

# Investigating the expected and perceived service quality of the elderly referring to the hospital emergency department: a multi-center cross-sectional study from northern Iran

Arezoo Hasani-Kordcandi,<sup>1</sup> Sepideh Mohammadi,<sup>2</sup> Ali Pourhabib,<sup>2</sup> Zahra Fotokian<sup>2</sup>

<sup>1</sup>Student Research Committee, Nursing Care Research Center, Health Research Institute, Babol University of Medical Sciences, Babol;

<sup>2</sup>Nursing Care Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran

## Abstract

Emergency departments play a critical role in delivering health-care services to elderly patients. However, limited data exists regarding the quality of services expected and perceived by this vulnerable population when accessing emergency care. The purpose of the current study is to determine the expected and perceived service quality of the elderly who refer to the hospital emergency room.

Correspondence: Zahra Fotokian, Nursing Care Research Center, Health Research Institute, Babol University of Medical Sciences, Babol, Iran.

Tel.: +981155225151

E-mail: zfotokian@yahoo.com

Key words: expected service, perceived service, nursing care, elderly, emergency department.

Conflict of interest: the authors declare no conflict of interest.

Ethics approval and consent to participate: this study was approved by the Research Ethics Committee of Babol University of Medical under the ethics code IR.MUBABOL.REC.1400.061. All participants provided written informed consent, with anonymous data securely stored.

Availability of data and materials: all data generated or analyzed during this study are included in this published article.

Acknowledgments: this research was supported by a master's thesis in Gerontological Nursing at Babol University of Medical Sciences (registration number: IR.MUBABOL.REC.1400.061). We would like to thank and acknowledge all the patients who participated in this study.

Received: 10 March 2025.

Accepted: 28 May 2025.

Early view: 10 July 2025.

This work is licensed under a Creative Commons Attribution 4.0 License (by-nc 4.0).

©Copyright: the Author(s), 2025

Licensee PAGEPress, Italy

Emergency Care Journal 2025; 21:3805

doi:10.4081/ecj.2025.13805

*Publisher's note: all claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article or claim that may be made by its manufacturer is not guaranteed or endorsed by the publisher.*

This is a descriptive-cross-sectional study. 285 elderly people referred to the emergency department of hospitals affiliated to Babol University of Medical Sciences participated in the study. Data were collected using demographic and service quality questionnaires. Data were analyzed using STATA (version 17). The average age of the samples was  $69.93 \pm 8.73$  years. The average quality of services expected and perceived by the elderly in the emergency department was  $93.56 \pm 6.76$  and  $48.78 \pm 11.39$  respectively at the moderate level. There was a negative and significant relationship between the quality of the expected services and the perceived services of the elderly (OR: 0.94, 95% CI: 0.92-0.96,  $p < 0.001$ ). There was an inverse relationship between expected service quality and perceived service quality. The results of the study, by identifying the strengths and weaknesses of the services provided in the emergency department, can improve the future plans of the Ministry of Health and insurance organizations to improve the quality of medical and care services and, as a result, provide the best possible care for elderly patients in the emergency department.

## Introduction

Global aging, driven by rising life expectancy and lower fertility, will increase the population aged 60 and over from 12% to 22% by 2025.<sup>1</sup> Age-related physiological changes increase susceptibility to chronic conditions including cardiovascular, respiratory, metabolic, and sensory impairments.<sup>2</sup> Elderly patients comprise 25% of emergency department visits, underscoring the critical need for patient-centered quality assessments.<sup>3</sup> Patient perceptions of care quality are shaped by comparing their expectations against the actual services received. Dissatisfaction arises when the delivered care does not meet these expectations.<sup>4</sup> According to a study by Hoon *et al.*, elderly patients visiting emergency departments reported numerous challenges, including overcrowding, disorganization, inadequate guidance, equipment shortages, unmet expectations, limited access to 24-hour healthcare, and nutritional deficiencies.<sup>5</sup> Yet, studies consistently reveal a gap between the expectations of patients, especially elderly individuals, and the quality of care they receive in hospitals.<sup>16</sup> Healthcare teams may struggle to identify specific needs of elderly patients. Nurses are essential in meeting patients' needs, including emotional support and respect.<sup>7</sup>

Studies consistently demonstrate expectation-perception gaps in service quality, including nurse-patient disparities in elderly care.<sup>8</sup> Behdioğlu *et al.* identified tangibles, responsiveness, reliability, assurance, and empathy as the dimensions with the largest discrepancies.<sup>9</sup>

While previous studies have primarily examined employee perspectives on service quality,<sup>10,11</sup> research on the quality of care for hospitalized elderly patients is limited. To address this gap and

given the importance of emergency departments, this study aimed to develop and validate a tool to measure the expected and perceived quality of care among elderly emergency department patients and to examine the relationship between these two constructs.

## Materials and Methods

### Study design

This cross-sectional descriptive study was conducted between the spring of 2021 and the summer of 2023 in Mazandaran Province, located in northern Iran (Figure 1).

This study was approved by the Research Ethics Committee of Babol University of Medical under the ethics code IR.MUBABOL.REC.1400.061.

This study was conducted in accordance with the STROBE guidelines, with emphasis on transparent reporting of the study design, participant characteristics, and analytical methods.

### Study subjects and sampling design

The study population comprised all elderly individuals who presented as outpatients to the emergency departments of hospitals affiliated with Babol University of Medical Sciences and had a minimum stay of 30 minutes.

Assuming a linear correlation of 0.2 between expected and perceived service quality scores among the elderly, and considering a significance level of 0.05 and a power of 80%, a sample size of 285 was calculated using G\*Power and Cohen's formula for Pearson's correlation coefficient. A quota sampling method was used to distribute the total sample size among the participating centers, with each center receiving approximately one-third of the total. Simple random sampling was employed within each center to select participants. Inclusion criteria comprised individuals aged 60-74 years who presented to the emergency department as outpatients for at least 30 minutes (for services such as ECG, IV fluid administration) and had no history of cognitive impairment (dementia or delirium). Those who completed less than one-third of the questionnaire were excluded from the analysis. Following approval from the administrators of Shahid Beheshti, Yahya Nejad, and Ayatollah Rohani hospitals in Babol, data were collected using standardized forms to assess the expected and perceived service quality among elderly patients presenting to the emergency departments of these institutions. Trained research assistants administered questionnaires face-to-face in private ED-adjacent rooms to optimize response rates and data quality. All participants provided written informed consent, with anonymous data securely stored.

### Data collection

#### Demographic information

A structured data collection form captured sociodemographic and clinical characteristics, including age, sex, marital status, education level, occupation, health insurance type, living arrangements, chronic conditions (e.g., diabetes, hypertension), and primary reason for emergency care. Socioeconomic status was evaluated using a validated index

#### Expected and perceived service quality among elderly emergency department patients questionnaire

The questionnaire was initially developed through a comprehensive literature review. Face and content validity were estab-

lished by an expert panel. Subsequently, 289 elderly emergency department patients completed the instrument to assess service quality expectations and perceptions. Qualitative methods were employed to evaluate face validity. To evaluate the face validity of the questionnaire, a qualitative approach was employed. Ten expert faculty members evaluated the questionnaire, assessing item simplicity, relevance to the target construct, and clarity. Following qualitative analysis of their feedback, two redundant items (items 13 and 19) were removed, resulting in a final 42-item instrument for subsequent analysis. Item impact and content validity were assessed quantitatively using a 5-point Likert scale (ranging from 'completely important' to 'completely unimportant'), evaluated by the same 10 expert panelists. All items demonstrated mean scores above the predefined threshold, confirming satisfactory validity. To assess content validity, both qualitative and quantitative approaches were used. For the qualitative approach, 10 nursing faculty members with experience in education and clinical practice provided feedback on the grammar, choice of words, and overall clarity of the questionnaire items. For the quantitative approach, the Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated to numerically evaluate the content coverage of the questionnaire. To calculate the CVR, 10 nursing experts were asked to rate the essentiality of each item on a 3-point Likert scale (not essential, essential). According to Lawshe's table, a score of 0.62 or higher was considered the criterion for retaining an item. To assess the CVI, the questionnaire was given to the same 10 experts to rate each item on a 4-point Likert scale for relevance, clarity, and simplicity. The mean score of the Scale-level Content Validity Index (S-CVI) for all items was 0.91, indicating acceptable content validity. This 42-item questionnaire was developed to assess the expected and perceived service quality among elderly emergency department patients. The questionnaire was structured into five dimensions: tangibles (questions 1-6, 21-26), reliability (7-11, 27-31), responsiveness (12-15, 32-35), assurance (16-17, 36-37), and empathy (18-20, 38-40). The first 20 items measured the elderly's expectations of service quality, while the remaining 20 items assessed their perceptions of the care received. Responses were recorded on a 5-point Likert scale (1-5). The total score for each dimension ranged from 20 to 100, with scores of 20-44 indicating low quality, 45-69 indicating moderate quality, and 70-100 indicating high quality. The internal consistency of the questionnaire and its subscales was confirmed with a Cronbach's alpha coefficient of 0.88, indicating high reliability.

### Statistical analysis

Data were collected and pre-processed in Microsoft Excel



Figure 1. Mazandaran Province, northern Iran.

before being analyzed using STATA version 17.

Categorical variables (e.g., gender, education level) were presented as frequencies and percentages, with between-group comparisons performed using Pearson’s  $\chi^2$  test. Continuous variables, including age, were summarized as mean  $\pm$  standard deviation with 95% confidence intervals. Normality was verified using Shapiro-Wilk tests and Q-Q plot inspection. As all variables met normality assumptions, parametric tests (independent samples t-tests) were appropriately employed for group comparisons. Logistic regression analysis was performed to evaluate associations between elderly patients’ expectations/perceptions of emergency department service quality and predictor variables. Associations were quantified using odds ratios with corresponding 95% confidence intervals.<sup>12</sup> All statistical analyses were conducted using a two-tailed test with a significance level of 0.05.

Missing data in both continuous and categorical variables were examined using statistical tests. Mean differences in continuous variables were less than 20% of the standard deviation, and frequency differences in categorical variables were less than 10%, indicating negligible differences between groups with and without missing data.<sup>13</sup>

## Results

Data were collected from 285 elderly participants who completed all research instruments and were included in the analysis (Figure 2; Table 1).

The mean score of the expected service quality among the elderly was 93.56 (95% CI: 92.77 to 94.35). Given this high mean, all participants were categorized as having high expectations of service quality. On the other hand, the mean score of the perceived service quality was 48.78 (95% CI: 47.45 to 50.11), indicating a lower assessment of the received service quality by the elderly. Based on these findings, participants were divided into two groups: those

with poor and those with moderate perceptions of service quality (Figure 3).

Results showed that men (mean = 93.64) and women (mean = 93.48) had similar expectations of emergency department services (Standardized Mean Difference = 0.02,  $p=0.83$ ). Furthermore, there were no significant differences in their perceptions of service quality across various dimensions, such as tangibles, reliability, responsiveness, and empathy. For instance, the mean perceived score for tangibles was 14.6 for men and 14.8 for women, indicating a negligible difference (SMD = -0.04,  $p=0.69$ ). These findings suggest that gender did not significantly influence the elderly’s expectations and perceptions of emergency department service quality (Table 2).

Logistic regression analysis revealed a significant negative association between elderly individuals’ expected and perceived service quality (OR: 0.94, 95% CI: 0.92-0.96,  $p<0.001$ ). This indi-

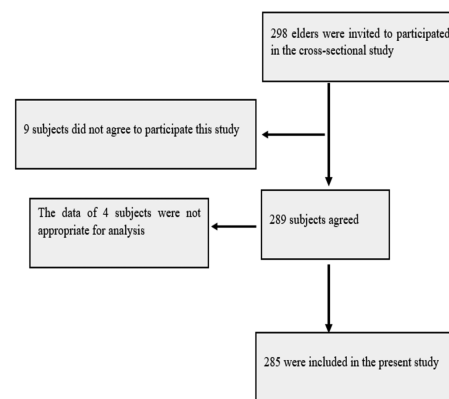


Figure 2. Patients included in the study.

Table 1. Characteristics of study participants according to gender.

Variable	Level	Male N=151 (%)	Female N=134 (%)	p
Age (years)	60 – 74 y	103 (68.2)	102 (76.1)	<b>0.08</b>
	> 75 years	48 (32.8)	32 (23.9)	
Marital Status <sup>†</sup>	Single	3 (1.9)	1 (0.7)	<b>0.14</b>
	Married	138 (91.3)	113 (84.3)	
	Widow	10 (6.8)	20 (15)	
Economy Level	Weak	107 (70.8)	23 (17.1)	
	Moderate	44 (29.2)	98 (73.1)	
	Good	0 (0)	13 (9.8)	
Education Level	Primary school	56 (37.1)	99 (73.8)	
	Diploma	67 (44.3)	26 (19.4)	
	Bachelor and above	28 (18.5)	9 (6.8)	
Job	Self-employed job	38 (25.1)	4 (2.9)	
	Retired	112 (74.1)	15 (11.3)	
	House wife	1 (0.6)	115 (85.8)	
Living Area	Urban	91 (60.2)	67 (50.3)	
	Rural			
	Yes			
Insurance	No	60 (39.8)	66 (49.7)	<b>0.32</b>
		145 (96.2)	126 (94.1)	
	Yes	6 (3.8)	8 (5.9)	

Data are presented as mean (SD) for continuous measures, and N (%) for categorical measures. Bold:  $p<0.05$ ; <sup>†</sup>Missing values within 2.5% to 9%.

cates that as elderly individuals' expectations of service quality increased, their likelihood of perceiving the received service quality as satisfactory decreased. Individuals aged 60-74 years had a 1.5-fold higher expectation of service quality compared to the reference group (aged 75-85 years), although this difference was not statistically significant ( $p=0.11$ ). Women reported a 25% higher expectation of service quality compared to men; however, this difference was not statistically significant ( $p=0.34$ ). Individuals with a bachelor's degree or higher had a 2.64-fold higher expectation of service quality compared to those with primary education, and this difference was statistically significant ( $p=0.04$ ). These findings suggest that education level significantly influenced individuals' perceptions of service quality. Other factors, such as marital status, socioeconomic status, occupation, place of residence, and insurance coverage, were not significantly associated with expected service quality (Table 3). Individuals aged 60-74 years were 2.42 times more likely to rate the service quality as high compared to the reference group (aged 75-85 years), and this difference was statistically sig-

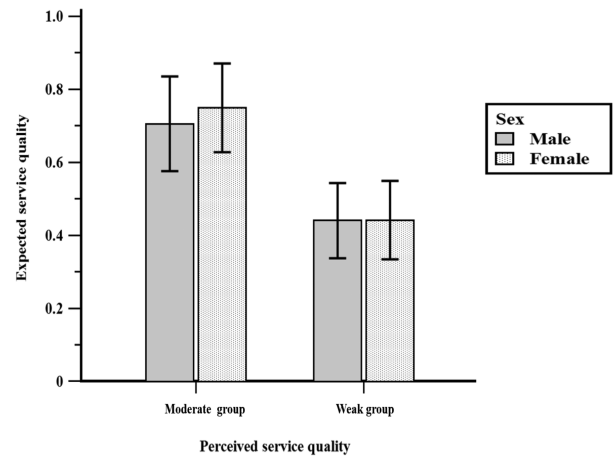


Figure 3. Perceived service quality.

Table 2. Expected and perceived service quality of the elderly referring to the hospital emergency department by gender.

Variable	Male Mean (SD)	Female Mean (SD)	SMD*	CI†	P‡
Mean Expectation: all domains	93.64 (6.6)	93.48 (6.9)	0.02	(-0.20 to 0.25)	0.83
Mean Perception: all domains	49.15 (11.1)	48.41 (11.6)	0.06	(-0.16 to 0.29)	0.58
Expectation: physical	29.19 (2.1)	28.85 (2.2)	0.15	(-0.07 to 0.38)	0.19
Perception: physical	14.6 (4.4)	14.8 (4.7)	-0.04	(-0.28 to 0.18)	0.69
Expectation: trust	24.38 (1.4)	24.23 (1.6)	0.09	(-0.13 to 0.33)	0.41
Perception: trust	17.1 (2.8)	17.2 (2.5)	-0.08	(-0.32 to 0.14)	0.45
Expectation: response	19.53 (1.2)	19.48 (1.2)	0.04	(-0.18 to 0.27)	0.72
Perception: response	10.09 (2.1)	10.29 (2.2)	-0.09	(-0.32 to 0.14)	0.43
Expectation: confidence	9.77 (0.6)	9.76 (0.6)	0.01	(-0.22 to 0.23)	0.94
Perception: confidence	10.6 (2.1)	10.9 (1.9)	-0.16	(-0.39 to 0.71)	0.17
Expectation: empathy	12.58 (1.2)	12.71 (1.2)	-0.09	(-0.32 to 0.13)	0.42
Perception: empathy	7.3 (1.3)	7.5 (1.3)	- 0.13	(-0.37 to 0.09)	0.24

\*SMD, standardize mean difference; †CI and P using by independent t test.

Table 3. Univariable analysis of expected quality service and associated factors.

Variable	Levels	OR	CI* (95%)	p*
Age (years)	60-74	1.51	(0.90 to 2.51)	0.11
	75-85	<b>1</b>	Reference	
Gender	Male	<b>1</b>	Reference	0.34
	Female	1.25	(0.78 to 2.01)	
Marital status	Single	<b>1</b>	Reference	0.62
	Married	1.42	(0.72 to 2.82)	
Economy level	Weak	<b>1</b>	Reference	0.68
	Moderate	1.05	(0.76 to 1.99)	
	Good	1.23	(0.33 to 3.30)	
Education level	Primary school	<b>1</b>	Reference	0.04
	Diploma	1.12	(0.66 to 1.85)	
	Master and above	2.64	(1.15 to 6.07)	
Job	Self employed	<b>1</b>	Reference	0.67
	Retired	1.35	(0.67 to 2.71)	
	House wife	1.16	(0.57 to 2.37)	
Living area	Urban	1.09	(0.68 to 1.75)	0.71
	Rural	<b>1</b>	Reference	
Insurance	Yes	1.51	(0.49 to 4.61)	0.46
	No	<b>1</b>	Reference	

\* CI and p using by Logistic regression; Bold:  $p<0.05$ .

nificant ( $p=0.002$ ). Individuals with a high socioeconomic status were 3.59 times more likely to rate the service quality as high compared to those with a low socioeconomic status, although this difference approached statistical significance ( $p=0.17$ ). Other factors, such as gender, marital status, occupation, place of residence, and insurance coverage, were not significantly associated with individuals' perceptions of service quality (Table 4).

## Discussion

This study aimed to determine and correlate the expected and perceived service quality among elderly patients visiting emergency departments. Results indicated that the mean scores for all dimensions of expected service quality—tangibles, reliability, responsiveness, assurance, and empathy—were above average, suggesting that the elderly had high expectations for all aspects of emergency care. This finding aligns with the results of previous studies. For example, Behdioğlu *et al.* reported general dissatisfaction with healthcare services.<sup>9</sup>

Results indicated that the elderly participants' perceived service quality was rated as moderate across all dimensions, including tangibles, reliability, responsiveness, assurance, and empathy. This finding is consistent with previous research. For instance, Hemati and colleagues' study reported significant differences between the elderly and healthcare staff regarding expectations of service quality, with the elderly having higher expectations across all dimensions. Similarly, the perceived quality of services, as evaluated by the elderly, was significantly lower compared to that perceived by healthcare staff, indicating a gap between the elderly's high expectations and their actual experiences.<sup>14</sup>

Results revealed a significant negative correlation between the expected and perceived quality of services among the elderly population. Furthermore, a significant negative correlation was found between the perceived quality of services and its dimensions (tangibles, reliability, responsiveness, assurance, and empathy). These

findings align with previous studies, such as those by Mwatawala, Fathie *et al.*, Karam Sina *et al.*, and Mahbifer *et al.*, which consistently reported a gap between the elderly's high expectations of healthcare services and their actual perceptions. This gap was most pronounced in the dimension of tangibles and equipment, and least pronounced in the dimension of empathy.<sup>10,15-17</sup> These results collectively suggest that healthcare services provided to the elderly often fall short of their expectations, highlighting a need for improvement in various aspects of care.

Results showed a significant effect of education level on the expected service quality among the elderly. Those with a bachelor's degree had higher expectations of service quality compared to other groups. Previous studies have shown that patient age, education level, nursing care quality, and the provision of information to patients and their families are among the factors influencing satisfaction with the quality of care provided in hospitals.<sup>18-19</sup>

One of the primary limitations of this study is its cross-sectional design, which restricts the ability to infer causal relationships between variables. Additionally, the use of self-reported questionnaires may have introduced response bias due to social desirability bias. Although efforts were made to mitigate this bias by providing detailed explanations of the study's objectives and emphasizing the confidentiality of responses, it cannot be entirely eliminated. Furthermore, limitations such as conducting the study in a specific geographic region and a relatively small sample size may constrain the generalizability of the findings. Therefore, the results of this study may only be generalizable to the studied population, and it is not possible to definitively conclude a causal relationship between the variables. To address these limitations, future studies should investigate the relationship between the quality of care and the expected and perceived quality of services.

## Conclusions

Our findings indicate a negative correlation between the

**Table 4.** Univariable analysis of perceived quality service and associated factors.

Variable	Levels	OR	CI* (95%)	p*
Age (years)	60 – 74	2.42	(1.33 to 4.38)	<b>0.002</b>
	75 – 85	<b>1</b>	Reference	
Gender	Male	<b>1</b>	Reference	<b>0.46</b>
	Female	1.19	(0.73 to 1.94)	
Marital Status	Single	<b>1</b>	Reference	<b>0.68</b>
	Married	1.56	(0.04 to 3.87)	
Economy Level	Weak	<b>1</b>	Reference	<b>0.11</b>
	Moderate	1.19	(0.72 to 1.94)	
	Good	3.59	(0.96 to 16.89)	
Education Level	Primary school	<b>1</b>	Reference	<b>0.35</b>
	Diploma	1.22	(0.86 to 2.51)	
	Master and above	1.47	(0.54 to 2.71)	
Job	Self employed	<b>1</b>	Reference	<b>0.71</b>
	Retired	1.37	(0.65 to 2.89)	
	House wife	1.06	(0.63 to 1.81)	
Living Area	Urban	1.11	(0.67 to 1.81)	<b>0.68</b>
	Rural	<b>1</b>	Reference	
Insurance	Yes	1.03	(0.33 to 3.16)	
	No	<b>1</b>	Reference	

\*CI and p using by Logistic regression; Bold:  $p<0.05$

expected and perceived quality of care among elderly emergency department patients. By identifying the strengths and weaknesses of emergency department services, this study can inform future policy decisions by the Ministry of Health and insurance providers to enhance the quality of healthcare services and, consequently, improve care for elderly patients in emergency settings.

### Study novelty

A novel contribution of this study is its exclusive focus on elderly patients presenting to emergency departments. A comprehensive literature review spanning the past decade revealed a dearth of research specifically addressing the quality of care experienced by this vulnerable population. Given the significant role of service quality in healthcare facility rankings, this study makes a substantial contribution by identifying factors influencing the quality of care experienced by the elderly in emergency settings.

### Study limitations

Its cross-sectional design precludes causal inferences, and self-reported data may be subject to recall or social desirability bias. The single-region focus (northern Iran) and relatively small sample size (n=285) may limit external validity.

### Suggestions for future research

Multisite investigations across diverse geographic and socio-economic settings would enhance the generalizability of findings. Additionally, mixed-methods approaches combining quantitative surveys with qualitative interviews could provide deeper insights into unmet needs and contextual factors influencing care experiences.

## References

- Rudnicka E, Napierała P, Podfigurna A, et al. The World Health Organization (WHO) approach to healthy ageing. *Maturitas* 2020;139:6-11.
- Saxon SV, Etten MJ, Perkins EA, RNLD F. *Physical change and aging: A guide for helping professions*: Springer Publishing Company; 2021.
- Cairns C, Ashman JJ, Kang K. *Emergency Department Visit Rates by Selected Characteristics: United States, 2022*. 2024.
- Grøndahl VA. Patients' perceptions of actual care conditions and patient satisfaction with care quality in hospital: *Nursing Science, Faculty of Social and Life Sciences, Karlstads universitet*; 2012.
- Hoon LS, Mackey S, Hong-Gu H. Elderly patients' experiences of care received in the emergency department: a systematic review. *JBI Evidence Synthesis* 2012;10:1363-409.
- Andrade LASd, Santos SdP, Corpolato RC, et al. Elderly care in the emergency department: an integrative review. *Revista Brasileira de Geriatria e Gerontologia* 2018;21:243-53.
- Naseer M, Dahlberg L, Ehrenberg A, et al. The role of social connections and support in the use of emergency care among older adults. *Arch Gerontol Geriatr* 2023;111:105010.
- Shankar KN, Bhatia BK, Schuur JD. Toward patient-centered care: a systematic review of older adults' views of quality emergency care. *Ann Emerg Med* 2014;63:529-50.
- Behdioğlu S, Acar E, Burhan HA. Evaluating service quality by fuzzy SERVQUAL: a case study in a physiotherapy and rehabilitation hospital. *Total Qual Manag Business Excellence* 2019;30:301-19.
- Mohebbifar R, Barikani A, Hasani H. Measuring hospital Service Quality Gap from the viewpoint of inpatients in educational hospitals of Qazvin University of Medical Sciences. *Bimarestan* 2015;14:97-104.
- Ghobadi H, Mehrnoush N, Hamidkholgh G, Amani F. Measuring the quality of services provided for outpatients in Kowsar Clinic in Ardebil City based on the SERVQUAL Model. *J Ardebil Univ Med Sci* 2014;14:387-79.
- Chen H, Cohen P, Chen S. How big is a big odds ratio? Interpreting the magnitudes of odds ratios in epidemiological studies. *Communications in Statistics—simulation and Computation* 2010;39:860-4.
- Lee KJ, Tilling KM, Cornish RP, et al. Framework for the treatment and reporting of missing data in observational studies: the treatment and reporting of missing data in observational studies framework. *J Clin Epidemiol* 2021;134:79-88.
- Hemati K, Nourozi K, Arsalani N, Saadati H. The expected and perceived service quality by geriatric patients and medical staff of NAJA hospitals. *Iran J Res Nurs* 2018;4:1-6.
- Mwatawala HW, Kapene TD. Assessing perceived service quality and satisfaction among elderly recipients of free health services in Dodoma, Tanzania: A SERVQUAL approach. *Asian J Med Health* 2024;22:10-19.
- Fatehi R, Motalebi A, Azh N. Nurses' and elderly's viewpoints regarding quality of nursing care in the educational hospitals of Sanandaj City. *Nurs Miwif J* 2019;16:779-86.
- Sina K, Babai Shibabandani M, Nadi Ghara A. Factors influencing the inpatients' satisfaction based on the Servqual model. *J Mazandaran Univ Med Sci* 2015;24:299-308.
- Purcărea VL, Gheorghe IR, Petrescu CM. The assessment of perceived service quality of public health care services in Romania using the SERVQUAL scale. *Procedia Econ Finance* 2013;6:573-85.
- Mehrabian F, Hemmati Nodoust Gilani M, Almaee A. Patient satisfaction with the quality of health services provided by public hospitals in Rasht, Iran. *J Holistic Nurs Midwif* 2021;31:17-25.