

## Loneliness, Cognitive Functioning and Quality of Life in Older Adults

Mahnoor Naveed<sup>1</sup>, Aleesha Riaz<sup>2</sup> and Nudra Malik<sup>3</sup>

1. MS Scholar

Institute of Applied Psychology,  
Punjab University, Lahore

2. Research Scholar

Department of Applied Psychology  
Lahore College for Women University, Lahore

3. Assistant Professor

Department of Applied Psychology  
Lahore College for Women University, Lahore  
Email: [nudramalik@gmail.com](mailto:nudramalik@gmail.com)

### ABSTRACT

Loneliness and cognitive impairment is a serious concern among the older adults and is a significant factor influencing elderly quality of life. The current study aimed to examine the associations among loneliness, cognitive functioning and quality of life in Pakistani older adults. The study is cross sectional study with a non-probability purposive sample comprising of 149 Pakistani older adults of ages 60 years and above. Internationally standardized scales have been used to collect online data. Multiple linear regression results indicate that loneliness ( $\beta = -0.23$ ,  $p < .001$ ) and cognitive functioning ( $\beta = 0.32$ ,  $p < .001$ ) are significant predictors of the quality of life in older adults. Furthermore, older men scored higher on loneliness and cognitive impairment than older women and the overall quality of life was better in women participants as compared to men. There is need for social and health interventions to promote the quality of life of elderly population, especially in times of pandemic, with specific focus on reducing loneliness and cognitive impairment,

**Keywords:** Loneliness, cognitive functioning, quality of life, older adults, gender difference.

## INTRODUCTION

According to the World Health Organization (WHO) (2015), the global elderly population of age 60 and above is expected to reach two billion by 2050. The wellbeing of older adults is a vital global challenge to the health sector and national stability which makes it more important to explore variables which have an influence on quality of life of elderly people. The process of aging is a biological phenomenon that is beyond human control. However, quality of life of older population could be promoted through steps taken in the right direction and it is one issue which is being consistently accentuated by WHO. New challenges and needs are faced by many elderly individuals during old age and usually the aging years have challenges such as social isolation, poverty, and disease progression. The emphasis of service providers is also more on provision of physical resources as compared to management of psychological factors which have a major role to play in the promotion of quality of life (Ahadi & Hassani, 2021).

Loneliness is a major source of concern in the elderly, mainly in societies where aging populations are growing rapidly. A person's state of being distant from others can be defined as loneliness. Loneliness is the perceived difference between the social needs of an individual and the degree that those needs are met by significant social interactions. Loneliness is further defined as an instinctively experienced state of emotions which results from unmet personal and social requirements, usually resulting from varying life course events such as diminishing health, aging, death of loved ones, old-age poverty and institutionalization. Loneliness is also considered to be a biopsychosocial determinant of health in elderly. It is associated with physical health issues like metabolic problems as well as with psychological and social issues like anxiety, depression, substance abuse, behavioral problems, and suicidal ideation (Lamis et al., 2014).

Older adults are at higher risk for loneliness because they are more likely to face factors such as living alone, the loss of relations, chronic illness, and hearing disorders. This vulnerability to loneliness and consequent social isolation can have serious effects on elderly wellbeing (Cacioppo & Hawkley, 2009). Meta-analyses have revealed that cognitive deterioration and increased risk of death are two of the most adverse health outcomes of loneliness in older adults (Jansson et al., 2017). Prominently, older individuals are more at risk of chronic diseases, and given the increase in life expectancy of elderly population groups across the world, there is resultant increase in chronic diseases and cognitive impairment overall (Wang et al., 2015).

Cognitive functions comprise of areas related to perception, learning, memory, decision making, attention, and language abilities. Cognitive function generally refers to mental processes involved in the gaining of knowledge, manipulation of information, and reasoning (Baltes et al., 1999). Impairment in cognition takes place when individuals have trouble in recollecting things, learning new things, getting involved in new activities, and focusing or settling on choices that influence their daily life. Cognitive impairment can progress from mild to extreme. Individuals with mild or moderate impairment might start to develop changes in psychological function, but at the same time are able to do their regular activities. However, individuals with severe levels of impairment lose their understanding, writing or talking abilities and are unable to live their life as an independent person, requiring non-stop care and support (Hu et al., 2017).

Cognitive decline in elderly populations is considered to be higher in low and middle income countries and is expected to become a dominant health challenge, especially for poorer populations living with limited resources. There is no treatment available which can cure cognitive impairment completely, thus making it even more important to identify factors

associated with helping to prevent or slow down the progression of cognitive decline.

Impaired cognitive functioning is itself damaging in older age as it reduces the already compromised functioning capacity. It decreases the ability to perform tasks of daily living, adequately accomplishing self-care activities, coping with the routine symptoms of chronic illness, and ability to monitor regular medication leading to a substantial deterioration in quality of life (Zhou et al., 2019).

Loneliness not only affects cognitive function but also increases the chances of late-life dementia (Boss et al., 2015; Zhong et al., 2017). At the cognitive level, social isolation harms new and old learning and also reduces cognitive function in individuals. Another likely cognitive mechanism is that loneliness usually reduces engagement of elderly in activities that are cognitively stimulating, such as playing games, visiting social places, museums, and free time leisure activities, thus contributing to loneliness and increased vulnerability to age-related neuropathology (Luo & Waite, 2014). Cognitive deterioration also influences the ability of elderly to perform activities of daily living and independently function for tasks like medication guidelines, taking care of their money, and preparing food.

A better understanding of different biological, psychological and social factors that may harmfully impact cognitive functions is vital to avoid a decline in quality of life in older adults. Currently the potential mechanisms underlying the relationship of loneliness and cognitive function are not very well understood and need more empirical evidence. It is observed that lonely people are more prone to engage in negative thoughts and they have generally less positive expectations (Lamis et al., 2014). The persistent cycle of negative thought processes and emotions increase stress, further deteriorating the feelings of loneliness and leading to negativity in life.

Ageing individuals often experience empty nest syndrome and spend the last years of their lives either living in isolation or in old age homes (Cassum et al., 2020; Shah, 2010). Recognition of the components that boost quality of life of ageing individuals is fundamental. However, it is additionally fundamental to also investigate those elements that lower their quality of life and assess their adverse consequences. Research studies indicate that decline in mental wellbeing is strongly associated with increased loneliness (Cacioppo et al., 2014). Psychological issues are additionally connected like self-destructive inclinations, substance misuse, uneasiness and depression. Past research has also showed a connection among depression and low quality of life (Zebhauser, 2014).

WHO (2015) has defined quality of life as an “individual’s perceptions of their position in life in the context of the culture and value system in which they live, and in relationship to their goals, expectations, and standards”. This definition suggests that individuals usually hold an intellectual capability to make judgments about their lives. Thus, if people experience cognitive decline, including deficits in attention, judgment, memory, communication and insight, it also contributes to lowering of quality of life. It is thus important to measure the quality of life in individuals who may have diagnosed or undiagnosed cognitive impairment. Quality of life assessments also provide a framework for patient reported outcomes and hence, have become a way to understand and gain feedback for planning supportive interventions. Furthermore, keeping an eye on changes in quality of life in individuals experiencing progressive cognitive decline may indicate new interventions to enhance overall wellbeing in elderly population groups.

Social help consists of real or perceived resources given by others that empower an individual. Elderly individuals suffer more from loneliness and isolation than younger people as they face stressful events such as the demise of the spouse, separation from family

members who may shift out of the house, and health problems. Elderly people with chronic disabilities who become socially isolated after the loss of loved ones or children getting settled elsewhere are in need of even more social support. Scholarship confirms that because of the absence of family and less socially engaging groups, older people experience loneliness and have health related issues (Belanger et al., 2016). Studying and improving elderly quality of life has become an important component in medical care (Cerin et al., 2016). Identifying the elements related to quality of life is required so that new interventions can improve quality of life among older individuals (Cadore and Izquierdo, 2015). Adding quality to older individuals' lives to improve their health capacity, freedom, and movement has become a primary research and policy objective in the developed world (Bowling, 2009).

Yang and colleagues (2020) examined depression as a mediating factor between social isolation and cognitive functioning among older adults in China. Multiple indicators were studied to examine if the construct of social isolation is apparent by four indicators: (i) engagement in social activity, (ii) caregiving for grandchildren, (iii) weekly contact between adult, and (iv) children and living alone. Structural equation modelling was used to look at the indirect influences among the variables. The findings proposed that less engagement in social activity, caregiving for grandchildren and adult-children weekly contact were significantly related with increased social isolation.

A similar study was conducted in Pakistan by Zafar and colleagues (2021), to examine the role of loneliness as a mediating factor in the relationship between depression and quality of life in older individuals with mild cognitive impairment. The aim was to analyze differences in loneliness, depression and the quality of life in the elderly with mild cognitive impairment among family and social gatherings. Older adults from different old age homes in cities of Lahore and Rawalpindi were sampled purposively. The relationship

between quality of life and depression among the older adults with mild cognitive impairment was found to be significant and loneliness mediated this relationship.

The feeling of loneliness is subjective, given that people can experience loneliness without being separated from people physically. To investigate this, Luchetti and colleagues (2020) used the UCLA loneliness scale items to identify the relationship between loneliness and cognitive dysfunction. It was found that a significant relationship exists between cognitive dysfunction and loneliness. Several factors can contribute to loneliness in elders such as: retirement, loss of spouse, family and friends to death, diminished cognitive capacities, social withdrawal, hearing and vision loss, and loss of fine motor skills. With the aging process, health related behavior modification is also required such as higher rate of visits to medical care, increased medical testing, and adherence to prescribed medication (Lara et al., 2019).

A longitudinal examination by Luchetti et al., (2020), tracked elderly people who experienced loneliness and revealed that they were inclined towards health risks behaviors, such as increased screen time, smoking, and social exclusion. It was indicated that these individuals in general experienced the ill effects of hypertension and other medical conditions that affected their cognitive well-being negatively. Another longitudinal investigation of older people by Lara and colleagues (2019) revealed that lonely older people have higher rates of cognitive dysfunction and loneliness adversely affects different areas of cognition, such as lower score on recalling abilities, verbal familiarity, and digit span or memory span. The study concluded that interventions aimed at enhancing the social connections and maintenance of emotional support system or relationships could prevent cognitive decline in elderly people.

A study was conducted to assess the relationship of cognitive dysfunction with quality of life among older adults in China (Pan et al, 2015). The influences of cognitive dysfunction on quality of life index and visual analogue were assessed using linear regression models and the relationship between cognitive dysfunction and self-reported EQ-5D health difficulties using logistic regression models. Both quality of life and visual analogue scores were found to be significantly lower for older people with cognitive dysfunction compared to ones with normal functioning. Cognitive dysfunction also showed association with reporting of problems in pain, discomfort, anxiety, and depression. Furthermore, the severity of cognitive dysfunction increased with adverse health-related quality of life.

### **Aim the Study**

Pakistan has a rapidly increasing older population and it is extremely important to study the role of loneliness and cognitive functioning on quality of life in the elderly. Literature has clearly depicted loneliness to be a serious concern among elderly people living in old-age homes of the country (Rizvi Jafree, 2021a). Loneliness is associated with both physical and psychological health, signifying the need to assess prevalence in elderly population groups, which may compound aging health issues. Most research on the elderly collects data from memory centers or nursing homes (Missotten et al., 2008) or are concentrated around the health-related quality of life exclusively (Kameyama et al., 2016). Comparatively, fewer studies focus on the health of aging people living within the homes and attempts to measure non-health related quality of life variables (Lapid et al., 2011). Also, research on cognitive impairment often revolves around the possibility of cognitive impairment as a risk factor for dementia, instead of on the immediate impact of cognitive impairment on aging people (Campbell et al., 2013; Hussenoeder et al., 2020; Roberts et al., 2014, Xu et al., 2010). The interrelationships between loneliness, cognitive functioning and quality of life are unknown

among Pakistani older adults. The current study aims to fill this gap and develop our understanding of the relationship between these variables so that culturally relevant interventions could be planned for the elderly population and to improve their quality of life. It is also important to identify the possible predictors of cognitive functioning and decline as they have a long term influence on cognition and deteriorating course of illnesses including cardiovascular problems, depression and mortality.

## **METHODOLOGY**

### **Ethics**

Permission and ethical approval for the study was obtained from the Department Ethical Review Board of Applied Psychology, Lahore College for Women University. Informed consent was taken from all participants. Confidentiality and anonymity was secured and participants were made aware of their right to withdraw at any point without any liability.

### **Hypotheses of the Study**

There are four hypotheses that this study will test, including:

H1. There will be a positive relationship between cognitive functioning and quality of life among older adults.

H2. There will be negative relationship between loneliness and quality of life in older adults.

H3. There will be significant gender differences in loneliness, quality of life and cognitive functioning among older adults.

H4. Loneliness and cognitive functioning will predict quality of life in older adults.

### **Research design**

A cross-sectional research design was used and data was collected through Google forms, due to the COVID-19 pandemic and need to maintain social distancing.

### **Sample selection**

Respondents were recruited through purposive sampling technique and a final sample of 149 people were part of the study, including 77 men and 72 women. The specific selection criterion included older adults: (i) above the age of 60 years; (ii) who live in their homes alone or with families (and not in old age homes); (iii) who were able to comprehend Urdu. Older adults with any physical disability or sensory impairment were excluded from this study.

### **Instrument**

The data was collected by using CASP-19, UCLA loneliness scale and MOS Cog-R scale. Permission for using the scales was taken from all the authors through email.

### ***Demographic Information Sheet***

Demographic data was collected including: age, gender, education, monthly income, marital status, no of children, no of people in house, diagnosis of chronic disease(s) (Appendix A).

### ***CASP-19***

The CASP-19 is a 19-item measure to assess the current quality of life of respondent-specifically aging population groups. The CASP-19 comprises of four subscales that form the instrument's acronym: control, autonomy, self-realization and pleasure. Each subscale contains 19 items with a four point Likert scale for responses. For scoring purposes, these responses correspond to 0-3 points per items. Higher score indicates better quality of life (Appendix A).

### ***MOS Cognitive Functioning Scale-Revised***

The six items MOS Cog-R Cognitive Functioning Scale-Revised survey assesses six main aspects of cognitive functioning, including: concentration, reasoning, thinking, memory, attention, confusion, and reaction time. It uses a five point Likert response (Appendix B).

### ***UCLA loneliness scale***

The UCLA loneliness scale originally established by Russell, Peplau and Cutrona (1980), has been used in several forms- both long and a short form. The revised scale comprises of 20 items. The scale consists of 10 positively and 10 negatively scored items and has uses a four point Likert scale. (Appendix C)

### Reliability Results

Table 1 shows the internal consistency and reliability of all the scales used in the current study. All results are found to be satisfactory: (i) UCLA loneliness scale,  $\alpha=0.94$ ; (ii) CASP-19  $\alpha= 0.78$ ; and (iii) MOS-R Cognitive functioning scale  $\alpha= 0.83$ .

**Table 1**

Reliability Coefficients of study scale

Scales	K	A
UCLA loneliness scale	20	.94
CASP-19	19	.78
MOS-R Cognitive functioning scale	6	.83

*Note:* K= Number of items,  $\alpha$ = Cronbach's alpha

### Data Collection

Due to the COVID-19 pandemic, online data was obtained through Google survey. Data was collected from March 2021 to May 2021. The Google survey form was posted on Pakistani Facebook groups as well as on Whatsapp. The survey was posted on Whatsapp through mutual contacts asking them to forward the survey further to their contacts using a network sampling approach. With the online survey, the information and consent letter clearly indicated the inclusion criterion so that only the intended sample answered the survey.

### Data Analysis

Statistical Package for Social Sciences version 21.0 was used to analyse the data. Independent Sample t-test and One-way ANOVA were used to measure differences between groups. Correlational analysis was run to examine the associations among variables.

Regression analysis was used to see the predictive model. To test the study hypotheses cognitive functioning, loneliness, education, and gender were put in the multiple linear regression model as independent variables. Quality of life was taken as a dependent variable. P values at less than 0.05 are considered significant for this study.

## RESULTS

### Demographic Results

As shown in the **Table 2**, 51.7% of the participants are male and 48.3% are female. Most of the participants had a matriculation degree (45.6%) or had only attended primary school (14.1%). The rest of the sample had an Undergraduate degree (20.8), Master's degree (15.4%) degree, or a PhD degree (04%). A significant number of participants have four or more children (33%). Majority of the participants are married (79.2%), whereas 20.8% are either single, divorced or widowed.

**Table 1**  
 Demographic characteristics of the participants (N=149)

Variables	F	%
Gender		
Male	77	51.7
Female	72	48.3
Marital status		
Married	118	79.2
Single/Divorced/Widowed	31	20.8
Education		
Primary school	21	14.1
Matriculation	68	45.6
Bachelors	31	20.8
Masters	23	15.4
Ph.D.	6	4.0
No of children		
None	16	10.7
One	17	11.4
Two	28	18.8
Three	38	25.5
Four and more	50	33.6

Note. F= frequency, %= percentage

## Correlation Results

In order to find the association between loneliness, cognitive functioning and quality of life among older adults Pearson's correlation was calculated (**Table 3**). The values of correlation show a significant positive correlation between quality of life and cognitive functioning among older adults ( $r=.21^*$ ,  $p=.01$ ). Loneliness is found to have negative correlation with quality of life ( $r=-.13$ ,  $p=.11$ ) and significantly positive correlation with cognitive decline ( $r=.44$ ,  $** p=0.00$ ). Some demographics also show significant correlations with the study variables. Age has negative correlations with quality of life and cognitive functioning. This means that with increasing age, there is a decline in quality of life and cognitive functioning. Education is found to have positive correlations with quality of life, loneliness and cognitive functioning.

**Table 3**

Correlation among Demographics, loneliness, cognitive functioning and quality of ilfe of older adults (N=149)

	1	2	3	4	5	6	7	8
1. Age	-	-.09	-.12	.25**	.04	-.18*	-.05	-.01
2. Gender		-	-.18**	.16**	-.16*	-.16*	.30**	-.06
3. Education			-	.06	.19*	.01	-.28**	-.08
4. Marital status				-	-.30**	-.01	-.01	.01
5. No of children					-	.07	-.01	.04
6. Loneliness						-	-.11	.43**
7. Quality of life							-	.22**
8. Cognitive functioning								-

Note: \*\* $p<0.01$ , \* $p<0.05$

## Multiple Linear Regression Results

The result of multiple linear regression shows that the loneliness ( $\beta= -0.23$ ,  $p<.001$ ) and cognitive functioning ( $\beta= 0.32$ ,  $p<.001$ ) are significant predictors of the quality of life in older adults (**Table 4**). Loneliness, cognitive functioning, education, gender, and number of children explained 24% variance ( $r= 0.24$ ,  $F=6.35$ ,  $p<.000$ ) in the quality of life of older people.

**Table 4**

Multiple regression analysis for predicting loneliness, quality of life and cognitive functioning among older adults (N=149)

Model	B	SE	$\beta$
Constant	50.33	10.28	
Age	-.14	.13	-.08
Gender	3.62	1.21	.23
Education	-1.66	.57	-.22
Marital status	-.60	1.54	-.03
No of children	-.14	.45	-.02
UCLA	-.13	.04	-.23
MOS	.45	.11	.32

Note B=unstandardized coefficient, S.E=standard error,  $\beta$ =standard beta coefficient.

The results in **Table 5** indicate that there are significant gender differences in all study variables. Independent sample t test reveal significant differences among males (M=49.13, SD=13.94) and females (M=44.63, SD= 12.86) with regard to experiencing loneliness [t=2.05, p=.04]. The mean value of loneliness for males is 49.13, which is higher than mean value of females experiencing loneliness. Similarly, the results for the mean value of cognitive functioning in men is higher (M=19.18, SD=5.22) than in females (M=18.46, SD=5.51) [t=0.82, p=0.41]. The results confirm that male older adults experience more loneliness and cognitive functioning than female older adults. The quality of life was better in female (M=45.43, SD=7.69) as compared to male older adults (M=40.83, SD=6.94) [t=3.83, p=0.00].

**Table 5**

Independent sample t test for comparing loneliness, cognitive impairment and quality of life among older adults between men and women

Variables	Males (n=77)		Females (n=72)		T	95% CI	
	M	SD	M	SD		LL	UL
Loneliness	49.13	13.94	44.63	12.86	2.05*	.15	8.85
Cog Func.	40.83	6.94	45.43	7.69	-3.83**	-6.96	-2.23
Quality of life	19.18	5.22	18.46	5.51	.82	-1.01	2.46

Note: n=sample size; M=mean; SD= standard deviation; LL=lower limit; UL=upper limit; CI=confidence interval; \*p<0.05; \*\*p<.01; Cog Func.=Cognitive functioning

## DISCUSSION

The relationship among loneliness or cognitive dysfunction in Pakistani older adults living in their own homes has been examined in this study. The results show that there is a significant positive relationship of loneliness with cognitive impairment. Our results are consistent with the existing research by (Bao-Liang Zhong et al., 2016) on relationship among loneliness and cognitive impairment. Our hypothesis also supported by another research by Bao-Liang Zhong and colleagues (2017) which reveals the association between loneliness and lower cognitive functioning. The research conducted by Luchetti and colleagues (2020) indicates that in middle-age as well as in older adults feeling lonely is a risk factor for cognitive dysfunction. In this study also we find that loneliness is negatively associated with the quality of life of older adults. Our hypothesis is also supported by the research conducted by Musich et al. (2015) in which 55% older adults experienced loneliness, negatively affecting their quality of life and a local research that elderly people in Pakistan suffer from loneliness and need intergenerational learning interventions (Rizvi Jafree, 2021b)

Further our results showed that the association of loneliness with cognitive impairment is higher in older men in comparison with elderly women. Our findings also corroborate with previous research on the association among loneliness and cognitive impairment (Zhong, 2016), which confirms that critical indicators for cognitive impairment in older individuals are ongoing and related to loneliness. The findings of other research have also showed that loneliness is associated with lower cognitive capacity (Zhong et al., 2017). The present study's findings are also consistent with past research which suggests that loneliness is essentially affecting cognitive impairment more among older males as compared to older females (Zhou et al., 2019).

For the non-significant association seen for loneliness and cognitive impairment among older females in this study, one possible reason could be that women in Pakistan may have better ability to keep themselves engaged with family and home management which prevents them from experiencing loneliness compared to older males. Men are more prone to remain disengaged with family and home management (Stevens, 1995), thus causing them greater loneliness during the pandemic. It is also true that men seek company from outside the house and with their friends, and social distancing during the pandemic has caused them to experience more loneliness compared to women.

Additionally, women have more engagement and interaction with informal communities, including domestic servants and neighbors, (Zebhauser et al., 2014), which may have helped them to experience less loneliness during the pandemic. Past research has demonstrated that loneliness might prompt physical and mental changes in the body and an inflammatory reaction in men (Hermes et al., 2006). This research suggests that Pakistani men and the loneliness they experience in times of social distancing and pandemics can contribute to cognitive decline, and problems such as memory retention, language use, thinking or judgment, and possibly even becoming a cause of serious decline of dementia.

### ***Limitations***

This study has limitations related to purposive online sampling. Being a cross sectional study, it could not establish causal relationships. However, it has strengths in shedding light on a gap in literature and presenting empirical research about the inter-relationship between loneliness, cognitive functioning and quality of life in Pakistani older adults. In addition, as this study has sampled only people living within their homes, there are implications for policy management and improved protective support

for elderly people, who may remain isolated and hidden within the homes without a voice or representation.

### **CONCLUSION**

This study shows that loneliness is a prevalent phenomenon in elderly people living within their homes in Pakistani since the pandemic started. Additionally the study identifies that loneliness and cognitive functioning is connected with quality of life among older people. Findings of the study suggests that Pakistan state and society needs to devise effective measures to control loneliness in elderly people and bring about an improvement in their quality of life. Interventions to reduce loneliness for elderly people from other countries may not be applicable to Pakistan due to cultural differences, and thus it is important for region-specific solutions and interventions to be developed. A combination of experts and stakeholders including policy makers, health workers, social workers, and psychologists must collaborate to develop strategies targeting to reduce loneliness and cognitive impairment in the elderly living within their homes, and at old-age centers. Furthermore, suitable interventions related to intergenerational support, awareness campaigns, and cognitive therapy should be designed at group level with family members, relatives, companions, and community members for effective results.

### **A Conflict of interest statement**

The authors declare that there is no conflict of interest.

### **Funding information**

No funds were received for this research.

### **Ethics**

The study was approved by the Departmental Ethical and Research Committee.

### **Data sharing and availability statement**

Raw data is available from the corresponding author upon reasonable request.

### **Authors' Contributions**

MN and AR gathered the data, conducted the preliminary analysis and drafted the manuscript. NM conducted the final data analysis, supervised the research and approved the final manuscript.

### **Acknowledgement**

The authors acknowledge the all elderly participants who took out time and provided the data.

## **REFERENCES**

- Ahadi, B., & Hassani, B. (2021). Loneliness and Quality of Life in Older Adults: The Mediating Role of Depression. *Ageing International*, 46(3), 337-350.
- Baltes, P. B., Staudinger, U. M., & Lindenberger, U. (1999). Lifespan psychology: Theory and application to intellectual functioning. *Annual Review of Psychology*, 50, 471–507.
- Bowling, A. (2009). The psychometric properties of the older people's quality of life questionnaire, compared with the CASP-19 and the WHOQUALITY OF LIFE-OLD. *Current Gerontology and Geriatrics Research*, <https://www.hindawi.com/journals/cggr/2009/298950/>
- Bowling, A. (2009). The Psychometric Properties of the Older People's Quality of Life Questionnaire, Compared with the CASP-19 and the WHOQOL-OLD", *Current Gerontology and Geriatrics Research*, <https://doi.org/10.1155/2009/298950>

- Boss, L., Kang, D. H., & Branson, S. (2015). Loneliness and cognitive function in the older adult: a systematic review. *International Psychogeriatrics*, 27(4), 541.
- Belanger, E., Ahmed, T., Vafaei, A., Curcio, C. L., Phillips, S. P., & Zunzunegui, M. V. (2016). Sources of social support associated with health and quality of life: a cross-sectional study among Canadian and Latin American older adults. *BMJ open*, 6(6), e011503.
- Cacioppo, J. T., & Hawkley, L. C. (2009). Perceived social isolation and cognition. *Trends in cognitive sciences*, 13(10), 447-454.
- Cacioppo, S., Capitano, J. P., & Cacioppo, J. T. (2014). Toward a neurology of loneliness. *Psychological bulletin*, 140(6), 1464.
- Cadore, E. L., & Izquierdo, M. (2015). Exercise interventions in polypathological aging patients that coexist with diabetes mellitus: improving functional status and quality of life. *Age*, 37(3), 1-13.
- Campbell, N. L., Unverzagt, F., LaMantia, M. A., Khan, B. A., & Boustani, M. A. (2013). Risk factors for the progression of mild cognitive impairment to dementia. *Clinics in geriatric Medicine*, 29(4), 873-893.
- Cassum, L. A., Cash, K., Qidwai, W., & Vertejee, S. (2020). Exploring the experiences of the older adults who are brought to live in shelter homes in Karachi, Pakistan: a qualitative study. *BMC Geriatrics*, 20(1), 1-12.
- Cerin, E., Sit, C. H., Zhang, C. J., Barnett, A., Cheung, M. M., Lai, P. C., ... & Lee, R. S. (2016). Neighbourhood environment, physical activity, quality of life and depressive symptoms in Hong Kong older adults: a protocol for an observational study. *BMJ Open*, 6(1),
- Hermes, G. L., Rosenthal, L., Montag, A., & McClintock, M. K. (2006). Social isolation and the inflammatory response: sex differences in the enduring effects of a prior stressor.

*American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 290(2), R273-R282.

- Hu, C., Yu, D., Sun, X., Zhang, M., Wang, L., & Qin, H. (2017). The prevalence and progression of mild cognitive impairment among clinic and community populations: a systematic review and meta-analysis. *International psychogeriatrics*, 29(10), 1595.
- Hussenoeder, F. S., Conrad, I., Roehr, S., Fuchs, A., Pentzek, M., Bickel, H., ... & Riedel-Heller, S. G. (2020). Mild cognitive impairment and quality of life in the oldest old: a closer look. *Quality of Life Research*, 29(6), 1675-1683.
- Jansson, A. H., Muurinen, S., Savikko, N., Soini, H., Suominen, M. M., Kautiainen, H., & Pitkälä, K. H. (2017). Loneliness in nursing homes and assisted living facilities: prevalence, associated factors and prognosis. *Journal of Nursing Home Research*, 3, 43–49. <https://doi.org/10.14283/jnhrs.2017.7>
- Kameyama, K., Tsutou, A., & Fujino, H. (2016). The relationship between health-related quality of life and higher-level functional capacity in elderly women with mild cognitive impairment. *Journal of Physical Therapy Science*, 28(4), 1312-1317.
- Lamis, D. A., Ballard, E. D., & Patel, A. B. (2014). Loneliness and suicidal ideation in drug-using college students. *Suicide and Life-Threatening Behavior*, 44(6), 629-640.
- Lapid, M. I., Rummans, T. A., Boeve, B. F., McCormick, J. K., Pankratz, V. S., Cha, R. H., ... & Petersen, R. C. (2011). What is the quality of life in the oldest old? *International Psychogeriatrics*, 23(6), 1003-1010.
- Lara, E., Caballero, F. F., Rico-Urbe, L. A., Olaya, B., Haro, J. M., Ayuso-Mateos, J. L., & Miret, M. (2019). Are loneliness and social isolation associated with cognitive decline? *International Journal of Geriatric Psychiatry*, 34(11), 1613-1622.
- Luchetti, M., Terracciano, A., Aschwanden, D., Lee, J. H., Stephan, Y., & Sutin, A. R. (2020). Loneliness is associated with risk of cognitive impairment in the Survey of

- Health, Ageing and Retirement in Europe. *International journal of geriatric psychiatry*, 35(7), 794-801.
- Luo, Y., & Waite, L. J. (2014). Loneliness and mortality among older adults in China. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 69(4), 633-645.
- Missotten, P., Squelard, G., Ylief, M., Di Notte, D., Paquay, L., De Lepeleire, J., & Fontaine, O. (2008). Quality of life in older Belgian people: comparison between people with dementia, mild cognitive impairment, and controls. *International Journal of Geriatric Psychiatry: A journal of the psychiatry of late life and allied sciences*, 23(11), 1103-1109.
- 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*, DOI: 10.1177/2333721415582119
- Pan, C. W., Wang, X., Ma, Q., Sun, H. P., Xu, Y., & Wang, P. (2015). Cognitive dysfunction and health-related quality of life among older Chinese. *Scientific Reports*, 5(1), 1-8.
- Pusswald, G., Moser, D., Pflüger, M., Gleiss, A., Auff, E., Stögmänn, E., & Lehrner, J. (2016). The impact of depressive symptoms on health-related quality of life in patients with subjective cognitive decline, mild cognitive impairment, and Alzheimer's disease. *International psychogeriatrics*, 28(12), 2045-2054.
- Rizvi Jafree, S., Mahmood, Q. K., Burhan, S. K., & Khawar, A. (2021a). Protective Factors for Life Satisfaction in Aging Populations Residing in Public Sector Old Age Homes of Pakistan: Implications for Social Policy. *Journal of Aging and Environment*, 1-20.
- Rizvi Jafree, S., Burhan, S. K., Khawar, A., Mahmood, Q. K., & Shahed, S. (2021b). The Impact of Intergenerational Learning on Quality of Life in Older Populations

Residing in A Public Sector Old Age Home: A Quasi-experimental Study. *Journal of Intergenerational Relationships*, 1-27.

Roberts, R. O., Knopman, D. S., Mielke, M. M., Cha, R. H., Pankratz, V. S., Christianson, T. J., ... & Petersen, R. C. (2014). Higher risk of progression to dementia in mild cognitive impairment cases who revert to normal. *Neurology*, 82(4), 317-325.

Russell, D., Peplau, L. A., & Cutrona, C. E. (1980). The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *Journal of personality and social psychology*, 39(3), 472.

Shah F. The curse of old age. Express Tribune. 2010. Retrieved:  
<https://tribune.com.pk/story/27667/the-curse-of-old-age>

Stevens, N. (1995). Gender and adaptation to widowhood in later life. *Ageing & Society*, 15(1), 37-58.

Wang, Z., Li, X., & Chen, M. (2015). Catastrophic health expenditures and its inequality in elderly households with chronic disease patients in China. *International Journal for Equity in Health*, 14(1), 1-11.

World Health Organization. (2015). World Report on Ageing and Health (1st ed.). World Health Organization.

Xu, W., Caracciolo, B., Wang, H. X., Winblad, B., Bäckman, L., Qiu, C., & Fratiglioni, L. (2010). Accelerated progression from mild cognitive impairment to dementia in people with diabetes. *Diabetes*, 59(11), 2928-2935.

Yang, R., Wang, H., Edelman, L. S., Tracy, E. L., Demiris, G., Sward, K. A., & Donaldson, G. W. (2020). Loneliness as a mediator of the impact of social isolation on cognitive functioning of Chinese older adults. *Age and Ageing*, 49(4), 599-604.

Zafar, J., Malik, N. I., Atta, M., Makhdoom, I. F., Ullah, I., & Manzar, M. D.

(2021). Loneliness may mediate the relationship between depression and the quality of life among elderly with mild cognitive impairment. *Psychogeriatrics*, 21(5), 805-812.

Zebhauser, A., Hofmann-Xu, L., Baumert, J., Häfner, S., Lacruz, M. E., Emeny, R. T. ... & Ladwig, K. H. (2014). How much does it hurt to be lonely? Mental and physical differences between older men and women in the KORA-Age Study. *International Journal of Geriatric Psychiatry*, 29(3), 245-252

Zhong, B. L., Chen, S. L., & Conwell, Y. (2016). Effects of transient versus chronic loneliness on cognitive function in older adults: Findings from the Chinese Longitudinal Healthy Longevity Survey. *The American Journal of Geriatric Psychiatry*, 24(5), 389-398.

Zhong, B. L., Chen, S. L., Tu, X., & Conwell, Y. (2017). Loneliness and cognitive function in older adults: Findings from the Chinese longitudinal healthy longevity survey. *The Journals of Gerontology: Series B*, 72(1), 120-128

Zhou, Z., Mao, F., Zhang, W., Towne, S. D., Wang, P., & Fang, Y. (2019). The association between loneliness and cognitive impairment among older men and women in China: a nationwide longitudinal study. *International journal of environmental research and public health*, 16(16), 2877.

**Appendix A**

**Demographic Data**

Age: \_\_\_\_\_ (in years)

Gender

Male

Female

Marital status:

Married

Single

Education:

Primary

High

Bachelors

Master

Ph.D.

No of children:

None

One

Two

Three

Four and more

Monthly income: \_\_\_\_\_

No of people in household: \_\_\_\_\_

Any chronic disease: \_\_\_\_\_

**CASP-19 Quality of Life Scale**

Items	Often	Sometimes	Not often	Never
My age prevent me from doing the things I would like to				
I feel that what happens to me is out of control				
I feel free to plan my future				
I feel left out of things				
I can do the things I want to do				
Family responsibilities prevent me from doing what I want to do				
I feel that I can please myself what I do				
My health stops me from the doing things I want to				
Shortage of money stops me from doing things I want to do				
I look forward to each day				
I feel that my life has meaning g				
I enjoy the things that I do				
I enjoy being in the company of others				
I look back on my life with sense of happiness				
I feel full of energies these days				
I choose to do things that bi have never done before				
I am satisfied with the way of my life				

I feel that life is full of opportunities				
I feel that future looks good for me				

## Appendix B

### MOS 6 Cognitive Functioning Scale

Items	All of the time	Most of the time	Some of the time	A little time	No time
Did you have difficulty reasoning and solving problems, for example, making plans, making decisions, and learning new things?					
Did you have difficulty doing activities involving concentration and thinking?					
Did you become confused and start several actions at a time?					
Did you forget things that happened recently, for example, where you put things and when you had appointments?					
Did you have trouble keeping your attention on any activity for long?					
Did you react slowly to things that were said or done?					

## Appendix C

### Loneliness scale

This research aims to see the loneliness, cognitive impairment and quality of life among older adults. Kindly read all items carefully all the information will be kept confidential and will only be used for research purposes.

Items	I often feel this way	I sometimes feel this way	I rarely feel this way	I never feel this way
I am unhappy doing so many things alone				
I have nobody to talk				
I cannot tolerate being so alone				
I lack companionship				
I feel as if nobody really understand me				
I find myself waiting for the people to call or write				
There is no one I can turn to				
I am no longer close to anyone				
My interest and ideas are not shared by anyone around me				
I felt left out				
I feel comfortably lonely				
I am unable to reach out and communicate with those around me				
My social relation are superficial				

I feel staved for company				
No one really knows me well				
I feel isolated from others				
I am unhappy being so withdrawn				
It's difficult for me to make friends				
I feel shutout and excluded by others				
People around me not with me				