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Depression, quality of life, and cognitive abilities among older adults

R Amridi * and Vimala M

Department of Psychology, Kristu Jayanti College, Bangalore, India.

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Abstract

The world's population is aging at an increasing rate. According to the World Health Organization, the global population over 60 is expected to double between 2015 and 2050. Mental health is crucial at every stage of life, encompassing emotional, psychological, and social well-being. This study aimed to explore the relationship between cognitive abilities, depression, and quality of life among older adults as well as to investigate the impact of depression on cognitive abilities and quality of life. Convenience sampling was used to collect data from 107 older adults (61 females and 46 males) living in residential homes with the family or old age homes. Addenbrooke's Cognitive Examination-III, the Geriatric Depression Scale short form, and The World Health Organization Quality of Life Brief Version were used for administration. Non-parametric approaches using Mann Whitney U test, Spearman correlation, and linear regression were employed for data analysis. A significant difference in the levels of depression between older adults living at home with their families and older adults living in old age homes was found. Depression and cognitive abilities and depression and quality of life were found to be significantly negatively correlated. A significant regression equation was present depicting depression has a notable impact on both cognitive abilities and quality of life. The results of this study can contribute to raising awareness and acknowledging the presence of depression and its related effects among older adults, regardless of their living circumstances.

Keywords: Depression; Quality of Life; Cognitive Abilities; Older Adults

1. Introduction

The recognition of individuals aged 60 and above as elderly or senior citizens dates back to the National Policy for Older People (1999). Over the years, the number of seniors has been steadily increasing, as highlighted by the Indian National Census (2011). This demographic trend indicates a more significant rise in the past decade compared to previous periods.

According to the World Health Organization (WHO; 2023), mental health challenges among older adults remain a significant concern. Approximately 14% of individuals aged 60 and older experience a mental disorder. Depression and anxiety rank as the most prevalent mental health conditions among older adults (Global Health Estimates; GHE, 2019). As they age, their mental health is affected by their physical and social environment, the accumulated effects of past experiences, and certain age-related stressors such as significant loss of intrinsic capacity, exposure to adversity, deterioration in functional ability, and adverse events such as grief, reduced income, and reduced purpose after retirement (World Health Organization, 2023).

As individuals grow older, there is a heightened prevalence of illness and a decrease in functional ability, accompanied by a reduction in the availability of social support networks. This can lead to feelings of loneliness and isolation, particularly when faced with significant life events like widowhood, divorce, or a lack of close familial connections. Additionally, factors such as retirement or unemployment can significantly impact one's psychological well-being,

* Corresponding author: R Amridi

rendering them more vulnerable to experiencing psychological distress (Singh & Misra, 2019). These age-related stressors lead to various mental health concerns, such as psychological distress, depression, anxiety, etc. which in turn impact the daily living, cognitive abilities (Muhammad & Meher, 2021), the overall well-being, and quality of life of this specific population (Sekhon et al., 2020).

It is important to also note that depression has been linked to cognitive decline in older adults with estimates suggesting that 20-50% of older adults with depression experience cognitive impairments (Muhammad & Meher, 2021). Cognition, encompassing processes like perception, information processing, and decision-making, is integral to an individual's autonomy, particularly in older age. Studies have shown a significant association between depression and cognitive decline in older adults, with severe depression doubling the risk of cognitive dysfunction.

Additionally, normal aging itself is associated with declines in cognitive functions like processing speed, memory, language, and executive functions (Aajami et al., 2020). Paterniti et al. (2018) investigated whether depressive symptoms predict cognitive deterioration in older persons with normal cognition. They found that high levels of depressive symptoms, when persistent, are associated with cognitive decline in a sample of elderly people.

Depression and its associated effect on cognition impact the quality of life of an individual. Quality of life (QOL) has been described as a person's perception of their life circumstances within the cultural and value frameworks they inhabit, considering their aspirations, standards, and concerns (Cai et al, 2021). Many studies have indicated that depressed older adults tend to experience lower levels of both overall and health-related QOL (HRQoL) compared to non-depressed counterparts (Cao et al, 2016; Hussenoeder et al, 2021; Sivertsen et al, 2015). Similarly, cognitive decline has also been researched in the context of quality of life, specifically HRQoL. Research conducted by Kazazi et al. (2018) has indicated that cognitive function is closely linked to health-related QOL in older adults, particularly those experiencing age-related cognitive decline. A recent study by Christiansen et al. (2019) attempted to study the factors affecting HRQoL in older adults with cognitive impairment and concluded the following characteristics linked with physical and mental HRQoL: dependence on activities of daily living (ADL), getting informal care, and experiencing loneliness and pain. Additionally, Cao et al. (2016) found that as the severity of depression increases, there is a corresponding decrease in QOL across various domains.

There have been many studies conducted and reported related to depression in older adults, quality of life of older adults, and cognitive decline in older adults in different contexts and both Indian and Western contexts. But there remains to be a dearth of literature wherein all the three components attempted to be studied in this present study, namely, depression, its associated impact on cognition, and its effect on the quality of life in older adults whether living with family or in old age home have been explored and understood in depth.

As documented in the previous sections, with a growing number of older adults worldwide, understanding the implications of depression, and cognitive abilities on the quality of life of older adults is important. Thus, this study aimed to explore the differences in depression, cognitive abilities, and quality of life-based on the type of residence. Further, this study also aimed to explore the relationship between cognitive abilities, depression, and quality of life among older adults as well as to investigate the impact of depression on cognitive abilities and quality of life. In a larger context, findings from this research can help in creating awareness and accepting the prevalence of depression and its associated impacts in older adults despite their living contexts. This awareness and understanding will help the family members, caregivers, and the larger community to be sensitized about the prevalence and impact of mental health concerns on the quality of life of older adults and accordingly provide them with adequate and appropriate support.

2. Material and Methods

2.1. Sample

This study recruited a total of n=107 older adults above the age of 60 years residing in both residential homes with the family or old age homes. Participants were recruited from three regions of South India, specifically, Bengaluru, Trichy, and Coimbatore as the questionnaires used in the study were of English and Tamil language. The inclusion criteria included the age criteria of 60 years and above along with a necessity of sufficient ability to read and write English and/or Tamil as the questionnaires were either English or Tamil. Participants diagnosed with any major chronic illness, physical impairment, or psychiatric illness and below the age of 60 years were excluded from the study.

2.2. Procedure

The participants in this study were recruited using convenience sampling through the networks of the researcher/principal investigator. The participants were older adults above the age of 60 years residing in Bengaluru, Trichy, and Coimbatore who lived either with their families or in old age homes. Each participant was individually approached for in-person engagement. Initially, they were briefed about the study's purpose while also highlighting the inclusion and exclusion criteria so that the participants could self-identify their eligibility to participate in this study as no other screening measures were used for this purpose. After the requisite information was provided, the participants were requested to sign the informed consent form which was read aloud to them. Following the informed consent, each participant was provided with questionnaires. These questionnaires were administered in their preferred language, either English or Tamil, with hard copies supplied to ensure accessibility. Following clear instructions for each test, participants were asked to complete the forms. The cognitive test, specifically, was conducted by the researcher. The total approximate time taken to complete all the questionnaires and activities of the cognitive test was 40-45 minutes.

2.3. Ethical Considerations

This study followed all the appropriate ethical considerations relevant to conducting an empirical study. Primarily, permission to conduct the study was sought from the relevant authorities at the old age home demonstrating respect for institutional guidelines and regulations. Further to this, the informed consent was diligently obtained from each participant which ensured that they fully understood the nature of the research and their involvement in it. Confidentiality of all the collected data was rigorously maintained, safeguarding the privacy and anonymity of each participant as the participants were noted with their participant identification (ID) numbers instead of names, such as Participant 1, Participant 2, etc. Additionally, participants were informed of their right to withdraw from the study at any given point, without any repercussions and need to justify their unwillingness. Furthermore, measures were taken to ensure that participants did not endure any physical or mental harm throughout the study, prioritizing their well-being and safety above all else. No incentives were provided to any participants to participate in this study.

2.4. Tools

Addenbrooke's Cognitive Examination-III (ACE-III; Hodges et al, 2000): It comprises of 19 activities assessing the five major cognitive domains, namely, attention, memory, fluency, language, and visuospatial processing. Scoring: Sum the items for each of the five domains (attention, memory, fluency, language, and visuospatial) to give the Domain Scores for ACE-III. The total score (/100) consists of the sum of the five domain scores. At the recommended cut-off scores of 88 and 82, the ACE was reported to have good sensitivity and specificity for identifying different forms of dementia and other impairments of memory and judgment (1.00 and 0.96; 0.93 and 1.00, respectively). The tool has been reported to have adequate convergent and divergent validity. The test-retest reliability coefficient with a two-week interval and Cronbach's alpha of the ACE-III were reported as 0.90 and 0.95 indicating the robustness of the measurement tool.

Geriatric Depression Scale Short Form (GDS-SF; Yesavage et al, 1986): The questionnaire consists of 15 yes-or-no questions, each scoring either 1 or 0 based on whether it indicates depression. Ten questions suggest depression when answered positively, while the remaining five suggest depression when answered negatively (questions 1, 5, 7, 11, 13). A score exceeding 5 indicates depression. The tool's validity and reliability have been established through clinical practice and research. Sheikh and Yesavage's (1986) validation study comparing the long and short forms of the GDS for self-assessment of depression symptoms found both forms effectively differentiated between depressed and non-depressed adults, showing a strong correlation ($r = 0.84, p < .001$).

World Health Organization Quality of Life Brief Version (WHOQOL-BREF, 1998): It is an abbreviated, 26-item version of the 100-item WHOQOL-100 quality of life measure. The 24 items are based on 4 domains i.e., physical health, psychological, social relationships, and environment, and the other 2 items assess the overall perception of quality of Life and overall perception of their General Health. Each item is scored from 1 to 5 on a 5-point Likert scale. Raw domain scores were transformed on a scale ranging from 0- 100 as per the guidelines given in the manual. The mean scores are then multiplied by 4 to make domain scores comparable with WHOQOL-100. WHOQOL-BREF has adequate test-retest reliability. The Cronbach alpha coefficient for the whole WHOQOL-BREF scale has been reported to be 0.89 indicating the internal consistency of the measurement tool.

3. Results

Data analysis was done using SPSS Statistics Version 23. Initially, the descriptives were calculated for the socio-demographic variables. The study had a total of 46 males (43%) and 61 (57%) females. Out of the 107 total participants, 66 (61.7%) participants lived with their families whereas 41 (38.3%) participants lived in old age homes. The results

show that 40.2% of the elderly people show symptoms of depression with 32.7% of the individuals showing mild depressive symptoms and 7.5% of the individuals showing moderate depressive symptoms. 49.5% of the elderly population show cognitive impairment with 34.6% showing mild cognitive impairment and 14% showing moderate to severe cognitive impairment. Only 23.4% of the elders showed a high quality of life. 68.2% reported moderate quality of life while 8.4% reported low quality of life. Further to this, the test of normality was conducted. Based on the results of the test of normality, non-parametric statistics (Mann-Whitney U test) to test the significant difference between two groups (older adults living with family and older adults living in old age homes) was performed. Then, to study the relationship between depression, cognitive abilities, and quality of life, inter-correlations using Spearman's correlation were performed on the dataset. To investigate the impact of depression on cognitive abilities and quality of life, regression analysis was conducted. The result tables for each of the analyses have been provided below.

Table 1 Test of significant difference using Mann-Whitney U test

Variable	Logistic Parameter	n	Mean Rank	U	p
Depression	Residential home with family	66	59.57	-2.374	0.018*
	Old age home	41	45.04		

*p<.05

Test of normality was significant suggesting that there are certain outliers in the data set which could not be dealt with as the sample size was small. Thus, a decision to use nonparametric statistics (Mann Whitney U test) to test was taken.

Table 1 shows a significant difference in the levels of depression between older adults living at home with their families and older adults living in old age homes (U= -2.374, p<.05). Whereas, no significant difference was found between the groups the parameters of cognitive abilities (U .180= , p= .857) and quality of life (U 1.214= , p= .225).

Table 2 Correlations between depression, cognitive abilities, and quality of life

Variable	M	SD	1	2	3
1. Depression	3.98	3.10	-		
2. Cognitive Abilities	86.95	7.79	-0.248*	-	
3. Quality of Life	58.82	8.84	-0.626**	0.183	-

*p < .05, **p < .01.

As indicated in Table 2, depression and cognitive abilities were found to be significantly negatively correlated at a .05 level. Depression and quality of life are negatively correlated at a .01 level. This means as depression increases, cognitive abilities and quality of life decrease significantly. The results show that cognitive abilities and quality of life do not have any significant relationship.

Table 3 Regression analysis for prediction of cognitive abilities

Predictor Variable	B	β	t	R ²	F
Depression	-0.719	-0.286	-3.06	0.082**	9.365

Table 4 Regression analysis for prediction of quality of life

Predictor Variable	B	β	t	R ²	F
Depression	-1.78	-0.627	-8.25	0.393***	68.123

The result of the linear regression (Table 3) to study the impact of depression on cognitive abilities shows that a significant regression equation is present (F (1,105) = 9.365, p < .01), with an R² value of .082. The result of the linear regression to study the impact of depression on quality of life shows that a significant regression equation is present (F(1,105) = 68.123, p < .001), with an R² value of .393.

4. Discussion

The present study attempted to investigate the differences in depression, cognitive abilities, and quality of life-based on the type of residence. Keeping in line with the aim, a respective analysis was conducted.

Test of significant difference using Mann-Whitney U test showed that there is a significant difference in the levels of depression as assessed by GDS between the two groups, i.e. older adults living with their respective families and older adults living in old age homes. The findings are consistent with the previous studies that found higher levels of depression among institutionalized older people than those of older people living with the family. A study conducted by Mahat (2018) suggests that the majority of participants residing in an old age home experienced severe depression, while the majority of those living with their families experienced mild depression. In a similar comparative study of depression among the elderly living in old age homes and communities, two independent researchers conducted by Mali et al. (2021) and Karini et al. (2019) found that older adults residing at old age homes were four times more likely to have depression than those residing in the community and the prevalence of depression was higher among older adults living in old age homes.

Concerning the other two parameters i.e. cognitive abilities and quality of life, there was no significant difference in the levels of cognitive ability and quality of life between older adults living at home with their families and older adults living in old age homes. This can be explained because of the various health-promoting strategies such as physical activity, community-based living, religious activities that could be more effective when focusing on the direct effect of physical function as well as the mediating effect of cognitive function to promote the quality of life in this population (Song et al, 2023).

A study conducted by Amir et al. (2021) found that there was a significant impact on the quality of life and cognitive function among elderly people practicing religious activities in their daily routine and its effects on their quality of life and cognitive function. The study by de Oliveira et al., (2019) found that older adults who are physically active have better physical activity levels and overall quality of life compared to those who are sedentary. Conversely, the sedentary group showed higher levels of anxiety and depression. The research also identified strong connections between different aspects of quality of life, vitality, and mental health. Ultimately, the study suggests that engaging in physical activity can protect against anxiety and depression among the elderly, highlighting the potential consequences of low physical activity levels in older adults living in the community. Many research studies have demonstrated the positive impacts of moderate physical activity, like walking or gardening, engaging in cognitively stimulating activities such as playing chess or solving crosswords, maintaining social engagement, and following a balanced, nutritious diet. These activities have been shown to help preserve and potentially enhance cognitive abilities in older adults (Shabir, 2020). Engagement of older adults whether living with family or in old age homes in such physical and cognitive enhancing activities might be a potential reason for why this present study did not report any significant differences in these two parameters.

Further, this study also aimed to study the relationship between cognitive abilities, depression, and quality of life. The results depict that depression and cognitive abilities were found to be significantly negatively correlated. Findings are in line with those of other studies that have categorically demonstrated a cognitive decline associated with depressive states in various forms. Various studies by Aajami et al. (2020); Camacho-Conde and Galán-López (2020), Muhammad and Meher (2021), and Paterniti et al. (2018) are suggestive that depressive symptoms are associated with lower cognitive performance. Depressive symptoms may be a risk factor for cognitive decline. These findings are in support of the findings of the present study attesting to the relationship between depression and cognitive impairment among older adults.

A recent study by Vijayalakshmi and Thirunavukarasu (2022) shows a highly significant negative correlation between depression and QOL. This implies that older persons with good QOL have low levels of depression and older persons with poor QOL have higher levels of depression which was also a finding in this present study.

Lastly, the study aimed to investigate the impact of depression on cognitive abilities and quality of life. The result of the linear regression depicts that depression has a notable impact on both cognitive abilities and quality of life. To support this, a study by Sivertsen et al. (2015) noted that in all the eleven high-quality cross-sectional studies exclusively focusing on overall quality of life (QOL), there was a consistent finding of a detrimental link between depression and global QOL. Specifically, a higher score on depression symptoms was correlated with lower global QOL. It was observed that individuals experiencing depression tended to have lower QOL compared to those without depression.

Similarly, Ribeiro et al. (2020) stated that depression and anxiety decisively shape individuals' trajectories of quality of life over time. Depression presented the highest relative importance out of the set of fixed factors, followed by anxiety. In context to cognitive impairment in depressed older adults, Morimoto et al. (2014) in their study stated that impairment in episodic memory, visuospatial abilities, verbal fluency, and psychomotor speed are frequently observed in older individuals experiencing late-life depression.

5. Conclusion and Limitations

Thus, overall, the results found in this study are well supported by previous research studies. A standout point of this research is the inclusion of all three parameters, namely, depression, cognitive abilities, and quality of life in older adults despite living status. However, this study also has certain limitations which include the sampling technique and the sample size. Future studies should aim to use randomized trials, and stratified sampling techniques with a larger sample size.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare no conflicts of interest with respect to this research. No funding was obtained for this research.

Statement of ethical approval

This study adhered to ethical standards, securing permission from the old age home. Confidentiality of the data was ensured and participants were given the freedom to withdraw if need be. No physical or mental harm was caused to any of the participants.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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