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Cultural adaptation and psychometric validation of the university of the West England interprofessional questionnaire (UWE-IP) for Turkish health education programs: a cross-sectional study

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Abstract

Background The objective of this study was to assess the accuracy and consistency of the University of the West England Interprofessional Questionnaire (UWE-IP) in Turkish health education settings. The aim was to evaluate its efficacy in gauging interprofessional attitudes among students from diverse healthcare fields.

Methods A cross-sectional study was conducted with 391 students from medical, nursing, and home care technician programs who participated in clinical internships. The UWE-IP was utilized to evaluate the psychometric properties of the scale, utilising exploratory factor analysis (EFA) to establish the internal structure and reliability.

Results The original four-factor structure of the UWE-IP scale was refined to a three-factor model, encompassing 'communication and teamwork,"interprofessional learning," and a combined 'interprofessional interaction and relationships' factor. This revised structure demonstrated sound reliability and validity y, with a Cronbach's alpha of 0.80. The factor loadings varied between 0.044 and 0.746, demonstrating a strong level of support for the scale's reliability in assessing interprofessional attitudes in the Turkish setting.

Conclusions The study affirms the validity and reliability of the UWE-IP scale for implementation in Turkish health education, highlighting its significance in assessing and improving interprofessional education. The cultural adaptation of the scale represents an important step forward in evaluating multidisciplinary training results, thereby contributing to improved healthcare services and patient outcomes in Turkey.

Keywords Interprofessional education, Health education, Health services, UWE IP scale, Validity, Reliability, Interdisciplinary collaboration

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Introduction

Interprofessional education (IPE) represents a pedagogical approach in which students from various healthcare disciplines collaborate to increase the quality of healthcare services [1, 2]. This method emphasizes the development of teamwork and cooperative skills across professions to improve patient care [3]. Despite the recognized benefits, Turkey encounters significant challenges in embedding IPE into its educational frameworks [4]. At present, IPE in Turkey predominantly exists as elective courses or additional modules within university curricula. This study investigates the application of IPE in healthcare education through validity and reliability assessments via the University of the West England Interprofessional Questionnaire (UWE-IP).

The UWE IP scale is employed to measure the effectiveness of interprofessional education and practices. Prior research has substantiated the appropriateness of using it as an assessment instrument for health education initiatives [5-8]. These studies demonstrate that IPE provides students with the capacity to devise solutions for practical challenges encountered in healthcare and to effectively cooperate with other disciplines.

The selection of the UWE-IP scale for this study is based on its comprehensive capacity to evaluate interprofessional attitudes and interactions, which makes it highly suitable for analysing educational outcomes in the health education. Although the Interprofessional Attitudes Scale (IPAS) and other measures also assess interprofessional collaboration, the UWE-IP scale's comprehensive evaluation and its proven effectiveness in previous research by Pollard et al. make it especially appropriate for this study [9, 10]. The chosen content demonstrates a dedication to using a variety of disciplines in order to improve the quality of healthcare in Turkey.

However, while previous studies have explored the effectiveness of IPE in various contexts, there is limited research regarding the cultural adaptation and validation of instruments like the UWE-IP within the Turkish healthcare education system [5-8]. This gap underlines the need to examine whether the scale remains reliable and valid when applied to Turkish students, who may have different linguistic and cultural characteristics compared to the populations previously studied.

The primary objective of this study is to investigate the suitability of the UWE-IP in Turkish health education environments through an evaluation of its cultural adaptation, reliability, and validity. This research aims to assess the effectiveness of the UWE-IP scale in measuring interprofessional education outcomes in Turkey through a comprehensive psychometric examination. The results of this study are anticipated to offer vital understanding into the prospective incorporation and development of interprofessional education in Turkish healthcare programs,

ultimately leading to the advancement of healthcare services and patient outcomes across the country.

Methods

Study design and participants

This study utilised a cross-sectional design to analyse the psychometric features of the Turkish version of the UWE-IP. The study comprised 391 students enrolled in medical, nursing, and home care technician programs at Erzincan Binali Yıldırım University, all of whom were actively participating in clinical internships. Participants were selected using convenience sampling. Participants were recruited from the fourth, fifth, and sixth years of the Faculty of Medicine, as well as from the second year and higher in other departments. Inclusion criteria were active participation in clinical internships and voluntary consent to participate. Students not actively involved in clinical internships or who declined participation were excluded. All 391 participants were included in the exploratory factor analysis (EFA) and in the internal consistency reliability analysis using Cronbach's alpha. The data were collected through self-administered paperbased questionnaires, completed by the participants during their clinical internship sessions under the supervision of a researcher.

UWE-IP scale

The UWE-IP scale used in this study was originally developed by Pollard et al. and has been previously validated and published [6, 7]. The scale is a reliable instrument for evaluating interprofessional interactions in healthcare. The scale consists of four subscales: Communication and Teamwork, Interprofessional Learning, Interprofessional Interaction, and Interprofessional Relationships.

The Communication and Teamwork subscale employs a 4-point Likert scale (1 = strongly agree, 4 = strongly disagree) that does not include a neutral choice, encouraging participants to provide clear and definitive replies. The remaining three subscales employ a 5-point Likert scale, where 1 represents strong agreement and 5 represents severe disagreement, with a neutral midpoint. Each subscale consists of nine questions, except for Interprofessional Relationships, which comprises eight. In addition, 12 out of the total 35 items are scored in the other direction to improve the accuracy and consistency of the results. These subscales represent the key variables measured in this study, including attitudes toward communication and teamwork, readiness for interprofessional learning, and perceptions of interprofessional interaction and relationships. Together, these dimensions provide a comprehensive assessment of students' interprofessional attitudes, which constitute the primary outcome variables of the research. The total and subscale scores were used to evaluate the participants' overall interprofessional collaboration competencies.

Ethical approval and permissions

Prior to the study, the Erzincan Binali Yıldırım University Clinical Research Ethics Committee granted the appropriate authority (approved date: 16.11.2023, decision no: 2023–20/4). Permission to use the Turkish version of the study, which was deemed legitimate and reliable, was obtained through email correspondence with the authors who possess the scale. Verbal and written informed consent was acquired from all volunteer participants, and they were informed that they were not required to provide their identities when completing the scale.

Scale translation and cultural adaptation

The translation of the scale into Turkish was carried out via forward and backward translation procedures following international guidelines [11]. This procedure was carried out by two translators who are skilled in the field of health and are native speakers of both Turkish and English. Throughout the translation process, meticulous attention was given to preserving the intended meaning while making suitable adjustments to accommodate linguistic peculiarities. The cultural suitability and linguistic adjustment of these translations were later assessed. During the last round, two more bilingual persons retranslated the translations into English and then compared them with the original text. The original English questionnaire and its initial four-factor Turkish translation are provided in Supplementary File S1. The final three-factor Turkish version used for psychometric testing is available in Supplementary File S2. A detailed description of the forward-backward translation process is provided in Supplementary File S3.

Psychometric evaluation according to COSMIN checklist

The psychometric properties of the Turkish UWE-IP were evaluated based on the COSMIN checklist guidelines. Internal consistency was assessed using Cronbach's alpha. Structural validity was examined first by confirmatory factor analysis (CFA); due to inadequate fit indices, exploratory factor analysis (EFA) was subsequently conducted. Face and content validity were ensured through a structured forward-backward translation and expert consensus. However, reliability (test-retest), measurement error, criterion validity, and responsiveness were not assessed due to the cross-sectional anonymous design and study limitations.

Statistical analyses

The analyses were performed using IBM SPSS Statistics (Version 27, Chicago, IL, USA) and IBM SPSS AMOS 22 (IBM SPSS AMOS for Windows, Version 22.0, Armonk, NY: IBM Corp.; 2013). Confirmatory factor analysis (CFA) was initially performed to test the original fourfactor model; however, the model fit indices indicated poor fit. Therefore, exploratory factor analysis (EFA) was conducted to explore the underlying factor structure suitable for the Turkish context. Prior to conducting EFA, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were used to determine the suitability of the dataset for factor analysis. The KMO value was found to be acceptable, and Bartlett's test was significant, indicating that the data were appropriate for factor analysis. Principal component analysis with varimax rotation was employed. Factors with eigenvalues greater than 1 were retained, and only items with factor loadings equal to or greater than 0.35 were included in the final model.

Hence, the scale's internal structural validity was assessed by exploratory factor analysis (EFA), resulting in a more precise three-component model. Only elements with factor loadings that were positive and/or greater than 0.35 were retained in the scale. After confirming the legitimacy of the internal structure, the reliability of internal consistency was evaluated using Cronbach's alpha coefficient [12]. Cronbach's alpha values above 0.70 were considered acceptable, and the overall reliability of the scale was calculated as 0.80. The significance of employing an adaptable methodology in assessing the accuracy and consistency of the Turkish adaptation of the scale is underscored by this procedure. No adjustments for confounding variables were made, as the aim of the study was limited to psychometric validation rather than evaluating associations between variables.

Results

Summary of main findings

The results of this study indicate that the UWE-IP scale can be successfully adapted for use in Turkish healthcare education, yielding a three-factor structure— "Communication and Teamwork," "Interprofessional Learning," and a merged "Interprofessional Interaction and Relationships." The overall Cronbach's alpha was 0.80, indicating sound reliability. Several items (e.g., 110 = 0.785, 111 = 0.871, 117 = 0.801) exhibited factor loadings above 0.70, suggesting particularly strong coherence within the "Interprofessional Learning" dimension. These findings confirm the scale's robustness in evaluating interprofessional attitudes among Turkish students.

Participants

The study included a total of 391 participants. The mean age of the participants was 22.02 ± 1.93 years, with 36.8% (n = 144) being male and 63.2% (n = 247) being female. Of these, 55.8% (n = 218) were studying medicine, 27.9%

(n = 109) were in nursing, and 16.3% (n = 64) were in patient care programs.

Exploratory factor analysis (EFA)

Following the exploratory factor analysis (EFA), the initial four-factor design of the scales was simplified into a three-factor structure that is more compatible with the dataset (Fig. 1). The decisions about factor linkages and structures were determined based on the outcomes of the factor analyses. The parts titled "Communication and Teamwork" and "Interprofessional Learning" were preserved in this modified structure. The portions titled "Interprofessional Interaction" and "Interprofessional Relationships" were merged, and corresponding revisions were made to the items. The updated three-factor arrangement provides a model that more accurately aligns with the distribution of the sample data and explains a significant percentage of the variability. The factor retention decision was supported by the scree plot, which demonstrated a clear inflection point at the third component (Fig. 2). Notably, items in the "Interprofessional Learning" factor (e.g., 110, 111, 117) displayed



Fig. 1 The conversion of the original four-factor structure into a three-factor structure



Fig. 2 Scree plot of eigenvalues for the exploratory factor analysis

loadings exceeding 0.70, indicating a high degree of internal coherence in this dimension.

Factor loading

In the three-factor structure obtained from the exploratory factor analysis, all the items loaded onto the 'communication and teamwork' factor, with positive loadings of significant magnitude (>0.3) (Table 1). The descriptive statistics for these loadings indicate an average factor loading ($|\lambda|$) of 0.518, with minimum and maximum values ranging from $|\lambda|=0.321$ to $|\lambda|=0.746$.

Internal consistency

In the three-factor structure, the component called 'Interprofessional Interaction and Relationships' showed positive loadings for all the items, except for I29, I30, and I31 (Table 1). Despite displaying stronger positive loadings on other factors, expert opinion determined that these elements were more relevant to this specific factor and hence included them inside it. Items I28 and I33 had positive loadings for this factor, albeit of a minor magnitude. Additionally, they were kept based on expert consensus. The descriptive statistics for these loadings revealed that the average loading ($|\lambda|$) was 0.423, with the minimum and greatest values being $|\lambda|$ =0.044 and $|\lambda|$ =0.726, respectively. Combined with the high-load items, the overall Cronbach's alpha of 0.80 reinforces the scale's reliability in capturing interprofessional attitudes

among Turkish healthcare students. Sub-scale reliability was acceptable to good: Communication and Teamwork $\alpha = 0.58$, Interprofessional Learning $\alpha = 0.81$, and Interprofessional Interaction & Relationships $\alpha = 0.67$. Test–retest data were not available; therefore, intra-class correlation coefficients (ICC) could not be calculated.

Discussion

This study provides robust evidence for reliability and validity of the UWE-IP scale adapted for the Turkish healthcare education context, emphasizing its efficacy as a precise tool for evaluating interprofessional attitudes. Our findings corroborate the utility of the UWE-IP scale in effectively capturing the essence of interprofessional education among healthcare students in Turkey. By examining how these three dimensions interact ('Communication and Teamwork,' 'Interprofessional Learning,' and the merged 'Interprofessional Interaction and Relationships') this study offers further clarity on the key drivers of collaborative attitudes in Turkish healthcare education, aligning with recent global perspectives on context-specific interprofessional education (Reeves et al., 2017; Riskiyana et al., 2018).

The merging of the 'Interprofessional Interaction' and 'Interprofessional Relationships' factors may reflect cultural characteristics of Turkish society, which is generally collectivist and emphasizes strong interpersonal relationships within professional and educational settings [13,

Table 1 Three-factor structure and factor loadings

ltem	Communication and Teamwork	Interprofessional Learning	Interprofes- sional Inter-
		5	action and
			Relationships
11	0.437	0.277	-0.068
12	0.537	0.330	-0.065
13	0.418	0.106	0.128
4	0.352	-0.049	0.250
15	0.574	0.351	0.004
16	0.542	0.085	0.104
17	0.541	0.106	0.155
18	0.601	0.258	0.073
19	0.605	0.217	0.012
110	0.234	0.785	-0.014
111	0.316	0.871	-0.025
112	0.043	0.380	0.146
113	0.330	0.771	-0.243
14	0.046	0.470	-0.137
115	0.330	0.766	-0.222
116	0.297	0.773	-0.164
117	0.330	0.801	-0.025
118	0.300	0.745	-0.215
119	-0.004	0.024	0.529
120	0.321	0.605	0.155
121	-0.079	-0.081	0.538
122	0.060	-0.062	0.726
123	0.177	0.387	0.400
124	0.373	0.525	0.218
125	-0.060	0.001	0.693
126	0.115	0.009	0.726
127	0.113	0.050	0.686
128	0.506	0.258	0.116
129	0.778	0.394	-0.177
130	0.633	0.429	-0.209
131	0.771	0.323	-0.230
132	0.746	0.383	-0.162
133	0.535	0.403	0.044
134	0.466	-0.001	0.026
135	0.732	0.298	-0.114

14]. In collectivist cultures, interactions and relationships are deeply interconnected, often making it difficult to distinguish between the two constructs at a conceptual level [15]. This cultural context likely contributed to the factor structure adaptation and supports findings from similar validation studies in Germany [5] and Saudi Arabia [16], where cultural and linguistic nuances similarly influenced the scale's structure. Moreover, this convergence underscores how local values and communication patterns can shape the perception of interprofessional dynamics, highlighting the importance of culturally sensitive measurement tools [9, 17].

Furthermore, these findings align with earlier studies conducted in other cultural settings, where similar adaptations were necessary to accommodate the unique educational contexts [5, 18]. This highlights the need of cultural adaptation in ensuring the relevance and accuracy of assessment tools for interprofessional education in various educational systems [19]. Several adjustments were required to accommodate the unique educational characteristics of the Turkish context, in order to fit with the emphasis on communication and teamwork that is vital in Turkish healthcare settings. Such contextual considerations are echoed in global IPE literature, wherein collectivist cultural norms often blend the notions of "interaction" and "relationship," as evidenced by adapted versions of the UWE-IP in other countries [5, 16, 20].

The results also highlight the importance of adopting a flexible approach to the psychometric evaluation of educational tools across different settings. A key outcome of this research is the modification of the original fourfactor structure of the scale to a three-factor structure, which is better aligned with the empirical data from our Turkish cohort. This refinement resulted in the subscales 'Communication and Teamwork', 'Interprofessional Learning, and the merged 'Interprofessional Interaction and Relationships'. Each of these factors plays a pivotal role in the multidimensional construct of interprofessional education, and their clear delineation within this modified scale enhances the interpretability and applicability of the results. By capturing the intertwined nature of interactions and relationships, the scale provides actionable insights into how educators might design curricula that reinforce mutual respect, shared decisionmaking, and effective communication [19, 21].

The UWE-IP scale has been adapted to various cultural and educational systems [5, 8, 16, 18, 22]. Each adaptation process is conducted to ensure the scale's suitability for language and cultural characteristics. However, these processes reflect unique cultural values, educational methods, and health professionals' perceptions of interprofessional interactions [20]. Statistical analyses have shown that the reliability and validity properties of the scale's new three-factor structure are satisfactory in the examined sample. These findings indicate that international comparisons of the validity and reliability of interprofessional education scales should pay special attention to cultural sensitivity and adaptation processes. Such findings resonate with broader research indicating that when assessment tools are adapted without sufficient cultural alignment, the resulting factor structures may obscure critical local dimensions of interprofessional attitudes [3, 23]. Hence, our culturally attuned validation of the UWE-IP scale not only strengthens its local relevance but also contributes to international discourse on how best to integrate intercultural factors into health education research [9].

In addition to these cultural considerations, the practical implications of our findings are significant for Turkish healthcare education. By highlighting the dimensions of communication, learning, and interaction, this study can inform targeted interventions to promote interprofessional collaboration among healthcare students. Educators can design structured training programs—such as simulation-based exercises and culturally tailored teamwork modules—that address the specific needs and challenges of the Turkish context. Such interventions may reinforce mutual respect, shared decision-making, and effective communication skills, ultimately improving teamwork and patient outcomes [22, 24].

From a theoretical standpoint, these results also underscore the importance of examining interprofessional attitudes through a culturally informed lens [25]. Future research should explore convergent and discriminant validity by correlating the UWE-IP with other interprofessional competency measures (e.g., IPAS) and investigate how different cultural factors (beyond collectivism) might shape attitudes and behaviors in interprofessional settings. Additionally, longitudinal studies that track changes in students' perceptions over time and studies examining patient outcomes associated with improved interprofessional attitudes would provide valuable insight into the long-term impact of such adaptations. This broader examination can further validate the utility and generalizability of the UWE-IP scale, both within Turkey and in other culturally diverse contexts [3].

Medical education implications

This study underscores valuable applications for medical education, particularly in advancing interprofessional training in Turkey. The adapted UWE-IP scale can effectively assess IPE curricula, pinpointing areas of strength and opportunities for growth (such as communication, teamwork, and interaction skills). Incorporating structured modules, simulation-based exercises, and culturally attuned teamwork activities can foster more effective collaboration among healthcare professionals, ultimately improving patient outcomes and strengthening the healthcare workforce in Turkey.

Limitations

Nevertheless, this study is not without limitations. The sample, while robust in size, is drawn from a single geographic region, which may limit the generalizability of the findings to other parts of Turkey or different educational contexts. Additionally, test–retest reliability could not be assessed due to the anonymous and cross-sectional nature of the data collection, which presents challenges in verifying the temporal stability of the scale. Furthermore, item-level analysis (e.g., item-total correlations) was not conducted prior to factor analysis, which limits insight into the individual performance of scale items. In addition, potential sources of bias should be considered. The use of convenience sampling from a single institution may have introduced selection bias, limiting the representativeness of the sample. Moreover, as the data were collected through self-administered questionnaires, information bias may have occurred due to socially desirable responses or misunderstanding of items. These limitations have been acknowledged and recommendations for future research have been provided accordingly.

Future research should involve longitudinal assessments across multiple regions in Turkey and examine convergent and discriminant validity by correlating the UWE-IP with other interprofessional competency measures such as the IPAS [9]. Studies should also evaluate the impact of interprofessional education interventions on clinical and patient outcomes to provide evidence of how improved attitudes translate into practice. These efforts, as emphasized in recent systematic reviews [3], will help determine whether the adapted UWE-IP meaningfully predicts collaborative behavior and contributes to improved healthcare delivery in the Turkish context.

Conclusion

In conclusion, the UWE-IP scale adapted for the Turkish setting demonstrates robust reliability (Cronbach's alpha = 0.80) and effectively captures interprofessional attitudes among healthcare students. By highlighting key dimensions such as communication, learning, and interaction, this instrument can guide culturally sensitive interventions that foster improved teamwork and patient outcomes in Turkish healthcare education.

Furthermore, these findings encourage the implementation of the UWE-IP across multiple regions of Turkey to evaluate its broader impact on student attitudes and collaborative behaviors. Future research should also examine the scale's relationship with other interprofessional competence measures and assess long-term effects on patient care, ensuring that interprofessional education initiatives remain evidence-based and contextually appropriate.

Supplementary Information

The online version contains supplementary material available at https://doi.or g/10.1186/s12909-025-07278-5.

Supplementary Material 1 Supplementary Material 2 Supplementary Material 3

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Author contributions

Ersan Gürsoy: Conceptualization, Methodology, Writing - Original Draft, Supervision Derya Gökmen: Statistical Analysis, Visualization Serhat Hayme: Statistical Analysis, Visualization Şafak Eroğlu: Data Collection Mehmet Akif Nas: Idea Generation, Initial Draft Writing.

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Data availability

The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

All necessary approvals were obtained from the Erzincan Binali Yıldırım University Clinical Research Ethics Committee (approval date: 16.11.2023, decision no: 2023-20/4). Verbal and written consent was acquired from all volunteer participants, with prior notification that there was no obligation to indicate names while completing the scale.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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