

Adaptation of the TeamSTEPPS® Teamwork Perceptions Questionnaire into Turkish for a Nurse Sample: A Methodological Study

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Abstract

Background: Teamwork is an essential building block in the healthcare system, where team members' perceptions significantly affect teamwork dynamics. Thus, a valid and reliable questionnaire is crucial for evaluating team members' perceptions.

Aim: The purpose of this study is to adapt and psychometrically test the TeamSTEPPS® Teamwork Perceptions Questionnaire for a nurse sample.

Methods: This cross-sectional validation study included a sample of 365 nurses working in both a university and a private hospital from November to December 2019. The study utilized the Guidelines for Reporting Reliability and Agreement Studies (GRRAS) checklist. The questionnaire was initially translated into Turkish using the back-translation method. Item analysis, an expert panel for content validity, confirmatory factor analysis for construct validity, internal consistency, the test-retest method, and item-total correlation coefficients were employed to verify the questionnaire's psychometric properties.

Results: The participating nurses, aged between 25-40 years (63.8%), primarily worked in intensive care units (29.6%). The questionnaire was deemed adequate in terms of language and content. Confirmatory factor analysis of the five-dimensional questionnaire indicated a good fit. The Cronbach's alpha for the entire questionnaire was 0.93, with sub-dimensions ranging from 0.91 to 0.94. The five-dimensional model demonstrated acceptable goodness-of-fit indices. The two-way mixed intraclass correlation coefficient for the five-dimensional questionnaire indicated excellent test-retest reliability.

Conclusion: The questionnaire proved to be an acceptable instrument for measuring nurses' perceptions of individual teamwork within their groups.

Keywords: Communication, nursing, perceptions, reliability, teamwork, validity

Introduction

Today's health systems operate within a matrix structure that integrates the expertise of numerous professionals. This collaboration not only enhances professionalism, efficiency, and quality of service but also underscores the essential role of teamwork.¹ According to Gestalt theory, needs arise from perception.² Therefore, managers aiming to achieve specific objectives in health services should understand the personal characteristics and needs of their team members to adequately address these needs. The Institute of Medicine (IOM) has highlighted the critical importance of teamwork for the benefit of patients and society at large. Consequently, it is advised in their reports that nurses enhance their leadership and innovation skills and collaborate with other professionals in the delivery of health services.³⁻⁶

In today's health institutions, nursing services involve team members of diverse talents, generations, educational backgrounds, and cultures.⁷ As different generations adapt to the workforce, technology, and lifestyle changes, their perceptions evolve accordingly.⁷

In the contemporary health system, nurses are accountable for reducing pressure ulcers, preventing patient falls, managing and controlling pain, minimizing catheter-related infections, shortening hospital stays, and achieving high patient satisfaction. To fulfill these responsibilities and attain desired patient outcomes, optimum care, and patient safety, nurses rely on teamwork. Effective collaboration among nurses facilitates the care process, boosts job satisfaction, and yields efficient results.⁸⁻¹⁰

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The TeamSTEPPS (Team strategies and tools to enhance performance and patient safety) framework was improved based on the “Big Five” Salas model, which encompasses the core elements of effective teamwork, including supportive behavior, harmony, team orientation, mutual performance monitoring, and team leadership.¹¹⁻¹³ These components, as defined by TeamSTEPPS, are crucial for ensuring patient safety, enhancing quality, and developing, improving, and optimizing effective team processes.

Teamwork among nurses is essential for safer and more effective patient care. A harmonious, safe, and effective working environment among team members is fostered through correct perception and understanding of one another. Recognizing and managing perceptions within the team is vitally important for successful teamwork. Differences in work values and attitudes exist among different generations of nurses.¹⁴ Wars and migrations have intensified cultural differences among nurses, necessitating collaborative efforts to accurately reflect the diverse patient profile.¹⁵ Sociological differences—such as generational-cultural differences and educational diversity—among nurses may pose administrative difficulties for managers. Nurse managers should adeptly handle the varied attitudes, beliefs, habits, expectations, and perceptions within their team. When nurse managers identify and address perceptual differences among nurses, they can resolve conflicts within the unit and contribute to achieving care goals. However, our country lacks a questionnaire to measure nurses’ perceptions within their team. Implementing the TeamSTEPPS Teamwork Perceptions Questionnaire (T-TPQ) in a unit or department allows nurse managers and other health administrators to assess teamwork perceptions, evaluate teamwork levels, and initiate improvements based on the findings.^{16,17} This questionnaire has been verified as a reliable and valid instrument in various languages, including English (United States), Norwegian, Korean, Japanese, Chinese, Greek, Swedish, and French.^{16,18-24} For this reason, the goal was to evaluate the psychometric properties of the questionnaire within a sample of nurses.

Research Questions

1. Is the Turkish version of the T-TPQ valid?
2. Is the Turkish version of the T-TPQ reliable?

Materials and Methods

Study Design

This cross-sectional validation study comprised phases for cross-cultural adaptation and the evaluation of psychometric properties. The Guidelines for Reporting Reliability and Agreement Studies (GRRAS) checklist was utilized during the research reporting process.²⁵

Sample and Sample Size

The study population included nurses employed at a university hospital and a private hospital in Istanbul, from November to December 2019, totaling 1,270 individuals. Literature suggests that for validity and reliability studies of questionnaires, a sample size of five to ten times the number of questionnaire items is advisable.^{26,27} Consequently, the study sample included 365 nurses working as a team across various units (such as service, specialty branch, emergency, operating room, and intensive care units). The sample size, approximately ten times the number of items, exceeded 350 in this study, indicating an acceptable level of adequacy. Thirty individuals participated in the pilot study, and another thirty were involved in the

“test-retest analysis”. These participants were not included in the validity and reliability analysis of the questionnaire (n=365). Nurses who voluntarily agreed to participate in the study and worked in clinics where teamwork is emphasized were included in the study.

Data Collection Tools

The study utilized the Descriptive Characteristics Form and the Turkish version of the T-TPQ (TrT-TPQ).

Descriptive Characteristics Form

This data collection tool was developed considering the research objectives and relevant literature.^{10,17} The form comprises a total of six questions designed to ascertain personal characteristics (such as gender, marital status, age, etc.) and professional characteristics (including the unit worked in and the hospital).

The TeamSTEPPS® Teamwork Perceptions Questionnaire (T-TPQ)

The questionnaire, developed by the Agency for Healthcare Research and Quality (AHRQ),¹⁶ is based on TeamSTEPPS’ five key teamwork components: “status monitoring,” “mutual support,” “team structure,” “leadership,” and “communication”. While the questionnaire can be administered in its entirety, each dimension can also be utilized independently. For instance, if an institution wishes to specifically assess the “Communication” aspect, only that dimension may be employed.¹⁶ The T-TPQ provides an evaluation of teamwork perceptions in health-care settings with the goal of enhancing patient safety. It can also be used to gauge changes in individuals’ perceptions following teamwork improvement training.

The questionnaire comprises five dimensions, which are: “Team Structure” (items: 1-2-3-4-5-6-7), “Leadership” (items: 8-9-10-11-12-13-14), “Situation Monitoring” (items: 15-16-17-18-19-20-21), “Mutual Support” (items: 22-23-24-25-26-27-28) and “Communication” (items: 29-30-31-32-33-34-35). The questionnaire features five response options, ranging from “1=strongly disagree” to “5=strongly agree.” The overall score is calculated by summing all the item scores or by dividing the total score by the number of items to obtain an average. An increase in the score indicates a higher perception of teamwork, whereas a lower score suggests a diminished perception of teamwork.¹⁶ The statements in the questionnaire follow a five-point Likert scale. Given the questionnaire’s five options and four difference intervals, a difference interval of $4/5=0.80$ was calculated. Teamwork perception scores were categorized as follows: Very low perceptions of teamwork (1.00–1.80), low perceptions of teamwork (1.81–2.60), moderate perceptions of teamwork (2.61–3.40), high perceptions of teamwork (3.41–4.20), very high perceptions of teamwork (4.21–5.00).²⁸

Data Collection and Analysis

Translation and Cultural Adaptation of the Instrument

To adapt the T-TPQ to the Turkish language and assess its validity and reliability, the following steps were meticulously followed:²⁷

Stage 1 - Language Validity: The linguistic equivalence of the questionnaire was established through the back-translation method. It was translated into Turkish by two scientific experts in nursing and a linguist, all proficient in English. The researchers merged these translations, leading to some semantic and conceptual modifications (e.g., “staff,” “overlap,” “future change,” and “feedback”). After reaching a consensus on the questionnaire items in consultation with a

Turkish language expert, the items were back-translated into English by a linguist and an academician, both fluent in both languages. A native English speaker then reviewed the original English version of the questionnaire and the back-translated version for semantic and conceptual consistency. Based on this expert's feedback, necessary adjustments were made, resulting in the questionnaire's final version.²⁷

Stage 2 - Content Validity: The content validity index (CVI) was employed to assess the clarity of expression and cultural relevance of the questionnaire. Experts rated each item on a scale from "1 (not applicable)" to "4 (very appropriate)" to determine the item-level CVI.²⁶ The CVI is calculated by dividing the number of experts who scored "3" or "4" by the total number of experts. The questionnaire-level CVI was derived by averaging the item-level CVIs. Content validity was evaluated by eight experts, all holding doctoral degrees in various nursing disciplines: Four in "management in nursing," one in "education in nursing," one in "principles of nursing," one in "internal medicine nursing," and one in "surgical nursing". They had a good command of both languages (Turkish and English). The acceptable score for content validity had to be 80% or higher.²⁶

Stage 3 - Pilot Application: To evaluate the survey's comprehensibility, a pilot study was conducted with 30 nurses from intensive care, emergency, and patient services. Following their feedback that the questionnaire was clear and straightforward, no further modifications were made to it. Nurses involved in this pilot stage were excluded from the main study sample.²⁷

Stage 4 - Construct Validity: This stage utilized confirmatory factor analysis (CFA) techniques through a statistical software program to assess the questionnaire's construct validity. The suitability of the questionnaire for construct validity was examined, and model fit was determined using various fit indices.²⁷

Stage 5 - Reliability Study: The questionnaire's reliability was tested using the Cronbach's alpha reliability coefficient, while item-total correlation analyses were employed to assess the internal validity of the items. To ascertain the questionnaire's consistency over time, measurements of internal structure consistency, the intra-class correlation coefficient (ICC), and test-retest reliability were undertaken.²⁷

Data Collection

Nursing services encompass various units, such as the intensive care unit, operating room, emergency room, and trauma unit. These units are characterized by frequent changes in team members and collaboration among multiple professionals.¹⁰ To achieve accurate results, clinics operating as cohesive teams (e.g., Emergency Department, Intensive Care Unit, Services, etc.) were selected for the study. The researcher conducted the data collection process, providing necessary explanations and distributing the data collection tool in person to nurses who volunteered for the study. Data were collected through one-on-one, face-to-face interviews lasting 15-20 minutes each. For nurses working shifts other than the daytime, surveys were left in the units, with feedback collected at predetermined intervals.

Data Analysis

Statistical analyses to assess the validity and reliability of the questionnaire were conducted using IBM SPSS (Statistical Package for

the Social Sciences) version 25 and IBM AMOS (Analysis of Moment Structures) version 24 (AMOS-SPSS-IBM Corporation, NY, USA). Surveys with missing responses were excluded from the analysis.

In the data analysis, descriptive statistics (percentages, means, and standard deviations) were evaluated. The reliability of the questionnaire, indicated by Cronbach's alpha coefficients greater than or equal to 0.70, is considered acceptable. At the end, the interrelationships among the dimensions were analyzed using Pearson's correlation.²⁹

Construct validity was assessed using CFA. CFA evaluates the similarity between the adaptation of a construct and its original conception.³⁰ After CFA is performed, the fit of the model with the data is determined by fit indices.³⁰ The goodness-of-fit indices were utilized to evaluate the models' fit. The chi-square value was found to be 2.4, indicating a good model fit. The normed chi-square (chi-square/df) should be less than 3; a Root Mean Square Error of Approximation (RMSEA) value of less than or equal to 0.08 and a p-value of less than 0.05 (0.062, $p < 0.05$) suggest a good fit. Additionally, if the Comparative Fit Index (CFI) (0.917) and the Tucker Lewis Index (TLI) (0.911) values are equal to or above 0.90, it denotes a good fit.^{26,29-31}

Ethical Considerations

Informed consent was obtained from the nurses, along with permission from the institution and approval from the Ethics Committee of İstanbul University-Cerrahpaşa (Approval Number 13022260-300-157435, Date:12.10.2019). Permissions were also secured from the creators of the questionnaire used in the research and obtained from the AHRQ to translate and use the original version of the questionnaire.

Results

Personal and Professional Characteristics of Nurses

The nurses were predominantly in the 25-40 age range (63%), female (87.1%), single (51.5%), with undergraduate degrees (66.3%), working at the university hospital (86.9%), and in the intensive care unit (29.6%) (Table 1).

Validity Findings

Content Validity

The results showed that the CVI was 1.00, indicating that the questionnaire items were understandable.

Construct Validity

As shown in Table 2 and Figure 1, the factor loadings for the five-dimensional model of the questionnaire ranged between 0.58 and 0.88. The factor loadings for the "team structure" dimension ranged from 0.58 to 0.80, for "leadership" from 0.72 to 0.88, for "situation monitoring" from 0.71 to 0.78, for "mutual support" from 0.70 to 0.81, and for "communication" from 0.76 to 0.86.

The fit indices of the final model confirm that all dimensions of the questionnaire can be used to measure individual perceptions of teamwork within health institutions (Table 3). According to the T-TPQ guidelines, the items within the questionnaire should remain unchanged. Consequently, no alterations were made to the T-TPQ.¹⁶

As indicated in Table 4, factor loadings exceeded 0.50, and Cronbach's alpha values were above 0.70. The fit indices, detailed in Table 3, are notably satisfactory. This supports the questionnaire's utility in evaluating teamwork perceptions across any department requiring such analysis.

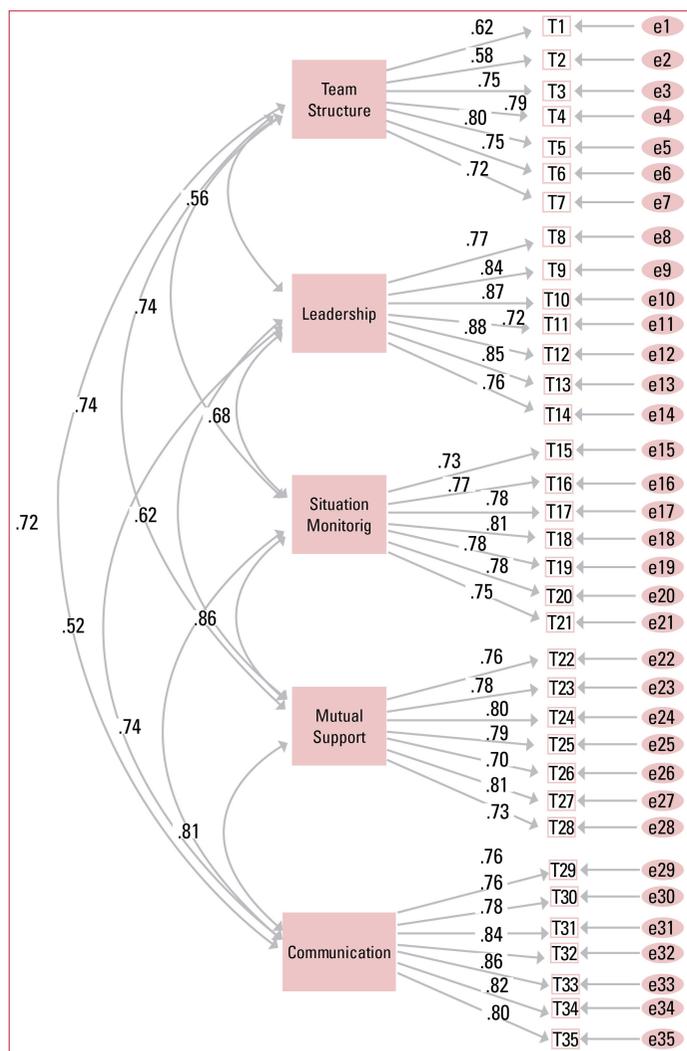


Figure 1. Confirmatory factor analysis diagram of the TrT-TPQ.

Findings Related to Reliability Analyses

Internal Consistency

The Composite Reliability (CR) scores and Cronbach's alpha coefficients were employed to assess the construct (factor) reliability of the questionnaire and the internal consistency of the items. As detailed in Table 2, the Cronbach's alpha coefficient for the total questionnaire is 0.93, with all sub-dimensions exceeding 0.90.

Time Invariance

Test-Retest Correlation and Intraclass Correlation Coefficient

In this study, the questionnaire was administered to a group of 30 nurses working in two different hospitals, with a two-week interval between sessions. The relationship between the average scores obtained from both administrations was examined. Concordance between the questionnaire scores across the two repeated measures was also assessed using the ICC.

The test-retest reliability was found to be high, as indicated by the significant bilateral correlations in the total score of the TrT-TPQ and within the dimensions of "Team Structure," "Leadership," "Situation

Table 1. Personal and Professional Characteristics of the Nurses (n=365)

Variables	n (%)
Hospital group	
University	317 (86.9)
Private	48 (13.1)
Age	
18-24 age	64 (17.5)
25-40 age	233 (63.8)
41-54 age	61 (16.7)
55 ve over age	7 (2.0)
Sex	
Female	318 (87.1)
Male	47 (12.9)
Marital status	
Married	177 (48.5)
Single	188 (51.5)
Education	
High school	32 (8.8)
Associate degree	39 (10.7)
Licence	242 (66.3)
Graduate	52 (14.2)
Worked Unit	
Service	86 (23.6)
Intensive care	108 (29.6)
Emergency unit	54 (14.8)
Operating room	44 (12.0)
Special branch	73 (20.0)

n: Number; %: Percentage

Monitoring," "Mutual Support," and "Communication" (0.945, 0.889, 0.975, 0.878, 0.869, and 0.936, respectively). A highly significant correlation was observed between the two sets of measurements across all questionnaire dimensions. As a result of the t-test for dependent groups, it was determined that there was no significant difference between the two sets of measurements, either for the total questionnaire or for any sub-dimension ($t=-1.838$; $p=0.76$) (Table 5).

When the ICC was examined to test the agreement between the initial and repeated test scores of the questionnaire and its five sub-dimensions, the ICC was 0.94 for the total questionnaire and ranged from 0.93 to 0.99 for the five sub-dimensions, indicating a highly significant level of agreement ($p < 0.01$) (Table 5).

Discussion

Nurses and healthcare professionals must collaborate effectively and harmoniously to achieve patient care goals, improve outcomes,

Table 2. Item Analysis Results of the TrT-TPQ Questionnaire (n= 365)					
Substances	r	α Value When Item is Deleted	Cronbach's Alpha	m ± ss	Factor Loads
Team structure			0.92		
The skills of staff overlap sufficiently so that work can be shared when necessary.	.508	.967		4.27 ± 0.68	.623
Staff are held accountable for their actions.	.460	.968		4.39 ± 0.60	.583
Staff within my unit share information that enables timely decision-making by the direct patient care team	.647	.967		4.36 ± 0.57	.751
My unit makes efficient use of resources (e.g., staff supplies, equipment, information)	.648	.967		4.27 ± 0.59	.793
Staff understand their roles and responsibilities	.644	.967		4.25 ± 0.60	.796
My unit has clearly articulated goals	.643	.967		4.21 ± 0.61	.745
My unit operates at a high level of efficiency	.650	.967		4.18 ± 0.69	.722
Leadership			0.94		
My supervisor/manager considers staff input when making decisions about patient care	.610	.967		4.04 ± .747	.770
My supervisor/manager provides opportunities to discuss the unit's performance after an event	.632	.967		3.93 ± .789	.836
My supervisor/manager takes time to meet with staff to develop a plan for patient care	.659	.967		3.92 ± .820	.870
My supervisor/manager ensures that adequate resources (e.g., staff, supplies, equipment, information) are available	.575	.967		4.14 ± .708	.725
My supervisor/manager resolves conflicts successfully	.619	.967		3.95 ± .817	.879
My supervisor/manager models appropriate team behaviour	.647	.967		3.98 ± .810	.848
My supervisor/manager ensures that staff are aware of any situations or changes that may affect patient care	.678	.967		4.18 ± .695	.762
Situation monitoring			0.91		
Staff effectively anticipate each other's needs	.716	.966		4.03 ± .681	.726
Staff monitor each other's performance	.710	.966		4.10 ± .640	.772
Staff exchange relevant information as it becomes available	.720	.966		4.21 ± .610	.780
Staff continuously scan the environment for important information	.744	.966		4.13 ± .629	.808
Staff share information regarding potential complications (e.g., patient changes, bed availability)	.713	.966		4.24 ± .601	.778
Staff meets to re-evaluate patient care goals when aspects of the situation have changed	.738	.966		4.10 ± .654	.776
Staff correct each other's mistakes to ensure that procedures are followed properly	.726	.966		4.10 ± .683	.751
Mutual support			0.91		
Staff assist fellow staff during high workload	.683	.967		4.24 ± .625	.764
Staff request assistance from fellow staff when they feel overwhelmed	.710	.966		4.27 ± .571	.778
Staff caution each other about potentially dangerous situations	.733	.966		4.29 ± .613	.796
Feedback between staff is delivered in a way that promotes positive interactions and future change	.752	.966		4.14 ± .626	.795

(Continued)

Table 2. Item Analysis Results of the TrT-TPQ Questionnaire (n= 365) (Continued)					
Substances	r	α Value When Item is Deleted	Cronbach's Alpha	m ± ss	Factor Loads
Staff advocate for patients even when their opinion conflicts with that of a senior member of the unit	.679	.967		4.09 ± .675	.697
When staff have a concern about patient safety, they challenge others until they are sure the concern has been heard	.751	.966		4.25 ± .573	.812
Staff resolve their conflicts, even when the conflicts have become personal	.694	.966		3.95 ± .723	.733
Communication			0.92		
Information regarding patient care is explained to patients and their families in lay term	.694	.967		4.24 ± .538	.764
Staff relay relevant information in a timely manner	.713	.966		4.23 ± .566	.757
When communicating with patients, staff allow enough time for questions	.662	.967		4.18 ± .617	.777
Staff use common terminology when communicating with each other	.729	.966		4.19 ± .591	.838
Staff verbally verify information that they receive from one another	.723	.966		4.21 ± .578	.859
Staff follow a standardized method of sharing information when handing off patients	.690	.967		4.22 ± .583	.821
Staff seek information from all available sources	.677	.967		4.14 ± .629	.798
T-TPQ			0.93		

Questionnaire: from 1=strongly disagree with the statement to 5=strongly agree with the statement. Reproduced from Teamwork Perceptions Questionnaire (T-TPQ) & Manual. Team Strategies & Tools to Enhance Performance & Patient Safety (TeamSTEPPS®) 2.0. Agency for Healthcare Research and Quality; Rockville, Maryland USA. March 2014. Available from: <https://www.ahrq.gov/teamsteps/instructor/tools.html>.
 r=Item-total score correlation; α=Cronbach alpha internal consistency coefficient; m=Average; ss= Standard deviation. For reliability, the Cronbach's alpha coefficient for the total T-TPQ was 0.94, the Factor loads for each item ranged from 0.583 to 0.879 and the Cronbach's alpha coefficient for each dimension ranged from 0.91 to 0.94 (Table 2).

Table 3. Fit Criteria and Reference Fit Values for the TrT-TPQ Questionnaire (n= 365)				
Compliance Value	Perfect Fit	Acceptable Fit	Model Value	Conclusion
X ² /sd	0 ≤ X ² /sd ≤ 3	3 ≤ X ² /sd ≤ 5	2.4	Perfect Fit
RMSEA	0 < RMSEA < 0.05	0.05 ≤ RMSEA ≤ 0.10	.062	Acceptable Fit
CFI	0.95 ≤ CFI ≤ 1	0.90 ≤ CFI ≤ 0.95	.917	Acceptable Fit
TLI	0.95 ≤ NNFI ≤ 1	0.90 ≤ NNFI ≤ 0.95	.911	Acceptable Fit

Abbreviations: RMSEA, root mean square error of approximation; CI, confidence interval; TLI, Tucker-Lewis index; CFI, comparative fit index.

Table 4. Intercorrelations and Cronbach's alpha value of the TrT-TPQ Dimensions (n= 365)					
T-TPQ Dimensions	Leadership	Situation Monitoring	Mutual Support	Communication	α
Team structure	.56*	.74*	.74*	.72*	0.926
Leadership	1	.68*	.62*	.52*	0.943
Situation monitoring		1	.86*	.74*	0.912
Mutual support			1	.81*	0.912
Communication				1	0.921

*P ≤ 0.001; Note: *Correlation is significant at the 0.01 level.

Table 5. Test-retest Analysis (n=30)

		\bar{x} (ss)	t/p		ICC/p
			r/p		
T-TPQ-TR	First measurement	4.02 (0.44)	t=-1.838/p=0.76 r=0.945, p<0.001*		0.94/ p<0.001*
	Second measurement	4.07 (0.45)			
Team structure	First measurement	4.15 (0.42)	t=-1.363/p=0.183 r=0.889, p<0.001*		0.94/ p<0.001*
	Second measurement	4.20 (0.45)			
Leadership	First measurement	3.97 (0.73)	t=-0.320/p=0.752 r=0.975, p<0.001*		0.99/ p<0.001*
	Second measurement	3.98 (0.71)			
Situation monitoring	First measurement	3.90 (0.53)	t=-1.613/p=0.118 r=0.878, p<0.001*		0.93/ p<0.001*
	Second measurement	3.98 (0.56)			
Mutual support	First measurement	3.99 (0.53)	t=-0.779/p=0.442 r=0.869, p<0.001*		0.93/ p<0.001*
	Second measurement	4.02 (0.48)			
Communication	First measurement	4.02 (0.58)	t=-1.728/p=0.95 r=0.936, p<0.001*		0.97/ p<0.001*
	Second measurement	4.17 (0.58)			

*P<0.001; \bar{x} = Mean; ss= Standard deviation; t= t test in dependent groups; r= Pearson correlation coefficient

ensure patient safety, and foster change.^{9,17} The results of this study indicated that the Cronbach's α coefficient of the questionnaire was 0.93, demonstrating excellent internal consistency across all dimensions. The TrT-TPQ exhibited good internal consistency, similar to studies conducted in other languages, such as in Sweden, Iran, and the USA.^{13,18,32} Additionally, the questionnaire demonstrated good test-retest reliability, akin to findings from studies in languages like Greek.²³

According to the CFA results, all criteria were shown to be acceptable, aligning with the findings by Aksu et al.³⁰ The RMSEA value was found to be 0.062, indicating a good fit. This study's fit (RMSEA index=0.062) is comparable to the fit observed in the Japanese study by Unoki et al.²¹ Literature suggests that RMSEA is the best criterion for evaluating fit in covariance structure modeling.³¹ Similarly, the French study by Diep et al,²⁴ with a CFI value of 0.912, and the study by Keebler et al,³² which found a CFI of 0.94, support these findings. The TLI was determined to be 0.911, signifying a good fit. The model fit in this study (RMSEA index=0.062) was also similar to that in the Greek study by Lakatamitou et al.²³

The chi-square goodness of fit (χ^2) index of the study was significant. The χ^2 index is sensitive to sample size and is often used as the primary criterion for model fit.³⁰ In this study, the chi-square value was anticipated to be less than 3. It was found that the χ^2 index was 2.4, indicating a perfect fit. The model derived in this study exhibited a similar fit when compared with studies from Sweden, Greece, and Japan.^{13,21,23}

The factor loadings for each item within its respective dimension were acceptable, and the path coefficients among the dimensions were also considered admissible. Significant correlations between dimensions were observed, akin to studies conducted in the USA and Norway.^{19,32} According to the study results, the correlation coefficient between situation monitoring and mutual support was found to be high, a conclusion also reached by Keebler et al.³² This suggests that

health professionals can improve their situation monitoring skills by developing mutual support. The questionnaire can be utilized to identify perceptions of interprofessional teamwork in healthcare settings.

Limitations

The findings of this study, as well as the data collection tools employed, are limited to the perceptions and statements of the participating nurses.

Conclusion and Recommendations

The questionnaire proves to be an effective good tool for measuring the individual perceptions of health professionals and nurses regarding teamwork at the group level. It can be utilized to assess teamwork, which significantly contributes to the quality of care in hospital settings. This tool offers healthcare and nursing administrators a means to evaluate and understand employee perceptions of teamwork.

The findings from this study demonstrate acceptable reliability and validity within the Turkish nurse sample, presenting positive implications for nursing management. When administered within a unit or department, the questionnaire enables nurse managers to assess nurses' perceptions of teamwork, evaluate the level of teamwork, and identify training needs based on the findings to facilitate improvements.

Ethics Committee Approval: This study was approved by Ethics Committee of Istanbul University-Cerrahpaşa University, (Approval Number: 13022260-300-157435, Date: 12.10.2019).

Informed Consent: Informed consent was obtained from the nurses.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – A.Y.A., A.Y.; Design – A.Y.; Supervision – A.Y.A., A.Y.; Resources – A.Y.A., A.Y.; Materials – A.Y.A., A.Y.; Data Collection and/or Processing – A.Y.; Analysis and/or Interpretation – A.Y.A., A.Y.; Literature Search – A.Y.A., A.Y.; Writing – A.Y.A., A.Y.; Critical Review – A.Y.A., A.Y.

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