Online First

The European Research Journal 2026 Research Article

DOI: https://doi.org/10.18621/eurj.1278 *Medical Services and Techniques*

Investigation of the Relationship Between Frailty and Sleep Quality in Postoperative Elderly Patients: A Descriptive Cross-Sectional Study

Elvan Demir[1], İsmail Öztaş[2], Ayla Yava[3], Aynur Koyuncu[3]

[1]Department of Medical Services and Techniques, Vocational School of Health Services, Giresun University, Giresun, Türkiye; [2]Department of Medical Services and Techniques, Vocational School of Health Services, Hakkari University, Hakkari, Türkiye; [3]Department of Nursing, Faculty of Health Sciences, Hasan Kalyoncu University, Gaziantep, Türkiye

Abstract:

Objective: With the aging population, the number of elderly patients undergoing surgical procedures is increasing. Frailty and sleep disturbances are two critical phenomena that directly affect postoperative recovery outcomes. This study aimed to investigate the relationship between frailty levels and sleep quality in elderly patients hospitalized after surgery.

Methods: This descriptive study was conducted between January and May 2023 with 94 elderly postoperative patients in orthopedics and abdominal surgery awards of a Training and Research Hospital. Data were collected using a sociodemographic information form, the Edmonton Frailty Scale, and the Richards–Campbell Sleep Questionnaire. Descriptive statistics and Pearson correlation analysis were used for data analysis.

Results: The mean age of participants was 71.98±5.38 years, and 52.1% were female. The majority of patients (89.4%) experienced sleep disturbances during hospitalization. Participants were classified as severely frail (26.6%), mildly frail (22.3%), and moderately frail (20.2%). The mean frailty score was 8.22 and the mean sleep quality score was 245.38. A negative, very weak, and statistically non-significant correlation was found between frailty level and sleep quality (r = -0.084; P=0.336).

Conclusion: Both frailty and sleep disturbances were found to be common among surgical elderly patients. The high proportion of participants in the moderate-to-severe frailty categories, combined with widespread sleep impairment during hospitalization, underscores the necessity of geriatric-sensitive approaches in surgical care. Although no statistically significant association was identified between frailty and sleep quality, factors such as pain and psychological stress were determined to negatively affect sleep quality in this population.

Keywords: Elderly Health, Frailty, Sleep Quality, Postoperative Care, Geriatric Nursing

The decline in fertility rates in some regions globally, combined with the extension of average life expectancy, is leading to a rapid increase in the elderly population. It has been reported that the proportion of the population aged 65 and over has approximately doubled in the last 50 years; while it was 8.5% in 2015, it reached 18.5% in 2023 [1, 2]. The decline in birth rates and the prolongation of life

Submitted: March 26, 2026 **Accepted:** June 8, 2026 **Published Online:** June 12, 2026

How to cite this article: Demir E, Öztaş İ, Yava A, Koyuncu A. Investigation of the Relationship Between Frailty and Sleep Quality in Postoperative Elderly Patients: A Descriptive Cross-Sectional Study. Eur Res J. 2026. doi: 10.18621/eurj.1278

Corresponding author: Elvan Demir, RN, Lecturer. Phone: +90 454 310 13 75, E-mail: elvan.demir1@std.hku.edu.tr

Available Online at https://www.eurj.org.tr

expectancy are decisive factors in the increase of the elderly population; this process leads to an increase in the share of elderly individuals within the total population [3]. In our country, the elderly population rate is increasing in line with global demographic trends. In 2023, the proportion of the population aged 65 and over within the total population was determined to be 10.2%. According to population projections, this rate is expected to reach approximately 21–25% by 2050 [4]. Old age is a period characterized by declines in physiological, psychological, and cognitive functions, an increase in chronic diseases, a decrease in independence in activities of daily living, and losses of spouses and friends alongside retirement, all of which negatively affect adaptation to aging [5]. While self-care skills are largely preserved in the 60–64 age group, loss of function in mobility and personal care increases as age progresses; this situation becomes more prominent at age 75 and beyond. Findings in the literature indicate that the level of dependency in activities of daily living increases with advancing age [6]. Care dependency refers to the individual's inability to independently meet their self-care needs and brings about the requirement for assistance due to factors such as limitations in activities of daily living and impairment in cognitive functions [7]. These problems arising during the elderly period also increase the risk of developing frailty syndrome, associated with a decrease in physiological reserves and a decline in resistance to stressors [8]. Frailty is defined as a geriatric syndrome where adverse health outcomes—such as decreased physiological reserves, slow walking speed, declines in muscle strength and physical activity levels, and a decrease in body mass index—are observed together, leading to serious consequences and even mortality [9]. Identifying frailty, assessing risks, and planning appropriate care interventions constitute a complex process for nurses in patient monitoring and care decisions [10]. The prevalence of frailty varies among elderly individuals living in hospitals, the community, or institutions. In the literature, the prevalence of frailty in hospitalized elderly patients is reported to be high in the surgical population (approximately 45%–55%); however, these evaluations reflect preoperative frailty status rather than postoperative [11]. The emergence of frailty leads to negative health outcomes such as prolonged hospital stays, increased frequency of falls in the hospital, the emergence of special care needs, and elevated healthcare expenditures and morbidity [12]. Prolonged hospitalization can lead to a decrease in sleep quality and the experience of sleep problems in individuals [13]. Literature shows that the hospital environment can negatively affect individuals' sleep quality through environmental factors [14]. In elderly individuals, physiological changes related to aging, deterioration in sleep hygiene, the increase in chronic diseases and medications used, and specific sleep disorders are effective in the decline of sleep quality [15]. The aging process leads to outcomes such as decreased sleep duration, frequent awakenings during sleep, and daytime sleepiness, while chronic diseases and medication use further negatively affect sleep quality by reducing sleep efficiency [16]. Furthermore, sleep quality in elderly individuals is influenced by socio-demographic and health-related factors such as education and income levels, the presence of chronic diseases, status and duration of stay in a nursing home, and loneliness [17].

This study was designed to investigate the relationship between frailty levels and sleep quality in elderly patients aged 65 and over who received inpatient treatment for a maximum of 5 days postoperatively in orthopedic and surgical.

METHODS

Study Design

This study was conducted between January and May 2023 with 94 elderly inpatients who had undergone orthopedic or abdominal surgery at a Training and Research Hospital located in the Black Sea region of Turkey. Prior to the commencement of the study, ethical approval was obtained from the Non-Interventional Research Ethics Committee in the southeastern region of Turkey (Approval No: 2023/8). Elderly patients hospitalized in the surgical wards were informed about the study in accordance with its aims and objectives. Written and verbal informed consent was obtained from all patients who voluntarily agreed to participate, and institutional permissions were secured from the relevant hospital administration. All phases of the study were conducted in strict adherence to the ethical principles outlined in the Declaration of Helsinki of the World Medical Association.

Study Population and Sample

Sample size was calculated using G*Power 3.1.9.7 software. Based on a two-tailed hypothesis, an anticipated correlation of r=0.30 between the two scales, a significance level of α = 0.05, a beta error of 0.20, and a statistical power of 80%, the minimum required sample size was determined to be n=84. The study population consisted of patients aged 65 years and older who were hospitalized for at least one postoperative day in the surgical wards of Giresun Training and Research Hospital.

Inclusion Criteria

Patients aged 65 years or older who had undergone orthopedic or abdominal surgery, were hospitalized for a minimum of one and a maximum of five postoperative days, possessed adequate cognitive function and communication skills, were not using any psychiatric medications, and provided voluntary consent either personally or through a family member were included in the study.

Exclusion Criteria

Patients who declined to participate, had cognitive impairment, were using psychiatric medications, had communication or comprehension difficulties, underwent unplanned (emergency) surgery, or had a diagnosis of cancer were excluded from the study.

Data Collection Instruments and Procedure

The data collection tools comprised three sections: a sociodemographic and medical information form consisting of 12 items developed by the researchers based on a review of the relevant literature, the Edmonton Frailty Scale (EFS) comprising 11 items, and the Richards-Campbell Sleep Questionnaire (RCSQ) comprising 6 items. The sociodemographic form included questions pertaining to patients' age, sex, marital status, educational background, chronic illnesses, regularly used medications, and sleep habits and care requirements. Data were collected through face-to-face interviews conducted in patient rooms, each lasting approximately 20–25 minutes.

Edmonton Frailty Scale (EFS)

The EFS was originally developed by Rolfson *et al*. in 2006 and subsequently adapted into Turkish by Aygör *et al*. in 2013. The scale consists of 11 items organized across nine frailty domains: cognitive status, general health status, functional independence, social support, medication use, nutrition, mood, continence, and functional performance. Total scores range from 0 to 17, with the following classifications: 0–4 = not frail; 5–6 = apparently vulnerable; 7–8 = mildly frail; 9–10 = moderately frail; and ≥11 = severely frail. The Cronbach's alpha coefficient of the scale was reported as 0.75 in the original adaptation study and was found to be 0.72 in the present study.

Richards-Campbell Sleep Questionnaire (RCSQ)

Originally developed by Richards, the RCSQ is a six-item instrument designed to assess nocturnal sleep quality across the following dimensions: sleep depth, sleep onset latency, frequency of nocturnal awakenings, duration of wakefulness after arousal, overall sleep quality, and ambient noise level. Each item is rated on a visual analogue scale ranging from 0 to 100. Total scores of 0–25 indicate very poor sleep quality, while scores of 76–100 indicate very good sleep quality. The sixth item, which evaluates ambient noise level, is excluded from the total score calculation; thus, the total score is derived from the remaining five items. Higher scores reflect better sleep quality. The Turkish validity and reliability study of the RCSQ was conducted Cronbach's alpha coefficient of 0.91 [19].

Statistical Analysis

Statistical analyses were performed using SPSS version 25.0 for Windows (IBM Corp., Armonk, NY, USA). Normality of data distribution was assessed using the Kolmogorov–Smirnov test. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize the data. For scale scores that demonstrated normal distribution, independent samples t-tests were used for comparisons between two groups, while one-way analysis of variance (ANOVA) was applied for comparisons among three or more groups. When a statistically significant difference was identified in multi-group comparisons, Scheffé's test was used in cases of homogeneous variances, and Tamhane's T2 post-hoc test was applied when variances were not

TABLE 1. Socio-Demographic Characteristics and Sleep-Related Variables of the Participants (n=94)

Variables		Median (Min–Max)	Mean±SD
Age (years)		70 (66-94))	71.98±5.538
		n	**%**
Age group (years)	65-74	74	78.7
	75-84	16	17.1
	85 over	4	4.2
Gender	Female	49	52.1
	Male	45	47.9
Educational level	Illiterate	24	25.5
	Literate	53	56.4
	Secondary education	8	8.5
	High school	4	4.3
	University and above	5	5.3
Economic status	Income less than expenses	26	27.7
	Income equal to expenses	62	66.0
	Income more than expenses	6	6.4
Chronic disease presence	Yes	70	74.5
	No	24	25.5
Primary chronic diseases	Hypertension (HT)	20	21.3
	Diabetes mellitus (DM)	2	2.1
	HT and DM	39	41.5
	Cardiac diseases	4	4.3
	Others	9	9.6
	None	20	21.3
Regular medication use	Yes	80	85.1
	No	14	14.9
Individual assisting in caregiving	Yes	92	97.9
	No	2	2.1
The person who helps with care	Spouse	47	50
	Child	36	38.3
	Other	11	11.7
Day of hospitalization (days)	1-3	43	45.7
	4-5	51	54.3
Sleep Problems in Hospital	Yes	84	89.4
	No	10	10.6
Sleep deprivation in the hospital is the most and least common problem*.	Pain	69	73.4
	Stress	67	71.3
	Feeling unfamiliar with the bed	36	38.3
	Daytime sleepiness	26	27.2
	Noise and lighting	24	25.5
	Nurse's treatment time	21	22.3
	Loneliness	17	18.1
	Room temperature	5	5.3
	Feeling hungry	4	4.3
The least and most common methods used when falling asleep*	TV	39	41.5
	Painkiller	23	24.5
	Exercise	28	29.8
	Doing nothing	17	18.1
	Listening to music	3	3.2
	Applying hot and cold compresses	2	2.1
	Warm shower/bath	1	1.1

*The number of responses has increased exponentially due to multiple people providing answers. Min, minimum; Max, maximum; SD, standard deviation; TV, television.

homogeneous. Relationships between continuous variables were examined using Pearson's correlation analysis. A P<0.05 was considered statistically significant for all analyses.

RESULTS

The descriptive characteristics and sleep-related variables of the elderly participants are presented in Table 1. The mean age of the patients was 71.98 ±5.53years, with the majority (78.7%) falling into the 65–74 age group. Of the participants, 52.1% were female, and 56.4% were literate. Regarding health status, 74.5% had at least one chronic disease, with the combination of Hypertension and Diabetes being the most common (41.5%). Furthermore, 85.1% of the patients reported regular medication use, and nearly all (97.9%) had a caregiver, who was most frequently a spouse (50.0%). In terms of sleep-related variables, a significant majority of the patients (89.4%) reported experiencing sleep problems during their hospitalization. When factors hindering sleep were examined, the most prominent reasons identified by the participants were pain (73.4%) and stress (71.3%), followed by unfamiliarity with the hospital bed (38.3%). To facilitate sleep, patients most commonly utilized watching television (41.5%), engaging in exercises (29.8%), or using analgesics (24.5%) (Table 1).

The mean scores and distribution of the participants' scale results are detailed in Table 2. The mean score obtained from the Edmonton Frail Scale (EFS) was 8.22±3.16, with scores ranging from 1 to 17. For the Richards–Campbell Sleep Questionnaire (RCSQ), the mean score was 245.38 ±103.82, with a range between 20 and 440.When the frailty levels according to the EFS were analyzed, it was observed that only 11.7% of the participants were categorized as "Not Frail." In contrast, a significant portion of the elderly patients was identified within the frailty spectrum, with 26.6% classified as "Severely Frail," followed by 22.3% as "Mildly Frail" and 20.2% as "Moderately Frail" (Table 2).

Pearson Correlation Analysis

Edmonton Frail Scale (EFS), and the Richards–Campbell Sleep Questionnaire (RCSQ).

The relationship between the frailty levels and sleep quality of the elderly participants was evaluated using Pearson correlation analysis. According to the results, a negative, very weak, and statistically non-significant correlation was found between the mean scores of the Edmonton Frail Scale (EFS) and the Richards–Campbell Sleep Questionnaire (RCSQ) (r = -0.084; P=0.336) (Table 3).

The comparison of the participants' Richards–Campbell Sleep Questionnaire (RCSQ) and Edmonton Frail Scale (EFS) scores according to their socio-demographic and sleep-related characteristics is presented in Table 4.

TABLE 2. Mean Scores and Distribution of The Richards–Campbell Sleep Questionnaire and Edmonton Frail Scale (n=94)

Scale and Sub-dimensions	Mean±SD (Min–Max)	
Richards–Campbell Sleep Questionnaire	245.38±103.82 (20-440)	
Edmonton Frail Scale	8.22±3.16 (1-17)	
Edmonton Vulnerability Scale Subdimensions	**n**	**%**
Not Fragile (0-4)	11	11.7
Seemingly vulnerable (5-6)	18	18.2
Slightly fragile (7-8)	21	22.3
Moderately fragile (9-10)	19	20.2
Severely fragile (11 and over)	25	26.6

Min, minimum; Max, maximum; SD, standard deviation.

TABLE 3. Correlation Between Frailty and Sleep Quality in Elderly Participants (n=94)

	Edmonton Frail Scale	Richards–Campbell Sleep Questionnaire
Edmonton Frail Scale		
r	1	−0.336
P-value		
Richards–Campbell Sleep Questionnaire		
r	−0.084	1
P-value	0.336	

A statistically significant difference was found in RCSQ scores based on the status of experiencing sleep problems in the hospital; participants who reported sleep problems had significantly lower sleep quality scores compared to those who did not (t = -4.202, P<0.001). Among the factors hindering sleep, pain (t = -2.401, P=0.018) and unfamiliarity with the bed (t = -4.019, P<0.001) were associated with significantly lower RCSQ scores. Additionally, elderly individuals who used analgesics as a method to fall asleep had significantly lower sleep quality scores (t = -2.490, P=0.015).

Regarding frailty levels, EFS scores showed a significant increase in older age groups (F = 7.504, P=0.001). Women were found to be significantly more frail than men (t = -2.270, P=0.026). Education level was a decisive factor, as frailty scores significantly decreased as the level of education increased (F = 6.158, P<0.001). Patients with chronic diseases (P=0.010), those using regular medications (P=0.001), and those requiring a caregiver (P=0.032) had significantly higher frailty scores. Furthermore, it was determined that frailty levels increased as the duration of hospitalization lengthened (P=0.027) and among those whose sleep was hindered by stress (P=0.020) and loneliness (P=0.001) (Table 4).

DISCUSSION

This study investigated the relationship between frailty levels and sleep quality in elderly individuals hospitalized postoperatively. According to the research findings, a vast majority of the participants (89.4%) experienced sleep problems during their hospitalization. The mean Edmonton Frail Scale (EFS) score was 8.22±3.16, and more than half of the individuals were in the moderate to severe frailty group. The mean score of the Richards–Campbell Sleep Questionnaire (RCSQ) was found to be at a moderate level. A negative, very weak, and statistically non-significant correlation was found between frailty and sleep quality. The high rate of sleep problems among elderly individuals in the hospital in our study is consistent with literature findings. It is reported that sleep problems are an inevitable part of the aging process and that the decrease in sleep quality in elderly individuals is associated with various fundamental reasons [20, 21]. Sleep disturbances are common in hospitalized elderly individuals; the primary reasons are reported to be pain, stress, environmental noise, lighting, and care interventions [13, 14]. In this study, pain (73.4%) and stress (71.3%) were the most frequent reasons for the inability to sleep, and these factors were found to significantly reduce sleep quality. Similarly, Amato *et al*. [16] reported that pain and medications negatively affect sleep quality in elderly individuals. The high level of frailty found in elderly individuals is an expected situation, especially in patient groups hospitalized in surgical wards. Literature reports that the prevalence of frailty in hospitalized elderly individuals is higher than in those living in the community [11]. In our study, frailty scores were found to increase significantly in older age groups. This result is consistent with previous studies reporting that frailty increases as physiological reserves decrease and resistance to stressors declines with advancing age [7, 8]. A study conducted with elderly individuals in Brazil found that 47.2% of the

TABLE 4. Comparison of RCSQ and EFS Scores According to Socio-Demographic and Sleep-Related Variables (n=94)

Scales	Categories	n	Mean±SD	t/F	P-value
RCSQ*	**Sleep problems while in the hospital**				
	Yes	84	231.0±98.3	-4.202	**<0.001**
	No	10	365.5±64.6		
RCSQ*	**Most and least common problems when sleeping in the hospital:**				
	Pain	69	230.2±98.0	-2.401	**0.018**
	Feeling unfamiliar with the bed	36	194.7±89.9	-4.019	**<0.001**
RCSQ*	**The least and most common methods used when falling asleep:**				
	Painkiller	23	199.7±100.7	-2.490	**0.015**
EFS**	**Age (years)**				
	65-74	74	7.6±2.9[a]		**0.001**
	75-84	16	10.5±2.3[ab]	7.504	
	Over 85	4	10.2±4.5[b]		
EFS*	**Gender**				
	Female	49	8.9±3.2	-2.270	**0.026**
	Male	45	7.4±2.8		
EFS**	**Educational status**				
	Illiterate	24	10.5±2.6[a]		**<0.001**
	Literate	53	7.7±2.9[a]		
	Secondary education	8	6.8±2.4[ab]	6.158	
	High school	4	6.2±2.6[b]		
	University and above	5	6.0±3.8[b]		
EFS*	**Presence of a chronic illness?**				
	Yes	70	8.7±3.1	2.649	**0.010**
	No	24	6.7±2.8		
EFS*	**Regular medication use status:**				
	Yes	80	8.6±3.1	3.391	**0.001**
	No	14	5.7±2.8		
EFS*	**Individual assisting in care**				
	Yes	92	8.3±3.1	2.175	**0.032**
	No	2	3.5±2.1		
EFS**	**Person who helps with care**				
	Spouse	47	7.3±2.4[a]		
	Child	36	9.6±3.0[b]	7.212	**0.001**
	Other	11	7.0±4.6[a]		
EFS*	**How many days in the hospital?**				
	1-3 days	43	7.4±3.2	-2.245	**0.027**
	4-5 days	51	8.8±3.0		
EFS*	**The most and least likely reasons for sleep problems in the hospital:**				
	Stress	67	8.7±3.2	2.362	**0.020**
	Loneliness	17	10.5±2.7	3.515	**0.001**

RCSQ, Richards–Campbell Sleep Questionnaire; EFS, Edmonton Frail Scale; Min, minimum; Max, maximum; SD, standard deviation; t, independent samples t-test; F, one-way anova.
a, b, different letters in the same column indicate statistically significant difference based on Tukey post-hoc test.
Statistically significant P-values are shown in bold.

participants were frail and that frailty rates rose significantly after the age of 75 [22]. In contrast, in the study by Düzgün *et al*. [23], the rate of severe frailty was found to be 19.8%, which is lower than some results reported in the literature. Furthermore, some studies have reported that a significant portion of individuals are at a severe frailty level, while there are also individuals showing moderate frailty [24, 25]. Another study found that only 11.7% were not frail, while 26.6% were in the severely frail group. This finding overlaps with the results reported by Liu *et al*. [8] and Chelu *et al*. [9], indicating that the presence of multiple chronic diseases and polypharmacy increases frailty. When the literature is evaluated in general, it is observed that a large portion of elderly individuals are at a level of frailty, consistent with the findings of the current study. This situation is thought to be related to numerous factors such as changes occurring at the cellular level with the aging process, physiological declines in body systems, the prevalence of chronic diseases, and insufficient socioeconomic and education levels.Additionally, the finding that women's frailty scores were higher than men's is parallel with studies in the literature pointing to frailty risk associated with women's longer life expectancy, decrease in muscle mass, and higher chronic disease burden [11]. Similarly, the study by Carneiro *et al*. [22] reported higher frailty levels in women, and the research conducted by Woo *et al*. [26] on geriatric individuals in China found that the frailty rate in women was higher than in men. Although Düzgün *et al*. [23] found women's frailty scores to be higher, they stated that this difference was not statistically significant. In Aygör's study [18], no significant relationship was found between gender and frailty. The decrease in frailty scores as education levels increase supports the decisive role of socioeconomic factors on frailty. This situation may be explained by the higher health literacy, easier access to healthcare services, and better self-care skills of individuals with higher education levels [17]. Similarly, the higher frailty scores of elderly individuals with chronic diseases, those using regular medications, and those with a caregiver reveal the multidimensional nature of frailty [10]. Although no statistically significant relationship was found between frailty and sleep quality in this study, the negative direction of the relationship is noteworthy. While some studies in the literature report significant relationships between frailty and sleep quality [15], others state that this relationship is weak or indirect [13]. The lack of significance in our study may be explained by the sample size, the evaluation being conducted in the early postoperative period and the dominance of environmental factors affecting sleep quality.

Strengths and Limitations

The strengths of this study include the use of internationally recognized and validated assessment tools, specifically the Edmonton Frail Scale (EFS) and the Richards–Campbell Sleep Questionnaire (RCSQ). Furthermore, the sample size was determined through a formal power analysis, ensuring adequate statistical power for the correlation and comparison evaluations performed. The present study has several limitations that should be acknowledged. First, the cross-sectional design of the research precludes the determination of direct causality between frailty levels and sleep quality. Second, the data were collected from a single center in the Black Sea region of Türkiye, which may restrict the generalizability of the findings to different geographical areas or hospital settings. Third, the exclusion of patients with cognitive impairment, those undergoing emergency procedures, or cancer surgeries resulted in a study population that may not fully represent the most complex geriatric surgical cases. Finally, the reliance on self-reported data for evaluating sleep quality and frailty may be subject to subjective perception and recall bias during the stressful early postoperative period.

CONCLUSION

This study demonstrates a high prevalence of frailty and sleep disturbances among elderly individuals hospitalized in the postoperative period. The fact that a significant portion of the participants was in the moderate to severe frailty group, coupled with the majority experiencing impaired sleep quality during hospitalization, highlights the necessity for geriatric-sensitive approaches within the surgical care process. Although no statistically significant relationship was found between frailty and sleep quality, both conditions were determined to be influenced by

similar risk factors. Specifically, the negative impact of pain and stress on sleep quality emphasizes the critical importance of symptom management in postoperative care. In line with these findings, it is recommended that frailty screening be integrated into routine care practices for elderly patients in surgical wards. Furthermore, individualized nursing interventions targeting environmental and clinical factors that adversely affect sleep quality should be planned. Strengthening holistic approaches to pain and stress management, implementing regulations to support sleep hygiene in the hospital environment, and designing longitudinal and interventional studies with larger sample sizes in this field will contribute

Ethics Approval and Consent to Participate

This study was approved by the Hasan Kalyoncu University Health Sciences Non-Interventional Research Ethics Committee. (Decision No: 2023/8; date: 18.01.2023). All procedures were conducted in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki Declaration and its later amendments. Informed consent was obtained from all individual participants included in the study.

Data Availability

All data generated or analyzed during this study are included in this published article. The data that support the findings of this study are available on request from the corresponding author, upon reasonable request.

Authors' Contribution

Study Conception: AY; Study Design: ED; Supervision: ED; Funding: AY; Materials: ED; Data Collection and/or Processing: ED; Statistical Analysis and/or Data Interpretation: AK, ED; Literature Review: İÖ, AK; Manuscript Preparation: AY; and Critical Review: İÖ.

Conflict of Interest

The author(s) disclosed no conflict of interest during the preparation or publication of this manuscript.

Financing

The author(s) disclosed that they did not receive any grant during the conduction or writing of this study.

Acknowledgments

We would like to express our sincere gratitude to the healthcare professionals and participants who contributed to the data collection process of this study.

Generative Artificial Intelligence Statement

The authors declare that artificial intelligence-based tools were used solely for language editing and grammar correction during the manuscript preparation process, No content generation, data analysis, or scientific interpretation was performed using artificial intelligence.. The all content of the study was produced by the author(s) in accordance with scientific research methods and academic ethical principles.

Editor's Note

All statements made in this article are solely those of the authors and do not represent the views of their affiliates or the publisher, editors, or reviewers. Any claims made by any product or manufacturer that may be evaluated in this article are not guaranteed or endorsed by the publisher.

REFERENCES

1. He W, Goodkind D, Kowal P. U.S. Census Bureau, International Population Reports. An Aging World: 2015. Washington, DC: Government Publishing Office; 2016.
2. Organisation for Economic Co-operation and Development. Health at a Glance 2025: OECD Indicators. Paris: OECD Publishing; 2025. doi: 10.1787/8f9e3f98-en.
3. Guillemot JR, Zhang X, Warner ME. Population Aging and Decline Will Happen Sooner Than We Think. Soc Sci. 2024;13(4):190. doi: 10.3390/socsci13040190.
4. Turkish Statistical Institute. Older Adults with Statistics 2024. Ankara: TurkStat; 2025.
5. Kütmeç Yılmaz C, Kıl A. The relationship between the older adults' adaptation to old age and perceived social support level. Cukurova Med J. 2020;45(1):338-346. doi: 10.17826/cumj.638504.
6. Chang CH, Wang F, Yang KL, Wang LQ, Wang LX, Peng N. Age-related differences in activities of daily living among older Chinese adults. Sci Rep. 2025;15(1):34604. doi: 10.1038/s41598-025-18163-y.
7. Zijlstra GAR, van der Vorst A, Op het Veld LPM, Witte ND, Schols JMGA, Kempen G. Dependency in Activities of Daily Living: The Role of Multidimensional Frailty and Protective Factors. Innov Aging. 2019;3(Suppl 1):S635–S636. doi: 10.1093/geroni/igz038.2367.
8. Liu Y, Huang L, Hu F, Zhang X. Investigating Frailty, Polypharmacy, Malnutrition, Chronic Conditions, and Quality of Life in Older Adults: Large Population-Based Study. JMIR Public

Health Surveill. 2024;10:e50617. doi: 10.2196/50617.
9. Chelu GC, Băjenaru OL, Nuță CR, Băjenaru L, Prada GI. Frailty Syndrome and Cardiovascular Diseases in Older People. Healthcare (Basel). 2025;13(24):3275. doi: 10.3390/healthcare13243275.
10. Uchmanowicz I, Faulkner KM, Iovino P, et al. Integrating frailty interventions into existing care models: a comprehensive approach to enhancing patient outcomes in chronic disease management. Front Public Health. 2025;12:1518774. doi: 10.3389/fpubh.2024.1518774.
11. Yüceler Kaçmaz H, Döner A, Kahraman H, Akin S. Prevalence and factors associated with frailty in older hospitalized patients. Rev Clin Esp (Barc). 2023;223(2):67-76. doi: 10.1016/j.rceng.2022.10.001.
12. Holden E, Devin R, Bhattacharya J, Waldie F, Watt I, Wu CJ. Prevalence of Older Hospitalised Adults with Sustained Fractures after a Fall in Regional Australian Hospitals. Healthcare (Basel). 2024;12(13):1318. doi: 10.3390/healthcare12131318.
13. Aluzaite K, Wu H, Hyslop B, Young J, Schultz M, Brockway B. Perceived versus objective sleep quality in long-stay hospitalised older adults-a mixed methods study. Age Ageing. 2021;50(3):955-962. doi: 10.1093/ageing/afaa292.
14. Burger P, Van den Ende ES, Lukman W, et al. Sleep in hospitalized pediatric and adult patients - A systematic review and meta-analysis. Sleep Med X. 2022;4:100059. doi: 10.1016/j.sleepx.2022.100059.
15. Feinsilver SH. Normal and Abnormal Sleep in the Elderly. Clin Geriatr Med. 2021;37(3):377-386. doi: 10.1016/j.cger.2021.04.001.
16. Amato L, Giannetta N, Taborri S, et al. Sleep Quality and Medication Adherence in Older Adults: A Systematic Review. Clocks Sleep. 2024;6(3):488-498. doi: 10.3390/clockssleep6030032.
17. Muhammad T, Pai M, Ahire K, Sharma M. Demographic, socioeconomic, and health correlates of sleep quality and sleep duration among community-dwelling older adults in India. BMC Psychiatry. 2024;24(1):665. doi: 10.1186/s12888-024-06122-2.
18. Aygör H. [Testing the reliability and validity of the Edmonton Frail Scale in Turkish population] [Master's thesis]. Izmir: Ege University Institute of Health Sciences; 2012.
19. Özlü ZK, Özer N. Richard-Campbell Uyku Ölçeği Geçerlilik ve Güvenilirlik Çalışması [Richard-Campbell Sleep Questionnaire Validity and Reliability Study]. Journal of Turkish Sleep Medicine 2015;2:29-32. doi: 10.4274/jtsm.02.008. [Article in Turkish]
20. Rodriguez JC, Dzierzewski JM, Alessi CA. Sleep problems in the elderly. Med Clin North Am. 2015;99(2):431-439. doi: 10.1016/j.mcna.2014.11.013.
21. Dolu İ, Nahcivan N. Yaslilarda Uyku Bozuklukları Nasıl Yönetilmeli? Semptom Yönetimi Teorisi ve Hemşirelik Uygulamalarında Kullanımı [How Manage Older Adults' Sleep Disturbance? Symptom Management Theory and Implications for Nursing Practice]. Koç University Journal of Education and Research in Nursing. 2020;17(Suppl 1):103-109. doi: 10.5222/HEAD.2020.59260. [Article in Turkish]
22. Carneiro JA, Cardoso RR, Durães MS, et al. Frailty in the elderly: prevalence and associated factors. Rev Bras Enferm. 2017;70(4):747-752. doi: 10.1590/0034-7167-2016-0633.
23. Düzgün G, Üstündağ S, Karadakovan A. Assessment of Frailty in the Elderly. Florence Nightingale J Nurs. 2021;29(1):2-8. doi: 10.5152/FNJN.2021.414736.
24. İmren IG. [Investigation of the relationship between frailty and dermatological quality of life and depression in geriatric patients] [Specialization thesis]. Denizli: Pamukkale University Faculty of Medicine; 2020.
25. Öztürk D. [Investigation of frailty, fear of falling avoidance behavior, and quality of life in older individuals] [Master's thesis]. Istanbul: Istanbul Sabahattin Zaim University; 2022.
26. Woo J, Yu R, Wong M, Yeung F, Wong M, Lum C. Frailty Screening in the Community Using the FRAIL Scale. J Am Med Dir Assoc. 2015;16(5):412-419. doi: 10.1016/j.jamda.2015.01.087.