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ORIGINAL ARTICLE

Validity and Reliability Study of the Turkish Version of the Leading a Culture of Quality for Infection Prevention Scale: A Methodological Study

Gul Hatice Tarakcioglu Celik[1], Seher Basaran-Acil[2], Hanife Avci[3], Vicdan Itisgen[4], Dilek Gokcek[4], Cumhur Artuk[4]

[1]Department of Fundamentals of Nursing, Hacettepe University Faculty of Nursing, Ankara, Türkiye
[2]Department of Nursing Management, Hacettepe University Faculty of Nursing, Ankara, Türkiye
[3]Department of Biostatistics, Hacettepe University Faculty of Medicine, Ankara, Türkiye
[4]Ankara Gulhane Training and Research Hospital, University of Health Science, Ankara, Türkiye
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Abstract

Objective: This study aims to determine the Turkish validity-reliability study of the "Leading a Culture of Quality for Infection Prevention" (LCQ-IP) for nurses and nurse managers.

Methods: This methodological design study was conducted with nurses and nurse managers (n = 210) in a university training-research hospital in Ankara between February and August 2024. Sociodemographic Characteristics Form and the Turkish version of LCQ-IP (LCQ-IP-TR) scale were used to collect data. Validity (language, content, etc.) and reliability of LCQ-IP were evaluated.

Results: The Content Validity Index was determined as .96. The Kaiser–Meyer–Olkin value was found to be .944. Items 4, 15, and 16 were removed from the scale because the distribution properties disrupted the structure, and the number of items decreased from 19 to 16. Items 13 and 14 were located under the subdimension of psychological safety, and item 9 was located under the subdimension of improvement orientation, unlike the original scale. The supportive work environment subdimension was removed from the Turkish version. For the confirmatory factor analysis model of the scale, the fit index values were calculated as $\chi^{2/df}$ = 1.694, G-oodness-ofFit Index = .922, Normed Fit Index = .944, Comparative Fit Index = .976, root mean square error of approximation = .058, and root mean square residual = .050. The Cronbach's alpha of the total scale was .952.

Conclusion: The LCQ-IP-TR scale is a valid and reliable instrument with 16 items and 3 subdimensions, showing strong psychometric qualities. Its reliability and validity make it a helpful tool for assessing and also developing infection prevention and control practices, which support high-quality patient care and ensure patients are safe at the end.

Keywords: Infection prevention and control, leadership, quality culture, reliability, validity

Introduction

Healthcare-associated infections (HAIs), which occur in 1 in every 30 patients treated in hospitals (3%), are a patient safety issue.[1] Every year, millions of people are faced with complications such as prolonged hospitalization, increased mortality, and costs due to the infections they catch while receiving care and treatment services in a health institution. The quality of care decreases, and there is a threat to care safety.[2-4] These infections affect not only the patient and their family but also other patients who benefit from healthcare services, healthcare professionals, and institutions that provide the service; they can lead to loss of labor, time, and cost. One of the goals (Goal 7) determined by Joint Commission International, an organization that often comes to mind when improving the quality of healthcare services and patient safety, is to prevent HAIs.[5] As stated in this goal, nurses and nursing managers who are responsible for implementing and maintaining nursing care have important roles in preventing harm that may arise due to HAIs.[6,7]

According to the World Health Organization, at the 2022 World Health Assembly, it was reported that 7 out of every 100 patients receiving acute care services in high-income countries and 15 in low- and middle-income countries develop at least 1 hospital-acquired infection during their hospital stay. This leads to costs that make up 4%-6% of recurring health expenses, totaling $6.5-9.6 billion, especially in

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Corresponding Author:
Gul Hatice Tarakcioglu Celik, E-mail: gultarakcioglu@hacettepe.edu.tr

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underdeveloped countries. In the call made to the member countries at the same meeting, it was emphasized that steps should be taken for sustainable infection prevention and control (IPC) in all health facilities , that the programs to be established should prioritize the quality of care and patient safety, that participation at the managerial level is important to maintain and improve the implementation of the programs, that policies should be established, and guidance should be provided on the use of good practice examples for IPC requirements.[8]

In this country, infection control programs for HAIs are implemented by infection control committees established in all inpatient treatment institutions by the regulation published on August 11, 2005.[9] In addition, one of the National Patient Safety (2023) goals is "Combating HAIs."[10] In this sense, HAIs have been addressed as a national patient safety problem under the "Prevention and Control of Infections" title in the Health Quality Standards (HQS) (version 6.1), one of the guidelines published by the Ministry of Health. These practices and regulations show that HAIs are one of the most important quality indicators that should be emphasized and developed in the country's healthcare system.[11]

Quality culture in IPC is closely tied to an infection prevention climate. This concept originated from the goal of eliminating infections worldwide in healthcare. An infection prevention climate can be described as the shared understanding among healthcare professionals about IPC within their hospitals.[12] With the increasing prevalence of HAI worldwide, climate change in IPC is affecting the quality of patient care.[13] While every unit and healthcare professional in the hospital is responsible for combating infections, nurses and nursing manager leaders are expected to lead healthcare professionals. Leadership plays an important role in IPC activities, and successful leaders have been reported to be effective in adopting behaviors aimed at preventing HAI.[14]

Leading quality is primarily the responsibility of managers, but quality in institutions can be achieved with the participation of all employees. Nurses are health professionals who make the most important contributions to quality studies in healthcare institutions, and they also lead quality studies specifically for HAIs. In this sense, they are important in developing a quality culture and creating an infection prevention climate to prevent HAIs in the country. It is known that nurses have a significant effect on the infection prevention climate. To determine the current situation and to provide a measurement tool that can be used in this field in the country's literature, a Turkish validity and reliability study of the Leading a Culture of Quality for Infection Prevention (LCQ-IP) will be conducted.

Main Points

- Registered nurses play a crucial role in developing a quality culture and promoting an environment that prevents hospital-acquired infections.
- The LCQ-IP-TR scale is a reliable and valid tool for evaluating and enhancing quality culture in infection prevention, a crucial aspect of patient safety and quality healthcare delivery.
- The LCQ-IP-TR scale can be used for enhancing infection prevention and control programs, conducting cross-cultural research, supporting evidence-based practices, and ultimately improving healthcare outcomes.

Materials and Methods

Study Design and Sample

This methodological design study was conducted in a university training and research hospital between February and August 2024. The study's population consists of nurses/manager nurses working in units where inpatient clinics are provided. In psychometric studies of scale adaptations, the sample size recommended for factor analysis is at least 5 to 15 times the total number of scale items.[15,16] For this study, the sample size was set at 190 people, based on ten times the number of items. However, to account for potential data loss, the sample size increased by nearly 10% to 210 individuals. The study did not include participants who did not have the title of nurse/manager nurse, who worked in units providing outpatient clinic services, or who had worked in clinics/units providing inpatient services for less than 6 months.

Data Collection

The data collection form consists of 2 parts. The first part includes sociodemographic characteristics of nurses. The second part consists of the LCQ-IP Scale, which was modified by performing psychometric analyses by Pogorzelska-Maziarz et al[17] in 2016.

Leading a Culture of Quality for Infection Prevention consists of 19 items with a 5-point Likert scale that includes actions taken to lead the quality culture of hospitals, especially regarding IPC. Here, 1 means "strongly agree" and 5 means "strongly disagree"; only in the responses to item 15 is 1 rated as "never" and 5 as "very often." Item 16 is reverse-coded. The measurement tool has 4 subdimensions: psychological safety, prioritization of quality, supportive work environment, and improvement orientation. Original scale subdimension Cronbach's α values are respectively: .883 for psychological safety, .840 for prioritization of quality, .767 for supportive work environment, and .724 for improvement orientation. In contrast, the Cronbach's α value for the total measurement tool is .926.[17]

Statistical Analyses

Analyses were performed using the free and open-source software R (version 4.4.1, https://cran.r-project.org), SPSS for Windows Version 23.0 statistical package (Chicago, IL), and AMOS-23 by an academic biostatistician. The normal distribution assumption of numerical variables was examined with the Kolmogorov–Smirnov goodness-of-fit test and Q-Q plot graphics. The reliability (internal consistency, test–retest reliability) and validity (structural) of LCQ-IP (19 items) were assessed. The intraclass correlation coefficient (ICC) value was utilized to evaluate test–retest reliability. The ICC ranges from .00 to 1.00, with values between .60 and .80 indicating good reliability, while values above .80 suggest

excellent reliability. The ICC and Bland–Altman graphical approach to "BlandAltmanLeh"[18] and "ggplot2"[19] packages were used to evaluate the agreement. Internal consistency is related to whether the measurement of a result is homogeneous. Cronbach's alpha was utilized for internal consistency, indicating high internal consistency when the value exceeds .894. Spearman's correlation coefficient was employed to assess test–retest reliability. Reliability coefficients were graded as follows: $r \geq .81$-1.0 excellent, .61-.80 very good, .41-.60 good, .21-.40 moderate, 0-.21 poor.[20] Item analysis was conducted to calculate the item-total score correlation coefficient, assessing how the individual items contributed to the overall scale score and determining the extent of their relationship to the entire scale. After completing the item analysis, the Kaiser–Meyer–Olkin (KMO) coefficient was calculated to assess sample adequacy and determine whether the 16-item scale exhibited a factorial structure. Next, the Bartlett Sphericity Test was applied to evaluate if the correlation matrix was appropriate for factor analysis. Finally, the determinant of the correlation matrix was examined. According to the Tukey Nonadditivity test result, it was concluded that the scale was suitable for obtaining the total score because the statistical *P*-value was <.05. Content validity was assessed using the Davis method based on expert evaluations. As a result of expert ratings, the overall Content Validity Index (CVI) for all items was calculated as .96, indicating a high level of content validity across the scale. To assess construct validity, an explanatory factor analysis (EFA) was initially conducted using the Varimax rotation method to identify the underlying factor structure. Subsequently, a confirmatory factor analysis (CFA) was performed to evaluate the fit of the proposed model. Overall, model fit was evaluated using several fit indices. The chi-square Statistic (χ^2), comparative fit index (CFI), root mean square error of approximation (RMSEA), Goodness of Fit Index (GFI), Normed Fit Index (NFI), Tucker–Lewis Index (TLI), Incremental Fit Index (IFI), and root mean square residual (RMR) were evaluated. The significance value was set at a two-tailed *P*-value of <.05.

Ethical Considerations

Ethical approval was taken from the Hacettepe University Social Sciences and Humanities Research Ethics Board (Approval no: E-66777842-300-00003204323; Date: November 14, 2023) and necessary institutional permission from the hospital's Health Practice and Research Center Education Planning Board (Date: December 27, 2023; ID: E-50687469-779-233347483). Permission was obtained from the authors who developed the measurement tool for the Turkish validity and reliability study. Written consent of the participants was obtained.

Results

Demographic Findings of the Nurses

The median age of the nurses participating in the study was 30 years, 89.0% were female, and 73.8% had a bachelor's degree. The median of the total working experience was 3.05 years, and only 12.9% of them were working as nurse managers (Table 1).

Table 1.
Demographic Characteristics of Nurses

Characteristics	Participants* (n = 210)	
Age (years)	30 (27-39)	22-54 years
Total working experience	3.05 (1.60-5.20)	11 months to 35 years
	n	**%**
Gender		
Female	187	89.0
Male	23	11.0
Nursing education		
High school	16	7.6
Associate's degree	16	7.6
Bachelor's degree	155	73.8
Postgraduate degree	23	11.0
Position		
Nurse	183	87.1
Nurse manager	27	12.9

*Data are presented with median (25th-75th percentile) or frequency (percent) descriptive statistics.

Adaptation Phase of Leading a Culture of Quality for Infection Prevention

Translation/Back Translation, Content, and Face Validity

The International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guide was used for the language equivalence study.[21] For this purpose, the scale was first translated from English to Turkish by 3 nurse academicians, all with PhD degrees, who were fluent in English and specialized in Fundamentals of Nursing, Nursing Management, and Obstetrics and Gynecology Nursing. The first Turkish document was created by the authors. The scale was then presented to a Turkish Language and Literature expert for evaluation regarding its conformity with Turkish language structure and grammar. Three faculty members, all with PhD degrees, who were fluent in English and specialized in Fundamentals of Nursing and Nursing Management, then translated it back into English. The re-translated English document was created by the authors. The back-translated English form was shared with the original authors, and their permission was obtained.

Then, content validity analyses of the scale were performed. For the content validity study, the items of the scale were evaluated by a total of 10 experts, including 5 faculty members who work in the field of nursing and also have studies in the field of Infection Control Nursing and 5 specialist nurses working in the clinic, using the content validty index (CVI) .[22] The experts evaluated the initial version of LCQ-IP using a CVI by rating each item from 1 to 4, wherein 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant but requires minor alteration, and 4 = very relevant. In evaluating the opinions from experts, the content validity rate (CVR) for each item was calculated (varying between 1.00 and .85), and the CVI was determined as .96 by taking the average of the calculated CVRs.

The pre-final version of LCQ-IP was presented to the scale's authors, and after their approval, it was ready for the face

validity study. Face validity was used to detect misinterpretations and improve the LCQ-IP items. A sample of 10 nurses from the infection control committees was invited to respond to the LCQ-IP. The nurses who voluntarily participated in this phase of the study were not added to the psychometric test. The participants were asked to evaluate items and give suggestions for clarity and comprehensibility in Turkish. This translated LCQ-IP was accepted as the final version.

Psychometric Testing of Leading a Culture of Quality for Infection Prevention

Validity

In order to examine the factor structure, the KMO value was found to be .944. According to the result of Bartlett's sphericity test, variables and data were found suitable for factor analysis ($P < .001$). When the frequency distributions of the items were examined, it was observed that the distribution properties of item numbers 4, 15, and 16 disrupted the structure. Therefore, these items were removed from the scale, and the number of items decreased from 19 to 16 (Table 2).

After obtaining permission from the original scale authors, explanatory and confirmatory factor analyses were conducted. First, the "Principal Components Technique," an EFA technique, was used to determine how many factors the 16 items were grouped under. As a factor rotation method, the Varimax rotation method was used. During the factor analysis, factors with eigenvalues greater than 1 were found. After this analysis, it was determined that a 3-factor structure emerged, and the explained variance rates were 70.80% of the total variability (Table 3). While item 14 was located under the subdimension of psychological safety (F1), item 9 was located under the subdimension of improvement orientation (F3), and item 13 was located under the subdimension of psychological safety (F1), unlike the original scale (Table 3). The scree plot graph showing the factors is given in Figure 1.

The conceptual 4-factor structure[17] was fitted to the modeling data (n = 210), and the fit measures were provided (Final model in Table 4, Figures 2 and 3). Considering the modification indices given in Table 4, it was concluded that the values are at an acceptable level in terms of the fit of the measurement model. As a result, a valid scale structure consisting of 16 items and 3 subdimensions was confirmed.

Reliability

The internal consistency of the LCQ-IP was assessed using Cronbach's alpha, and values higher than 0.60 were acceptable. The test–retest reliability was checked after 2 weeks using ICCs with 50 participants.[23] The findings of the reliability analysis are presented in Table 5. The total scale demonstrated excellent internal consistency with a Cronbach's alpha of .952. Subscale reliability coefficients were also high, ranging from .792 (F3: improvement orientation) to .932 (F1: psychological safety). The ICC for the subscales ranged between .790 and .924, indicating strong test–retest reliability. Furthermore, the Spearman correlation coefficients (r) were high and statistically significant ($P < .001$), supporting the internal consistency and structural coherence of each subscale (Table 5, Figure 4).

Table 2.
Item Analysis Results

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item - Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I1	58.07	183.88	.723	.694	.949
I2	58.25	184.77	.642	.638	.951
I3	58.54	184.10	.669	.602	.950
I4	**70.41**	**254.43**	**.602**	**.640**	**.903**
I5	58.13	186.95	.666	.558	.950
I6	58.23	182.09	.785	.739	.948
I7	58.59	183.95	.707	.611	.949
I8	58.21	181.08	.779	.666	.948
I9	58.42	182.02	.721	.610	.949
I10	58.26	188.94	.619	.471	.951
I11	58.34	183.30	.715	.574	.949
I12	58.24	182.46	.729	.612	.949
I13	58.16	182.77	.782	.667	.948
I14	58.04	183.45	.756	.669	.948
I15	**69.34**	**239.75**	**.242**	**.118**	**.944**
I16	**70.46**	**270.87**	**.141**	**.195**	**.915**
I17	58.06	181.56	.808	.740	.947
I18	58.47	181.44	.734	.667	.949
I19	58.42	182.49	.768	.695	.948

Table 3.
Transformed Components Matrix After Explanatory Factor Analysis

Items	F1	F2	F3
I1		.798	
I2		.823	
I3		.684	
I5		.630	
I6		.694	
I7	.543		
I8	.622		
I9			.618
I10			.754
I11			.621
I12	.709		
I13	.540		
I14	757		
I17	.816		
I18	.739		
I19	.635		

F1, psychological safety; F2, prioritization of quality; F3, improvement orientation.

Discussion

The culture of quality is crucial for IPC as it influences practices and varies across countries, specialties, and healthcare organizations. It enhances compliance and reduces infections, improves patient and staff safety, supports effective IPC strategies, facilitates continuous improvement, encourages staff engagement and education, and addresses organizational and cultural factors.[24-26] Strong leadership support is crucial for fostering a positive IPC culture, and leadership attention positively affects continuous improvement in IPC practices.[27] The LCQ-IP scale is designed to measure the culture of quality in IPC within healthcare organizations and has been translated and validated in multiple languages, including Arabic,[28] Chinese,[29] and Russian,[30] demonstrating good reliability and validity across different cultural contexts. Its application across different countries and healthcare environments highlights its versatility and importance in promoting patient safety and IPC practices. This study was conducted with 210 nurses in order to adapt the LCQ-IP scale to Turkish and to examine its psychometric properties. The Turkish version of the LCQ-IP scale (LCQ-IP-TR) consists of a total of 16 items and 3 subdimensions (See Table 3 and Figure 3) (Supplementary Material).

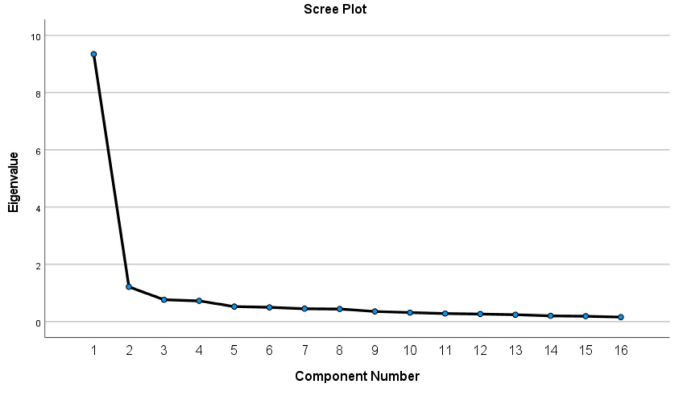


Figure 1.
Scree plot from explanatory factor analysis.

The KMO index was .944, whereas the Bartlett's test of sphericity was statistically significant ($P < .001$). These values imply that the sample size was adequate for exploratory factor analysis and the factor model was appropriate. The analysis supported a 3-factor solution for the scale with a cumulative percentage of variance of 70.80%. This explained variance was higher than the explained variance of the original (58.80%),[17] Russian (69.80%),[30] and the Arabic version (70.70%)[28] of the scale. Three items were deleted because of low factor loadings; these were items 4, 15, and 16, leaving 16 items across 3 factors. Three items were located under the subdimensions different from the original scale; these were items 14 and 13 (F1: psychological safety), item 9 (F3: improvement orientation). Therefore, the final dimensions of the scale followed as: Factor 1: psychological safety (7, 8, 12, 13, 14, 17, 18, and 19; factor loading = .543-.816); Factor 2: prioritization of quality (1, 2, 3, 5, and 6; factor loading = .630-.823); Factor 3: improvement orientation (9, 10, and 11; factor loading = .618-.754).

The phrase "item 4-Senior leadership here has created an environment that enables changes to be made" in the original scale was not included in the Turkish version. In institutions, employees should have responsibilities as much as managers in patient safety culture and IPC.[31] However, of course, leaders are needed in the creation, development, and supervision of these processes.[32] Leaders are expected to improve processes through employee involvement. Since IPC and related processes are addressed within the framework of the HQS (Version 6.1)[11] and Health Accreditation Standards (v3.0/2021)[33] in Türkiye, employee involvement may be limited. Since employees cannot use their safety voices based on their own knowledge and experience about the processes, they may not have seen field-specific leaders and leadership as participatory.

The original scale's item 15 ("The quality of work suffers because of the amount of work staff are expected to do") and item 16 ("Most people in this organization are so busy that they have very little time to devote to infection prevention efforts") statements were not included in the Turkish version. The IPC is a basic practice in providing health care services and nursing care within the framework of the ethical principles of "doing no harm while doing good" to the patient. In this sense, institution managers should monitor employees' compliance with IPC principles, and the reasons for non-compliance should be investigated with qualitative and quantitative methods. Nurses and managers/nurse managers are expected to walk hand in hand on this path.

In this study, CFA was used to evaluate model fit. A CFI, GFI, NFI, TLI, and IFI close to 1; an RMSEA and RMR less than .08, and a $\chi^{2/df}$ value less than 3 at the adjusted model indicate

Table 4.
Confirmatory Factor Analysis Results

Parameter	Abbreviation	Acceptable Range	Initial Model	Final Adjusted Model
Chi-square Fit Test	CMIN/*df*	2 ≤ CMIN/*df* ≤ 3	3.035	1.694
Comparative Fit Index	CFI	.95 ≤ CFI ≤ .97	.916	.976
Goodness-of-Fit Index	GFI	.85 ≤ GFI ≤ .90	.838	.922
Normed Fit Index	NFI	.90 ≤ NFI ≤ .95	.881	.944
Tucker–Lewis Index	TLI	TLI ≥ .95	.901	.966
Incremental Fit Index	IFI	.90 ≤ IFI ≤ .95	.917	.976
Root mean square error of approximation	RMSEA	.05 ≤ RMSEA ≤ .08	.099	.058
Root mean square residual	RMR	.05 ≤ RMR ≤ .08	.068	.050

that all items are appropriately distributed in the 3 subdimensions and contribute significantly to the total score of the measurement tool.[34] These results show that there is a sufficient model fit between the original model and the sample data of this study, providing sufficient evidence for the construct validity of the Turkish version of the LCQ-IP scale.

The scale's overall Cronbach's alpha is .952, with a range of .792 to .932 for its 3 subscales. According to Alpar,[23] a criterion of .60 or above indicates acceptable internal consistency. This result is higher than that of previous studies that performed the psychometric evaluation of the same instrument and reported similar good internal consistency reliability. The Chinese version showed a high Cronbach's alpha coefficient of .931, indicating excellent internal consistency.[29] In the Russian version of the scale,[30] the scale's overall Cronbach's alpha was found to be .909, with a range of .809 to .921 for its 4 subscales. The computed Cronbach's alpha of the scale was .89 for the Arabic version.[28] Thus, the LCQ-IP-TR exhibits excellent internal consistency.

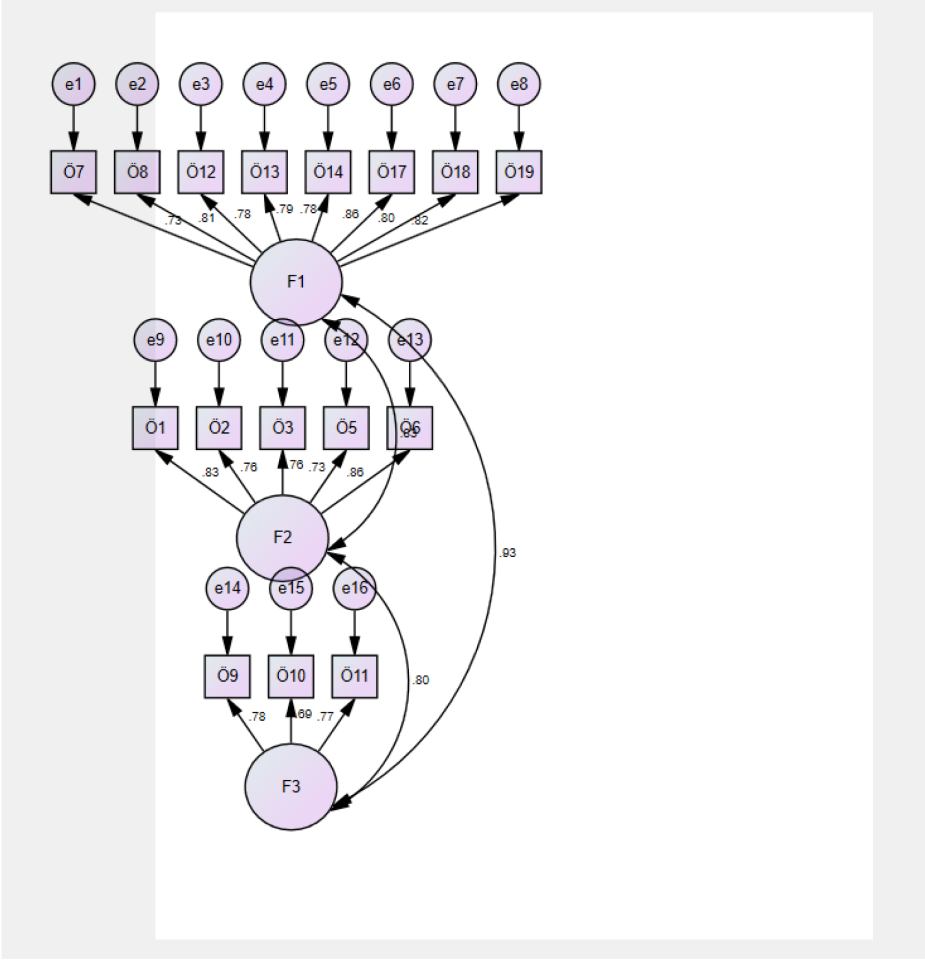


Figure 2.
Diagram of confirmatory factor analysis (initial model).

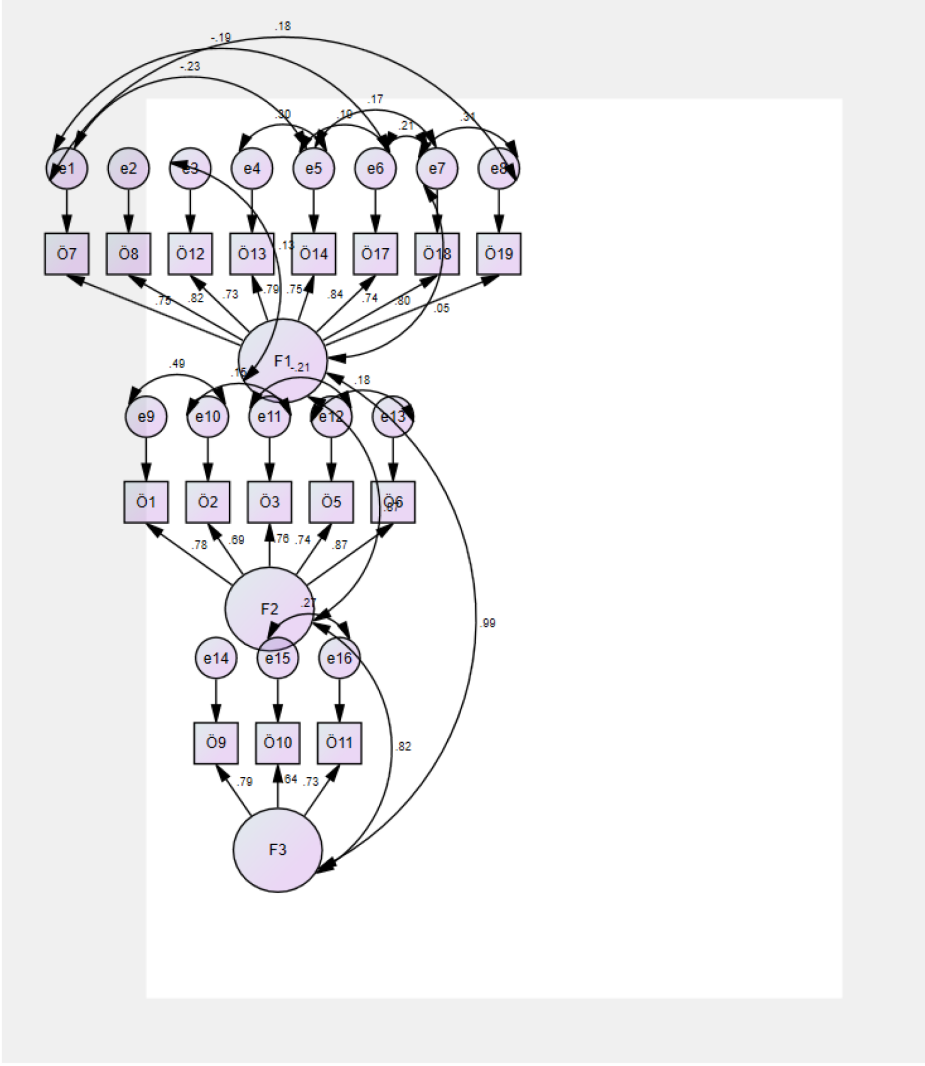


Figure 3.
Diagram of confirmatory factor analysis (final adjusted model).

LCQ-IP-TR's validated structure makes it an effective instrument for assessing and improving the IPC climate. Hospital and nursing management can use the LCQ-IP-TR scale to reflect on their organizational climate and make necessary adjustments to improve IPC initiatives and patient safety strategies. Emphasizing the components of the LCQ-IP scale in training programs can enhance the competency of infection preventionists and support the development of a robust IPC culture. The LCQ-IP-TR scale offers a comprehensive framework for assessing the effectiveness of IPC policies by emphasizing implementation, staff engagement, psychological safety, quality focus, continuous improvement, and outcomes. Using this scale helps researchers and managers compare their IPC practices with the world or other healthcare institutions. Also, healthcare organizations can identify their strengths and weaknesses in infection prevention and make informed decisions to improve their policies.

Table 5.
Findings on Reliability Analysis

Factor	Cronbach's Alpha	ICC (95% CI)	r_s	*P*
F1	.932	.836 (.728-.904)	.778	<.001
F2	.889	.924 (.869-.956)	.755	<.001
F3	.792	.790 (.657-.875)	.703	<.001
Total scale	.952	.889 (.813-.936)	.755	<.001

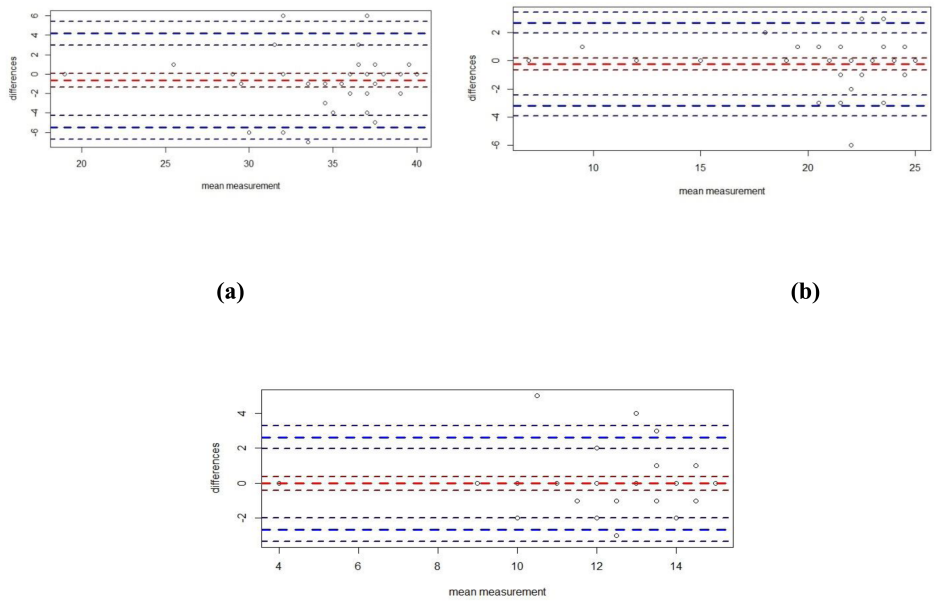
F1, psychological safety; F2, prioritization of quality; F3, improvement orientation; ICC, intraclass correlation coefficient.

Study Limitations

The current study has some limitations. First, data were collected from a single location. Second, the results of this study were based on self-reported data.

Conclusion

Studying the validity and reliability of the LCQ-IP scale is essential for ensuring accurate measurement, enhancing infection prevention programs, facilitating cross-cultural research, supporting evidence-based practices, and ultimately improving healthcare outcomes. The LCQ-IP-TR scale



(a) (b)

(c)

Figure 4.
(a) Psychological safety (F1). (b) Prioritization of quality (F2). (c)Improvement orientation (F3).

is titled "Enfeksiyon Önleme ve Kontrolünde Kalite Kültürüne Liderlik (Leading a Culture of Quality for Infection Prevention and Control)" with the permission of the developer(s) of the original scale.

LCQ-IP-TR is a valid and reliable tool that can be used to assess and improve quality culture in infection prevention, which is critical for patient safety and effective healthcare delivery. This scale could have significant implications for both clinical practice and future research. The future results from the LCQ-IP-TR scale can be utilized to give feedback to healthcare workers, promoting a supportive environment and encouraging ongoing improvement. The scale can be integrated into regular clinical assessments to consistently monitor and improve IPC efforts. This continuous review supports maintaining high-quality care and allows for root cause analysis of infection and solving the problem.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethical committee approval was received from the Ethics Committee of Hacettepe University Social Sciences and Humanities Researches Ethics Board (Approval No: E-66777842-300-00003204323; Date: November 14, 2023).

Informed Consent: Written informed consent was obtained from the nurses who agreed to take part in the study.

Peer-review: Externally peer-reviewed.

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Declaration of Interests: The authors have no conflicts of interest to declare.

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References

1. Centers For Disease Control And Prevention (CDC). Healthcare associated infections (HAIs): data portal 2021. Accessed September 02, 2022. https://www.cdc.gov/healthcare-associated-infections/php/data/?CDC_AAref_Val=https://www.cdc.gov/hai/data/portal/index.html.
2. Gidey K, Gidey MT, Hailu BY, et al. Clinical and economic burden of healthcare-associated infections: A prospective cohort study. *PLOS One*. 2023;*18*(2):e0282141. [CrossRef]
3. Manoukian S, Stewart S, Graves N, et al. Bed-days and costs associated with the inpatient burden of healthcare-associated infection in the UK. *J Hosp Infect*. 2021;*114*:43-50. [CrossRef]
4. Stewart S, Robertson C, Pan J, et al. Impact of healthcare-associated infection on length of stay. *J Hosp Infect*. 2021;*114*:23-31. [CrossRef]
5. JCI. Hospital. National Patient Safety Goals 2023. Accessed May 22, 2023. https://www.jointcommission.org/-/media/tjc/documents/standards/national-patientsafety-goals/2023/npsg_chapter_hap_jul2023.pdf.
6. Vollman K, Garcia R, Miller L. Interventional patient hygiene: proactive (hygiene) strategies to improve patients' outcomes. ACCN News. 2005;22(8):12-16..
7. Vollman KM. Interventional patient hygiene: discussion of the issues and a proposed model for implementation of the nursing care basics. *Intensive Crit Care Nurs*. 2013;*29*(5):250-255. [CrossRef]

8. World Health Organization (WHO). Global strategy on infection prevention and control. Accessed May 22, 2023. https://www.who.int/news/item/28-05-2022-seventy-fifth-world-health-assembly—-daily-update—28-may-2022
9. TC Sağlık Bakanlığı. Yataklı Tedavi Kurumları Enfeksiyon Kontrol Yönetmeliği. Accessed September 22, 2024. https://www.resmigazete.gov.tr/eskiler/2005/08/20050811-6.htm.
10. Sağlık Hizmetleri Genel Müdürlüğü, Sağlıkta Kalite, Akreditasyon ve Çalışan Hakları Daire Başkanlığı. Sağlık Hizmetleri ile İlişkili Enfeksiyonlar ile Mücadele. Accessed September 22, 2024. https://shgmkalitedb.saglik.gov.tr/TR-105685/saglik-hizmeti-iliskili-enfeksiyonlarla-mucadele.html.
11. Sağlık Hizmetleri Genel Müdürlüğü, Sağlıkta Kalite, Akreditasyon ve Çalışan Hakları Daire Başkanlığı. SKS Hastane (sürüm 6.1). Accessec May 20, 2023. https://dosyamerkez.saglik.gov.tr/Eklenti/41258/0/skshastane-seti-s-61—09082021pdf.pdf.
12. Gershon RR, Stone PW, Zeltser M, et al. Organizational climate and nurse health outcomes in the United States: a systematic review. *Ind Health*. 2007;*45*(5):622-636. [CrossRef]
13. Tumala RB, Almazan J, Alabdulaziz H, et al. Assessment of nursing students perceptions of their training hospital's infection prevention climate: a multi-university study in Saudi Arabia. *Nurse Educ Today*. 2019;*81*:72-77. [CrossRef]
14. Saint S, Kowalski CP, Banaszak-Holl J, et al. The importance of leadership in preventing healthcare-associated infection: results of a multisite qualitative study. *Infect Control Hosp Epidemiol*. 2010;*31*(9):901-907. [CrossRef]
15. Grove SK, Burns N, Gray J. *The Practice of Nursing Research: Appraisal, Synthesis, and Generation of Evidence*. 7th ed. St. Louis, MO: Elsevier Health Sciences; 2012.
16. DeVellis RF, Thorpe CT. *Scale Development: Theory and Applications*. 5th ed. Sage publications; 2021.
17. Pogorzelska-Maziarz M, Nembhard IM, Schnall R, et al. Psychometric evaluation of an instrument for measuring organizational climate for quality: evidence from a national sample of infection preventionists. *Am J Med Qual*. 2016;*31*(5):441-447. [CrossRef]
18. Lenhert B. BlandAltmanLeh LB: plots (slightly extended) Bland-Altman plots. R package version 03. 2015;*1*:16.
19. Wickham H. *ggplot2: Elegant Graphics for Data Analysis*. NY: Springer; 2016.
20. Norman GR, Streiner DL. *PDQ Statistics: PMPH USA*; 2003.
21. Wild D, Grove A, Martin M, et al. Principles of Good Practice for the Translation and Cultural Adaptation Process for Patient-Reported Outcomes (PRO) Measures: report of the ISPOR Task Force for Translation and Cultural Adaptation. *Value Health*. 2005;*8*(2):94-104. [CrossRef]
22. Erefe İ. *Hemşirelikte Araştırma: İlke Süreç ve Yöntemleri*. 3rd ed. Ankara: Hemşirelikte Araştırma ve Geliştirme Derneği-Hemar-Ge; 2004.
23. Alpar R. *Applied Statistics and Validity-Reliability*. 8th ed. Ankara: Detay Publishing; 2025.
24. Braun BI, Chitavi SO, Suzuki H, et al. Culture of safety: impact on improvement in infection prevention process and outcomes. *Curr Infect Dis Rep*. 2020;*22*(12):34. [CrossRef]
25. Alshehry AS. Culture of quality in infection prevention of a hospital as perceived by health care workers. *J Nurs Manag*. 2019;*27*(6):1131-1139. [CrossRef]
26. Borg MA. Lowbury Lecture 2013. Cultural determinants of infection control behaviour: understanding drivers and implementing effective change. *J Hosp Infect*. 2014;*86*(3):161-168. [CrossRef]
27. Wang L, Zhang D, Liu J, et al. The mediating role of incentives in association between leadership attention and self-perceived continuous improvement in infection prevention and control among medical staff: a cross-sectional survey. *Front Public Health*. 2023;*11*:984847. [CrossRef]
28. Cruz JP. Infection prevention climate and its influence on nursing students' compliance with standard precautions. *J Adv Nurs*. 2019;*75*(5):1042-1052. [CrossRef]
29. Li S, Shang L, Yuan L, et al. The sinicization of the Leading a Culture of Quality for Infection Prevention Scale and the test of its reliability and validity. *Chin J Nurs*. 2024;*59*(6):713-718.
30. Cruz JP, Colet P, Almazan J, et al. Assessing the validity and reliability of the Russian version of the leading a culture of quality in infection prevention Scale among nurses in Kazakhstan. *J Nurs Manag*. 2023;*2023*(1):5309218. [CrossRef]
31. Borg MA, Waisfisz B, Frank U. Quantitative assessment of organizational culture within hospitals and its relevance to infection prevention and control strategies. *J Hosp Infect*. 2015;*90*(1):75-77. [CrossRef]
32. Alruwaili RF, Alsadaan N, Alruwaili AN, et al. Unveiling the symbiosis of environmental sustainability and infection control in health care settings: A systematic review. *Sustainability*. 2023;*15*(22):15728. [CrossRef].
33. Sağlık Hizmetleri Genel Müdürlüğü, Sağlıkta Kalite, Akreditasyon ve Çalışan Hakları Daire Başkanlığı. Sağlıkta Akreditasyon Standartları Hastane Seti. v3.0/2021. Accessed May 28, 2025. https://files.tuseb.gov.tr/tuska/files/akreditasyon/2024-11-04-13-13-28.pdf
34. Wang J, Wang X. *Structural Equation Modeling: Applications Using Mplus*. John Wiley & Sons; UK; 2019. [CrossRef]

Supplementary Material

ENFEKSİYON ÖNLEME ve KONTROLÜNDE KALİTE KÜLTÜRÜNE LİDERLİK ÖLÇEĞİ

Bu ölçüm aracı hastanelerin özellikle enfeksiyonları önleme ve kontrolüyle ilgili kalite kültürüne liderlik edilmesi adına yapılan eylemleri içermektedir. Lütfen kurumunuzu düşünerek cevap veriniz.						
No	**ÖLÇEK MADDELERİ**	**Kesinlikle katılmıyorum**	**Biraz katılmıyorum**	**Kararsızım**	**Biraz katılıyorum**	**Kesinlikle katılıyorum**
1	Kurumumuzun sağlık hizmeti ilişkili enfeksiyon önleme amaçları ve stratejik planı, açık ve net bir şekilde ifade edilmiştir.					
2	Enfeksiyon önleme ve kontrol çalışmalarımızın sonuçları düzenli olarak ölçülür ve çalışanlarla paylaşılır.					
3	Yüksek kalitede hasta güvenliği ve bakımın sağlanması için bölümler arasında iyi bir bilgi akışı vardır.					
4	Buradaki çalışanlar, sağlık hizmeti ilişkili enfeksiyonların önlenmesi konusunda aciliyet hissi duyar.					
5	Çalışanlar enfeksiyon önleme ve kontrol çalışmalarına katılmaya teşvik edilir.					
6	Kurumdaki iklim özgür fikir alışverişini teşvik eder.					
7	Çalışanlar, hasta bakımını iyileştirebilecek veya hasta güvenliğini etkileyebilecek bir şey gördüğünde bunu özgürce dillendirebilir.					
8	Sonuçları konusunda endişe duymadan fikirlerimi ifade etmede özgür hissediyorum.					
9	Hasta enfeksiyonlarıyla ilgili sorunların prosedürlerimizde veya ekipmanımızda değişikliklere yol açtığı örnekleri hatırlayabilirim.					
10	Bu yıl kurumumuzda bir veya daha fazla sağlık hizmeti ilişkili enfeksiyon önleme girişiminin yürütüldüğünü biliyorum.					
11	Genel olarak, kurumumuzda çalışanlar birbirlerine saygılı davranırlar.					
12	Kurumun misyonu, vizyonu ve değerleri hakkında net bir anlayışa sahibim.					
13	İşyerimdeki çalışanlar, yaptıkları işin sonuçlarından sorumlu tutulur.					
14	Bu kurumdaki çalışanlar, bir işi yapmanın doğru yoluyla ilgili soruları olduğunda birbirlerine danışmakta rahattırlar.					
15	Bu kurumdaki çalışanlar, diğer çalışanların eşsiz beceri ve yeteneklerine değer verir.					
16	Bu kurumdaki çalışanlar, sorunları ve zor konuları gündeme getirebilirler.					