

Features Influencing Older Adults' Quality of Life and Their Association With Loneliness and Activities of Daily Living: A Cross-sectional Study in Iran

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Abstract

Objectives: This study was conducted to assess the features that affect the quality of life (QoL) of older adults and how they are linked to their ability to perform activities of daily living (ADL) and feelings of loneliness.

Design: A random sampling method was employed for this cross-sectional study.

Setting (s): Tabriz, East Azerbaijan, Iran.

Participants: Home-dwelling older adults.

Outcome measures: Data collection tools included the SF-12 QoL, ADL, Loneliness Scale, and demographic information. Relationships between loneliness, ADL, and QoL were examined using a multiple linear regression model by means of the backward method.

Results: On average, the age of the participants was 67.71 years with a standard deviation (SD) of 7.13 years. Of all these older adults, 209 (67%) were aged 60-69 years, 270 (86%) were married, and 155 (49.4%) had elementary education. Mean \pm SD for the physical and mental components of QoL were obtained at 49.35 ± 9.45 and 48.38 ± 11.65 , respectively. Emotional loneliness had a significant reversed association ($\beta = -0.38$, $P < 0.01$) with Mental Component Summary (MCS), while social loneliness had a significant positive association ($\beta = 0.27$, $P = 0.03$) with MCS. Furthermore, dependent ADL had a negative correlation ($\beta = -0.23$; $P < 0.01$) with Physical Component Summary (PCS). Moreover, age, gender, and educational status had a statistically significant relationship with QoL.

Conclusions: Given the significant negative impact of loneliness and low ADL scores, it is imperative to develop efficient interventions and modify existing procedures to improve the QoL for older people. Individual-level interventions and societal-level interventions need to be developed and applied among this population. Additionally, national health policymakers may prioritize loneliness as a significant concern for public health.

Keywords: Activities of daily living, Loneliness, Quality of life, Behavioral epidemic, Epidemiology

Introduction

The critical concern of quality of life (QoL) has been brought to attention due to the rapid rise in life expectancy and the aging population.¹ According to the World Health Organization (WHO), an individual's evaluation of their own life is known as QoL, which is influenced by their cultural background, values, objectives, expectations, benchmarks, and worries.² Based on a systematic assessment of the aspect of QoL in older adults³ and considering our country's conditions such as extended

family and activity-based work in the last decades, it seems that activities of daily living (ADL) and loneliness have had important roles in the QoL of older adults.

The results of a review study showed that 42% of the Iranian older people have low, 50% have moderate, and 7% of them have high QoL.⁴ Receiving education on a healthy lifestyle, which includes engaging in regular physical activity, maintaining a nutritious diet, and addressing emotional and other health concerns, has a beneficial impact on one's QoL.⁵ Maintaining and enhancing the



QoL for older adults involves prioritizing physical activity and mental health.⁶

ADL is a series of basic activities performed to maintain and gain independence in daily life such as getting dressed, eating, and doing personal hygiene.⁷ Functional independence and self-reliance in older adults are significantly influenced by ADL.^{8,9} Further, there seems to be a significant association between older adults' ADL and QoL.¹⁰⁻¹³ Accordingly, limitations and dependency on older people in performing ADL can reduce the QoL and increase the costs for older adults.¹⁴

Investigations on older adults documented one of the essential problems that are less frequently addressed, namely, the experienced loneliness in various societies.^{15,16} They are at risk of loneliness or perceived social isolation (as a modern behavioral epidemic and public health issue) due to decreased interactions, limited capacity, performance, changes in physical health, as well as the death of relatives and friends.¹⁷ Numerous older people describe later-life ages as an isolated period and regard it as an undesirable event.^{18,19}

The results of Berg-Weger and Morley's study demonstrated that a significant number of older adults, around one-third or more, are impacted by loneliness.²⁰ In addition, a study in the United States showed that 17%-57% of older adults have loneliness, in particular individuals who are experiencing anxiety, depression, and dementia.²¹ Furthermore, it has been noted that there exists a notable inverse relationship between ADL and psychological aspects, including feelings of isolation.²²⁻²⁴ There is a different rating of loneliness described as a painful feeling among older adults.²⁵ Berg-Weger and Morley indicated that loneliness as a health issue is not adequately addressed and needs further attention from professionals and social workers.²⁰ Generally speaking, lifestyle modification can greatly affect the capability and independence of aged persons, assisting individuals in managing and regulating the limitations and impairments of bodily systems. Additionally, this practice decreases the likelihood of developing illnesses and disorders later in life.²⁶

Increasing the number of older population and decreasing their accessible resources probably will exacerbate their social support, rehabilitation, and healthcare. These people need to spend the remaining years of their lives in peace while maintaining good physical and mental well-being as well. Additionally, living a long life should be accompanied by a high QoL. Therefore, this research sought to explore the relationship between older adults' QoL and its association with ADL and loneliness.

Methods

Design of the Study and Data Collection

We performed an analytical cross-sectional investigation in Tabriz, East Azerbaijan, Iran, from September to November 2022.

Inclusion and Exclusion Criteria

Older adults (aged 60 and over) who had at least a six-month history of living in Tabriz, were active members of the Comprehensive Health Centers (CHCs), and were accompanied by receiving informed consent met the inclusion criteria. After explaining the design and purpose of the study and obtaining informed consent, the questionnaires were completed by conducting an interview. The interview was done by two trained master students. The exclusion criteria included those who had cognitive and psychological problems such as major depression, Alzheimer's (or other Dementia), bipolar disorders, and schizophrenia. Exclusion criteria were also assessed based on the medical records of CHC.

Sampling

Considering the standard deviation (SD) of the QoL score in the older adult population as 14.4²⁷ and the margin of error as 0.05 at a 95% confidence interval, the sample size was established as nearly 314.

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 S^2}{d^2}$$

Participants were recruited by randomly selecting a sample from 16 CHC, and about 20 samples were chosen from each CHC with an equal gender ratio.

Questionnaires

Three valid instruments, namely, the Iranian version of the 12-item short form (SF-12) Health Survey, the De Jong Gierveld loneliness scale, the Katz ADL scale, and a demographic checklist were used for data collection.

Quality of Life

The SF-12 Health Survey has two summary measures, including six items in the Physical Component Summary (PCS) and six items in the Mental Component Summary (MCS).²⁸ This questionnaire was validated by Zare et al among older people within two dimensions: the PCS Cronbach's alpha (α)=0.68 and the MCS α =0.71.²⁹ The scores range from 0 to 100. A score of 50 or less on PCS-12 is the cut-off for physical condition. Likewise, a score of 42 or less on MCS-12 may suggest clinical depression.³⁰

Loneliness

The 6-item De Jong Gierveld loneliness scale containing six items has been validated for Iranian older adults, which includes three items dealing with emotional loneliness and three related to social loneliness. This questionnaire has 3-point Likert answers including no, more or less, and yes. Items 2, 3, and 4 have negative and neutral answers and are related to social loneliness, while items 1, 5, and 6 have positive and neutral answers related to emotional loneliness.³¹

Activities of Daily Living

The third scale was the 6-item Katz ADL scale. A previous

study confirmed the validity and reliability of the 6-item ADL scale on Iranian older people with an internal consistency α of 86%.³² This scale includes bathing, getting dressed, transfer, toileting, feeding, and continence. To score this questionnaire, if participants are able to perform an activity, they will get one point and otherwise get zero. The total score ranges between 0 (lack of performance) and 6 (maximum performance), 2 or less indicates severe functional impairment, and a score of 4 shows moderate impairment.³²

Data Analysis

We analyzed the gathered data using descriptive statistics, including frequency, mean, and SD to evaluate the attributes of the participants. The normality of the data was checked using the Kolmogorov-Smirnov test. Moreover, the independent *t* test was used to compare the items of QoL with the characteristics of gender. Additionally, the relationship between the PCS and MCS with the characteristics of older individuals was assessed using Spearman and Pearson's tests. Furthermore, the multiple linear regression model was applied to predict the value of an MCS and PCS based on the value of marital status, age, education, loneliness, and ADL variables using the backward method. This technique can help reduce the chances of overfitting the data, find the best subset of features from a given set of features, and make the linear regression model more interpretable. All statistical examinations were double-sided, and it was considered statistically significant when the *P* value was under 0.05. The statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS 24.0, SPSS Inc., Chicago, USA).

Results

Baseline Demographic Profile of the Participants

A total number of 314 older adults (response rate was about 98.7%), including 163 (51.9%) women and 151 (48.1%) men, participated in this research. This study involved participants with a mean age of 67.71 ± 7.13 years. Of all these older adults, 209 (67%) were aged between 60-69, 270 (86%) were married, and 155 (49.4%) had elementary education (Table 1).

Quality of Life Using SF-12

Table 2 presents the scores of QoL, ADL, and loneliness across gender. The mean \pm SD of PCS and MCS of QoL were 49.35 ± 9.45 and 48.38 ± 11.65 , respectively. Moreover, no significant difference was observed between genders. Furthermore, the comparison of QoL items demonstrated that the physical role ($P=0.02$) and social functioning ($P=0.04$) were significantly higher in men, but the mean emotional loneliness of women was significantly higher ($P=0.01$).

Correlation between Quality of Life, Activities of Daily Living, and Loneliness

The PCS exhibited a positive relationship with marital

status, education, and ADL. To be more specific, the correlation coefficients were 0.20, 0.15, and 0.23, respectively. On the other hand, the PCS showed a negative correlation with age, social loneliness, and emotional loneliness (-0.19, -0.24, and -0.28, respectively). Additionally, the MCS had a negative correlation with age and emotional loneliness (-0.11 and -0.17, respectively), as depicted in Table 3.

Multiple Analysis

Multiple regression analysis demonstrated that emotional loneliness ($\beta = -0.38$, $P < 0.001$) has an inverse significant association, and social loneliness ($\beta = 0.27$, $P = 0.03$) has a significant positive association with MCS, with adjusting the mentioned covariates (Table 4, Model A). Moreover, age had an effective significant association with MCS, that is, age > 80 years illustrated a lower MCS compared to the 60-69 age group ($\beta = -0.26$, $P < 0.01$). In addition, the age group (70-79) showed a lower MCS compared

Table 1. Characteristics of the Study Population (N=314)

| Variables | Male No. (%) | Female No. (%) | Total No. (%) |
|----------------|-----------------------------|----------------|---------------|
| Age groups | 60-69 | 104 (68.9) | 209 (66.9) |
| | 70-79 | 35 (23.2) | 79 (33.1) |
| | 80+ | 12 (7.9) | 26 (8.3) |
| Marital status | Married | 136 (90.1) | 270 (86.0) |
| | Widowed | 15 (9.9) | 44 (14.0) |
| Education | Illiterate | 43 (28.5) | 105 (33.4) |
| | Elementary | 75 (49.7) | 155 (49.4) |
| | Senior high school or above | 33 (21.9) | 54 (17.2) |

Table 2. Quality of Life, Loneliness, and Activities of Daily Living of Older Participants by Gender

| Variable | Male Mean (SD) | Female Mean (SD) | Total Mean (SD) | P Value |
|----------------------|----------------|------------------|-----------------|---------|
| PCS-12 | 49.95(9.0) | 48.80(9.8) | 49.35(9.4) | 0.28 |
| MCS-12 | 48.93(10.8) | 47.93(12.3) | 48.35(11.6) | 0.21 |
| Concepts of SF-12 | | | | |
| Physical functioning | 80.79(28.9) | 78.52(30.6) | 79.52(29.8) | 0.54 |
| Physical role | 91.05(27.1) | 83.74(34.1) | 87.30(31.1) | 0.02 |
| Bodily pain | 78.64(23.8) | 77.30(24.0) | 77.77(24.0) | 0.56 |
| General health | 60.26(22.0) | 60.27(24.1) | 60.24(23.1) | 0.93 |
| Vitality | 63.04(23.8) | 60.12(26.7) | 61.46(25.3) | 0.22 |
| Social functioning | 73.67(21.7) | 68.55(23.8) | 71.03(22.9) | 0.04 |
| Emotional role | 92.71(24.7) | 89.57(29.6) | 90.79(27.8) | 0.30 |
| Mental health | 63.18(26.4) | 62.69(26.5) | 62.88(26.4) | 0.83 |
| Independent ADL | 142(94.0) | 148(90.8) | 290(92.4) | 0.28 |
| Dependent ADL | 9(6.0) | 15(9.2) | 24(7.6) | |
| Emotional loneliness | 0.41(0.9) | 0.72(1.1) | 0.58(1.0) | 0.01 |
| Social loneliness | 0.28(0.7) | 0.47(0.9) | 0.38(0.8) | 0.05 |

Note. PCS: Physical component summary; MCS: Mental component summary; SD: Standard deviation; ADL: Activities of daily living; Physical role: Role limitations due to physical health; *P* values are based on independent samples *t*-test.

Table 3. The Correlation between the Quality of Life, Activities of Daily Living, and Feelings of Loneliness in Older Adults

| | Gender | Age | Marital Status | Education | ADL | Loneliness | |
|-----|--------|---------|----------------|-----------|--------|-------------------|----------------------|
| | | | | | | Social Loneliness | Emotional Loneliness |
| MCS | 0.07 | -0.11* | -0.11 | 0.00 | 0.09 | -0.11 | -0.17** |
| PCS | 0.05 | -0.19** | 0.20** | 0.15** | 0.23** | -0.24** | -0.28** |

Note. ADL: Activities of daily living; MCS: Mental component summary; PCS: Physical component summary; * $P < 0.05$; ** $P < 0.01$.

Table 4. A: Multiple Regression Analysis for Predicting Mental Component Summary of Quality of Life, B: Multiple Regression Analysis for Predicting Physical Component Summary of Quality of Life

| | | Non-standardized Coefficient B | β Coefficient | P Value |
|-------------------------------|--------------------|-----------------------------------|---------------------|---------|
| Model A | | | | |
| Marital (Ref=Married) | Single | 7.00 | 0.21 | <0.01 |
| Age (Ref=60-69) | 70-79 | -3.33 | -0.13 | 0.03 |
| | 80+ | -10.79 | -0.26 | <0.01 |
| Education (Ref=Illiterate) | Elementary | -2.93 | -0.13 | 0.05 |
| | \geq High school | 0.71 | 0.02 | 0.72 |
| Loneliness | Emotional | -4.07 | -0.38 | <0.01 |
| | Social | 3.57 | 0.27 | 0.03 |
| Model B | | | | |
| Marital (Ref=Married) | Single | -4.71 | -0.17 | <0.01 |
| Age (Ref=60-69) | 70-79 | -3.03 | -0.14 | 0.01 |
| | 80+ | -2.22 | -0.06 | 0.26 |
| Education (Ref=Illiterate) | elementary | 1.25 | 0.07 | 0.25 |
| | \geq High school | 3.77 | 0.15 | 0.01 |
| ADL (Ref=Independent) | Dependent | -8.16 | -0.23 | <0.01 |

Note. (A) Dependent variable=MCS: Mental Component Summary, adjusted $R^2 = 0.113$; (B) Dependent variable=PCS: Physical component summary, adjusted $R^2 = 0.171$; Ref: Reference.

to the reference group ($\beta = -0.13$, $P = 0.03$), and single people had a significant positive association with MCS ($\beta = 0.21$, $P < 0.01$) (A). In the second model (B), the factor that influenced PCS was ADL, which exhibited a significant negative relationship between dependency in ADL and PCS. The beta coefficient was -0.23 , with a P value of less than 0.01. Furthermore, being educated was found to have a higher impact on the PCS compared to illiterates ($\beta = 0.15$, $P = 0.01$). Single people indicated a significant inverse association with PCS compared to their married participants ($\beta = -0.17$, $P < 0.01$). Additionally, the age group (70-79) showed a lower MCS as opposed to the reference group ($\beta = -0.14$, $P = 0.01$), as illustrated in Table 4 (Model A).

Discussion

This study examined the relationship between the loneliness status, ADL, and QoL of older adults in Tabriz. The results demonstrated an association between age, gender, education status, ADL, and loneliness status with QoL. Emotional loneliness had an inverse significant association, and social loneliness had a significant positive association with MCS. Moreover, there was a significant inverse association between dependency in ADL and PCS. Furthermore, being educated was found to have a higher impact on the PCS compared to being an illiterate one. While physical role and social functioning were

significantly higher in men, emotional loneliness was significantly higher in women.

Almost one-third of older people often suffer from loneliness.^{33,34} Loneliness has a significant impact on one's QoL and is linked to disease, widowhood, social isolation, and/or reduced family support.^{35,36} The present study agrees with previous findings and offers additional evidence. Older individuals are more likely to live alone compared to other age groups, and some of them may be less engaged in society, leading to potential negative impacts on their mental well-being and increased social isolation.

The mental performance was greatly affected by the coronavirus disease 2019 (COVID-19) pandemic, especially that of seniors.³⁷⁻⁴⁰ To reduce social isolation, using virtual programs about social services and other online programs was reported to increase the QoL of older adults.⁴¹⁻⁴³ A decrease in family communication and the fear of disease spread caused a rise in emotional loneliness.⁴⁴⁻⁴⁶

Age is another factor that has an influence on QoL among older people.⁴⁷ The results indicated that higher age has an inverse significant association with QoL. This finding agrees with Jivraj and colleagues' findings which showed that QoL tends to weaken as they age, partly because of having poorer health.⁴⁸

Compared to married older adults, single ones had a

higher score on MCS; nonetheless, they had a lower score on PCS in terms of QoL. Married individuals experienced increased anxiety about the possibility of losing their partners during the COVID-19 pandemic, leading to a decrease in their QoL.⁴⁹ Along with this, the prevalence of depression among married people was greater during this period.⁵⁰ Poorolajal reported that the prevalence of aggression among the Iranian adult general population is higher in singles.⁵¹ Furthermore, single older adults had a higher QoL due to having better communication with their network of friends.⁴

ADL was established to be an influential factor in PCS. Therefore, ADL-dependent older adults had eight times lesser scores in the physical field of QoL compared to independent ones. Dependency in ADL reduces the QoL in older people.^{52,53} Older individuals who are capable of independently performing Instrumental Activities of Daily Living (IADL) experience a significantly higher QoL.⁵⁴ The COVID-19 pandemic required older adults to stay at home and limit their social activities, causing the closure of their favorite places such as parks, restaurants, and sports clubs. Consequently, older adults experienced a decrease in their opportunities for social interaction and participation in daily activities, which negatively impacted their PCS of QoL.⁵⁵⁻⁵⁷ Unlike younger adults, physical activity is a daily requirement for older individuals and has a significant impact on different aspects of their health, particularly their physical well-being. Older individuals can enhance their health problems by engaging in physical activities, particularly when they combine aerobic and strength exercises.

However, these findings are limited owing to the use of a cross-sectional design. Due to the nature of the study, it is not possible to examine the time precedence in the relationships between the investigated variables. Moreover, the data of this study were collected during the COVID-19 pandemic, and its data may be different from the non-pandemic period.

Conclusions

The QoL in older individuals is significantly impacted by both ADL and loneliness. In this study, the decline in ADL, coupled with advancing age and the experience of loneliness, led to a reduction in QoL among the elderly. Consequently, the subsequent recommendations are proposed:

1. For older individuals who experience loneliness, interventions that aim to strengthen social support and social contacts (e.g., visits and daily contacts) may be beneficial.
2. The development of recreational sports programs should be personalized to the needs of older adults to enhance physical activity through collaboration between health and social institutions.
3. Establishment and training on the utilization of existing infrastructure and programs for older adults need to be carried out by organizations responsible for their health and welfare.

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Data availability statement

All data generated or analyzed during this study are included in this published article.

Ethical approval

The Research Ethics Committee at Tabriz University of Medical Sciences reviewed and approved this study (Ethical ID: IR.TBZMED.REC.1400.1235). Additionally, oral informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

Conflict of interests

The researchers of this study have no conflict of interests.

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