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Evaluation of Factors Influencing the Quality of Life of Older Adult Earthquake Survivors in Türkiye: A Cross-Sectional Interview-Based Study

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Original Research

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Abstract

Objective: Due to frailty, chronic health issues, limited mobility, dependence on assistive devices, and polypharmacy, the geriatric population is more susceptible to the adverse effects of earthquakes. The aim of this study was to determine the factors affecting the quality of life of older adults who experienced the Kahramanmaraş-centered earthquakes in Türkiye on February 6, 2023.

Methods: This cross-sectional interview-based study was conducted with 340 older adults who experienced the earthquakes on February 6, 2023, and visited outpatient departments in Gaziantep. Data were gathered using a demographic form, Modified Fried Frailty Index, and WHO Quality of Life Instrument for Older Adults.

Results: Participants' average age was 71.37 ± 6.56 years, and 56.6% were women. Among them, 20.9% lost a first-degree relative, 15.3% were injured, and 45.3% were displaced. WHOQOL-OLD scores differed significantly by age, marital status, education, chronic illness, polypharmacy, living arrangements, and frailty.

Conclusions: This study highlights the factors influencing the quality of life of older adults in Türkiye after an earthquake. Living with a spouse and having primary or secondary education improved quality of life, while chronic illnesses and displacement had negative impacts. These findings emphasize the importance of considering the specific needs of older adults in disaster preparedness and response.

Introduction

Disasters are catastrophic events that significantly disrupt community functionality, causing physical, psychological, sociological, economic, or environmental damage that surpasses the community's ability to manage using its own resources. They also result in disruptions that deteriorate the flow of daily life and can cause serious long-term health problems.[1,2] According to the World Disasters Report, 2850 disasters occurred worldwide, each affecting 100 or more people, triggered by natural or human-made causes between 2010 and 2019. The vast majority of these disasters (83%) were natural, impacting approximately 1.8 billion people. Many individuals were injured, left homeless, or deprived of their livelihoods.[3]

Earthquakes are among the most common and devastating natural disasters, affecting the largest number of people and causing effects that can last months or even years. The World Health Organization reported that between 1998 and 2017, earthquakes affected over 125 million people and claimed the lives of more than 750,000 individuals. This number represents more than half of all deaths caused by natural disasters.[4]

Türkiye, situated in a significant seismic zone, experienced earthquakes and aftershocks measuring 7.8 and 7.6 on the Richter scale on February 6, 2023. These earthquakes and their aftershocks affected the southeastern region of Türkiye and the northern part of Syria.[5]

These earthquakes have led to numerous injuries, disabilities, and psychological trauma among affected individuals. Furthermore, they ripped the families and communities apart, thus preventing reunification.[6] As of the end of April 2023, data collected from multiple sources indicated that earthquakes in Türkiye and Syria have resulted in over 56,000 fatalities and more than 100,000 injuries. Additionally, it was reported that over 230,000 buildings were partially damaged or completely destroyed in 11 provinces in Türkiye.[7]

Earthquakes cause deaths, injuries, infrastructure destruction, housing, water, and food shortages, and disrupt health care, affecting society in various ways. Vulnerable groups like the disabled, chronically ill, children, refugees, and the elderly are particularly impacted.[8] These groups face higher risks of illness, injury, premature death, discrimination, and barriers to

health care access post-disaster[6]. Older adults are especially vulnerable due to chronic health issues, limited mobility, dependence on assistive devices, polypharmacy, and disability.[9,10] These factors, manageable before earthquakes, can become significant societal burdens.[11] Research shows that disaster survivors' quality of life is poorer than that of other older individuals.[12]

A systematic review found that older adults have higher mortality rates post-disaster. Studies consistently show elevated mortality rates among older populations, with age as a significant risk factor.[13] Factors affecting their quality of life include advanced age, female gender, education level, physical illness, injury, depression, living alone, poor living conditions, community resilience, and loss of family members.[12,14–16] Disruption of social networks and decreased social support reduce quality of life. Older adults may also struggle to access medical services due to overcrowded facilities.[16–19] Post-earthquake, basic needs like food, clothing, and shelter are threatened. Effective disaster management and fair distribution of resources are crucial to improving the quality of life for these vulnerable populations.[10,16]

Few studies have investigated the factors affecting the quality of life of the geriatric population after an earthquake.[10] Although Türkiye is highly prone to earthquakes, no study has investigated the factors affecting the quality of life in the older adult population. It is essential to elucidate multidimensional factors, including individual and social environmental factors, among older adults. Conducting studies on the quality of life of older adult earthquake survivors can provide valuable insights and evidence to improve health care services, earthquake preparedness, and support programs during earthquake relief operations, developing disaster policies, and promoting management processes. In light of this information, the aim of this study was to determine the factors affecting the quality of life of older adults who experienced the Kahramanmaraş-centered earthquakes in Türkiye on February 6, 2023.

Specifically, the study addressed the following research questions:

1. What is the overall quality of life score of older adults who directly experienced the Kahramanmaraş-centered earthquakes in Türkiye?
2. Which sociodemographic (age, gender, education, marital status, income), health-related (chronic diseases, perceived health status), and frailty-related (Fried Frailty) factors are significantly associated with quality of life in this population?
3. After adjusting for potential confounders, which factors remain as independent predictors of quality of life among older adult earthquake survivors?

Methods

Design

This cross-sectional interview-based study was conducted at two state hospitals in Gaziantep, one of the provinces affected by the earthquake on February 6, 2023. Owing to its population density, large area, and advanced health care facilities among the 11 provinces affected by the specified earthquakes, this province was chosen for the study. The study was conducted between November 15, 2023, and February 15, 2024, with older individuals who visited the medical and surgical outpatient diagnosis and treatment departments of the two state hospitals for any health problems.

Study Sample

During the data collection period, 405 older patients were admitted to hospitals. Among these patients, 340 met the following inclusion criteria and were included in the sample: Inclusion criteria were:

- Experiencing the earthquakes centered in Kahramanmaraş, Türkiye, on February 6, 2023
- Being aged 65 years or older
- Visiting the outpatient clinics of the specified hospitals for any health problem during the study period
- Being conscious and able to communicate
- Not having a diagnosis of dementia, Alzheimer's disease, or other mental illnesses
- Being able to speak and understand Turkish
- Willing to participate in the study

During the data collection period of the study, 84% of the elderly population who applied to outpatient clinics were reached.

Data Collection Tools

Descriptive Characteristic Form of Older Adults

This form, created by the researchers through a comprehensive literature review,[12,14,16] was comprised 12 items. It encompasses details regarding participants' age, gender, marital status, education, medication usage, chronic medical conditions, duration of medication usage, polypharmacy status, post-earthquake living arrangements, cohabitation status, earthquake-related injuries, and loss of first-degree family members.

Fried Frailty Phenotype

The Fried frailty phenotype, originally developed by Fried et al. (2001), is used to assess frailty in older adults. It evaluates five specific components: weakness (measured by handgrip strength), slowness (measured by walking speed), exhaustion (self-reported fatigue), reduced physical activity (self-reported activity level), and unintentional weight loss. Each component is scored as 1 if present and 0 if absent, yielding a total score ranging from 0 to 5. Based on this score, individuals are classified as non-frail (0 points), pre-frail (1-2 points), or frail (3-5 points).[20,21]

The Turkish adaptation and psychometric validation study was conducted by Doğan Varan et al. (2022). In the study, cultural adaptation was achieved through a forward-backward translation method, and 450 individuals aged 59 years and older were evaluated. The handgrip strength cut-off values specific to the older Turkish population, best predicting low skeletal muscle mass index, were determined as ≤13.6 kg for women and ≤27.7 kg for men.[22]

The study found that the FFP showed good agreement (kappa = 0.66, $p < 0.001$) with the frailty status clinically defined by an expert geriatrician after comprehensive geriatric assessment, and that the "modified FFP," created using the revised cut-off values, was also valid and reliable. In addition, both inter-rater (kappa = 0.67) and intra-rater (kappa = 0.74) agreements were good. These results indicate that the Turkish version of the Fried frailty phenotype is a valid and reliable tool for assessing frailty in older adults in Türkiye.[22] In the present study, the physical activity component of the original Fried Frailty Phenotype was not assessed; therefore, frailty classification was performed using the four-item Modified Fried Frailty Index.[20]

World Health Organization Quality of Life Instrument (WHOQOL-OLD)

The World Health Organization Quality of Life Instrument for Older Adults (WHOQOL-OLD), developed by Power, Quinn,

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Schmidt, and the WHOQOL-OLD Group in 2005, is comprised of 24 items rated on a five-point Likert scale, covering six domains: sensory abilities; autonomy; past, present, and future activities; social participation; death and dying; and intimacy.[23] The Turkish adaptation, validity, and reliability study was conducted by Eser et al. (2010), demonstrating good psychometric properties with Cronbach's α ranging from 0.83 to 0.98 for the subscales, and test–retest reliability coefficients between 0.81 and 0.94, confirming its suitability for use in Türkiye.[24]

The "sensory abilities" domain evaluates sensory functions and their impact on quality of life. "Autonomy" refers to independence in old age and self-sufficiency. "Past, present, and future activities" reflect satisfaction with life achievements and outlook. "Social participation" involves engagement in community activities. The "death and dying" domain addresses fears and anxieties about death. "Intimacy" assesses the ability to form personal relationships. Each item is scored from 1 to 5, with higher scores indicating a better quality of life. Individual item scores are summed to compute domain scores and the overall score.

For this study, data were sent via email to Sultan Eser and her research team, who conducted the Turkish validation, and based on their recommendations, the total and subscale scores were converted to a 100-point scale for analysis.[24]

Implementation of the Study

Data for this study were collected between November 15, 2023, and February 15, 2024. During the specified dates, patients meeting the sampling criteria who visited the designated hospitals were invited to participate in the study. Data were collected through face-to-face administration of the survey form. The purpose and objectives of the study were explained to the participants before the survey, and written informed consent was obtained. For participants who were illiterate or had difficulty reading, the survey questions were read aloud by the researchers, and the responses were recorded and confirmed on the survey forms. Data collection took place in a quiet and private room within the outpatient departments of the hospitals, and it took approximately 15-20 minutes for each participant to complete the data collection forms.

Ethical Considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Non-Interventional Ethics Committee of Hasan Kalyoncu University (Date: 12.10.2023; No: 2023/61) prior to the commencement of the research. All participants were informed about the purpose and objectives of the study, and written informed consent was obtained from each participant. For illiterate participants, the informed consent form was read aloud, and a literate relative/caregiver signed the form in the presence of an impartial witness. Permission to use the measurement tools employed in the study was secured by the authors, who conducted the validity and reliability studies via email.

Data Analysis

Statistical analysis of the data was performed using IBM SPSS for Windows version 22.0 software. The normal distribution of the data was assessed using the Kolmogorov–Smirnov and Shapiro–Wilk tests. Although these tests indicated significant deviations from normality ($p < 0.001$), the skewness and kurtosis values of the WHOQOL-OLD total and sub-dimension scores were within the acceptable range (–1.5 to +1.5), suggesting approximate normal distribution (Supplementary Table 1). Student's t-test was used to compare the means of two groups, while one-way ANOVA was used to compare the means of three or more groups. Bonferroni correction was applied in post-hoc analyses to determine the source of significant differences. Factors affecting quality of life were investigated using stepwise multiple regression analysis. Residuals were examined to confirm the assumptions of regression, and variance inflation factor (VIF) values confirmed the absence of multicollinearity. The results were considered statistically significant at $p < 0.05$, with a confidence interval of 95%.

Results

In this study, the participants had a mean age of 71.37 ± 6.56 years (min-max: 65-92), with 75.9% falling in the age range of 65-74 years. Among the participants, 56.6% were female, 75.3% were married, and 69.5% were illiterate. Additionally, 62.9% of older adult participants had a chronic illness, and 67.6% were using medications regularly, with an average daily medication intake of 2.85 ± 1.29 (min-max: 1-6). Among those using medication, 21.2% had been using medication for more than 10 years. Furthermore, 20.9% of participants used four or more medications daily, meeting the definition of polypharmacy. Approximately 20.9% of participants lost a first-degree relative during the earthquake, 15.3% were injured, and 45.3% could not live in their own homes in the immediate aftermath of the earthquake, and 60.3% of participants reported living with their spouse after the earthquake.

According to the Modified Fried Frailty Index, 36.5% of the participants were identified as frail. The mean total score of the WHOQOL-OLD scale was found to be 61.14 ± 8.85(22.92-89.58) (Table 1).

When participants were compared based on age groups, statistically significant differences were found in the mean scores of sensory abilities, autonomy, Past, present, and future activities, social participation, intimacy subscales, and the WHOQOL-OLD total score (respectively all; $p < 0.001$). Following Bonferroni correction to determine the source of the difference, it was found that younger older adult participants (aged 65-74 years) had the highest mean scores for sensory abilities, autonomy, past, present, and future activities, social participation, intimacy subscales, and the WHOQOL-OLD total score. When participants were compared based on marital status, married older individuals had higher mean scores for sensory abilities, autonomy, past, present, and future activities, social participation, intimacy subscales, and the WHOQOL-OLD total score (respectively all; $p < 0.001$). According to advanced statistics, there was a statistically significant difference in the mean scores of sensory abilities, autonomy, social participation subscales, and the WHOQOL-OLD total score based on educational status (respectively; $p < 0.001$; $p = 0.003$; $p = 0.002$; $p < 0.001$). Specifically, participants with no formal education had lower mean scores on the sensory abilities and social participation subscales than high school graduates. For the autonomy and WHOQOL-OLD total scores, participants with no formal education had lower mean scores than those who completed primary and high school education.

Participants with chronic diseases had lower scores on all subscales and the total score on the WHOQOL-OLD (respectively; $p < 0.001$; $p < 0.001$; $p < 0.001$; $p < 0.001$; $p = 0.008$; $p < 0.001$; $p < 0.001$).

The mean scores of participants' sensory abilities, autonomy, past, present, and future activities, social participation, intimacy

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Table 1. Distribution of characteristics of older adults earthquake survivors (N = 340)

Characteristics	N	%	Mean ± Sd (min-max)
Age (years)	340	100	71.37 ± 6.561(65–92)
Young old (65–74 years)	258	75.9	
Middle old (75–84 years)	61	17.9	
Advanced old (85 years and older)	21	6.2	
Gender			
Male	148	43.5	
Female	192	56.5	
Marital status			
Married	256	75.3	
Single (never married or widowed)	84	24.7	
Education level			
Illiterate	235	69.1	
Primary education	70	20.6	
High school	22	6.5	
University	13	3.8	
Chronic disease			
Yes	214	62.9	
No	126	37.1	
Do you take medication regularly?			
Yes	220	67.6	2.85 ± 1.297 (1–6)
No	110	32.4	
How many years have you been taking medication?			
Less than 1 year	35	10.3	
1–5 years	67	19.7	
6–10 years	56	16.5	
11 years and above	72	21.2	
Using four or more medications (Polypharmacy condition)			
Yes	71	20.9	
No	269	79.1	
Were you injured during the earthquake?			
Yes	52	15.3	
No	288	84.7	
Did you lose a first-degree relative in the earthquake?			
Yes	71	20.9	
No	269	79.1	
Where did you live after the earthquake?			
We continued to live in our own home	185	54.4	
We lived in temporary shelters in the same city	77	22.6	
We lived in another unaffected city for a while	78	22.9	
Who are you currently living with?			
I live alone	16	4.7	
I live with my spouse	205	60.3	
I live with my children/relatives in an extended family	100	29.4	
I live with a caregiver	19	5.6	
According to the Modified Fried Frailty Index			
Not frail	124	36.5	
Pre-frail	92	27.1	
Frail	124	36.5	
(WHOQOL-OLD) module*	340	100	61.14 ± 8.85(22.92–89.58)
Sensory abilities	340	100	68.86 ± 29.03 (0–100)
Autonomy	340	100	64.63 ± 20.84 (6.25–100)
Past, present, and future activities	340	100	63.93 ± 21.37 (6.25–100)
Social participation	340	100	53.18 ± 26.64 (0–100)
Death and dying	340	100	41.77 ± 19.74 (0–100)
Intimacy	340	100	74.55 ± 21.59 (12.5–100)

Note. * The total and subscale scores of the **WHOQOL-OLD** scale were calculated by the team conducting the scale's validity and reliability study. Authors recommended using the scores transferred to a scale of 100 for all subscales.

subscales, and the total score of the WHOQOL-OLD were lower in participants who regularly used medication than in those who did not (respectively all; $p < 0.001$). Statistically significant differences were found in the mean scores of sensory abilities; autonomy, past, present, and future activities; social participation; intimacy subscales; and the total score of the WHOQOL-OLD among participants based on the duration of regular medication use (respectively all; $p < 0.001$). In advanced statistics, it was found that participants who used medication regularly for 10 years or more had lower scores on sensory abilities, autonomy subscales, and the total score of the WHOQOL-OLD than those who used medication for 1-5 years and 5-10 years. Moreover, in the past, present, and future activities subscale, their scores were lower than those of all other groups, and in the intimacy subscale, their scores were lower than those who used medication for 5-10 years.

In terms of polypharmacy status, the scores of participants using four or more medications were simultaneously significantly lower in all subscales except the death and dying subscale (respectively all; $p < 0.001$).

When comparing the mean scores according to the place of residence after the earthquake, statistically significant differences were found in the average scores of sensory abilities, past, present, and future activities, social participation, intimacy, and WHOQOL-OLD total scores (respectively; $p = 0.012$; $p = 0.042$; $p = 0.010$; $p = 0.010$). In advanced statistics, the mean scores of the older adults who continued to live in their own homes were higher than mean scores of participants who had to move to another city. In the comparison according to the individuals they currently live with, statistically significant differences were found in the mean scores of sensory abilities, autonomy, past, present, and future activities, social participation, intimacy, and WHOQOL-OLD total scores (respectively

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all; $p < 0.001$). In advanced statistics, it was found that the mean scores of the older adults living with their children/relatives were lower than the mean scores of the other groups on the sensory ability subscale. On the autonomy subscale, the mean score of the older adults living alone was higher than that of participants living with children/relatives or caregivers.

Similarly, in the past, present, and future activities subscales, the scores of participants living alone were higher. On the social participation subscale, scores of the older adults living alone were higher than those of participants living with their children/relatives, while scores of participants living with their spouses were higher than those of participants living with their children/relatives or caregivers.

On the intimacy subscale, the highest scores were observed among older adults living with their spouses. Regarding the total WHOQOL-OLD score, the scores of participants living alone were higher than those of participants living with their children, relatives, or caregivers. The scores of older adults living with their spouses were also higher than those of participants living with their children, relatives, or caregivers. When comparing the mean scores of older individuals according to the frailty status determined by the Fried Frailty Scale, statistically significant differences were found in all subscales (sensory abilities, autonomy, past, present, and future activities, social participation, death and dying, intimacy) and the total score of the WHOQOL-OLD (respectively all; $p < 0.001$). According to the Bonferroni Correction, non-frail older individuals had higher mean scores than frail older individuals on all subscales and total scores (Table 2), while pre-frail older individuals had higher mean scores than frail older individuals.

Factors affecting the WHOQOL-OLD total score were investigated using a linear multiple regression analysis with a stepwise method. According to this analysis, frailty status of the elderly, age group, social environment, duration of regular medication use, and educational level were identified as significant factors affecting the WHOQOL-OLD total score (Table 3).

It was found that experiencing injury during the earthquake and losing a first-degree relative during the earthquake did not significantly affect the subscale and total scores of the quality of life measures.

Frail older individuals (Fried Frailty category) were associated with a significant decrease in their quality of life by −13.231 points. However, younger older individuals (aged 65-74) experienced an increase in their quality of life by 5.520 points, and older individuals living with their spouse positively influenced their quality of life by 4.634 points (Table 3). Older individuals who had been taking medication regularly for ten years or more were associated with a decrease in their quality of life of −2.414 points. In contrast, the quality of life of the older individuals with primary education increased by 2.098 points. According to the results of this study, the adjusted R-squared value of the model is 67%. The Durbin-Watson statistic calculated in this study was 1.685, indicating no autocorrelation (Table 3).

Discussion

Earthquakes and other natural disasters can significantly harm the overall health of older adults and diminish their quality of life.[2] Despite the frequent occurrence of earthquakes in Türkiye, support systems for vulnerable populations are inadequate.[25] To the best of our knowledge, this study represents the first attempt to assess the quality of life among older adults who have encountered natural disasters in Türkiye and explore the correlation between associated factors and quality of life.

In this study, it was found that older individuals obtained the lowest scores from the death and dying subscale of the WHOQOL-OLD. Gobbens and Remmen (2019) identified much higher scores on the death and dying subscale in the German population aged 50 and over. In this study, it is possible that the increased anxiety about death and dying due to recent experiences of earthquakes may have resulted in lower average scores on the death and dying subscale.[26]

It was found that participants in the younger older adults group had higher average scores on all subscales and the total score, except for the death and dying subscale. No study comparing age groups in the older adult population after disasters was found. However, studies have shown that as age advances, overall quality of life tends to decrease. In fact, the lowest quality of life scores have been demonstrated in individuals aged 80 and above.[10,27] In this study, considering the post-earthquake conditions, even minor problems that would not actually be a problem in normal life may have been perceived as more severe in the older adult population. However, the uniformly low scores on the death and dying subscale across all age groups, along with the lack of differences between groups, may be attributed to the traumatic nature of the earthquake, which likely elicited fear and anxiety among all older individuals.

In this study, older individuals who were married had higher scores in sensory abilities, autonomy, past, present, and future activities, social participation, intimacy subscales, and WHOQOL-OLD total score compared to those who were single. Following a flood disaster in China, it was noted that married couples had significantly higher quality of life compared to singles.[28] The reason for this could be interpreted as the mutual support provided by spouses to each other in physical, psychological, sociological, and economic aspects. Similarly, in this study, married older individuals may have recovered more quickly after the earthquake due to the support they provided to each other.

In this study, the majority of the older adult participants were illiterate, and there were very few older individuals with a bachelor's degree. The quality of life was lowest among the illiterate elderly. The autonomy subscale and WHOQOL-OLD total scores of older individuals with high school and primary education were higher compared to those of illiterate older individuals. In the sensory abilities and social participation subscales, the quality of life of illiterate individuals was lower compared to that of high school graduates. According to Cao et al. (2015),[14] higher education levels among older individuals are associated with higher quality of life in both mental and physical domains. Education indirectly influences the quality of life of older individuals. For instance, individuals with higher education levels typically have healthier dietary habits, which can positively impact physical health and overall well-being. Additionally, higher education levels are often associated with higher income levels, which can increase older individuals' access to additional resources that may improve their medical care and quality of life.[10,14]

In the current study, individuals with chronic illnesses had lower scores across all subscales and the overall quality of life compared to those without chronic illnesses. Moreover, participants who regularly used medication, had been using medication for many years, or experienced polypharmacy had lower scores in sensory abilities, autonomy, past, present, and future activities, social participation, intimacy subscales, and the WHOQOL-OLD total score. Among the physical factors that negatively impact the quality of life of older individuals after a disaster, we can include chronic illnesses, regular medication use, polypharmacy, regular medical check-ups and hospitalizations, and injuries sustained during the earthquake.

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Table 2. Comparison of WHOQOL-OLD scores according to descriptive characteristics of older adults earthquake survivors (N = 340)

Characteristics	N (%)	Sensory abilities	Autonomy	Past, present, and future activities	Social participation	Death and dying	Intimacy	WHOQOL-OLD total
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
	Age (years)							
Young older adults (65–74 years)[a]	258 (75.9)	73.15 ± 28.57	68.31 ± 19.11	67.03 ± 1.20	58.38 ± 24.35	41.40 ± 20.13	76.86 ± 19.97	59.46 ± 9.14
Middle older adults (75–84 years)[b]	61 (17.9)	60.75 ± 25.62	56.76 ± 22.36	56.76 ± 3.16	41.18 ± 26.96	41.80 ± 19.01	69.26 ± 25.80	52.94 ± 11.99
Advanced older adults (85 years and above)[c]	21 (6.2)	39.58 ± 22.03	42.26 ± 16.87	46.72 ± 4.77	24.10 ± 23.49	45.23 ± 17.33	61.60 ± 21.12	45.50 ± 10.69
Test, p		F = 17.422 p < 0.001* a > b > c**	F = 23.127 p < 0.001* a > b > c**	F = 13.929 p < 0.001* a > b,c**	F = 27.260 p < 0.001* a > b > c**	F = 0.366 p = 0.694	F = 7.350 p = 0.001* a > b,c**	F = 27.429 p < 0.001* a > b > c**
	Gender							
Male	148 (43.5)	68.37 ± 29.81	65.75 ± 21.07	64.18 ± 21.54	54.56 ± 27.33	44.08 ± 20.10	76.73 ± 19.85	58.18 ± 10.54
Female	192 (56.5)	69.23 ± 28.49	63.77 ± 20.69	63.77 ± 21.30	52.11 ± 26.11	39.87 ± 19.31	72.88 ± 22.75	56.84 ± 10.53
Test, p		t = 0.273 p = 0.785	t = 0.869 p = 0.386	t = 0.193 p = 0.847	t = 0.839 p = 0.402	t = 1.958 p = 0.052	t = 1.633 p = 0.103	t = 1.163 p = 0.246
Marital status								
Yes	256 (75.3)	71.72 ± 28.32	67.70 ± 19.59	66.99 ± 20.79	57.05 ± 25.32	41.11 ± 19.99	79.61 ± 19.13	59.35 ± 9.73
No	84 (24.7)	60.11 ± 29.58	55.28 ± 21.85	54.61 ± 20.53	41.36 ± 27.21	43.52 ± 18.94	59.15 ± 21.46	51.56 ± 10.79
Test, p		t = 3.224 p = 0.001*	t = 4.894 p < 0.001*	t = 4.749 p < 0.001*	t = 4.835 p < 0.001*	t = 0.972 p = 0.319	t = 8.248 p < 0.001*	t = 6.193 p < 0.001*
	Education status							
Illiterate[a]	235 (69.1)	65.37 ± 29.49	62.07 ± 20.53	62.18 ± 21.67	49.97 ± 26.55	40.66 ± 18.95	72.57 ± 22.18	55.87 ± 10.67
Primary education[b]	70 (20.6)	73.66 ± 28.39	69.64 ± 19.25	67.32 ± 20.19	58.57 ± 24.77	46.51 ± 23.03	78.30 ± 19.35	60.44 ± 9.23
High school[c]	22 (6.5)	88.06 ± 19.37	75.56 ± 18.98	69.88 ± 19.25	69.03 ± 21.94	36.07 ± 16.12	81.25 ± 19.28	63.32 ± 8.39
University[d]	13 (3.8)	73.55 ± 21.97	65.38 ± 28.36	67.30 ± 23.54	55.28 ± 33.05	44.23 ± 16.62	78.84 ± 22.61	59.40 ± 11.76
Test, p		F = 5.286 p < 0.001* a < c	F = 4.699 p = 0.003* a < b,c	F = 1.802 p = 0.147	F = 4.877 p = 0.002* a < c	F = 2.296 p = 0.078	F = 2.260 p = 0.081	F = 6.347 p < 0.001* a < b,c
	Chronic disease							
Yes	214 (62.9)	61.82 ± 28.80	59.52 ± 22.00	58.44 ± 22.58	44.30 ± 27.60	43.89 ± 20.52	69.71 ± 22.94	54.18 ± 11.06
No	126 (37.1)	80.80 ± 25.36	73.31 ± 15.25	73.26 ± 15.19	68.25 ± 16.19	37.99 ± 17.81	82.78 ± 16.09	62.93 ± 6.65
Test, p		t = 6.126 p < 0.001*	t = 6.209 p < 0.001*	t = 6.545 p < 0.001*	t = 8.877 p < 0.001*	t = 2.686 p = 0.008*	t = 5.631 p < 0.001*	t = 8.052 p < 0.001*
	Do you use medication regularly?							
Yes	220 (67.6)	62.85 ± 29.28	59.97 ± 21.85	59.15 ± 22.16	46.30 ± 27.55	42.22 ± 20.04	69.75 ± 22.82	54.47 ± 10.89
No	110 (32.4)	81.42 ± 24.17	74.37 ± 14.39	73.92 ± 15.49	67.55 ± 17.44	40.62 ± 19.15	84.60 ± 14.30	63.61 ± 6.28

(*Continued*)

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Table 2. (*Continued*)

Characteristics	N (%)	Sensory abilities	Autonomy	Past, present, and future activities	Social participation	Death and dying	Intimacy	WHOQOL-OLD total
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Test, p		t = 5.774 p < 0.001*	t = 6.288 p < 0.001*	t = 6.286 p < 0.001*	t = 7.408 p < 0.001*	t = 0.700 p = 0.478	t = 6.256 p < 0.001	t = 8.166 p < 0.001*
How many years have you been using medication regularly?								
Not using medication regularly[a]	110 (32.4)	81.59 ± 24.53	74.65 ± 14.41	73.57 ± 15.39	67.61 ± 17.37	40.45 ± 19.26	84.82 ± 14.15	63.63 ± 6.25
Less than 1 year[b]	35 (10.3)	59.10 ± 26.40	58.57 ± 18.00	62.14 ± 19.23	49.28 ± 25.84	37.67 ± 14.57	71.96 ± 19.55	54.30 ± 10.04
1–5 years[c]	67 (19.7)	66.13 ± 30.09	66.23 ± 17.74	63.15 ± 20.18	53.82 ± 25.16	42.16 ± 18.79	73.60 ± 22.39	57.23 ± 9.69
5–10 years[d]	56 (16.5)	68.63 ± 27.39	66.40 ± 18.52	67.07 ± 21.33	51.22 ± 24.32	44.79 ± 21.21	74.77 ± 22.23	57.81 ± 8.86
10 years or more (≥10 years)[e]	72 (21.2)	56.85 ± 29.85	49.39 ± 25.06	48.35 ± 22.57	33.94 ± 29.14	41.70 ± 19.74	60.85 ± 22.98	49.35 ± 11.97
Test, p		F = 10.574 p < 0.001 a > b,c,d,e e < c,d	F = 20.887 p < 0.001 a > b,c,e e < c,d	F = 18.818 p < 0.001 e < a,b,c,d	F = 22.160 p < 0.001 a > b,c,d,e e < a,b,c,d	F = 0.931 p = 0.446	F = 16.060 p < 0.001 a > b,c,d,e e < d	F = 27.375 p < 0.001 a > b,c,d,e e < c,d
Do you use four or more medications (Polypharmacy status)?								
Yes	71 (20.9)	54.84 ± 26.18	51.23 ± 21.22	48.94 ± 20.88	33.27 ± 26.08	44.19 ± 19.68	63.20 ± 23.23	49.52 ± 10.95
No	269 (79.1)	72.56 ± 28.65	68.16 ± 19.28	67.89 ± 19.71	58.43 ± 24.23	41.05 ± 19.74	77.55 ± 20.14	59.51 ± 9.40
Test, p		t = 4.716 p < 0.001*	t = 6.442 p < 0.001*	t = 7.112 p < 0.001*	t = 7.656 p < 0.001*	t = 1.191 p = 0.235	t = 5.167 p < 0.001	t = 7.691 p < 0.001*
Were you injured during the earthquake?								
Yes	52 (15.3)	68.26 ± 30.68	63.58 ± 19.44	61.29 ± 20.11	49.75 ± 27.34	41.94 ± 20.42	73.43 ± 21.50	56.47 ± 10.35
No	288 (84.7)	68.96 ± 28.77	64.82 ± 21.11	64.40 ± 21.69	53.79 ± 26.51	41.66 ± 19.65	74.76 ± 21.63	57.60 ± 10.58
Test, p		t = 0.159 p = 0.874	t = 0394 p = 694	t = 0.966 p = 0.335	t = 1.006 p = 0.315	t = 0.094 p = 0.925	t = 0.406 p = 0.685	t = 0.708 p = 0.479
Did you lose a first-degree relative in the earthquake?								
Yes	71 (20.9)	64.08 ± 27.09	63.02 ± 19.89	61.97 ± 21.64	51.76 ± 27.69	42.42 ± 19.04	71.39 ± 22.57	56.07 ± 10.12
No	269 (79.1)	70.12 ± 29.43	65.05 ± 21.10	64.45 ± 21.31	53.55 ± 26.39	41.51 ± 19.95	75.39 ± 21.29	57.78 ± 10.64
Test, p		t = 1.562 p = 0.119	t = 0.728 p = 0.467	t = 0.869 p = 0.385	t = 0.504 p = 0.614	t = 0.345 p = 0.730	t = 1.392 p = 0.165	t = 1.220 p = 0.212
Where did you live after the earthquake?								
We continued to live in our own home[a]	185 (54.4)	72.60 ± 29.40	65.87 ± 21.45	66.48 ± 21.13	56.55 ± 26.69	40.77 ± 20.14	76.04 ± 22.24	58.70 ± 10.82
We stayed in temporary shelters in the same city[b]	77 (22.6)	67.69 ± 27.08	65.17 ± 19.64	62.17 ± 22.02	52.59 ± 26.21	43.10 ± 20.64	75.64 ± 19.46	57.37 ± 9.92
We lived in another city unaffected by the earthquake for a while[c]	78 (22.9)	61.13 ± 28.73	61.13 ± 20.41	59.61 ± 20.68	45.75 ± 25.69	42.54 ± 17.90	69.95 ± 21.62	54.46 ± 9.97
Test, p		F = 4.447 p = 0.012* a > c	F = 1.456 p = 0.235	F = 3.212 p = 0.042* a > c	F = 4.630 p = 0.010* a > c	F = 0.466 p = 0.628	F = 2.331 p = 0.099	F = 4.4539 p = 0.010* a > c

(*Continued*)

Table 2. (*Continued*)

Characteristics	N (%)	Sensory abilities	Autonomy	Past, present, and future activities	Social participation	Death and dying	Intimacy	WHOQOL-OLD total
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
	Who are you currently living with?							
I live alone[a]	16 (4.7)	69.53 ± 32.42	69.14 ± 11.74	63.28 ± 18.66	59.76 ± 23.27	43.35 ± 21.34	68.35 ± 16.53	58.15 ± 6.13
I live with my spouse[b]	205 (60.3)	76.21 ± 26.96	71.61 ± 17.65	71.61 ± 17.65	63.04 ± 21.56	40.60 ± 20.06	82.13 ± 18.13	61.69 ± 8.21
I live with children/relatives[c]	100 (29.4)	54.06 ± 27.97	50.56 ± 20.47	49.81 ± 21.53	33.00 ± 24.74	44.00 ± 19.27	61.12 ± 22.36	49.17 ± 10.35
I live with a caregiver[d]	19 (5.6)	66.77 ± 24.74	59.53 ± 23.13	55.92 ± 19.70	53.18 ± 26.64	40.13 ± 17.46	68.75 ± 18.75	54.27 ± 10.50
Test, p		F = 14.671 p < 0.001* c < a,b	F = 29.367 p < 0.001* a > c,d; b > c,d	F = 30.624 p < 0.001* b > c,d	F = 38.904 p < 0.001* a > c; b > c,d	F = 0.737 p = 0.531	F = 27.399 p < 0.001* b < a,b,c,d	F = 44.633 p < 0.001* a > c,d; b > c,d
	Frailty status according to the Modified Fried Frailty Index							
Not fragile[a]	124 (36.5)	80.49 ± 25.81	76.61 ± 12.36	77.55 ± 13.59	69.55 ± 13.54	38.10 ± 18.07	84.72 ± 14.54	63.89 ± 5.33
Pre-frail[b]	92 (27.1)	80.09 ± 23.82	72.35 ± 14.39	73.98 ± 12.98	66.84 ± 14.10	36.48 ± 18.46	82.47 ± 14.83	62.46 ± 5.08
Frail[c]	124 (36.5)	48.89 ± 24.56	46.92 ± 19.65	44.85 ± 19.27	26.66 ± 22.50	49.19 ± 20.12	58.51 ± 22.36	47.22 ± 9.63
Test, p		F = 63.103 p < 0.001* a > c; b > c	F = 122,924 p < 0.001* a > c; b > c	F = 143.104 p < 0.001* a > c; b > c	F = 225.253 p < 0.001* a > c; b > c	F = 15.409 p < 0.001* a > c; b > c	F = 79.090 p < 0.001* a > c; b > c	F = 199.291 p < 0.001* a > c; b > c

Note: F, One-way ANOVA value; SD, standard deviation; t, independent samples t-test. Post-hoc comparisons were conducted using Bonferroni correction; WHOQOL-OLD, World Health Organization Quality of Life Instrument for Older Adults. Superscripts (a, b, c, d, e) indicate significant group differences. *p < 0.05 was considered statistically significant.

Table 3. Factors influencing participants' WHOQOL-OLD scores

Total scores of WHOQOL-OLD Stepwise optimal models			95% confidence interval				
Variables	Beta	SE	Lower bound	Upper bound	β	p	VIF
(constant)	55.35	0.871	53.639	57.067		<0.001*	
Fried frailty category = Frail elderly	−13.231	0.760	−14.726	−11.737	−0.605	<0.001*	1.249
Age group = young older adults (65–74 years)	5.520	0.788	3.970	7.07	0.224	<0.001*	1.061
Living arrangement = older adults living with spouse	4.634	0.731	3.196	6.073	0.215	<0.001*	1.195
Duration of regular medication use = older adults using medication ≥ 10 years	−2.414	0.871	−4.127	−0.700	−0.094	0.006*	1.182
Level of education = primary school graduate	2.098	0.819	0.486	3.709	0.081	0.011*	1.024
Durbin Watson				**1.685**			
Adjusted R-squared				**0.67**			

Note: β, Standardized regression coefficient; SE, Standard error; VIF, variance inflation factor; WHOQOL-OLD, World Health Organization Quality of Life Instrument for Older Adults. Multiple linear regression analysis with stepwise method was applied. Adjusted $R^2 = 0.67$ indicates that the model explains 67% of the variance in WHOQOL-OLD scores. Durbin–Watson statistic = 1.685, indicating no autocorrelation. *p < 0.05 was considered statistically significant.

The presence of multiple chronic illnesses in older adults can lead to a decrease in their ability to perform daily functions, increase social isolation, and decline in welfare.[29–32] Additionally, chronic medical issues in older individuals may require continuous support from the health care system. However, since this system is disrupted during disasters, the older adults are at greater risk. Access to health care services may be limited for patients with chronic disorders due to overflow of trauma cases in the acute phase following such a major disaster, making it difficult to obtain and use medications. In this scenario, older individuals who require regular medication use for specific medical conditions are particularly at risk.[16–19] As demonstrated in this study, the impact of disasters like earthquakes on older adults can be particularly challenging, especially for individuals with chronic illnesses, those who require regular medication use, and those with polypharmacy, potentially worsening their quality of life.

Older individuals who were not sure about the safety of their homes or whose homes were damaged after the earthquake had to temporarily or permanently change their place of residence. Compared to the older individuals who relocated to another city following the earthquake, those who remained in their own homes exhibited higher average scores in the sensory abilities, past, present, and future activities, and social participation subscales, as well as the total score of the WHOQOL-OLD. Additionally, individuals living with their spouses had higher QoL scores than those living with relatives or children. Also, the quality of life of older individuals living alone was higher than that of those living with relatives/children or with a caregiver at home. Previous studies have reported that relocating older individuals to a different place or living with different individuals, or not living with a spouse, can have negative effects on their quality of life.[10,14,28,33] This situation may imply that married older individuals can generally benefit from more emotional and physical support and may tend to feel less lonely. Additionally, maintaining the household routines and habits may have positively influenced the emotional and physical well-being of the elderly. The earthquake may have negatively impacted the quality of life of the older adults by distancing them from their familiar environment and disrupting their routines. Similarly, being forced to live with relatives or elsewhere may have made it difficult for the older adults to maintain social connections and engage in daily activities, which could have negatively affected their quality of life. Older individuals who are independent in daily life activities and social interactions can be considered to have high quality of life because they are able to live alone at home.

In this study, frail older individuals had a lower quality of life compared to pre-frail and non-frail older individuals. Crocker et al. (2019) demonstrated the relationship between frailty and quality of life in their meta-analysis of older individuals, highlighting how weakness, frailty, and vulnerability negatively affect quality of life. Factors such as health status, chronic diseases, limited access to health care services, mobility limitations, pain, decline in activities of daily living and independence, psychological state, lack of social support, and the environment in which older adults live all play a significant role in determining quality of life.[34] Similarly, Aurizki et al. (2024)[35] emphasized that older people face challenging physical and emotional situations during disasters, with insufficient attention paid to their needs and perspectives. Inappropriate post-disaster management can exacerbate health issues, reduce quality of life, and contribute to mental health problems. The adaptation process of older individuals following the 2018 Lombok earthquakes revealed three key contexts: surviving the disaster, dealing with disaster-induced life changes, and navigating post-disaster life through challenges and hope before eventually coping.[35] Both studies suggest that increased frailty and the challenges of post-disaster life can negatively impact older adults' quality of life. Therefore, it is crucial for nurses and key stakeholders to remain attentive to their needs throughout the adaptation phase, involving local communities in disaster response and developing effective interventions to support their well-being. Furthermore, the causal analysis conducted in this study led to the development of a model identifying the most influential factors associated with quality of life. In this model, being frail according to the Fried Frailty Phenotype and having used medication for 10 years or more emerged as negative predictors of quality of life, whereas being a younger older adult (65-74 years), living with a spouse, and having a primary school education were positive predictors. The model accounted for approximately two-thirds of the variance in quality of life explained by the independent variables.[10,27,28,31] These findings shed light on identifying the determining factors affecting quality of life, thereby assisting in the development of strategies aimed at improving quality of life.

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Limitation

This study is limited by its focus on older individuals who sought outpatient care at two state hospitals in the city center. The findings may not be generalizable to the broader population in the 11 earthquake-affected provinces, who may have different experiences and needs. Additionally, data were collected 9-11 months after the earthquake, which may have led to forgotten experiences and limited the accuracy of quality of life scores.

Conclusion

This study reveals key factors affecting the quality of life among older adults in Türkiye post-earthquake. Living with a spouse and higher education levels positively impact quality of life, while chronic illnesses, regular medication use, and changes in residence negatively affect it. Frailty reduces quality of life, whereas younger age, cohabitation with a spouse, and higher education improve it. These insights are crucial for developing strategies to enhance the quality of life for older adults during natural disasters.

Supplementary material. The supplementary material for this article can be found at http://doi.org/10.1017/dmp.2025.10255.

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Ethical standard. This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Non-Interventional Ethics Committee of Hasan Kalyoncu University (Date: 12.10.2023 / No: 2023/61).

Consent to participate. Informed consent was obtained from all individual participants included in the study. For illiterate participants, the informed consent form was read aloud, and a literate relative signed the form in the presence of an impartial witness.

Consent to publish. Not Applicable

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