhout, D. (1999). Changes in and factors related to loneliness in older men: The Zutphen elderly study. *Age and Ageing*, 28(5), 491-495.
- Tse, M. M., Lai, C., Lui, J. Y., Kwong, E., & Yeung, S. Y. (2016). Frailty, pain and psychological variables among older adults living in Hong Kong nursing homes: Can we do better to address multimorbidities? *Journal of Psychiatric and Mental Health Nursing*, 23(5), 303-311. <https://doi.org/10.1111/jpm.12303>
- U. S. Census Bureau. (2018). *The population 65 years and older in the United States*. <https://www.census.gov/content/dam/Census/library/publications/2018/acs/ACS-38.pdf>
- VanderWeele, T., Hawkey, L., & Cacioppo, J. (2012). On the reciprocal association between loneliness and subjective well-being. *American Journal of Epidemiology*, 176(9), 777-784. <https://doi.org/10.1093/aje/kws173>
- Vozikaki, M., Papadaki, A., Linardakis, M., & Philalithis, A. (2018). Loneliness among older European adults: Results from the survey of health, aging and retirement in Europe. *Journal of Public Health*, 26(6), 613-624.
- Weijs-Perrée, M., van den Berg, P., Arentze, T., & Kemperman, A. (2015). Factors influencing social satisfaction and loneliness: A path analysis. *Journal of Transport Geography*, 45, 24-31. <https://doi.org/10.1016/j.jtrangeo.2015.04.004>

- Whittemore, R., & Knafl, K. (2005). The integrative review: Updated methodology. *Journal of Advanced Nursing*, 52(5), 546-553.
- Wilson, C., & Moulton, B. (2010). Loneliness among older adults: A national survey of adults 45+. *Washington, DC: AARP*.  
[https://www.aarp.org/research/topics/life/info-2014/loneliness\\_2010.html](https://www.aarp.org/research/topics/life/info-2014/loneliness_2010.html)
- Windle, G., & Woods, R. (2004). Variations in subjective wellbeing: The mediating role of a psychological resource. *Ageing and Society*, 24, 583.
- World Health Organization. (2017). *Mental health of older adults*.  
<https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults>
- World Health Organization. (2018). *Ageing and health: Key facts*.  
<https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
- Wrzus, C., Hanel, M., Wagner, J., & Neyer, F. J. (2013). Social network changes and life events across the life span: a meta-analysis. *Psychological Bulletin*, 139(1), 53-80.  
<https://doi.org/10.1037/a0028601>
- Xiang, X., Chen, J., & Kim, M. (2019). Trajectories of homebound status in Medicare beneficiaries aged 65 and older. *Gerontologist*.  
<https://doi.org/10.1093/geront/gnz023>
- Yanguas, J., Pinazo-Henandis, S., & Tarazona-Santabalbina, F. J. (2018). The complexity of loneliness. *Acta Bio Medica: Atenei Parmensis*, 89(2), 302.
- Yin, J., Lassale, C., Steptoe, A., & Cadar, D. (2019). Exploring the bidirectional associations between loneliness and cognitive functioning over 10 years: The English longitudinal study of ageing. *International Journal of Epidemiology*.  
<https://doi.org/10.1093/ije/dyz085>

Yu, J., Lam, C., & Lee, T. (2016). Perceived loneliness among older adults with mild cognitive impairment. *International Psychogeriatrics*, 28(10), 1681-1685.

<https://doi.org/10.1017/S1041610216000430>