

Original Article

Health Education and Competency Scale: Turkish Validity, Reliability, and Psychometric Validation

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Abstract

Background: In order to provide health education effectively, it is important for the health educator to have certain competencies.

Aims: To effectively deliver health education, health educators must possess certain competencies. This study aimed to assess the Turkish validity and reliability of the "Health Education and Competency Scale" through cultural adaptation.

Methods: The study employed a methodological and descriptive design. Data were collected from nurses working at a university hospital in Turkey in 2020. A total of 284 registered nurses with professional experience participated, and the data were used for psychometric testing. The validity and reliability of the scale were evaluated through language validity, content validity, item analysis, internal consistency, test-retest analysis, and confirmatory factor analysis.

Results: Among the nurses, 41.9% were aged 18-25 (n=119), 69.4% were female (n=197), 62.0% held undergraduate degrees (n=176), and 62.0% (n=176) had 1-5 years of professional experience. Statistical analysis revealed that the internal consistency reliability of the Health Education and Competency Scale was $\alpha=0.95$. Confirmatory Factor Analysis (CFA) was conducted to test the four-factor structure. Item factor loadings ranged from 0.76 to 0.93, generally supporting the scale's structure. Model fit indices provided partial support for the factor structure; while some indices were acceptable (CFI = 0.923, S-RMR = 0.045, $\chi^2/df=3.54$), others were close to or exceeded the recommended limits (GFI = 0.852, RMSEA = 0.095). Despite some borderline fit indices, the overall four-factor structure of the scale was confirmed.

Conclusions: The Turkish version of the Health Education and Competency Scale was found to be an acceptable, valid, and reliable tool for application.

Background

Health education has been recognized as a fundamental role and responsibility of nurses since the origins of modern nursing. Most definitions of nursing emphasize the core duty of helping patients acquire the knowledge and skills necessary to maintain and improve their health. Florence Nightingale advocated for patient education on nutrition, fresh air, exercise, and personal hygiene, believing these teachings would enhance patient

outcomes. In the early 1900s, the role of nurses in health education was seen as crucial for disease prevention and public health. In 1918, the National League for Nursing Education (NLNE) defined health education as a fundamental nursing function, and by 1950, patient education was incorporated into nursing curricula. Since the 1980s, the educational role of nurses has shifted from a disease-focused approach to one centered on prevention and health promotion. Today,

lifestyle changes have proven to be more effective than expensive medical treatments. The World Health Organization (WHO) defines health education as a discipline aimed at raising awareness, promoting the effective use of healthcare services, encouraging healthy lifestyles, and developing problem-solving skills in individuals and communities. For health education to be effective, it is essential that educators possess the necessary knowledge and competencies (Chachkes, 1996; Johns, 1937; Bastable, 2007 ; Rifas, 1994; Davidhizar, 1999; Tabak, 2000). Competence is generally defined as the condition of taking responsibility and/or performing tasks in a specific area (ANA, 2014; TLA, 2020) The competence of the nurse is expressed as the knowledge, skills, and attitudes necessary to perform effectively in clinical settings (Greene, 2011). It is evaluated on a holistic basis that also includes personality and professional traits (Hsu, 2013). Hand (2006) states that the foundation of competence is based on fundamental components such as knowledge, skills, attitudes, and values that enable effective and professional action (Hand, 2006). Health education provided by competent health professionals according to the individual characteristics of patients has been reported to be important in empowering patients, improving care quality, and reducing healthcare needs (Chen, 2016). Although health education is an important part of nursing care, many deficiencies are observed in practice as emphasized in nursing practice guidelines, and the capacity of nurses to fulfill this role and their educational competence is often questioned. The ability to effectively teach has long been considered a challenge for many clinical nurses (Tomey, 2009; Van Horn ER, 2010; Bergh, 2015; Pueyo-Garrigues M, 2019; Chen, 2009)

A significant number of nurses still view health education primarily as the simple transfer of 'health' information, often focusing on risk factors and disease-related situations (Hwang, 2018; Whitehead, 2011)

For some, it is seen as an additional task, leading to unstructured, inconsistent, and often ineffective health education practices. The primary barriers to delivering effective

health education have been identified as a lack of knowledge, motivation, and skill. Furthermore, health education is consistently ranked as one of the least developed areas of nursing competence, a trend that persists today (Pueyo-Garrigues, 2021)

Studies on nurses' health education competencies indicate that competency levels in this field vary depending on various factors. In particular, perceptions of professional competency differ among newly graduated nurses. For example, a study conducted in 2023 found that 36.5% of newly graduated nurses felt professionally competent, while 30.5% reported feeling inadequate. In the same study, 58.2% of participants stated that the COVID-19 pandemic had affected their professional competencies. These findings suggest that nurses' perceptions of professional competence are influenced by personal and environmental factors. (Terkes, 2023). Another study examined intern nurses' self-assessments of their professional and academic competencies based on the Turkish Higher Education Qualifications Framework. In this study, 56.7% of students stated that the theoretical education provided was compatible with practical topics. However, more than half of the students indicated that they lacked opportunities to apply theoretical knowledge directly in clinical practice. This finding highlights the impact of the alignment between theoretical education and clinical practice on nurses' self-efficacy perceptions (Yavuz, 2022). In the literature, nurses' health education competencies are generally evaluated through self-assessment methods. These assessments consider factors such as the compatibility of theoretical knowledge with clinical practice, the adequacy of educational materials, and health literacy. In particular, health literacy refers to individuals' ability to understand and use health information and is crucial for nurses to provide effective health education (Bayık Temel & Ateş, 2019). Studies on nurses' health education competencies demonstrate that these competencies are influenced by various factors and should be continuously assessed and developed.

Assessing the teaching abilities of clinical nurses and providing ongoing education in this area is crucial for advancing nursing practice. A review of the literature reveals three primary tools for measuring nurses' educational competence (Lin, 2017; Tavsancil, 2019; Yazicioglu, 2011).

The "Nurses' Knowledge, Skills, and Personal Attributes for Competent Health Education Practice" scale, developed by Pueyo-Garrigues et al., is a measurement tool that identifies the competencies nurses need in the health education process. This study demonstrated that the scale effectively evaluates nurses' abilities to communicate effectively with patients, utilize teaching strategies, and provide individualized education (Pueyo-Garrigues, 2021). The "Patient Education Competence Scale for Registered Nurses in Taiwan", developed by Lin & Wang, was designed to assess nurses' knowledge and skills in patient education. The study revealed that nurses faced the greatest challenges in education planning and evaluation stages (Lin, 2017). The measurement tool "Health Education and Competency Scale: Development and Testing", developed by Hwang, Kuo & Tu (2018) and whose Turkish validity we have established, covers the key competency areas related to health education, including knowledge, skills, and attitudes (Hwang, 2018). While Pueyo-Garrigues et al. (2021) and Lin and Wang (2017) primarily focus on knowledge and skills, the Hwang, Kuo, and Tu (2018) scale assesses three core competency areas: Knowledge (understanding of health education principles), Skills (ability to effectively deliver health education), Attitudes (perception and willingness to educate patients). (Hwang, 2018; Pueyo-Garrigues, 2021; Lin, 2017) This makes it a more holistic tool compared to others that focus primarily on practical skills and aims to assess nurses' readiness to educate patients as part of their professional responsibilities. This scale can be used not only for assessment but also for training and competency development.

The aim of the study is to evaluate the validity and reliability, along with the psychometric

properties, of the Turkish cultural adaptation of the 'Health Education and Competence Scale (HECS)' developed by Hwang and colleagues in 2018.

Methods

Participants: A university hospital's population consisted of 550 nurses. Nurses who had been working for at least one year were included in the study. The sample size for this study was determined using a rough estimation method, which suggests that the sample should be 5 to 10 times the number of items in the scale used. The scale used in the study consists of 18 items. Therefore, a sample size of $18 \times (5 \sim 10) = 90 \sim 180$ would be sufficient. The study was completed with a group of 284 nurses who agreed to participate (Tavsancil, 2019, Yazicioglu, 2011; Erkuş, 2024; Cokluk, 2018).

Data Collection Instruments: The data were collected using two instruments: the "Socio-Demographic Characteristics Information Form" created by the researchers and the "Health Education and Competence Scale (HECS)."

The Socio-Demographic Characteristics Information Form consists of seven questions addressing participants' gender, age, marital status, educational background, years of professional experience, and whether they received training on health education during or after their undergraduate education.

The Health Education and Competence Scale (HECS) was developed by Hwang and colleagues in 2018 (Hwang, 2018). It is a 7-point Likert-type scale, where 1 represents "strongly disagree" and 7 represents "strongly agree." The scale consists of four subdimensions: assessment, pedagogy, motivation, and empowerment. The internal consistency and reliability were high for the entire scale (Cronbach's $\alpha = 0.97$) as well as for each of the four factors: empowerment (Cronbach's $\alpha = 0.96$), assessment (Cronbach's $\alpha = 0.92$), pedagogy (Cronbach's $\alpha = 0.94$), and motivation (Cronbach's $\alpha = 0.90$).

Language Validity: Permission for the Turkish version of the scale was obtained through email correspondence with the original authors. The adaptation process involved assessing both linguistic and

contextual validity, as well as examining the construct validity and reliability of the scale. When adapting a scale to a different language and culture, a standardized approach must be followed to ensure linguistic validity. According to the latest international literature, the following four steps are commonly recommended: Forward translation (at least two translators); Back translation (at least two translators); Expert review/expert opinion; Pilot testing (pre-testing the instrument on a small group before full implementation) (De Lima Barroso, 2018; ITC, 2018; WHO, 2023; Karacam, 2019)

For linguistic validity, the translation-back translation method was used. Two bilingual experts fluent in both Turkish and English translated the scale into Turkish and then refined it. Another expert then translated the scale back into English. During this process, cultural equivalence was ensured by achieving the closest conceptual match in Turkish. Cultural adaptation is crucial as it is shaped by the context, language, and intended purpose of the instrument (Karacam, 2019)

Content Validity: A consensus was reached among the translators, and the scale items were reviewed by experts for linguistic and conceptual appropriateness (Capik, 2018). To ensure the linguistic and conceptual validity of the Turkish version, feedback was collected from eight experts experienced in scale development and adaptation. Opinions were obtained using the Lawshe method from two nursing management academics, one nursing management specialist, two nurses, two medical history and ethics academics, and one healthcare management specialist. The Lawshe method is a technique used to assess the necessity, clarity, specificity, and face validity of measurement items or questions. In this method, an expert evaluation form with four-point Likert-type questions is used to ensure that the items in the measurement instrument are relevant, clear, understandable, and appropriate for the study's purpose and evaluation. The experts rated each item on a scale from 1 ("inappropriate, should be removed") to 4 ("completely appropriate"). Lawshe's Content Validity Ratio (CVR) was calculated for each item. Since the minimum CVR at the 0.5 confidence level was set at 0.78, and all items met or exceeded this

threshold, no items were removed, resulting in an average validity score of 0.87. Therefore, the final version of the scale was approved (Lawshe, 1975)

It was concluded that the scale was clear and comprehensible, and a pilot study was conducted. The pilot test was carried out with 20 nurses who were not part of the main study sample. The Cronbach's alpha value was found to be 0.87, and the final version of the scale was approved.

Before starting the study, participants were informed about its purpose, and their verbal and written consent was obtained. Individual interviews were conducted with the nurses who voluntarily participated in the study, and they completed the questionnaire. The entire process took approximately 15 minutes.

Ethics Committee Approval: Ethical approval was obtained from the Eskisehir Osmangazi University's Non-invasive Clinical Research Ethics Committee to conduct the study (Date: January 15, 2019, Decree No: 10840098-604.01.01-E.1662).

Statistical Analysis: For the descriptive analysis of the socio-demographic data, arithmetic means, standard deviations, frequencies, and percentages were calculated. Since the data did not show a normal distribution, non-parametric tests such as the Mann-Whitney U and Kruskal-Wallis H tests were used. If a scale has already been developed with a theoretically or empirically established factor structure, conducting an Exploratory Factor Analysis (EFA) may not be necessary (Worthington & Whittaker, 2006). The primary purpose of EFA is to identify underlying factors among variables. However, if the scale has already been developed with a well-defined structure and its factor structure has been confirmed in previous studies, and if the original scale's factor structure is strongly supported (Schmitt, 2011), conducting a new exploratory analysis may not be scientifically appropriate (Floyd, 1995). In the literature, it is particularly recommended to perform Confirmatory Factor Analysis (CFA) instead of EFA when adapting a scale to a different population for cultural adaptation or linguistic validity rather than exploring a new factor structure (Yaslioglu, 2017; Ozdamar, 2017). Confirmatory Factor Analysis (CFA) was

performed using the LISREL software program to assess the reliability of the scale and evaluate its items. For test-retest reliability, the scale was administered to the same group twice at four-week intervals and evaluated. The correlation between the scores from both rounds of testing was calculated, with the reliability coefficient indicating the stability of the results over time. For high reliability, the correlation should be close to +1. A total of 50 nurses participated in the test-retest reliability process (Ozdamar, 2017).

Results

A total of 284 nurses participated in the study. Of these, 41.9% were aged between 18-25, 69.4% were female, 60.6% were single, 62% held an undergraduate degree, and 62% had 1-5 years of professional experience.

Additionally, 74.3% of the nurses reported receiving health education-related training or courses during their basic nursing education, and the same percentage received such

Validity Analysis

Factor loadings (Lambda values) for each item, squared multiple correlation values (R^2) showing the strength of the relationship

training after completing their education (Table 1).

It was determined that the t-values of the scale items were significant ($p < 0.05$) and the factor loadings exceeded the threshold value of 0.30 except for two items, indicating a strong relationship. Items 15 and 16 were 0.28 and 0.29. The sample size also depends on the number of factors and the size of the population correlation coefficient (Tavsancil, 2019). In our study, the sample size is proportional to the number of items, but when the item-total correlation is examined, it is seen that removing the relevant items from the scale will not lead to an improvement in the scale and will not have an effect on the total explained variance. The correlation between the item-total scores of both the general scale and its sub-dimensions is also high, and based on these values, it was not necessary to remove any items. CFA showed that each item made a significant contribution to explaining the structure that the scale was designed to measure (Table 2).

between each item and the latent variable, and t-values showing the statistical significance of these relationships are presented in Table 2.

Table 1: Distribution of Nurses by Socio-Demographical Characteristics (N: 284)

Socio-Demographical Characteristics		(N:284)	
		(N)	(%)
Gender	Female	197	69.4
	Male	87	30.6
Age	18-25	119	41.9
	26-33	89	31.3
	34-41	53	18.7
	42 and ↑	23	8.1
The average age	29.12 ± 8.09		
Average of working years	6.26± 6.32		

Operation time	1-5 year	176	62.0
	6-10 year	57	20.1
	11-15 year	21	7.4
	16 year and ↑	30	10.6
Marital status	Married	112	39.4
	Single	132	60.6
Educational Status	Health vocational high School	44	15.5
	Two-year degree	38	13.4
	Undergraduate	176	62.0
	Postgraduate	26	9.2
Status of taking courses related to health education during nursing education	Yes	211	74.3
	No	73	25.7
Status of receiving education in health education after nursing education	Yes	211	74.3
	No	73	25.7

Table 2. Factor loading values of HECS items, square of multiple correlation (R²) value, and t values

HECS Sub-dimensions	HECS questions	Factor Loads	Corrected Item-Total Correlation	t value	R²
Assessment	S1	0.93	.639	10.58	0.559
	S2	0.45	.715	8.53	0.759
	S3	0.53	.698	9.02	0.730
	S4	0.63	.701	9.21	0.716
Pedagogy	S5	0.63	.753	10.56	0.624
	S6	0.53	.743	10.33	0.658
	S7	0.40	.793	9.34	0.756
	S8	0.40	.784	10.10	0.688

	S9	0.52	.733	10.44	0.643
Motivation	S10	1.27	.554	11.06	0.351
	S11	0.47	.714	7.92	0.701
	S12	0.57	.707	8.96	0.640
Empowerment	S13	0.65	.618	11.15	0.561
	S14	0.84	.604	11.31	0.504
	S15	0.28	.697	9.70	0.784
	S16	0.29	.728	8.14	0.860
	S17	0.30	.732	9.28	0.811
	S18	0.38	.698	10.24	0.733

Model fit indices were calculated to assess how well the HECS's four-factor structure fit the observed data. These fit indices evaluate the degree of alignment between the model and the data, and the results from CFA indicated that the four-factor structure had generally acceptable fit indices. When the goodness-of-fit indices obtained from the confirmatory factor analysis are evaluated collectively, it is observed that the model demonstrates an acceptable level of fit. The χ^2/df ratio of 3.54 meets the recommended criterion of <5 , indicating a moderate model fit. The CFI (0.923) and NNFI/TLI (0.909) values exceed the acceptable threshold of 0.90, suggesting a good level of fit. The RFI (0.877) and NFI (0.896) values are slightly below the ideal cutoff yet remain within the acceptable range according to the literature. Although the GFI value (0.852) is below the preferred >0.90 level, it can still be considered acceptable given the sample size and model complexity. Additionally, the S-RMR value of 0.045 indicates a very good model fit. The RMSEA value of 0.095 is above the recommended <0.08 cutoff; however, some researchers consider RMSEA values below 0.10 to be within an acceptable range.

Overall, considering all fit indices together, the model demonstrates acceptable to good fit levels supporting the structural validity of the scale. These findings indicate that the scale is consistent with the theoretical construct and

that the confirmatory factor analysis supports the model fit.

The PATH diagram was used to evaluate the model's structure, confirming that both the factor loadings and the path diagram of the items were within the acceptable range (Figure 1).

Reliability Analysis

The scale's reliability was evaluated through test-retest analysis, Cronbach's alpha coefficient, and item-total score correlation.

Item Analysis: The item-total score correlations for the 18-item scale ranged from 0.76 to 0.93, further confirming the scale's reliability. The internal consistency of the scale and its sub-dimensions was evaluated by calculating Cronbach's alpha coefficients and total item correlations. The results showed that all sub-dimensions, as well as the overall scale, demonstrated high reliability.

The HECS was developed to assess key competencies in health education, including assessment, pedagogy, motivation, and empowerment. The goal of this tool is to determine whether a minimum competency level in providing health education has been met. The mean scores of the HECS subscales were all above average, where the possible range is from 1 to 7, indicating that nurses demonstrated above-average competence in health education. Among the sub-dimensions, the "Assessment" subscale had the lowest

scores, while the "Empowerment" subscale had the highest mean score (Table 4).

Cronbach's Alpha Coefficient: Cronbach's alpha, which measures internal consistency, was calculated for the entire scale and its subdimensions. The overall Cronbach's alpha value of the scale is 0.950, indicating high reliability. Among the sub-dimensions, the alpha coefficient was 0.896 for "Assessment," 0.910 for "Pedagogy," 0.768 for "Motivation," and 0.933 for "Empowerment" (Table 3).

Test-retest Analysis: The HECS was administered to a group of 50 nurses at two separate times, four weeks apart. The correlation coefficient between the two administrations was $r=0.97$ ($p=0.000$), indicating excellent stability over time. No significant difference was found between the test-retest mean scores ($p>0.05$).

When analyzing the distribution of HECS scores based on demographic characteristics (Table 4), no statistically significant differences were found in relation to gender, age, marital status, or working hours ($p>0.05$). However, in terms of educational attainment, nurses with postgraduate degrees had significantly higher mean scores in the "Motivation" sub-dimension, as well as higher overall mean scores compared to those with other educational backgrounds.

A statistically significant difference was also observed when comparing the mean scores of nurses who had received health education training during and after their vocational education. In both cases, those who had received training scored significantly higher on both the sub-dimensions and the total scale, with the difference favoring those who had undergone such training ($p<0.05$).

Discussion

The Health Education and Competence Scale (HEC) has been adapted into Turkish as the Health Education and Competence Scale (HEC-TR) through a cross-sectional study conducted with nurses working in a university hospital in Türkiye. The validity and reliability of the scale were established, and the results obtained from the Turkish adaptation and validity-reliability analysis

were evaluated by comparing them with the existing literature.

During the linguistic and cultural adaptation process of the scale into Turkish, a standardized approach was followed to ensure linguistic validity (De Lima Barroso, 2018; ITC,2018; WHO,2023; Karacam, 20191)

The literature indicates that considering cultural awareness during the adaptation of a measurement tool into another language has a positive effect on its validity and reliability (Capik, 2018). In this process, the closest conceptual equivalence in Turkish was achieved, ensuring cultural equivalence (Karacam,2019). The Lawshe method was used to assess the necessity, clarity, specificity, and face validity of the measurement items or questions. After confirming that the scale was clear and comprehensible, a pilot study was conducted with 20 nurses who were not part of the main study sample.

The Cronbach's alpha value was found to be 0.87, and the final version of the scale was approved. The literature states that Cronbach's alpha values range between 0.00 and 1.00, with reliability increasing as the value approaches 1.00. A value of 0.50 or above is considered acceptable, while a value above 0.70 is desirable (Ozdamar, 2017; Tavsancil, 2019).

The Kaiser-Meyer-Olkin (KMO) Test and Bartlett's Sphericity Test were used to evaluate the suitability of the data for factor analysis. KMO values range between 0.00 and 1.00, and the Bartlett's Sphericity Test should be statistically significant. Generally, KMO values of ≥ 0.70 are considered acceptable (Watkins, 2018). In this study, the KMO value was calculated as 0.931, and the Bartlett's Sphericity test value was 4293.155, which was statistically significant ($p = 0.000$). This indicates that the data and sample size were appropriate for analysis.

Confirmatory Factor Analysis (CFA) was conducted to assess structural validity, revealing significant t-values and high factor loadings for all items. The amount of variance explained by each item was also high. These findings confirm the four-dimensional

structure of the scale, consistent with the original version developed by Hwang et al. ($p < .000$).

Some researchers expect item-total correlations to be positive and above 0.25, as this indicates that an item aligns well with the theoretical construct being measured. Higher correlation values suggest stronger alignment with the construct. If the correlation coefficient is below 0.25 or negative, it is recommended to remove the item from the scale. These correlation values are also considered indicators of internal consistency. In studies where factor loadings are below 0.30, items may still be retained if the item-total correlations are at an acceptable level (Tezbasaran,1996)

In this study, items 15 and 16 had correlation values of 0.29 and 0.28, respectively, which were close to the threshold. However, since the item-total correlation was high, it was determined that removing these items from the scale was not necessary.

In the literature, it is stated that Cronbach's alpha values range between 0.00 and 1.00, with reliability increasing as the value approaches 1.00. A value of 0.50 or above is considered acceptable, while a value above 0.70 is desirable (Ozdamar, 2017; Tavsancil, 2019).

When examining similar instruments developed to measure nurses' educational competence, Lin and Wang (2017) reported Cronbach's alpha values of 0.96 for the "Preparation for Patient Education" subscale and 0.97 for the "Readiness for Patient Education" subscale (Lin,2017). Additionally, the test-retest reliability for these subscales was found to be 0.82 and 0.88, respectively. Similarly, the "Nurse Health Education Competence Instrument" developed by Pueyo-Garrigues et al. (2020) reported a Cronbach's alpha value of 0.90. (Pueyo-Garrigues,2021).

In our study, the overall Cronbach's alpha value for the HECS was 0.950. The subscale coefficients were 0.896 for "Assessment," 0.910 for "Pedagogy," 0.768 for "Motivation," and 0.933 for "Empowerment." These results indicate that the Turkish version of the HEC-TR is a reliable measurement tool for assessing nurses' humanism-based care delivery.

The fit index values for the validated four-factor structure of the scale were found as follows: RMSEA = 0.095, GFI = 0.852, CFI = 0.92, RFI = 0.87, NFI = 0.90, SRMR = 0.04, and $\chi^2/df = 3.54$.

Figure 1. : HECS pat h diyagramı

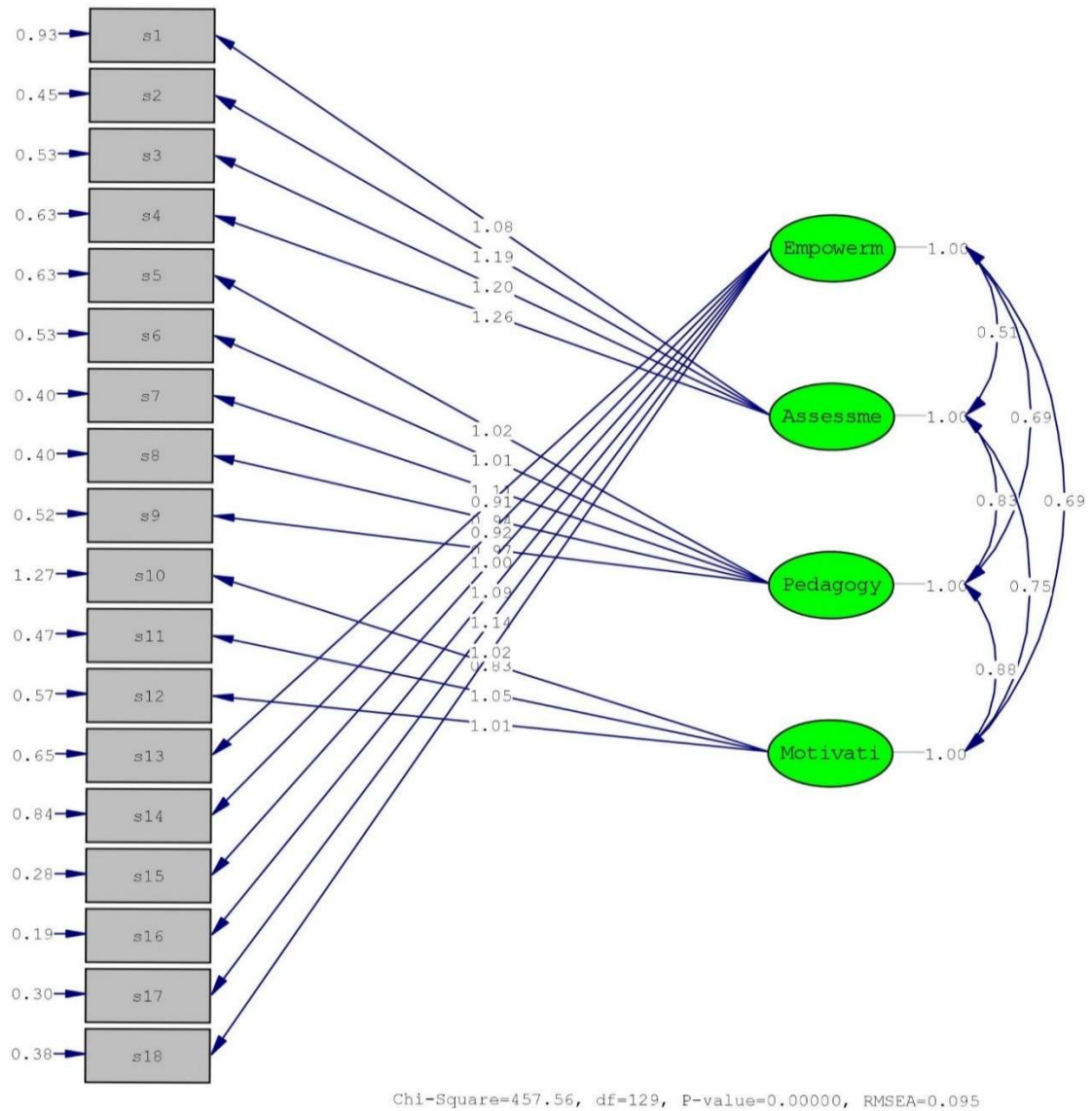


Table-3. Reliability and Item Analysis of the Health Education and Competency Scale

Sub-dimensions	Health Education and Competency Scale	Item Score Average		Cronbach's Alpha
Assessment	1. Obtaining information about the previous knowledge and experience of the patient's health problems before the training	5.04±1.45	5.06±1.24	.896
	2. Evaluate health status and needs before training	5.17±1.36		
	3. Learn about their habits and lifestyles before training	5.10±1.40		
	4. Asking patients about their preferences regarding learning styles	4.92±1.48		
Pedagogy	5. Allowing the patient to participate in the process	5.40±1.29	5.51±1.05	.910
	6. Using appropriate gestures and facial expressions when presenting educational content	5.58±1.24		
	7. Summarizing the “knowing and doing” tricks	5.43±1.27		
	8. Considering individual characteristics during training	5.59±1.13		
	9. Using multiple teaching strategies and appropriate supplementary materials during training	5.54±1.21		
Motivation	10. Designing a discrepancy between the patient's goals and behavior	5.00±1.39	5.32±1.07	.768
	11. Working with the patient to establish a life purpose	5.42±1.25		
	12. Encouraging the patient to change their bad behavior	5.54±1.26		
Empowerment	13. Protecting the patient's privacy	5.91±1.21	5.86±1.05	.933
	14. Avoiding arguing with the patient	5.78±1.29		
	15. Empathizing with the patient	5.92±1.13		
	16. Supporting the patient's efforts	5.90±1.17		
	17. Show enthusiasm when giving information	5.82±1.26		
	18. Responding positively to the patient's suggestions	5.85±1.18		
Health Education and Competency Scale Total Score			5.49±0.94	.950

Table-4.Comparison of the Distribution of Demographic Information of the Participants and the Average Scores They Got from the Health Education and Competency Measurement Tool according to their Characteristics

Particulars	Nurses(N:284)					Total Scale
	Number (n)	Assessment	Pedagogy	Motivation	Empowerment	
Female	197	5.90±1.026	5.06±1.252	5.50±1.093	5.33±1.090	5.51±0.952
Male	87	5.78±1.105	5.06±1.233	5.52±0.973	5.30±1.061	5.47±0.925
p>0.05*						
18-25	119	5.93±1.100	5.06±1.195	5.59±0.990	5.20±1.195	5.52±0.927
26-33	89	5.93±1.100	5.21±1.160	5.54±1.019	5.48±0.933	5.56±0.915
34-41	53	5.85±0.982	4.75±1.400	5.32±1.258	5.30±1.038	5.33±1.013
42 and ↑	23	5.76±1.069	5.17±1.382	5.42±1.030	5.37±1.055	5.48±0.981
p>0.05**						
1-5 year	176	5.88±1.087	5.07±1.242	5.57±1.003	5.31±1.122	5.52±0.934
6-10 year	57	5.76±1.024	5.17±1.271	5.38±1.144	5.25±0.998	5.44±0.998
11-15 year	21	5.77±0.980	4.65±1.292	5.36±1.431	5.28±1.212	5.33±1.048
16 year and ↑	30	6.02±0.942	5.05±1.173	5.52±0.899	5.55±0.881	5.59±0.833
p>0.05**						
Married	112	5.89±0.949	5.08±1.262	5.51±1.037	5.47±0.952	5.53±0.896
Single	132	5.85±1.113	5.05±1.236	5.50±1.071	5.22±1.147	5.47±0.973
p>0.05*						
Health vocational high School	44	5.64±1.230	4.74±1.226	5.28±1.053	5.01±0.900	5.23±0.831
Two-year degree	38	5.92±1.094	4.84±1.599	5.36±1.124	5.33±1.182	5.42±1.071
Undergraduate	176	5.90±0.983	5.14±1.121	5.57±1.035	5.35±1.113	5.55±0.920
Postgraduate	26	5.91±1.116	5.38±1.398	5.66±1.082	5.65±0.876	5.68±1.032
$\chi^2 : 8.021$ df:3 p:0.46**						

Health education during nursing education	Yes	211	5.98±1.021	5.16±1.255	5.60±1.059	5.38±1.098	5.59±0.937
	No	73	5.53±1.070	4.77±1.172	5.25±1.011	5.15±1.010	5.22±0.910
z:5807.500 z:6325.000 z: 6103.000 z:6501.000 z:5807.000 U:-3.147 U:-2.282 U:-2.649 U:-1.997 U:-3.133 p: .002* p: .022* p: .008* p: .046* p: .002*							
Health education after your nursing education	Yes	211	6.04±0.961	5.20±1.194	5.65±1.015	5.46±1.040	5.65±0.877
	No	73	5.35±1.131	4.64±1.297	5.09±1.071	4.90±1.087	5.04±0.987
z:5070.500 z:5682.500 z:5350.500 z:5302.000 z:4935.000 U:-4.371 U:-3.347 U:-3.897 U: -3.991 U:-4.575 p: .000* p: .001* p: .000* p: .000*							

*Mann Whitney-U Testi **KruskalWallisTesti

The closer the fit index values are to 1, the better the model fit. The literature suggests that an RMSEA value below 0.10, a GFI value greater than 0.80, and other fit indices above 0.85 or 0.90 indicate a good model-data fit (39,43). In the original study of the scale, the reported fit indices were $\chi^2/df = 2.515$, RMSEA = 0.077, SRMR = 0.04, CFI = 0.962, and GFI = 0.868. The fit indices in our study indicate that the model has an acceptable fit, similar to the original version.

The confirmatory factor analysis (CFA) demonstrated that the data fit the model, the four-factor structure was validated, the factors

were related to the scale structure, and the items within each factor defined their respective factor.

The path diagram obtained from CFA provides insights into factor loadings, t-values, unexplained variances, and other fit indices (Gatignon ,2011). It was determined that the path coefficients of the scale items were within an acceptable range. Additionally, reliability analyses included a test-retest assessment.

Test-retest reliability refers to the ability of a test to produce consistent results across

repeated measurements. Correlation analysis is used to evaluate this consistency, where a correlation coefficient close to 1 indicates high test-retest reliability. In the analysis conducted for the scale items, the correlation between the first and second application scores was found to be statistically significant ($p = 0.001$). The same test was administered to a sample of 50 nurses at a two-week interval, and the overall test-retest correlation for the scale was calculated as $r = 0.97$. This result indicates that the scale has high external reliability and a stable structure (Tavsancil,2019).

These findings confirm that the Turkish version of the HECS is a reliable and valid instrument for measuring the competence of nurses and healthcare managers in providing patient and health education. The subscales—Assessment, Pedagogy, Motivation, and Empowerment—are effective and reliable for assessing health education competence. Competencies such as evidence-based knowledge, communication with patients/families, and information-sharing skills are essential for delivering effective patient education (Polit,2010; Alpar, 2010; Kelo, 2013).

Previous instruments measuring health education practices have primarily focused on teaching skills, often overlooking the importance of motivation and empowerment, which are critical for promoting healthy behaviors and enhancing patients' self-care skills (Levensky, 2007; Chiang, 2015; Castro, 2016).

The HECS fills this gap by not only addressing pedagogical skills but also emphasizing the significance of motivation and empowerment in health education. In Türkiye, while there is no standardized criterion defining the required "competence" or "maturity" for health educators in patient and family education, some definitions of competent healthcare professionals can be found in health regulations. In Türkiye, according to the Nursing Regulation dated 08.03.2010 and published in the Official Gazette No. 27515:

Article 4- e) *"Specialist nurse: A nurse who specializes in her/his profession through*

postgraduate education and whose diploma is registered by the Ministry". Accordingly

Section Three (Specialist Nurse)

Article 7 - (2) *"In addition to their basic nursing roles, specialist nurses take responsibility for the programming, implementation and evaluation of clinical knowledge, skills, health research, consultancy services, health education services in the field of their specialization, implement and evaluate them".*

(3) (Annex: R.G-19/4/2011-27910) *"Conducts comprehensive health assessments related to the field of specialization. Plans, implements and manages nursing care. Develops new strategies in case the desired goals are not achieved in care".*

(5) (Annex: R.G-19/4/2011-27910) *"Plans the education of patients and their families.*

Inform patients about care and treatment methods and possible side effects. Ensures that patients have access to up-to-date and reliable health information".

The relevant articles of this regulation assign responsibility for planning and implementing health education to nurses who have completed undergraduate and postgraduate education. When undergraduate and postgraduate education programs are evaluated in this regard, it is evident that appropriate content and applications are provided to ensure competence in health education across all fields (Nursing Regulation,2010).

Studies evaluating nurses' competence in health education are crucial for improving teaching skills and identifying factors that influence patient education and problem-solving outcomes. Additionally, it is essential to recognize areas where nurses may lack competence in health education and determine which aspects need further development (Pueyo-Garrigues,2019).

Previous research has highlighted various challenges nurses face in delivering effective health education. For instance, some studies emphasize that nurses may not fully grasp the complex relationship between their approach to health education, patients' medical

outcomes, and behavior changes (Hwang,2018; Pueyo-Garrigues,2021).

A study conducted in Iran found that nurses did not perceive health education as part of their role and did not prioritize patient education. Furthermore, limitations such as a lack of hospital resources and time constraints were identified as barriers to providing health education to patients (Aghakhani,2013).

Similarly, a study in Sweden (Bergh, 2015) revealed that nurses reported insufficient knowledge of health education in their clinical practice. Research conducted in Spain showed that nurses' knowledge, skills, and attitudes toward health education ranged from low to moderate, with the primary reasons being inadequate training, time constraints, and heavy workloads (Pueyo-Garrigues,2021).

Therefore, enhancing nurses' competence in health education and accurately measuring their proficiency is of great importance.

In this study, it was determined that demographic factors of nurses did not affect their competence in health education. In the pedagogical subscale, significant differences were found only in favor of nurses with bachelor's and graduate degrees, compared to nurses with other educational levels.

Friberg et al. (2012) found that individuals with bachelor's or graduate degrees scored higher in the cognitive domain subscale of the health education competence scale (Friberg,2012). On the other hand, Pueyo-Garrigues' study in 2022 identified significant differences in knowledge scores between nurses with different educational levels regarding health education competence variables (Pueyo-Garrigues,2021)

Overall, other studies in the literature have found that nurses with bachelor's degrees place more emphasis on professional knowledge, and their education did not create a significant difference in developing knowledge, skills, and positive personal traits (Soto, 2018; Tofthagen, 2010).

When evaluating whether participants had received additional training in nursing education and health education, it was found that those who had received training scored

significantly higher in all scales and subscales. In our sample group, 62% had a bachelor's degree and 9.2% had a graduate degree. The average scores of this group in the general scale and its subscales were higher than those in other education groups, and a significant difference was found in the motivation subscale. In this context, it can be said that legally authorized nurses make a difference in practice.

Our study showed that nurses who participated in health education training and seminars had better knowledge and attitudes toward health education compared to those who did not have similar experiences. This finding is notable, given the necessity of continuous education for nurses to achieve lifelong learning and enhance their ability to provide quality patient care in their professional development (Mlambo,2021). Studies indicating that participation in training workshops increased nurses' knowledge acquisition and skills in practice have shown that educational seminars enhance nurses' knowledge and skills, enabling them to regularly produce the necessary outputs to achieve institutional goals (Ayeleke, 2019; Tariga, 2021)

Conclusion: The primary aim of creating this measurement tool is to evaluate the competence of healthcare professionals in delivering health education. The four dimensions of the Health Education and Competence Scale holistically assess various aspects of knowledge, attitude, and skills. This study found that the Turkish version of the Health Education and Competence Scale retained the same features as the original version. Future research could use this scale to assess clinical performance, scores from objective clinical exams, changes in educator behavior, and management of diseases or treatments. Furthermore, patient satisfaction and the perceived competence of healthcare professionals in providing education can also be examined. Nurses with bachelor's and master's degrees should be given greater responsibilities in health education within clinical settings, with a focus on expanding their roles. Nursing schools and medical training programs should prioritize health education as a core competency, providing

opportunities for theoretical knowledge, practical skill development, and simulated patient interactions. Hospitals and healthcare organizations should offer continuous education workshops and mentorship programs focusing on enhancing health education skills for new graduate nurses and interns. Encouraging a culture that evaluates and rewards effective health education prioritizes this crucial aspect of patient care for new healthcare professionals. The study has some limitations. It was conducted in only one hospital sample. Future studies can be conducted in different institutions and with nurses of different statuses.

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