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Mayo High Performance Teamwork Scale: Turkish Validity and Reliability Study

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ABSTRACT

Purpose: This study aimed to translate the Mayo High Performance Teamwork Scale (MHPTS) into Turkish, ensure its cultural adaptation, and evaluate its psychometric properties among nursing students.

Methods: This methodological research was conducted between January 2022 and January 2023 with nursing students enrolled in a surgical nursing program. The translation and cultural adaptation process followed the standardized forward–backward translation method recommended by Beaton et al. Expert review was conducted to determine content validity, and a pilot test was performed with students experienced in simulation-based learning. Reliability was assessed using the test–retest method, and internal consistency was evaluated using Cronbach's alpha. Construct validity was examined using the Rasch measurement model, including item fit statistics, person and item reliability indices, and separation values.

Results: A total of 339 scale evaluations were used in the study. Cronbach's alpha coefficient was 0.839, indicating high internal consistency. Rasch analysis demonstrated acceptable INFIT and OUTFIT mean-square values for all items, supporting the unidimensional structure of the scale. Rasch item and person reliability coefficients were 0.95 and 0.73, respectively. The mean total score on the scale was 26.67 ± 4.34, reflecting positive perceptions of teamwork and non-technical skills during simulation-based learning experiences.

Conclusion: The Turkish version of the MHPTS is a valid and reliable instrument for evaluating non-technical skills and teamwork performance among nursing students in simulation-based surgical nursing education. The scale can be used to assess the effectiveness of educational interventions, identify areas for improvement in team-based competencies, and support the development of patient safety culture in clinical education environments.

Keywords: Nursing, Surgical; Simulation Training; Teamwork; Nontechnical Skills; Psychometrics

ÖZET

Amaç: Bu çalışma, Mayo Yüksek Performanslı Ekip Çalışması Ölçeği'nin (MYPTÖ) Türkçe 'ye uyarlanması, kültürel geçerliliğinin sağlanması ve psikometrik özelliklerinin değerlendirilmesi amacıyla gerçekleştirilmiştir.

Yöntem: Metodolojik nitelikteki araştırma, Ocak 2022–Ocak 2023 tarihleri arasında hemşirelik öğrencileri ile yürütülmüştür. Ölçek, ileri-geri çeviri yöntemiyle Türkçe 'ye uyarlanmış, uzman görüşleri doğrultusunda içerik geçerliği indeksi hesaplanmış ve pilot uygulama yapılmıştır. Güvenirlik analizi için test-tekrar test yöntemi uygulanmış; yapı geçerliliği Rasch ölçüm modeline göre değerlendirilmiştir.

Bulgular: Araştırmada toplam 339 anket değerlendirmesi kullanılmıştır. Ölçeğin Cronbach alfa değeri 0,839 olup yüksek iç tutarlılık göstermiştir. Maddelere ilişkin INFIT/OUTFIT değerleri kabul edilebilir aralıktadır ve ölçeğin tek faktörlü yapısı korunmuştur. Rasch analizinde madde ve kişi güvenirliği sırasıyla 0,95 ve 0,73 olarak bulunmuştur. Ölçek toplam puan ortalaması 26,67±4,34'tür.

Sonuç: MYPTÖ'nin Türkçe versiyonu, simülasyona dayalı öğrenme deneyimlerinde cerrahi hemşireliği öğrencilerinin ekip çalışmasına yönelik teknik olmayan becerilerinin değerlendirilmesinde geçerli ve güvenilir bir araçtır. Ölçeğin kullanımı, eğitim programlarının etkinliğinin izlenmesine ve hasta güvenliği kültürünün güçlendirilmesine katkı sağlayabilir.

Anahtar Kelimeler: Cerrahi hemşireliği; simülasyon eğitimi; ekip çalışması; teknik olmayan beceriler; psikometri

Patient safety is considered one of the most essential components of modern healthcare, and errors occurring particularly in surgical settings directly affect morbidity and mortality. The literature indicates that 70–80% of healthcare-related errors stem from deficiencies in non-technical skills such as communication breakdowns, role ambiguity, and inadequate teamwork (1,2). Especially during surgical interventions, the rapid, accurate, and effective coordination of multidisciplinary teams is critically important for patient safety.

Non-technical skills include leadership, communication, role and task distribution, situational awareness, and decision-making processes. The conceptual framework of these skills was first defined through Crisis Resource Management (CRM), which was developed in the aviation field following major accidents in the 1970s and later adapted to the healthcare domain to improve team performance in high-risk clinical situations (3,4). In healthcare education, CRM refers to a structured, scenario-based training approach aimed at strengthening non-technical skills and is most commonly operationalized through simulation-based learning. Simulation-based CRM training allows teams to engage in realistic clinical scenarios in a safe and controlled environment, enabling the observation, practice, and evaluation of teamwork behaviors such as communication, leadership, and error management (2–4).

Simulation-based learning provides students and healthcare professionals with a safe, repeatable, and risk-free learning environment, and has become a common method for developing both technical and non-technical skills. Particularly for surgical nursing students, simulation strengthens competencies such as assuming leadership roles, clinical decision-making, intra-team communication, and emergency management (5,6,7). Research demonstrates that simulation increases self-confidence and leadership, contributes to teamwork, and has positive effects on patient safety (8,9,10).

Within this framework, CRM-based simulation training plays a central role in evaluating team performance and non-technical skills, creating a need for valid and reliable measurement tools that can be applied during simulation scenarios.

In this context, the use of tools that can reliably and validly measure team performance is of great importance. The Mayo High Performance Teamwork Scale (MHPTS), developed by Malec et al. (2007), is a short, practical, and reliable scale created to evaluate crisis management and team performance (11). The scale assesses fundamental components of surgical teamwork.

MHPTS has been adapted and used in different cultures to date. In a study conducted in Brazil, semantic and cultural equivalence of the scale was achieved, and a high level of content validity was obtained (12). In the French adaptation study carried out with nursing students in Canada, the internal consistency coefficient of the scale was found to be 0.74, indicating an acceptable reliability level (13). In Türkiye, however, no validity and reliability study of MHPTS has yet been conducted.

Given the increasing use of simulation-based education and CRM training in surgical nursing curricula, the adaptation of MHPTS into Turkish is essential for both evaluating educational effectiveness and enabling international comparisons.

Methods

2.1 Study Design

This study is a methodological research conducted to translate the Mayo High Performance Teamwork Scale (MHPTS) into Turkish, perform its cultural adaptation, and carry out validity and reliability analyses. The study was conducted between January 2022 and January 2023 in the Department of Nursing, Faculty of Health Sciences, Acıbadem Mehmet Ali Aydınlar University.

2.2 Scale Characteristics

MHPTS was developed by Malec et al. to evaluate team performance in Crisis Resource Management (CRM) training (11). The scale measures non-technical skills such as team leadership, communication, role distribution, situational awareness, decision-making, and error management. The scale consists of 16 items and is evaluated with a three-point Likert-type scoring system as "0=Never/Rarely," "1=Inconsistently," and "2=Consistently." Some items can only be evaluated if the corresponding situation occurs; otherwise, the option "Not Applicable (NA)" may be selected (11,12).

2.3 Translation and Cultural Adaptation Process

Ensuring equivalence by taking into account the linguistic and cultural characteristics of the target population is important in scale adaptation (14). In this study, the standard methodology recommended by Beaton et al. (2000) was followed (15). The process consisted of the following steps:

1. **Forward Translation:** The scale was translated from English into Turkish by two independent translators whose native language is Turkish and who hold translation competency certification. One translator had expertise in the healthcare field, while the other was selected from outside the field to prevent technical bias.

2. **Backward Translation:** The Turkish version was then translated back into English by two independent translators who were unaware of the original scale, allowing for the detection of conceptual discrepancies and meaning shifts.

3. **Expert Review:** The resulting translation was evaluated by a committee of 10 experts with experience in nursing and health sciences. The fields of expertise included surgical nursing, fundamentals and management in nursing, nursing education, pediatric nursing, public health, biomedical engineering, and simulation technologies. Experts were asked to evaluate each item using a scale of "1=Not Suitable, 2=Somewhat Suitable, 3=Quite Suitable, 4=Highly Suitable" (12,13). Based on the evaluations, the Content Validity Index (CVI) was calculated, and the value for all items was determined as 0.84.

4. **Language Accuracy:** The translation was reviewed by an expert in Turkish Language and Literature to ensure grammatical accuracy and fluency of Turkish expressions.

2.4 Pilot Application

The Turkish form of the scale was administered to 10 nursing students with simulation experience to test its comprehensibility. The students were asked to complete the scale following a simulation-based "patient safety in the operating room" scenario, and the statements were found to be clear, understandable, and culturally appropriate.

2.5 Reliability and Construct Validity Analyses

To test the reliability of the scale, the test–retest method was applied. Second-year nursing students were invited to participate (n=74), and they were asked to complete the scale after performing two pre-prepared scenarios in small groups prior to CRM training. This constituted the first test stage (n=152). Subsequently, the students completed their training under the supervision of instructors certified in CRM education and then performed two equivalent scenarios. The same students were again asked to complete the scale, forming the second dataset (n=187). A four-week interval was left between the test and retest applications.

For internal consistency, the Cronbach's Alpha coefficient and "Alpha if Item Deleted" values were calculated. Construct validity was examined using Rasch measurement theory, as this approach enables item-level evaluation of model fit and provides strong evidence for unidimensionality and construct validity through fit statistics such as infit and outfit mean square (MNSQ) values, person and item reliability indices, and separation statistics (16,17,18).

2.6 Ethical Approval

Ethics approval was obtained from the Acıbadem Mehmet Ali Aydınlar University Ethics Committee (2021-23/05), and written informed consent was obtained from all participating students.

Results

A total of 339 nursing students participated in the study. Of the participants, 90.3% (n=306) were female and 9.7% (n=33) were male. The mean age of the students was 20.08±0.45, with an age range of 19–24 years.

No statistically significant differences were found between test and retest scores for most scale items, including those related to team leadership, role sharing, communication, adherence to protocols, repetition of commands, management of disagreements, error-preventive behaviors, and requesting assistance during periods of high workload ($p > 0.05$).

However, statistically significant differences between test and retest measurements were observed for the items "Team members encourage each other to pay attention to clinical indicators" (p = 0.012) and "Team members seek preventive responses to errors or complications" (p = 0.019), as shown in Table 1.

The Cronbach's alpha value indicating the internal consistency of the scale was determined as 0.839, demonstrating that the scale is highly reliable.

Table 1. Comparison of Mayo High-Performance Teamwork Scale Items

Items		Test	Re-Test	*p*
1. The team leader is clearly recognized by all team members.	*Mean ± SD*	1,79±0,47	1,86±0,35	***0,153***
	Median (Q1–Q3)	2 (2-2)	2 (2-2)	
2. The team leader ensures an appropriate balance between command authority and team member participation.	*Mean ± SD*	1,74±0,51	1,74±0,44	***0,879***
	Median (Q1–Q3)	2 (2-2)	2 (1-2)	
3. Each team member clearly demonstrates that they understand their role.	*Mean ± SD*	1,67±0,57	1,68±0,48	***0,808***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
4. Team members encourage one another to pay attention to all important clinical indicators throughout the procedure/intervention.	*Mean ± SD*	1,71±0,50	1,84±0,39	***0,012****
	Median (Q1–Q3)	2 (1-2)	2 (2-2)	
5. While actively attending to the patient, team members verbalize their actions aloud.	*Mean ± SD*	1,62±0,55	1,64±0,52	***0,725***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
6. Team members repeat or rephrase instructions and explanations to indicate that they have heard them correctly.	*Mean ± SD*	1,56±0,62	1,49±0,57	***0,274***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
7. Team members refer to established protocols and checklists for the procedure/ intervention.	*Mean ± SD*	1,65±0,53	1,68±0,52	***0,676***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
8. All team members participate and engage appropriately in the procedure.	*Mean ± SD*	1,66±0,56	1,72±0,51	***0,311***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
9. Disagreements or conflicts among team members are addressed without losing situational awareness.	*Mean ± SD*	1,98±0,67	1,97±0,76	***0,904***
	Median (Q1–Q3)	2 (2-2)	2 (2-2)	
10. Roles are adjusted when necessary to address significant or urgent events	*Mean ± SD*	1,64±0,66	1,75±0,61	***0,095***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
11. When instructions are unclear, team members indicate that they do not understand and request repetition or clarification.	*Mean ± SD*	1,74±0,62	1,79±0,56	***0,391***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
12. Team members accept commands aimed at preventing, controlling, or clarifying errors with a positive attitude.	*Mean ± SD*	1,88±0,46	1,82±0,44	***0,245***
	Median (Q1–Q3)	2 (2-2)	2 (2-2)	
13. Team members draw attention to actions they believe may lead to errors or complications.	*Mean ± SD*	1,86±0,54	1,82±0,51	***0,399***
	Median (Q1–Q3)	2 (2-2)	2 (2-2)	
14. Team members seek responses to potential errors or complications by applying practices that prevent the error or complication.	*Mean ± SD*	1,87±0,61	1,74±0,52	***0,019****
	Median (Q1–Q3)	2 (2-2)	2 (1-2)	
15. If explanations aimed at preventing or controlling errors or complications are not helpful in resolving the issue, team members persist in seeking an appropriate response	*Mean ± SD*	1,73±0,73	1,64±0,64	***0,211***
	Median (Q1–Q3)	2 (1-2)	2 (1-2)	
16. Team members request assistance from one another before or during periods of high workload.	*Mean ± SD*	1,85±0,49	1,87±0,50	***0,648***
	Median (Q1–Q3)	2 (2-2)	2 (2-2)	

[a]Wilcoxon signed-rank test **p < 0,05*

The effects of the items forming the factor on reliability are presented in Table 2. Examination of the "Cronbach's Alpha if Item Deleted" values in the table shows that removing any item would not increase the reliability. In this context, the single-factor structure was preserved.

Table 2. Cronbach Alpha Coefficients of Mayo High Performance Teamwork Scale Items

Items	Mean	SD	*Cronbach's alpha*
1. The team leader is clearly recognized by all team members.	1,83	0,410	**0,826**
2. The team leader ensures an appropriate balance between command authority and team member participation.	1,74	0,472	**0,824**
3. Each team member clearly demonstrates that they understand their role.	1,67	0,523	**0,820**
4. Team members encourage one another to pay attention to all important clinical indicators throughout the procedure/intervention.	1,77	0,447	**0,825**
5. While actively attending to the patient, team members verbalize their actions aloud.	1,63	0,530	**0,835**
6. Team members repeat or rephrase instructions and explanations to indicate that they have heard them correctly.	1,52	0,593	**0,827**
7. Team members refer to established protocols and checklists for the procedure/intervention.	1,67	0,520	**0,825**
8. All team members participate and engage appropriately in the procedure.	1,69	0,529	**0,822**
9. Disagreements or conflicts among team members are addressed without losing situational awareness.	1,54	0,545	**0,834**
10. Roles are adjusted when necessary to address significant or urgent events	1,57	0,558	**0,827**
11. When instructions are unclear, team members indicate that they do not understand and request repetition or clarification.	1,64	0,521	**0,831**
12. Team members accept commands aimed at preventing, controlling, or clarifying errors with a positive attitude.	1,78	0,421	**0,826**
13. Team members draw attention to actions they believe may lead to errors or complications.	1,72	0,465	**0,828**
14. Team members seek responses to potential errors or complications by applying practices that prevent the error or complication.	1,67	0,491	**0,822**
15. If explanations aimed at preventing or controlling errors or complications are not helpful in resolving the issue, team members persist in seeking an appropriate response	1,49	0,551	**0,828**
16. Team members request assistance from one another before or during periods of high workload.	1,76	0,448	**0,826**
Total scale Cronbach's alpha			**0,839**

The Rasch analysis results for construct validity and the item descriptives for all participants are presented in Table 3. In our data, the floor effect (defined as those rated 0 = Never/Rarely) was small (range 0%–5%), whereas the ceiling effect (defined as those rated 2 = Consistently) was large for all 16 items (range 56%–84%). This indicates that participants generally gave positive ratings to team qualities (items 1–8) and responded adaptively to potentially negative events that may have occurred (items 9–16) (Table 3).

Table 3. Item Descriptives based on Participants' Ratings

Items	Mean ± SD	Skewness (SE)	Missing, n	N/A, n (%)	Floor, n (%)	Ceiling, n (%)
1. A leader is clearly recognized by all team members.	1.82±0.41	-2.23	0	0	4 (1.2)	284 (83.8)
2. The team leader assures maintenance of an appropriate balance between command authority and team member participation.	1.73±0.47	-1.50	0	0	5 (1.5)	255 (75.2)
3. Each team member demonstrates a clear understanding of his or her role.	1.68±0.52	-1.30	0	0	9 (2.6)	238 (70.2)
4. The team prompts each other to attend to all significant clinical indicators throughout the procedure/intervention.	1.77±0.45	-1.70	0	0	4 (1.2)	266 (78.5)
5. When team members are actively involved with the patient they verbalize their activities aloud.	1.63±0.53	-1.02	0	0	8 (2.4)	222 (65.5)
6. Team members repeat back or paraphrase instructions and clarifications to indicate that they heard them correctly.	1.52±0.59	-0.82	0	0	17 (5.0)	194 (57.2)
7. Team members refer to established protocols and checklists for the procedure/intervention.	1.66±0.52	-1.19	0	0	8 (2.4)	233 (68.7)
8. All members of the team are appropriately involved and participate in the activity.	1.68±0.53	-1.45	0	0	11 (3.2)	244 (72.0)
9. Disagreements or conflicts among team members are addressed without a loss of situation awareness.	1.69±0.54	-1.45	0	73 (21.5)	8 (3.0)	192 (72.2)
10. When appropriate, roles are shifted to address urgent or emergent events.	1.61±0.56	-1.04	0	22 (6.5)	11 (3.5)	203 (64.0)
11. When directions are unclear, team members acknowledge their lack of understanding and ask for repetition and clarification.	1.69±0.51	-1.30	0	21 (6.2)	7 (2.2)	225 (70.8)
12. Team members acknowledge—in a positive manner—statements directed at avoiding or containing errors or seeking clarification.	1.81±0.40	-1.73	0	12 (3.5)	1 (0.3)	266 (81.3)
13. Team members call attention to actions that they feel could cause errors or complications.	1.76±0.44	-1.45	0	21 (6.2)	2 (0.6)	244 (76.7)
14. Team members respond to potential errors or complications with procedures that avoid the error or complication.	1.71±0.47	-1.22	0	24 (7.1)	3 (1.0)	228 (72.4)
15. When statements directed at avoiding or containing errors or complications do not elicit a response to avoid or contain the error, team members persist in seeking a response	1.54±0.56	-0.67	0	34 (10.0)	9 (2.9)	173 (56.7)
16. Team members ask each other for assistance prior to or during periods of task overload.	1.80±0.42	-1.85	0	17 (5.0)	3 (0.9)	260 (80.8)

As presented in Table 4, the overall Rasch item reliability was 0.95, and the Rasch person reliability was 0.73. The separation index for items was 4.36, while the separation index for persons was 1.63. These results indicate strong confidence that participants with high scores on the Mayo High Performance Teamwork Scale truly possess higher levels of the latent trait, and that participants with low scores indeed possess lower levels of the latent trait.

Item–scale correlations presented in Table 5 ranged from 0.410 to 0.640, indicating that inter-item correlations were moderate to high. The item INFIT/OUTFIT mean square values (indicating how accurately or predictably the data fit the model) presented in Table 1 ranged from 0.77 to 1.31, suggesting that all items had values within the acceptable range required for a unidimensional measure and that they fit the Rasch model well.

Unidimensionality, examined using Principal Component Analysis of Residuals, showed that the first component explained 25% of the total variance, and the eigenvalue of the first contrast was <2.0 (1.82), indicating no evidence of multidimensionality of the scale.

The measures of item difficulty presented in Table 4 and Figure 1 showed that item 6 ("Team members repeat or rephrase instructions and explanations to indicate that they have heard them correctly.") is considered the most difficult item among all (logit 0.95), while item 12 ("Team members accept commands aimed at preventing, controlling, or clarifying errors with a positive attitude.") is the easiest item to agree upon for all participants (logit -1.25).

Based on these results, the scale was found to be valid and reliable, and its suitability for being grouped under a single factor was confirmed. The average score for the Mayo High Performance Teamwork Scale was 26.67±4.34.

Table 4. Rating Scale Model Item and Person Reliability Statistics

MAYO High Performance Teamwork Scale	Item Reliability	Item Separation	Person Reliability	Person Separation
	0.950	4.36	0.73	1.63

Table 5. Item Difficulty, Infit and Outfit Mean Squares (MNSQ) and Item-scale Correlations for Items of the Scale

Items	Difficulty (logits)	Infit MNSQ	Outfit MNSQ	Item-scale Correlations
1	-0.58	0.98	0.77	0.538
2	-0.22	0.92	0.82	0.581
3	0.27	0.87	0.80	0.640
4	-0.44	0.93	0.90	0.554
5	0.30	1.22	1.31	0.410
6	**0.95 (most)**	1.06	1.04	0.550
7	0.23	0.98	0.72	0.563
8	0.36	0.91	0.93	0.610
9	0.49	1.18	1.25	0.445
10	0.62	1.03	0.96	0.545
11	0.19	1.13	1.17	0.467
12	**-1.25 (least)**	0.92	0.92	0.548
13	-0.69	0.99	0.97	0.517
14	-0.34	0.87	0.84	0.608
15	0.69	1.02	1.03	0.533
16	-0.57	0.95	0.90	0.545

MNSQ: mean square error

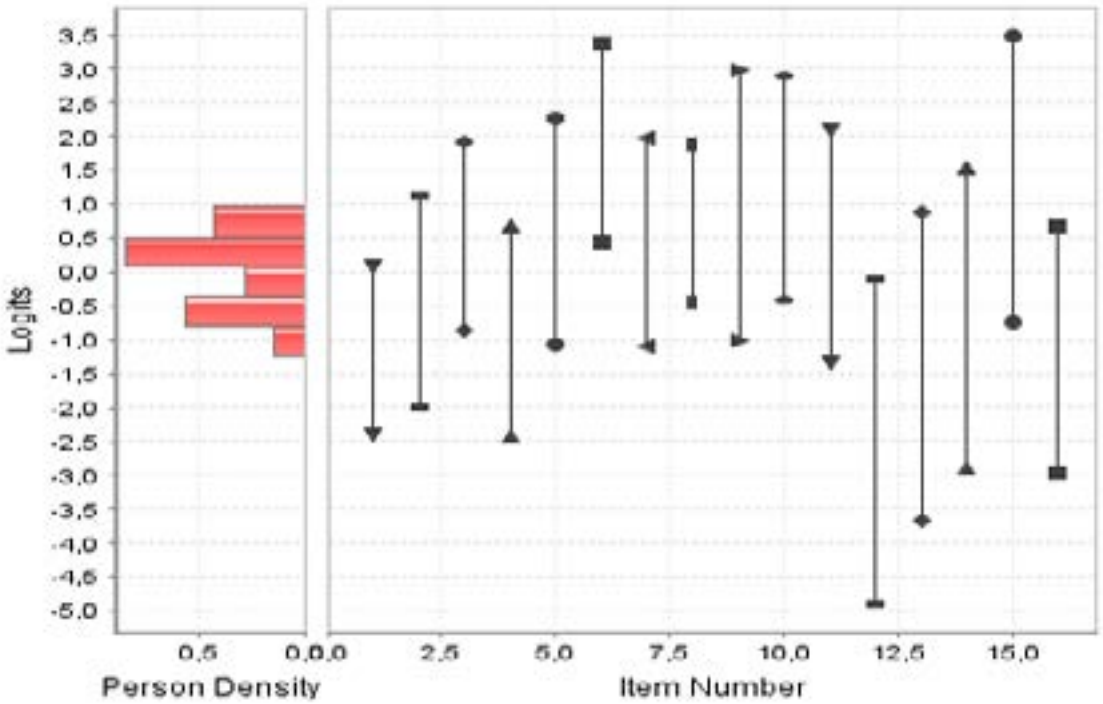

Figure 1. Person-Map Item map. The vertical scale shows the logit scale of item difficulty and person ability.

Discussion

Surgical nursing is one of the fields in which multidisciplinary teamwork is most intensively experienced. In the operating room environment, patient safety is directly associated not only with technical skills but also with non-technical skills such as communication, leadership, role sharing, and situational awareness. The literature shows that a large proportion of events that threaten patient safety arise from communication breakdowns and inadequate coordination among team members (1,2,19). Therefore, assessing and improving team performance is critically important in surgical nursing education.

The Mayo High Performance Teamwork Scale (MHPTS) was developed to evaluate team performance in Crisis Resource Management (CRM)-based training and has begun to be widely used in simulation training due to its brief and practical structure (3). In the original study, the scale was reported to have high internal consistency (Cronbach's alpha = 0.85), and Rasch analysis findings supported the validity of the scale (11,16,17,18).

Adaptations of the MHPTS conducted in different cultures indicate that the scale is a valid tool internationally. In the Brazilian adaptation, content validity indices were found to range between 0.90 and 1.00, and the scale was successfully applied in simulation-based learning experiences (12). In the Canadian French adaptation, the internal consistency coefficient was reported as $\alpha = 0.74$, demonstrating its usability, particularly for measuring non-technical skills among nursing students (13). In the Spanish adaptation, linguistic and cultural equivalence were established, although psychometric findings were reported to a limited extent (12,20).

Consistent with these findings, previous studies indicate that simulation-based learning experiences have a strong effect on improving non-technical skills. Research in intensive care and surgical nursing has shown that CRM and similar training approaches significantly enhance communication, team cohesion, error awareness, and crisis management skills (21,22). Additionally, ultra-high-fidelity simulations have been shown to strengthen leadership and collaboration behaviors among nurses, thereby directly supporting patient safety (23).

MHPTS is easily understood and administered by students due to its simple three-point Likert scoring structure. However, some studies note that the limited scoring range may constrain the sensitivity of the scale in detecting change (24). The relatively high ceiling effects observed in this study may be partly explained by the structured nature of simulation-based training and the generally positive teamwork behaviors demonstrated by students in controlled educational settings. While ceiling effects may limit sensitivity to detect small changes over time, the Rasch model fit indices and unidimensionality results indicate that the scale remains suitable for assessing overall teamwork performance in simulation-based learning contexts. Nonetheless, the scale systematically evaluates teamwork behaviors among surgical nursing students, making it a valuable tool for assessing the effectiveness of training programs.

In conclusion, the Turkish adaptation of the MHPTS contributes to the evaluation of non-technical skills in simulation-based learning experiences among surgical nursing students. The scale demonstrates consistency with both the original study and adaptations conducted in different cultures. It is considered that this adaptation will help enhance the culture of patient safety in surgical nursing education and support internationally comparable research.

Conclusion

In surgical nursing education, patient safety depends not only on the development of clinical skills but also on the enhancement of non-technical skills such as intra-team communication, leadership, role sharing, and error awareness. The Turkish adaptation of the Mayo High Performance Teamwork Scale (MHPTS) enables these skills to be evaluated systematically and reliably within simulation-based learning experiences. The scale demonstrates results consistent with the psychometric findings reported in international adaptations and supports its usability in assessing team performance among surgical nursing students.

The Turkish version of MHPTS is a valuable tool for evaluating the effectiveness of training programs, identifying the strengths and weaknesses of students and healthcare professionals in teamwork, and contributing to the development of a patient safety culture. In the field of surgical nursing, the use of this scale is expected to facilitate more objective monitoring of team-based learning processes and provide a strong foundation for future research.

Declarations

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Conflicts of interest

The authors declare that there is no conflict of interest in this study.

Availability of data and material

The datasets generated and/or analyzed during the current study are available from the corresponding author upon request.

Authors' contributions

Motivation / Concept: N.O., Ü.K.
Study Design: N.O.
Control / Supervision: V.Ü., A.Ö.
Data Collection and/or Processing: N.O.
Analysis and/or Interpretation: V.Ü.
Literature Review: N.O., Ü.K.
Manuscript Writing: N.O., V.Ü.
Critical Review: Ü.K., A.Ö.

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