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Development and psychometric testing of the quality of care for trauma patients scale using exploratory and confirmatory factor analysis

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Abstract: **Objective:** Identifying trauma care quality from the trauma victims' viewpoints is key to patient-centered care, identifying service gaps, developing effective protocols, and building trust in medicine. The current study aims to establish a new quality of trauma care questionnaire and to assess its psychometric characteristics within the hospital context in Iran.

Methods: First, items were developed through a combination of literature review and interviews. Then, the validity of the items, including content, face, and internal consistency, was evaluated. Construct validity was assessed using exploratory factor analysis (EFA) on a sample of 220 patients, followed by confirmatory factor analysis (CFA) with a separate group of 253 patients from August to October 2022.

Results: Content validity, as measured using modified Kappa, was 0.95. Cronbach's alpha for internal consistency was 0.91, and test-retest reliability over two weeks was 0.94. The EFA revealed four factors: interpersonal quality, technical quality, outcome quality, and non-medical quality, which collectively accounted for 67% of the total variance in measuring the quality of care in trauma victims. Using CFA, researchers validated the final version of the trauma quality scale from patients' perspective (TQS-PP), which includes 22 items across four dimensions. The CFA model of the TQS-PP demonstrated an acceptable fit, with 2/df = 2.064, RMSEA=0.058, CFI=0.912, and NNFI=0.920.

Conclusion: Psychometric evaluations demonstrated sufficient validity and reliability for TQS-PP application in quality research involving trauma victims in Iran. The developed and evaluated TQS-PP serves as a reliable measure of health care quality from the perspective of trauma victims. The new tool could assist public health researchers in assessing the quality of care in emergency departments (EDs) and similar contexts.

Keywords: Validation; Structural Equation Modeling (SEM); Quality of Health Care; Questionnaire

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1. Introduction

Trauma is a leading cause of death worldwide, impacting the lives of nearly five million people annually. Over 90% of injury mortalities are recognized in developing nations, which makes traumatic injuries the world's highest source of disease burden. Trauma threatens the health of all age groups. Most traumatic injuries are in the age range of 18-44. The injury burden is rising due to an increase in traumatic incidence as a result of a rise in road traffic incidents, falls, burns, and occupational injuries. In addition to physical injuries, it causes psychological damage, disabilities, and handicaps to the patient and their families.

Trauma distribution varies at the global, national, and local levels. Trauma is highly heterogeneous in terms of its underlying causes, types of injuries, and their severity . Risk factors for trauma are linked to human behavior and social, occupational, economic, political, and cultural health variables. Reducing the burden of trauma is a complex task that requires a multidisciplinary approach to avoid its continued treatment as an "unattended epidemic."

A systematic review by Azami-Aghdash et al. found that the average age of injured individuals in Iran, a low-middle-income country in the eastern Mediterranean region, was 30 years. Men accounted for 76% of all patients. The most common mechanism of injury was road traffic accidents (50%), followed by falls (22.3%). In road traffic accidents, motorcyclists accounted for a significant proportion of patients

(45%). The most common injuries were to the head and neck (47.3%). The overall case fatality rate was 3.8%.

Assessing the quality of trauma care is emphasized by the world health organization (WHO) and the international society of trauma surgery and critical care (IATSIC) (9). The use of the WHO trauma care checklist has significantly enhanced patient care process measures across various settings . In a review for assessing the impact of a trauma care system in low- and middle-income countries, the researchers observed that education, prehospital systems, and overall system organization were the most commonly reported interventions. Quality improvement, costing, restructuring, and legislation and governance were relatively neglected areas.

A systematic review study in 2017 indicated a significant relationship between technical quality and improved patient outcomes. Better technical quality positively affected various patient outcomes, including morbidity and mortality.

A review study on models used to assess the quality of healthcare services identified five primary frameworks through an analysis and synthesis of existing literature: the Donabedian model, SERVQUAL (SERVPERF), HEALTHQUAL, PubHosQual, and HospitalQual .

A range of tools has been developed to assess the quality of care in the medical field . These metrics enable healthcare providers to pinpoint areas for improvement, elevate patient experiences, and guarantee the provision of high-quality medical services.

Regarding emergency departments (EDs) and trauma care quality, a study from Iran aimed to improve the quality of nursing care in trauma EDs and advance trauma care practices (21). The study found a notable difference in scores for patient assessment, care planning and implementation, and care plan evaluation (21). Also, Liu et al. developed a psychometric assessment of the nursing care quality scale from nurses' perspectives, identifying six key factors: staff features, task-oriented actions, human-centered actions, physical environment, patient outcomes, and precondition (14). Nurses and physicians often differ from patients in their views of what constitutes good-quality care. Muntlin et al., conducted a study at a university hospital's ED in Sweden, where patients rated the quality of care in the ED as moderately good. Quality in healthcare can be assessed from the perspectives of patients and healthcare providers. However, to the best of our knowledge, no previous study has addressed the medical quality of care concerning traumatic patients. Thus, the current study aimed to develop a quality of trauma care instrument and to evaluate its psychometric properties among trauma victims who visit EDs in Tabriz, Iran.

2. Methods

2.1. Design, setting, sampling, data collection, software, and inclusion criteria

In the present psychometric study, 473 trauma patients of the Imam Reza and Shohada hospitals (Tabriz, Iran), which are the most crowded trauma centers, participated from August to October 2022. The sampling type used in our study was purposeful sampling and participants were selected based on inclusion criteria. Adult trauma victims aged 18 and older who met the following criteria were included in the study: (a) recently diagnosed as physically injured trauma subjects by emergency medical services, (b) able to read and speak in Farsi or speak in Turki-Azerbaijani (for researcher-assisted participation), (c) alert and cognitively sound, and (d) having stable vital signs to participate in the study. The individuals who experienced trauma and were subjects of this investigation frequently sustained injuries due to vehicular collisions or accidental descents. Individuals who met any of the subsequent conditions were omitted from the analysis: non-survivable injuries and insufficient data.

To assign participants, a random sampling approach was used. The self-administered questionnaire took participants 9 minutes to complete. For data collection, either a face-to-face interview or a Google Forms link was used, based on patients' preferences. Data analysis was conducted using STATA software (ver. 14) and SPSS-Amos software (ver. 24).

2.2. Item construction

The literature review was conducted using the following databases: ScienceDirect, Scopus, PubMed, Web of Science, Magiran, and Google Scholar (Figure 1). Keywords such as "Quality of Health Care," "Health Services," "Surveys," "Emergency Medical Services," "Emergency Service," "Hospital," "Wounds and Injuries," "Trauma," "Tool," and "Questionnaires" were searched. Then, an initial list of items related to quality of care was prepared. The researchers independently developed all items included in the questionnaire. No items were directly copied or adapted from existing tools. A panel of 14 experts was invited to review the prepared items, comprising 11 emergency medicine specialists, one anesthesiologist, one epidemiologist, and one clinical psychologist. The expert panel session resulted in the inclusion of new items to address topics that were insufficiently covered by the existing items, staff feedback, or patient opinions—the reviewing of the questions by the panel was moderated as a group discussion using a Likert rating method.

Professional reviewers were asked to evaluate and comment on the wording and item allocation. In the face validity method, after revising items based on respondents' feedback, the item impact method was used to refine and prioritize items. A 5-point Likert scale was applied, with the following options: completely important (5), somewhat important (4), moderately important (3), slightly important (2), and not important at all (1). The impact score for each item was cal-

culated using the formula: Impact score=frequency (%) * importance, where frequency (%) represents respondents scoring 4 or 5, and importance is the average score. Items with an impact score >1.5 were retained for further analysis.

2.3. Face validity

Professional reviewers were asked to evaluate and comment on the wording and item allocation. In the face validity method, after revising items based on respondents' feedback, the item impact method was used to refine and prioritize items. A 5-point Likert scale was applied, with the following options: completely important (5), somewhat important (4), moderately important (3), slightly important (2), and not important at all (1). The impact score for each item was calculated using the formula: Impact score=frequency (%) * importance, where frequency (%) represents respondents scoring 4 or 5, and importance is the average score. Items with an impact score >1.5 were retained for further analysis.

2.4. Content validity

In conducting a quantitative content validity assessment, the modified Kappa (K*) coefficient was used to ensure that the tool included all crucial and pertinent items. As a result, specialists were requested to assess the necessity of the tool's items using the following classifications: unnecessary, useful but unnecessary, and necessary. The panel of experts evaluated the relevance of each statement on a scale of one to four, from irrelevant to totally relevant. This investigation was conducted under the advice of Polit and Colleagues (strong theory, suitable items, outstanding experts, and unambiguous methods regarding the primary constructs and the evaluation procedure) (23).

Based on K*, any Item-level (I-CVI) score ≥0.78 and a Scale-Level CV (S-CVI) score ≥0.90 were regarded as very good . To determine k*, the possibility of chance consensus (pc) was first measured, where N represents the number of experts and A indicates the items with ratings of three or four.

$$p_c = \left[\frac{N!}{A!(N-A)!}\right] 0.5^N$$

The I-CVI and the pc were then used to compute k*.

$$k^* = \frac{I\text{-}CVI - p_c}{1 - p_c}$$

2.5. Construct validity assessment

2.5.1. EFA

The minimum number of samples for factor exploration was designated to be ten cases for each item. Conducting factor analysis adequacy measures, the Kaiser-Meyer-Olkin (KMO) measure was found to be greater than 0.7, and a significant Bartlett's sphericity test (P<0.05) was obtained. The number of factors was assessed using the Kaiser criterion, which selects eigenvalues above 1 in the correlation matrix. With the scree test, we use the steep slope of the scree plot as the criterion. The PAF method was used to extract the factors with the maximum likelihood approach. Due to the correlation of factors, the oblimin rotation is used. In EFA, especially with the maximum likelihood extraction method, items with a commonality of less than 0.3 were ignored. Cross-loadings were carefully examined, and items were assigned to factors where they demonstrated the strongest conceptual alignment and statistical significance.

2.5.2. CFA

In the confirmatory factor analysis (CFA), a sample size ratio of 2.5:2 was applied.The CFA was conducted to determine the optimal factor structure of the TQS-PP. In CFA, we follow the following steps: model specification, model identification, model estimation, model testing, and model modification (24). Model fit was deemed acceptable if X^2/df was less than 5, the comparative fit index (CFI) exceeded 0.9, and the root mean square error of approximation (RMSEA) was below 0.08.

2.6. Reliability assessment

The intra-class correlation (ICC) values were employed to test the reliability. To evaluate the test–retest reliability of the TQS-PP over two weeks, ICC was utilized with a two-way mixed method for items. Furthermore, ICC was calculated, and the results were interpreted as follows: ICC<0.5 indicated poor reliability, 0.5-0.75 moderate; 0.75-0.9 good, and >0.90 excellent. Also, the internal consistency was determined using Cronbach's coefficient.

2.7. Missing data and normality

The frequency command in SPSS was utilized to identify missing data. Generally, if less than 10% of the data for each item is missing, it is not a significant concern. When data were missing, they were imputed with the average score of the remaining items. To minimize missing data, the questions were designed to be straightforward, and participants were given the option to respond online. A distribution with a skewness between±1.5 and a kurtosis between±2 is sufficient (24).

2.8. TQS-PP scoring method

To assess each of the TQS-PP items, a five-point Likert-type questionnaire was used, where the numbers correspond to the following meanings: 1=strongly disagree, 2=disagree, 3= neutral, 4=agree, and 5=strongly agree. The range of aggregated scores was 22 to 110, with the highest score indicating higher quality of care from the perspective of trauma patients.

3. Results

Table 1 illustrates some of the main characteristics of the traumatized individuals. The majority of them were male

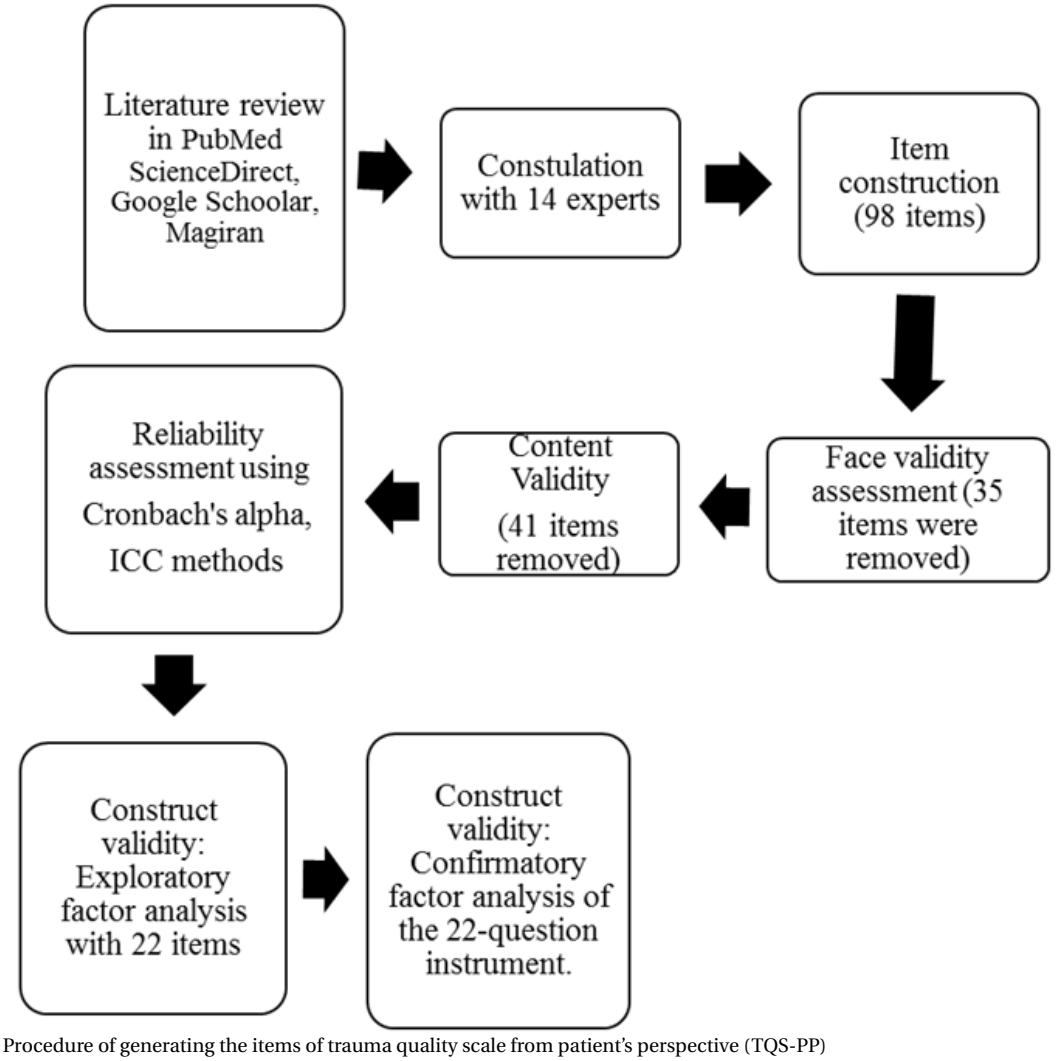

Figure 1 Procedure of generating the items of trauma quality scale from patient's perspective (TQS-PP)

(n=352, 74%). The participants' mean age was 28.7 years (SD = 13.6), and 64% of them were single. The majority of respondents had an education level below a diploma (55%). In the present study, the response rate was 87 percent.

3.1. Item construction

A thorough literature review, expert advice, and patients' interviews were used to produce a total of 98 items.

3.2. Face validity

At this stage, 35 items were eliminated because they were confusing, redundant, or inappropriate, or had a high proportion of non-responses or skewed responses, and were merged with other items. Items with an impact score >1.5 were retained for further analysis.

3.3. Pilot testing

In this phase, a pilot feasibility assessment was conducted with 20 trauma patients by a trained interviewer through face-to-face interviews, addressing implementation barriers, weaknesses, and problems expressed in the questions. In response to participant feedback, a revision of the TQS-PP was conducted.

3.4. Content validity

The TQS-PP's content validity, based on specialists' ratings using modified kappa, was determined to be 0.95. Items with a score of 0.78 or higher were considered to have adequate content validity. Regarding relevance, necessity, and feasibility, 41 items were deleted, leaving 22 items for further analysis. The remaining items in the instrument showed an acceptable value (0.8-1) in terms of content validity ratio (CVR).

3.5. Structural validity

3.5.1. EFA (n=220)

The factor structure based on EFA was analyzed using principal components with direct oblimin rotation. The adequacy and proportionality of the samples were tested for factor analysis using the Kaiser-Meyer-Olkin (KMO) and Bartlett's sphericity tests. The KMO test yielded a value of 0.89, and the

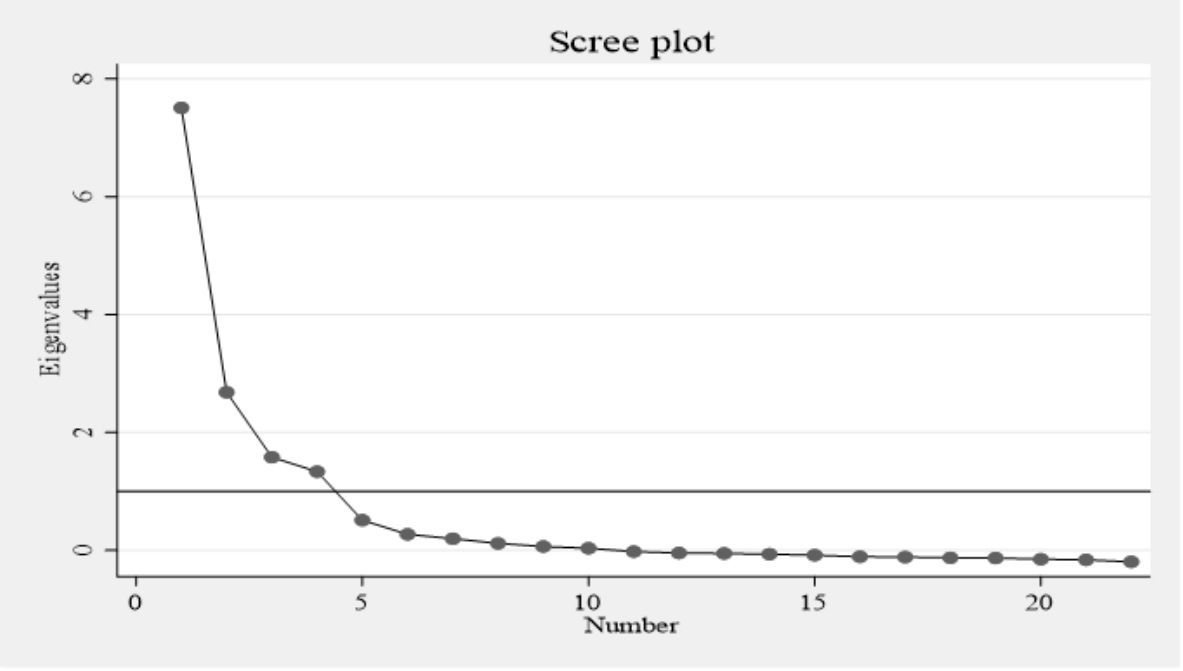

Figure 2 Scree plot of the exploratory factor analysis (EFA) for the trauma quality scale from patient's perspective (TQS-PP) (n=220)

Table 1 Demographic features of traumatic respondents (n=473)

Demographic characteristics	**Number (%)**	
sex	Male	352 (74)
	Female	121 (26)
Marital status	Single	303 (64)
	Married	170 (36)
Education	Diploma and over	210 (45)
	Under diploma	263 (55)
	Mean (SD), range	
Age	28.7(±13.6), 18-86	

SD: Standard deviation

Bartlett's sphericity test was significant (P<0.1000, 4183.84, df= 231), indicating the adequacy of the sample for factor analysis.

The EFA after rotation identified four factors, consisting of 22 items, that accounted for 67% of the variance through factors with eigenvalues greater than one. The scree plot results also indicated that four factors should be extracted (Figure 2).

The extracted factors have approximately 67% predictive power, given that the extraction method used was PAF, which provides the actual predictive value. The factor loadings of all items ranged from 0.564 to 0.912 (Table 2).

Table 2 presents the results obtained by EFA, in which "interpersonal quality with six items explained 35.90% of the variance (eigenvalue=7.90). The "technical quality" with five items accounted for 14.07% of the variance (eigenvalue=3.09). Additionally, the "nonmedical quality" factor with six items accounted for 99.8% of the variance (eigenvalue=1.97). Furthermore, the "outcome quality" factor with five items accounted for 7.80% of the variance (eigenvalue=1.71). These four factors can accurately measure the quality of care in trauma patients to a degree of 67%, which is a considerable and acceptable percentage.

3.5.2. CFA (n=253)

To assess the fit of the extracted EFA model to the observed data, we conducted CFA using the maximum likelihood method for estimation through structural equation modeling (SEM), using Amos software. Based on the chi-squared value of 717.408 with 198 degrees of freedom, the model is over-identified. The final model indices, including the model coefficients (standardized coefficients are indicated in Figure 3), were estimated. All relationships are significant at the 0.001 level. The CFA model of the TQS-PP demonstrated an acceptable fit, with X^2/df=2.064. The GFI and AGFI indices had values of 0.92 and 0.862, respectively. The NFI, RFI, IFI, TLI, and CFI indices are greater than 0.9. Additionally, RMSEA=0.058 and NNFI=0.920. According to the presented indices, the model was approved.

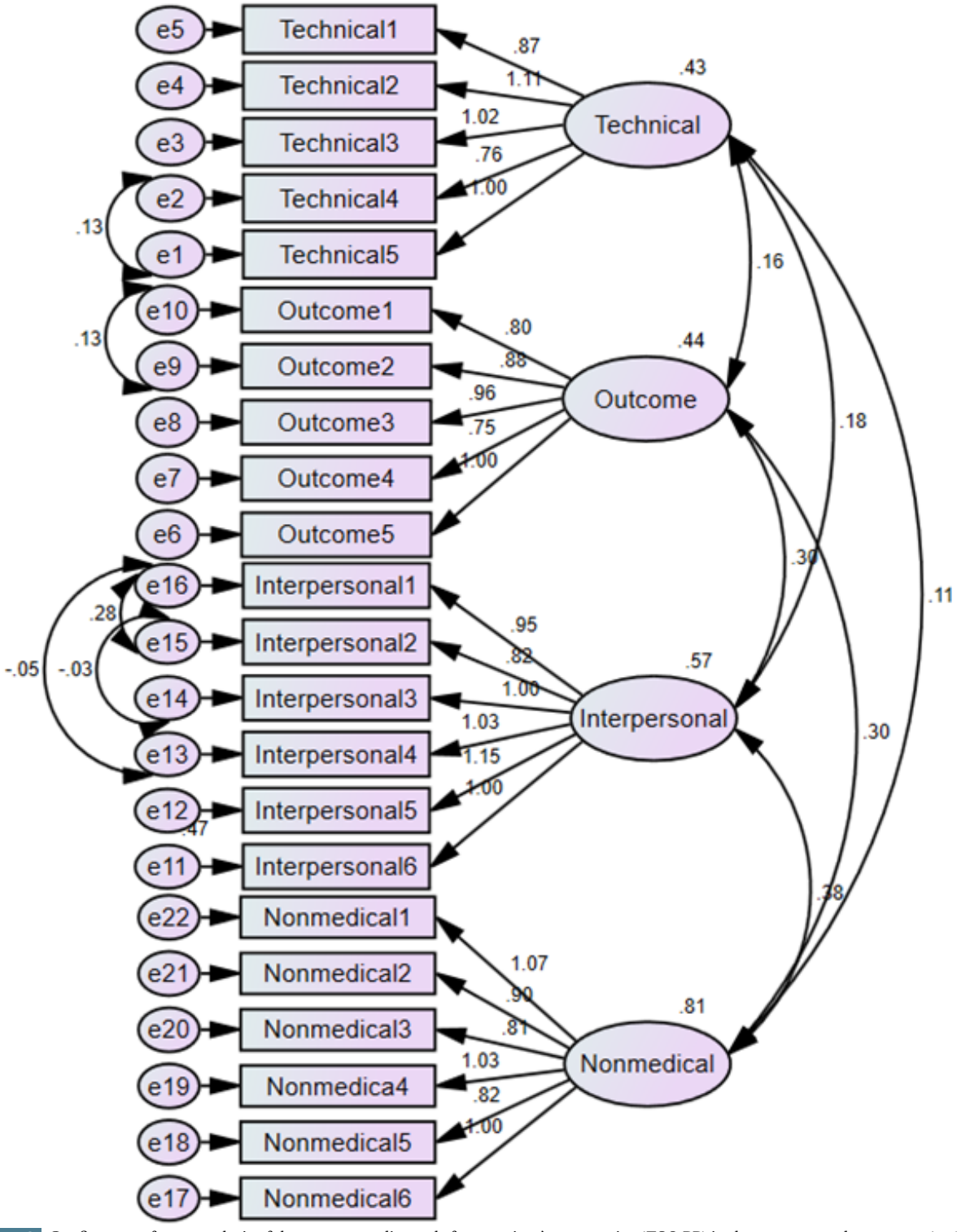

Figure 3 Confirmatory factor analysis of the trauma quality scale from patient's perspective (TQS-PP) in the emergency department (n=253)

3.6. Reliability

An overall Cronbach's alpha score of 0.91 was observed to assess the internal consistency of the instrument items. Cronbach's alpha score for dimensions of scale, including interpersonal quality, technical quality, nonmedical quality, and outcome quality, were 0.89,0.88,0.87, and 0.87, respectively. The test-retest reliability for all items in the instrument was 0.94 (95% confidence interval: 0.91,0.96), as determined by an intraclass correlation coefficient (ICC) at a two-week in-

Table 2 Results of rotational exploratory factor analysis (EFA) for the trauma quality scale from patient's perspective (TQS-PP)

	Items	Quality of care factors			
		Interpersonal	Technical	Nonmedical	Outcome
1	Health care providers treated you with respect.	**0.71**		0.39	0.47
2	A proper medical history was taken from you by the physicians.	**0.68**		0.32	0.47
3	The physicians coordinated with you in carrying out the treatment plan.	**0.75**	0.30	0.47	
4	You were treated fairly regardless of your age, ethnicity, gender, cultural beliefs, religious beliefs, or other personal characteristics.	**0.76**		0.30	0.33
5	Your healthcare providers clearly explained where you were being transferred at the time of your transfer.	**0.91**		0.36	
6	The nurses were cooperative during your transfer between wards.	**0.71**		0.36	0.47
7	Emergency rooms of this hospital have suitable treatment staff for the night shift as well as the day shift.		**0.77**		
8	Upon arrival, an experienced nurse prioritized patients visiting the emergency department.		**0.84**		
9	During your care, vital signs (heart rate, breathing rate, blood pressure, oxygen saturation, etc.) were measured.		**0.85**		
10	Nursing service providers administered the required injections and dressings promptly.		**0.79**		
11	The doctors clearly explained the injuries to you in a way you could understand.	0.32	**0.81**		
12	The cost of hospital services was reasonable.	0.41		**0.83**	0.35
13	The cooling, heating, and ventilation system of the hospital was suitable and desirable.	0.35		**0.78**	0.33
14	Complaining to the competent authorities was possible without disrupting the quality of medical services received.			**0.74**	
15	Amenities (such as tables and chairs, portable beds, public telephones, buffets, water coolers, etc.) were available.			**0.82**	
16	The service providers responded appropriately to your concerns.	0.48		**0.63**	
17	The hygiene conditions in the hospital and the water closet were satisfactory when you visited.	0.39		**0.83**	
18	Doctors and nurses attended the treatment process with minimal waiting time.	0.39			**0.84**
19	Laboratory and imaging services were performed as quickly as possible, and the results were reported.	0.42			**0.89**
20	The care provided was effective in improving your condition.	0.42		0.37	**0.82**
21	Doctors and nurses provided safe care.			0.36	**0.75**
22	The doctors and nurses did everything they could to relieve your pain, discomfort, and restlessness.	0.54	0.32	0.36	**0.71**

terval using data collected from 30 participants.

4. Discussion

The EFA in structural validity revealed four factors, comprising interpersonal relationship quality, technical quality, nonmedical quality, and outcome quality. Together, these factors effectively measure the quality of care in trauma patients, accounting for 67%, a significant and acceptable proportion. The identified dimensions are theoretically coherent and grounded in established healthcare quality frameworks. The outcome quality dimension agrees directly with the outcome factor in Donabedian's model, which assesses the effects of healthcare on patient health and well-being. Nonmedical quality in the TQS-PP reveals the structure factor in Donabedian's model. It also matches the tangibles dimension in the SERVQUAL framework, which includes the appearance of physical facilities and equipment. Non-medical quality issues meaningfully impact patient perceptions and satisfaction with care. Technical quality in TQS-PP supports the technical feature of Donabedian's framework, emphasizing the necessity of appropriate and adequate medical care. Ensuring high technical quality is essential for reaching favourable health outcomes and maintaining patient safety. The interpersonal relationship quality of TQS-PP relates to the interpersonal aspects of care, including communication, empathy, trust in medicine, and respect between healthcare providers and patients. It resonates with Donabedian's emphasis on the process component of care, which involves the interactions between patients and providers. Moreover, the SERVQUAL model underscores the importance of empathy and assurance in service delivery, highlighting the significance of relationship quality in patient satisfaction.

In CFA, a theoretical model was established, and through SEM, the application of fit indices and hypothesized paths significantly enhanced the model, ultimately leading to its

confirmation.

Upadhyai (2019) analyzed health service quality dimensions and their measurement using EBSCO and Google Scholar, categorizing the findings into medical and non-medical aspects (19). The dimensions introduced in the present study are consistent with them. While most studies evaluate patients' perspectives, the healthcare provider's viewpoints remain overlooked (25).

In medical aspects of care, technical care includes staff, equipment, medications, expertise, professionalism, and medical services. Outcomes focus on sanitation, equity, timeliness, prevention, safety, and reliability. Interpersonal care emphasizes decision-making, communication, customization, and attentiveness (25). Non-medical aspects of care encompass servicescapes, accessibility, and responsiveness .

Providing a valid quality of service tool for trauma survivors in Iran can improve the quality of services, identify patients' needs and expectations, evaluate the performance of medical staff, facilitate research and development, increase satisfaction and comparison, and ultimately improve treatment outcomes. Priority five aimed to enhance healthcare quality for road traffic accident victims, as noted in the study "setting research priorities to achieve long-term national road safety goals in Iran" (26).

A study on the development and psychometric assessment of the nursing care quality scale, based on nurses' perspectives, identified six key factors: staff characteristics, task-focused activities, human-centered activities, physical environment, patient outcomes, and preconditions . These differences could be attributed to variations in the study population (nurses vs. patients) and the different nursing specialty services (vs. whole department performance) examined in this study, as well as differences in quality dimensions across service types.

High-quality care (QoC) means utilizing high-quality data, evidence, diagnostics, and management procedures. Reporting the patient experience of QoC is essential for an ED's health improvement plans. There is a strong connection between the quality of care and patient satisfaction from the patient's perspective, especially in EDs.

The TQS-PP, to the best of our knowledge, was the first one used to measure the quality of care in trauma patients in Iran. Other settings may utilize it to assess high-quality emergency medical treatment for injured patients. Bobrovitz et al. developed a similar tool that utilized patient-reported experience measures in healthcare studies to collect firsthand information from patients regarding their encounters with healthcare services .

In a study by Muntlin et al. (2002), their questionnaire provides four domains: healthcare and technological capability, physical–technological circumstances, identification-centered method, and cultural-social environment among all patients of Eds. They asked all subjects who visited the ED to participate.

According to research on patients' perceptions of quality of care, gender, age, psychological wellness, the amount of crowding, and nurses' frequency, pain, and severity remain essential elements that need to be highlighted if subjects are to rank the quality of care as great. Prior research conducted in Iran has identified major healthcare stakeholders, including patients, providers, supervisors, legislators, and payers, as recognizing "efficacy, effectiveness, efficiency, empathy, and environment" as the most crucial elements of quality care. Enhancing healthcare quality builds patient trust, fostering better collaboration, adherence to advice, and improved outcomes. Prioritizing quality and trust transforms patient experiences and elevates care standards . Establishing trust through quality improvement is essential in EDs where patients may exhibit aggressive behaviors .

The Persian version of the TQS-PP has been demonstrated in this study to be a reliable instrument for assessing the quality of healthcare received among trauma patients in Iran. The psychometric properties of this scale suggest that it is a trustworthy and beneficial tool that could be used in Persian populations of trauma patients in EDs. An essential consideration in the broader application of our findings is the adaptability of the questionnaire tool. Though the TQS-PP has been validated for Iranian trauma patients, it could be adapted for other population settings. The adaptations would involve a robust validation structure, including cultural translation, language, and context-specific testing for reliability and validity of measuring the quality of care in the target population. Additionally, the adapted questionnaires could facilitate comparative studies across diverse healthcare systems for trauma patients or other medical conditions.

5. Limitations

Given the novelty of assessing the quality of care in trauma patients presenting to the emergency department, one of the main limitations of the study was the lack of relevant evidence worldwide, which limits the comparison of findings. This study included patients with less severe conditions, so generalizations should be made with caution. The study measured the quality of care at all stages of pre-hospital, in-hospital, and post-hospital care, as well as disabilities. Another limitation is that only some aspects of care, from the patient's perspective, were addressed in this study. Additionally, the study's generalizability is limited due to sample characteristics, the cross-sectional design, potential social desirability bias in self-reported responses, and the lack of external validation across diverse settings.

6. Conclusion

To our knowledge, this study is the first to develop a quality of care measure specifically for trauma patients in contemporary Iranian hospitals. The findings established that TQS-PP produced four-factor solutions with appropriate psychometric properties in this sample of trauma patients. The newly

developed scale empowers patients to comprehensively assess the performance of healthcare teams in delivering medical services, offering insights into the quality of care provided. It also identifies specific areas where improvements can be made, fostering a more patient-centered approach and enhancing overall healthcare outcomes. Further work is needed to identify shorter forms of the TQS-PP for different patient populations and settings. The new tool could assist public health researchers in assessing the quality of care in EDs and similar contexts.

7. Declarations

7.1. Acknowledgement

We would like to appreciate the cooperation of the Clinical Research Development Unit, Imam Reza General Hospital, Tabriz, Iran, in conducting this research.

7.2. Authors' contribution

Conceptualization and research design: ES, HS, HSB, AA, MF; Interview: ES,AP, HS; Data collection: ES and HS; Data analysis: ES,HSB; Writing—the initial draft: ES; Writing—review and editing: ES, HSB, MF, AP, AA, HS; Supervision: HS, HSB, MF, AA; the final manuscript was read and approved by all writers.

7.3. Conflict of interest

None.

7.4. Funding

None.

7.5. Availability of data and materials

The datasets collected and/or studied in the current investigation are available upon acceptable request from the corresponding author.

7.6. Ethics approval and consent to participate

This study was approved by the Research Ethics Board of Tabriz University of Medical Sciences, with the number IR.TBZMED.REC.1399.1098. After describing the research's objectives and procedure, all patients provided written informed consent at the start of the investigation. Furthermore, participants received assurances that the information they provided would be kept confidential. All personal information was de-identified using allocated codes. Additionally, withdrawal was allowed at any time, and integrity and transparency were ensured throughout. All questionnaire items were developed following established ethical guidelines for human subjects research. During item generation, we ensured that no questions were coercive, intrusive, or likely to cause psychological distress. All methods were carried out in adherence with the relevant guidelines of the Declaration of Helsinki (DoH).

Formal authorization was obtained, written informed consent was secured, confidentiality was maintained, participants were informed about the recordings, withdrawal was allowed at any time, and integrity and transparency were ensured throughout the study.

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