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Psychometric properties of an evidence-based practice competencies self-assessment scale

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Abstract

Background: Evidence-based practice competencies are essential for safe, high-quality nursing care; however, culturally validated instruments grounded in comprehensive competency frameworks remain limited. This study aimed to psychometrically test the Evidence-Based Practice Competencies Self-Assessment Scale for nurses in the Turkish cultural context.

Methods: The study was conducted using a descriptive, cross-sectional, and methodological design. Data were collected between 2024 and 2025 from 304 nurses. Linguistic equivalence was ensured using forward and backward translation. Content validity was evaluated by expert review. Construct validity was examined using exploratory and confirmatory factor analyses. Criterion-related validity was assessed through comparison with an established evidence-based practice measure, and known-groups validity was tested based on evidence-based practice training. Reliability was evaluated using internal consistency, split-half reliability, test–retest reliability, and item–total correlations.

Results: Content validity indices were satisfactory. Exploratory factor analysis identified a four-factor structure explaining more than half of the total variance. Confirmatory factor analysis demonstrated acceptable model fit. Moderate and significant correlations supported criterion-related validity. Nurses who had received evidence-based practice training scored significantly higher than those who had not. The scale demonstrated high internal consistency and strong test–retest reliability.

Conclusion: The scale is a valid and reliable instrument for assessment of nurses' evidence-based practice competencies and suitable in both clinical and educational settings.

Background

Evidence-based practice (EBP) provides a framework for integrating scientific evidence into healthcare delivery by synthesizing clinical expertise with patient values and preferences [1]. The integration of scientific evidence into routine practice is key to improving patient outcomes and the quality of care [2]. EBP has evolved into an essential requirement for clinical decision-making; furthermore, its integration into routine care is intended to facilitate the attainment of high-reliability healthcare organizations [3]. Therefore, it is emphasized that health system managers and healthcare professionals should consider the benefits of EBP and focus on continuous improvements in the quality of care [4].

Increasing quality expectations are expanding the professional role of nursing and enhancing its complexity [3]. The ability to translate research findings into practice for effective and safe care delivery renders the clinical role of nurses even more critical [4]. The acquisition of EBP competency is essential for safe and high-quality nursing practices [2]. EBP competency encompasses the skills to formulate meaningful clinical questions, access information sources, appraise obtained evidence, and implement and analyze outcomes within the care process for individuals or communities [5]. As levels of competency and responsibility increase, nurses are expected to strengthen their engagement in EBP [4]. Although nurses are familiar with EBP and maintain positive attitudes, many perceive their EBP skills as

insufficient and do not feel adequately prepared to utilize these skills in practice [6,7]. Since the effective implementation of EBP depends on the proficiency level of nurses, it is of paramount importance to develop these competencies [8].

In line with efforts to define EBP competency, competency sets based on structured consensus have been developed [1–3,6] . These competency sets provide a fundamental reference for the systematic use of EBP in education, practice, and evaluation. Nevertheless, the primary need remains for healthcare institutions to understand and implement standards and competency frameworks encompassing all EBP steps, as well as to possess validated and reliable assessment tools that can be utilized to measure the EBP competency levels of nurses [6,9]. On the other hand, EBP competency has been measured using various instruments. It is observed that most of these tools measure EBP in a general manner, focusing on dimensions such as attitudes, knowledge/skills, and utilization [10,11]. Furthermore, cultural adaptations of instruments measuring knowledge, attitudes, practices, and skill domains related to EBP among nurses and nursing students in Türkiye have been utilized [12,13]. This situation presents a challenge for the measurement of EBP competencies of nurses working in Türkiye. Consequently, there is a distinct need to develop comprehensive new assessment tools or to test existing ones through cultural adaptation.

The 24-item EBP-CSAS used in this study is based on a comprehensive competency set developed by Melnyk et al. [6], structured to evaluate nurses' fundamental knowledge, skill, and behavioral competencies regarding the EBP process. This scale enables nurses to perform a self-assessment based on a comprehensive competency framework that encompasses all steps of EBP (e.g., formulating clinical questions, appraising evidence, implementation, and analyzing outcomes). In this regard, it possesses the potential to measure not only knowledge or attitudes but also practice-oriented skills. Consequently, as it offers the opportunity to evaluate nurses' EBP competency levels multidimensionally. The study was aimed to psychometrically test the EBP-CSAS for nurses in the Turkish cultural context.

Methods

Design

This study employed a descriptive, cross-sectional, and correlational design. The cultural adaptation of the EBP-CSAS was performed following the best practice guidelines for scale development and validation in order to ensure methodological rigor [14,15]. The study was reported in accordance with the COSMIN checklist for studies on measurement properties and STROBE.

Setting and Participants

The study was conducted between December 2024 and May 2025 at a Training and Research Hospital, a State Hospital, and a psychiatric hospital located in the Western Black Sea Region of Türkiye. In line with literature suggesting that the sample size for instrument validation should be five to ten times the number of items [16], a target of 240 participants was set (24 items x 10). Ultimately, the study was

conducted with a final sample of 304 participants. Nurses were eligible for inclusion if they were employed as members of the nursing staff at the specified hospitals, were present at the hospital during the data collection period, and voluntarily agreed to participate in the study. Nurses who declined participation or did not provide voluntary consent were excluded.

Data Collection and Tools

Data were collected using a demographic form, EBP-CSAS, and the Evidence-Based Practice Questionnaire (EBPQ). The data collection process was conducted via face-to-face interviews and took approximately 10 minutes to complete.

The demographic form consisted of five questions regarding the participants' age, gender, role within their institution (e.g., administrator, clinician), professional experience duration, and prior education on EBP.

The Evidence-Based Practice Competencies Self-Assessment Scale (EBP-CSAS), which consists of 24 items, was developed by Melnyk et al. [6] as a result of a study conducted to describe the current status of nurses' EBP competencies and to identify key factors associated with these competencies. The instrument does not have a factorial structure; instead, it allows nurses to self-evaluate their EBP competencies on a 4-point Likert-type scale (1=Not competent, 2=Needs improvement, 3=Competent, 4=Highly competent). Total scores on the scale range from 0 to 96, with higher scores representing superior EBP competency. The internal consistency coefficient of the scale was reported as 0.98 in original study [6].

The Evidence-Based Practice Questionnaire (EBPQ) was developed by Upton and Upton (2006) to evaluate nurses' EBP competencies and comprehensively examine concepts related to their attitudes. The Turkish EBPQ consists of 22 items and two subscales: 'knowledge and attitudes' and 'practice' [17]. The items are rated on a 7-point scale (ranging from 1 = 'never' to 7 = 'frequently' for the 'practice' subscale, and 1 = 'poor' to 7 = 'excellent' for the 'knowledge and attitudes' subscale), and a mean score is calculated for each subscale. High scores obtained by nurses indicate high levels of knowledge, positive attitudes, and frequent clinical implementation of EBP. The Cronbach's alpha for the Turkish adaptation of the scale was found to be 0.96. In the present study, the Cronbach's alpha coefficient was calculated as 0.94.

Psycholinguistics validity

The translation and cultural adaptation of the EBP-CSAS were conducted using the back-translation method proposed by Dhamani and Richter [18]. Initially, permission for the Turkish adaptation of the scale was obtained from the author via e-mail. In the first step, the scale was translated from English to Turkish by a bilingual expert (forward translation). Secondly, the scale was back-translated into English by another bilingual expert. The original and back-translated versions were evaluated by an independent bilingual expert, and corrections were made where necessary to ensure clarity and consistency.

Following the verification of linguistic equivalence by the language expert, the final version of the scale was sent to and approved by the original developer.

Content validity

Opinions were obtained from 10 experts (3 clinical nurses and 7 nursing academics) to evaluate the content validity of the Turkish version of the EBP-CSAS. All experts held doctoral degrees, were proficient in both Turkish (native) and English, and possessed knowledge and experience in scale development and cultural adaptation. The Davis technique was employed to assess content validity. The experts rated the scale items using a 4-point Likert scale: (a) 'Appropriate,' (b) 'Item should be slightly revised,' (c) 'Item should be seriously revised,' and (d) 'Item is not appropriate' [19]. Content validity estimates were examined by calculating the item-level content validity index (I-CVI) for each component of the instrument and the scale-level content validity index (S-CVI). I-CVI and S-CVI values of 0.80 or higher are generally considered acceptable and indicative of adequate content validity [20].

Face validity

It is recommended to administer the version—for which linguistic and content validity have been established—to at least 30 participants with characteristics similar to the target sample to evaluate the face validity of the scale [20]. In this context, the scale was administered to 30 nurses who were not included in the primary sample but shared similar characteristics, and the items were found to be clear and understandable. Consequently, no further revisions were made to the items. Data obtained from the pilot study were not included in the main analysis.

Data analysis

Data analysis were performed using SPSS 25.0 and AMOS 24.0. All statistical analyses were planned a priori based on established guidelines for scale development and validation. The socio-demographic characteristics of the participants were presented using descriptive statistics (frequencies, percentages, means, and standard deviations). Reliability estimates were evaluated using Cronbach's alpha, item–total correlations, inter-item correlations, split-half reliability, and test-retest reliability. The Hotelling T-square test was used to determine whether there was response bias in the scale. For test-retest reliability, Pearson correlation and the Intraclass Correlation Coefficient (ICC) were computed. Furthermore, the difference between the two time points was examined using the paired-samples t-test.

Exploratory Factor Analysis (EFA) was conducted using Principal Axis Factoring with Promax rotation. The sampling adequacy was evaluated via the Kaiser-Meyer-Olkin (KMO) test, while the presence of sufficient correlation for factor analysis was assessed using Bartlett's Test of Sphericity. Confirmatory Factor Analysis (CFA) was employed to evaluate model fit and construct validity. The Maximum Likelihood method was employed in the CFA as the assumption of multivariate normality was met. Prior to the CFA, multicollinearity was tested and not detected. The Chi-Square/Degree of Freedom ($\chi 2/df$), Goodness of Fit Index (GFI), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Normed Fit Index

(NFI), Incremental Fit Index (IFI), Relative Fit Index (RFI), and Root Mean Square Error of Approximation (RMSEA) were utilized to evaluate the fit between the data and the model derived from the EFA results. A correlation matrix was used for the EFA, and a covariance matrix was used for the CFA. The known-groups comparison between EBP training status and EBP-CSAS scores was examined using the independent samples t-test. To test convergent validity, the relationship between the EBP-CSAS and the EBPQ was analyzed using Spearman's correlation. The normality of the scale scores was evaluated using skewness and kurtosis values, with a range of ±2 indicating a normal distribution. For all statistical analyses, a significance level of $p < 0,05$ was accepted.

Results

Participants

The nurses had a mean age of 32.12 ± 7.38 years, and the majority were female (77.3%, n = 235). Nearly half of the participants were employed as clinical/ward nurses (47.4%, n = 144). Their mean duration of professional experience was 9.72 ± 8.22 years, and 57.2% (n = 174) reported having received training on EBP.

Content validity

Content validity estimates were evaluated, revealing an I-CVI ranging between 0.8 and 1.00, while the S-CVI was 0.95.

Construct validity

Sampling adequacy was supported by a KMO estimate of 0.926, and Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 4077.679$, $p < 0.001$). EFA using Principal Axis Factoring with Promax rotation identified a four-factor structure explaining 52.55% of the total variance. The first sub-dimension (sustaining evidence-based practice and improving evidence-based practice; item 11,13,17,18,19,20,21,22,23,24) accounted for 42.22%, the second sub-dimension (evidence based decision making and evidence synthesis; item 9,10,12,14,15,16) accounted for 4.61%, the third sub-dimension (formulating clinical questions and evidence analysis; item 3,4,5,6,7,8) accounted for 3.07%, while the fourth sub-dimension (inquiring into clinical practice and problem identification; item 1,2) contributed 2.64% of the variance. Item factor loadings in the first sub-dimension ranged between 0.39 and 0.77, the second sub-dimension ranged between 0.37 and 0.96, the third sub-dimension ranged between 0.42 and 0.89, whereas in the fourth sub-dimension, they ranged between 0.41 and 0.89. Eigenvalue estimates for the four sub-dimensions were calculated as 10.606, 1.491, 1.168 and 1.094, respectively (Table 1).

CFA supported the four-factor model. The chi-square estimate was 847.724 with 244 degrees of freedom ($p < 0.001$), yielding a χ^2/df ratio of 3.474. Model fit estimates were RMSEA 0.090, GFI 0.81, CFI 0.85, IFI 0.85, RFI 0.77, TLI 0.83, and NFI 0.80. As a result of CFA, it was determined that the factor loads

of the first sub-dimension of the scale ranged from 0.58 to 0.78, the factor loads of the second sub-dimension ranged between 0.67 and 0.74, the factor loads of the third sub-dimension varied between 0.63 and 0.77, and the factor loads of the fourth sub-dimension varied between 0.68 and 0.72 (Table 2, Figure 1).

In terms of criterion-related validity, moderate and statistically significant correlations were found between the EBP-CSAS and the EBPQ subscales of 'knowledge and attitudes' ($r=0.64$) and 'practice' ($r=0.65$) ($p < 0.001$).

Known groups validity

Known-groups validity estimates indicated a statistically significant difference between nurses who had received EBP training and those who had not. Participants with prior training had higher mean total scale scores (71.27 ± 13.89) compared with those without training (61.80 ± 11.59), and this difference was statistically significant ($t = 6.47$, $p < 0.001$).

Reliability analysis

Internal consistency estimates for the total scale indicated high reliability, with a Cronbach's alpha estimate of 0.94. Cronbach's alpha estimates for the four subscales were 0.899, 0.864, 0.843, and 0.653, respectively (Table 3).

As a result of the split-half analysis, the Cronbach's alpha value of the first half was determined to be 0.888, and the Cronbach's alpha value of the second half was determined to be 0.897. The correlation between the two halves was found to be 0.916. The Spearman- Brown was calculated as 0.956, and the Guttman split-half was calculated as 0.956 (Table 3). The Hotelling T-square test was used to determine whether there was response bias in the scale, and the Hotelling T-square value was found to be 196.615, $F = 7.928$, and $p < 0.001$. As a result of the analysis, it was determined that there was no response bias on the scale.

It was determined that the correlations of the scale items with the scale total score ranged between 0.436 and 0.714. It was determined that the correlations of the scale items with the sub-dimension total score ranged between 0.489 and 0.715. When removed from the scale, it was determined that no item significantly increased Cronbach's alpha (Table 4).

Test–retest reliability analysis revealed a high positive and statistically significant correlation between the scores obtained at the two different time points ($r = 0.788$, $p < 0.05$). The ICC values for EBP-CSAS overall scale were 0.97 (95% CI, 0.963 to 0.983). No statistically significant difference was found between the test and retest mean scores ($t = -1.645$; $p = 0.106$).

Discussion

This study was conducted to adapt the EBP-CSAS into Turkish and evaluate its psychometric properties. Although the original study performed face, content, and construct validity analyses, detailed empirical data were not provided, and only the internal consistency coefficient was reported [6]. Furthermore, no validated and reliable versions of the scale adapted into other languages were found in the literature. Only a cross-sectional study translated the 13-item core competencies section into Chinese and reported its internal consistency [21]. In this regard, the present study represents the first detailed cross-cultural adaptation of the EBP-CSAS and provides an original tool for assessing nurses' EBP competencies in Türkiye.

Validity refers to the extent to which an instrument accurately measures the characteristic it is intended to measure [22]. In this study, the validity of the Turkish version of the EBP-CSAS was examined through content, face, and construct validity. Opinions from 10 experts were obtained to determine the S-CVI. The literature suggests that after ensuring linguistic validity, opinions from at least three and at most 20 subject matter experts should be sought to examine content validity [20]. To conclude that there is a consensus among expert opinions regarding measurement instruments, it is recommended that I-CVI and S-CVI values be above 0.80 [19]. It was determined that both the I-CVI and the S-CVI values were above 0.80. This result indicates that the Turkish version of the scale adequately measures a construct similar to the original scale and that content validity has been established.

The construct validity of the EBP-CSAS was primarily tested using factor analysis (EFA and CFA). Additionally, convergent validity and known-groups validity methods were employed to support construct validity. Construct validity refers to the extent to which a scale measures the theoretical concept it intends to measure [20]. The first step in evaluating construct validity is to determine the suitability of the data for factor analysis using the KMO coefficient and Bartlett’s test of sphericity. It has been stated that for factor analysis to be performed, the Bartlett’s test of sphericity must be statistically significant, and the KMO value must be at least 0.60 [15]. KMO values are interpreted as weak if between 0.50–0.59, moderate between 0.60–0.69, good between 0.70–0.79, very good between 0.80–0.90, and excellent if >0.90 [20,23]. These results indicate that the sample size was adequate and the correlation matrix was suitable for factor analysis.

The original version of the EBP-CSAS consists of 24 items without a factorial structure. In this study, contrary to the original structure, EFA revealed a four-factor structure with eigenvalues greater than 1: (1) sustaining and improving evidence-based practice, (2) evidence-based decision-making and evidence synthesis, (3) formulating clinical questions and evidence analysis, and (4) inquiring into clinical practice and problem identification. The four-factor scale explains 52.55% of the total variance. In scale adaptation studies, an explained variance of at least 50% is generally considered an acceptable level [23]. In the present study, the total explained variance ratio exceeds the recommended minimum of 50%, thereby supporting the validity of the scale. Following the EFA, the factor loadings of the items in the four subscales were determined to be greater than 0.30. The literature suggests that factor loadings should be at least 0.30 [24]. These findings indicate that the items possess adequate validity in the Turkish sample and are strongly associated with the intended construct.

Two issues are significant regarding the factorial structure of the Turkish version of the EBP-CSAS. First, no factorial structure was proposed in the original scale, and the factor solution obtained from the Turkish sample represents the first empirical structure of the instrument. Melnyk et al. [6] developed the EBP-CSAS items based on competency domains; therefore, there is no validated factor structure for the English version. Second, it is expected that each subscale contains at least three items to capture the true essence of that dimension [15]. In the Turkish instrument, only the 'inquiring into clinical practice and problem identification' subscale consists of two items, while the other subscales meet this expectation. It is anticipated that scales adapted to different cultures may reveal different factor structures compared to their original versions. This stems from cultural, linguistic, and contextual differences in the interpretation of the items [25].

The four-factor structure of the EBP-CSAS was examined using first-order CFA, and the model showed acceptable, though not optimal, fit indices. CFA is a psychometric analysis that tests the extent to which an alternative a priori factor structure fits the data and examines the relationships between latent constructs free from measurement errors [14]. In first-order CFA, the recommended minimum factor loading is accepted as 0.30 (preferably ≥0.50) [20,24]. In the present study, the factor loadings obtained were at least 0.58, which is above the recommended threshold values. Regarding the model fit indices, the χ^2/df value of 3.47 indicates that the model is within the limits of acceptable fit [20]. The RMSEA value was found to be 0.090; although this value is above the 0.08 threshold recommended for good fit, it is evaluated in the literature as a borderline yet acceptable fit for multi-factor and relatively complex measurement models. Examination of the incremental fit indices revealed that the CFI and IFI values were 0.85, TLI was 0.83, NFI was 0.80, and GFI was 0.81. While these indices remain below the traditional threshold of 0.90, it has been reported that such values are commonly observed in models with moderate sample sizes containing a large number of items and factors [26]. It is stated that model fit can be considered reasonable, especially when supporting indices such as RMSEA and χ^2/df are at acceptable levels [27]. Thus, the four-factor model of the EBP-CSAS identified via EFA was found to be reasonably acceptable.

Criterion-related validity was tested to support the construct validity of the EBP-CSAS. Conceptually, criterion-related validity is a type of construct validity based on examining theoretically expected relationships between the scores of two related scales [24]. In this study, the criterion-related validity of the instrument was tested through the relationship between the EBP-CSAS and the subscales of the EBPQ. The positive, strong, and statistically significant correlation of the scale with both subscales of the EBPQ indicates that it possesses good convergent validity [20]. This provides strong evidence that the Turkish version of the EBP-CSAS evaluates a construct similar to the EBPQ [28].

The known-groups validity of the scale was also tested, thereby providing additional support for its construct validity [20]. Known-groups validity refers to the ability of an instrument to significantly distinguish between groups that are theoretically predicted to differ [14]. In this study, a statistically significant difference was found between the EBP-CSAS scores of those who had received EBP training

and those who had not. This finding demonstrates that the scale is capable of discriminating between specific known groups.

These findings indicate that the Turkish version of the EBP-CSAS offers significant contributions to the fields of clinical practice and nursing education. In clinical settings, this scale can be utilized for planning in-service training programs, identifying EBP-oriented professional development needs, and monitoring the effectiveness of interventions. In the field of education, it can serve as a functional measurement tool for assessing EBP competencies in undergraduate and graduate nursing programs, strengthening the curriculum, and monitoring learning outcomes.

Reliability refers to the extent to which a measurement instrument remains stable over time and produces consistent and similar results across different applications [29]. Various methods are utilized to determine the reliability of scales used in empirical research. In this study, internal consistency analyses (Cronbach's alpha, split-half, and item-total correlations) and test-retest reliability, which are among the most frequently used methods, were examined [20].

The EBP-CSAS is a four-point Likert-type scale. The Cronbach's alpha, a method of internal consistency estimate, was calculated. Cronbach's alpha examines whether the items forming the scale measure the same construct based on their relationship with the total score [14]. Cronbach's alpha values of ≥0.60 are considered acceptable, while values ≥0.90 indicate excellent internal consistency [16]. The overall Cronbach's alpha for the scale was 0.944, and estimates for the four subscales were 0.899, 0.864, 0.843, and 0.653, respectively. In the original development study, the Cronbach's alpha was reported as 0.98 [6]. Furthermore, in the study where the scale was adapted into Chinese and only the 13 core competency items were examined, the alpha estimate was reported as 0.917 [21]. These results indicate that the Turkish version of the EBP-CSAS demonstrates high reliability and internal consistency in measuring the intended construct.

Another method used to evaluate reliability is the split-half method, which involves dividing the scale into two equal halves and calculating the correlation using the Spearman-Brown and Guttman coefficients [16,28]. A correlation estimate of at least 0.30 between the first and second halves of the scale, Cronbach's alpha ≥0.70 for each half, and a Spearman–Brown coefficient of 0.70 or higher are considered indicative of acceptable reliability [20,29]. In this study, the correlation estimate between the first and second halves of the scale was found to be 0.916, the Spearman–Brown coefficient was calculated as 0.956, and the Cronbach's alpha for the first and second halves were 0.888 and 0.897, respectively. These findings are well above the thresholds recommended in the literature, indicating that the scale possesses a high level of reliability.

Item-total score analysis indicates the extent to which scale items measure the construct intended to be measured [14]. The literature suggests that the item-total correlations for the items in a measurement instrument should range between 0.30 and 0.80 [20]. It is considered that item-total correlation estimates below 0.30 indicate that the items do not adequately represent the conceptual structure, while estimates above 0.80 suggest that they reflect only a limited aspect of the structure [29]. In this study,

the item-total correlation estimates of the items were found to range between 0.436 and 0.714. Furthermore, inter-item correlations are evaluated in a similar manner [20]. In the present study, the correlations between the items and the scale total score, the subscale total scores, and the inter-item correlations were found to be within acceptable values. The results of the study demonstrated that the items are associated with both the scale and the subscales, and the reliability of the scale items is high.

The stability of the scale—specifically, the extent to which consistent results are obtained when measurements are repeated—was evaluated through test-retest analysis, and ICC was calculated [28]. As suggested in the literature, the test-retest results demonstrated a strong and significant correlation between the two time points, and no significant difference was observed between the first and second measurements using the paired samples t-test [20,30]. Furthermore, the ICC was found to be high at 0.97, as expected. These results reveal that the scale possesses a very high level of consistency over time.

Potential response biases must be eliminated to maintain a high level of reliability [31,32]. In the process of testing the response bias of a scale, the homogeneity of the responses given to each item is evaluated. In other words, the researcher determines whether the mean scores of the items differ significantly from one another. Hotelling's T-square test also measures whether the items in the scale are perceived in the same way by participants and assesses the difficulty level of each item. If Hotelling’s T2 test is statistically significant (P < ,05), it indicates the absence of response bias [20]. In this study, the values for the Hotelling’s T2 test were found to be consistent with the literature (Hotelling T-square= 196.615, F = 7.928, and p < 0.001), demonstrating that there was no response bias.

This study has several limitations. First, the data were collected in only one province located in the Western Black Sea region of Türkiye, which limits the generalizability of the findings to all regions of the country. Second, random sampling was not employed for the inclusion of nurses, which further constrains the generalizability of the results to the entire nursing population. Additionally, since the data are based on self-reporting, responses may be influenced by social desirability bias. Finally, the fact that EFA and CFA were not performed on separate datasets can be considered another limitation of the study.

Conclusion

In conclusion, the Turkish version of the EBP-CSAS was found to be a valid and reliable measurement instrument capable of multidimensionally evaluating nurses' EBP competencies. It consists of a total of 24 items, with total scores ranging from 24 to 96. Possible score ranges for the subscales are 2–8 for 'inquiring into clinical practice and problem identification,' 6–24 for 'formulating clinical questions and evidence analysis,' 6–24 for 'evidence-based decision-making and evidence synthesis,' and 10–40 for 'sustaining and improving evidence-based practice.' Higher scores obtained from the scale indicate higher levels of EBP competency among nurses. In future studies, testing the scale in different sample

groups, various healthcare institutions, and through longitudinal designs will contribute to strengthening the psychometric findings.

Declarations

Ethics approval

Permission to use the original scale was obtained from the developer. Ethical approval was granted by Bolu Abant Izzet Baysal University ethics committee consisting of multidisciplinary faculty members (Research Ethics Committee No. 2024/202, August 20, 2024). Informed consent was obtained from all participants.

Consent for publication

Not applicable

Availability of data and materials

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

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

SDE and EGS contributed to the conception and design of the study. SDE and EGS were responsible for data collection. MB performed the data analysis and interpretation. SDE and EGS drafted the manuscript, and MB critically revised it for important intellectual content. All authors approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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Tables

Table 1. Exploratory factor analysis results of the EBP Competencies Scale (n = 304)

Items	Subscale			
	F1	F2	F3	F4
Competency 1: I question clinical practices for the purpose of improving the quality of care.				.41
Competency 2: I identify clinical problems using internal evidence*.				.89
Competency 3: I participate in the formulation of clinical questions using the PICO(T)** format.			.53	
Competency 4: I search for external evidence*** to answer specified clinical questions.			.49	
Competency 5: I participate in the critical appraisal of pre-appraised evidence****.			.60	
Competency 6: I participate in the critical appraisal of published studies to determine their strength and applicability to clinical practice.			.89	
Competency 7: I participate in the evaluation and synthesis of all evidence collected to determine its strength and applicability to clinical practice.			.84	
Competency 8: I collect practice data (e.g. patient data, quality improvement data) systematically as internal evidence for clinical decision making in the care of individuals, groups and communities.			.42	
Competency 9: I integrate evidence collected from external and internal sources in order to plan evidence-based practice changes.		.52		
Competency 10: I implement practice changes based on evidence, clinical expertise and patient preferences to improve care processes and patient outcomes.		.54		
Competency 11: I evaluate the outcomes of evidence-based decisions and practice changes for the individuals, groups and communities to determine best practices.	.55			
Competency 12: I disseminate best practices supported by evidence to improve quality of care and patient outcomes.		.96		
Competency 13: I participate in strategies to sustain an evidence-based practice culture.	.50			
Competency 14: I systematically conduct a comprehensive search for external evidence*** to answer clinical questions.		.37		
Competency 15: I critically appraise relevant preappraised evidence**** and primary studies, including evaluation and synthesis.		.74		
Competency 16: I integrate external evidence*** from health and related fields with internal evidence* when in making		.42		

decisions about patient care.				
Competency 17: I lead trans-disciplinary teams in applying synthesized evidence to initiate clinical decisions and practice changes to improve the health of individuals, groups and communities.	.40			
Competency 18: I generate internal evidence through outcomes management and evidence-based practice projects for the purpose of integrating best practice.	.39			
Competency 19: I measure processes and outcomes of evidence-based clinical decisions.	.42			
Competency 20: I formulate evidence-based policies and procedures.	.51			
Competency 21: I participate in the generation of external evidence*** with other healthcare professionals.	.74			
Competency 22: I mentor others in evidence-based decision making and in the process of evidenced-based practice .	.53			
Competency 23: I implement strategies to sustain an evidence-based practice culture.	.77			
Competency 24: I communicate the best evidence to individuals, groups, colleagues and policy makers.	.77			
Eigenvalue	10.606	1.491	1.168	1.094
Explained variance (%)	42.22	4.61	3.07	2.64
Total explained variance (%)	52.55			
KMO coefficient	.926			
Bartlett's Test	$\chi 2 = 4077.679$ ($p < .001$)			

Table 2. Model fit indices of the four-factor model (n = 304)

Models	χ2	df[a]	p	χ2/df	RMSEA[b]	GFI[c]	CFI[d]	IFI[e]	RFI[f]	NFI[g]	TLI[h]
	847.724	244	.000	3.474	.090	.81	.85	.85	.77	.80	.83

[a] Degree of free. [b] Root mean square error of approximation. [c] Goodness of fit index. [d] Comparative fit index. [e] Incremental fit index. [f] Relative fit index. [g] Normed fit index. [h] Tucker-Lewis index

Table 3. Reliability analysis of the scale (n = 304)

Sub-Dimensions	Cronbach alpha	Split-Half Analysis				
		First Half Cronbach α	Second Half Cronbach α	Spearman–Brown	Guttman Split-Half	Correlation Between the Two Half
Total	0.944	0.888	0.897	0.956	0.956	0.916
Sustaining evidence-based practice and improving evidence-based practice;	0.899					
Evidence based decision making and evidence synthesis	0.864					
Formulating clinical questions and evidence analysis	0.843					
Inquiring into clinical practice and problem identification	0.653					

Table 4. Item- total score and subscale total score analyses (n = 304)

Items	Corrected item-total score correlation (r)*	Corrected item- subscale total score correlation (r)*
İtem 1	0.436	0.489
İtem 2	0.456	0.489
İtem 3	0.613	0.613
İtem 4	0.607	0.599
İtem 5	0.609	0.622
İtem 6	0.608	0.673
İtem 7	0.650	0.707
İtem 8	0.605	0.526
İtem 9	0.658	0.676
İtem 10	0.627	0.613
İtem 11	0.557	0.553
İtem 12	0.626	0.700
İtem 13	0.636	0.638
İtem 14	0.704	0.648
İtem 15	0.614	0.669
İtem 16	0.714	0.643
İtem 17	0.687	0.664
İtem 18	0.684	0.657
İtem 19	0.675	0.644
İtem 20	0.650	0.660
İtem 21	0.662	0.692

İtem 22	0.657	0.644
İtem 23	0.584	0.621
İtem 24	0.672	0.715

Figures

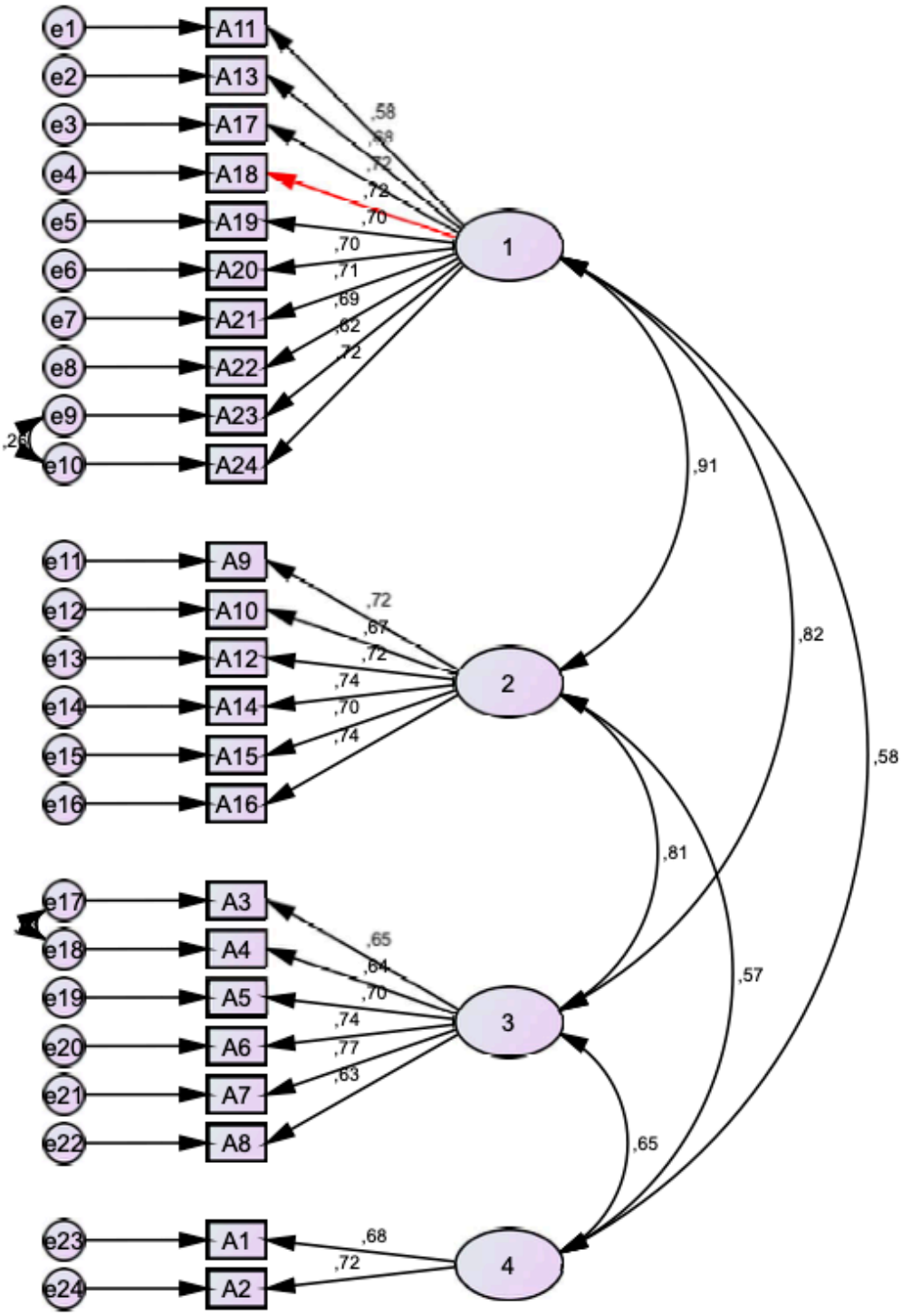


Figure 1

Confirmatory factor analysis