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Cross-cultural adaptation, validity, and reliability of the Turkish version of the Nurse Occupational Stigma Scale (NOSS-TR)

Burcu Arkan^{1*} , Işıl Alban² and Yalçın Kanbay³

Abstract

Background While the stigmatizing tendencies of nurses towards patients have been the subject of frequent research, there is a notable lack of research evaluating the stigmatizing attitudes of patients towards nurses. This study aimed to adapt the Nurse Occupational Stigma Scale (NOSS), which was developed to assess occupational stigma towards the nursing profession, for use in Turkish culture and to examine its validity and reliability.

Methods The study followed the COSMIN guidelines for scale adaptation and psychometric evaluation. Data were collected via social media using the snowball sampling method, yielding responses from 692 adults in Turkey. Of the sample, 55.4% were female, 45.4% were married, and 53.4% had higher education; the mean age was 31.9 ± 11.1 years (range: 18–70). The adaptation process included forward–backward translation, expert review, and calculation of the content validity ratio (CVR) and content validity index (CVI). Construct validity and internal validity were assessed, and Cronbach's α reliability coefficient, Guttman's coefficient, and Spearman-Brown two-thirds test consistency were calculated to evaluate reliability.

Results Ten experts participated in the content validity assessment, and the critical CVR value for 10 experts (.62) was exceeded by all items. The overall CVI value was 0.925 ($CVI > CVR$). Construct validity was assessed using confirmatory factor analysis (CFA); as a result of the analysis, the structure of the scale, comprising three factors and 11 items, was confirmed. Model fit indices were found to be excellent ($\chi^2/df = 2.923$, $RMSEA = 0.054$, $CFI = 0.97$, $GFI = 0.97$, $AGFI = 0.95$, $NFI = 0.95$). Standardized factor loadings ranged between 0.47 to 0.84. In the internal validity analysis, 27% lower–upper group comparisons yielded significant results ($p < 0.001$). In the reliability analysis, the Cronbach's α coefficient of the scale was found to be 0.80, and between 0.61 and 0.87 for the sub-dimensions. Additionally, Spearman-Brown and Omega reliability coefficients fell within the limits recommended in the literature.

Conclusions In line with the findings, it was determined that the NOSS-TR is a valid and reliable measurement tool for assessing occupational stigmatization towards the nursing profession in Turkish culture.

Clinical trial number Not applicable.

Keywords Nursing, Occupational stigmatization, NOSS, Validity, Reliability

*Correspondence:

Burcu Arkan
burcuarkan@uludag.edu.tr

¹Psychiatric Nursing Department, Faculty of Health Sciences, Bursa
Uludag University, Bursa, Turkey

²Psychiatric Nursing Department, Institute of Health Sciences, Bursa
Uludag University, Bursa, Turkey

³Faculty of Health Sciences, Psychiatric Nursing Department, Artvin Coruh
University, Artvin, Turkey



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Background

Professions that contain elements that are physically, socially, or morally undesirable by society are considered within the scope of the concept of “dirty work” in the literature [1]. The nursing profession, which is characterized by working night shifts, interacting with strangers, and performing tasks considered “dirty” by society, is frequently associated with stigmatization in this context [2]. Stigmatization has been defined by Goffman [3] as a social process that discredits an individual’s identity, and later conceptualized by Link and Phelan [4] as involving labeling, stereotyping, separation, status loss, and discrimination operating in contexts of unequal power [3, 4]. These theoretical perspectives highlight that stigma toward nursing does not arise merely from individual prejudice but is reinforced by cultural norms, gendered expectations, and occupational hierarchies.

Stigmatization is frequently mentioned in the literature as a significant issue in the nursing profession. Since the nursing profession is associated with both traditional and cultural stereotypes, stigmatization can become even more complex [5]. Nurses often encounter stigmatizing situations due to their exposure to death, bodily waste, mental illness, homelessness, substance use, and other cases considered contrary to social norms [2, 6, 7]. These experiences may lead to social and professional exclusion, discrimination, and harassment, negatively affecting nurses’ professional identities and psychological well-being [7–10]. In certain cultural contexts, such as Bangladesh, nursing has been linked to decreased social value and even associations with sex work, highlighting the social consequences of occupational stigma [11]. During the COVID-19 pandemic, stigmatization and violence toward healthcare workers became more pronounced, particularly for frontline nurses [12]. Additionally, perceived “dirty work” has been shown to reduce professional commitment among nursing students, although social support and career adaptability can mitigate these effects [13].

Although nursing is a core component of the healthcare system, occupational stigmatization remains a significant issue, shaped by historical, cultural, and social factors [2]. In Türkiye, research has largely focused on nurses’ stigmatization tendencies toward patients or specific patient groups [14–16]. However, studies examining patients’ stigmatization of nurses are lacking. Given the historical perception of nursing in Türkiye as a gendered and subordinate profession, understanding occupational stigma toward nurses is critical.

Valid and reliable measurement tools are essential to address this gap. The Nurse Occupational Stigma Scale (NOSS) developed by Yang et al. [2] measures stigma in three dimensions: negative label, nurse-patient relationship, and devaluation and discrimination. The literature

review reveals that no valid and reliable measurement tool assesses stigmatization toward the nursing profession in Türkiye. Therefore, the aim of this study was to adapt the “Stigma Scale for Nursing Profession” developed by Yang et al. [2] into Turkish and test its validity and reliability in line with the COSMIN guidelines [17]. The scale in question has been tested thus far only in Chinese culture, and its usability in different cultural contexts has yet to be demonstrated. In this context, the validity and reliability study to be conducted in the Turkish sample will make important contributions to the national and international literature.

The study is guided by the following research question: Is the NOSS a valid and reliable instrument for assessing occupational stigma toward nursing in the Turkish cultural context?

Occupational stigmatization is an important psychosocial factor that can negatively affect nurses’ psychological well-being, professional satisfaction, and patient-nurse relationships. As a result of this research, a measurement tool will be developed to objectively evaluate stigma toward the nursing profession in Türkiye. Owing to this scale, the place of the nursing profession in the eyes of society can be evaluated more objectively, and it can be a guide in shaping both the vocational education curriculum and awareness campaigns for society. The findings obtained will both contribute to the understanding of the stigmatization processes to which nurses are exposed and provide a scientific basis for intervention and prevention studies in the relevant field.

Method

Study design and setting

This methodological study was conducted in June 2025, following ethical approval obtained in May 2025. The study aimed to adapt the Nurse Occupational Stigma Scale (NOSS) [2], which was developed to evaluate occupational stigma toward the nursing profession, for use in Turkish culture and to examine its validity and reliability. Accordingly, this study aimed to adapt the NOSS scale into Turkish in line with the COSMIN guidelines [17], to examine its usability in measuring stigmatization against nurses, to verify its factor structure, to determine its validity and reliability levels, and to test its psychometric properties as an applicable measurement tool in Turkish culture.

Participants

The population of this study consisted of individuals aged 18 years and over who had at least one inpatient hospitalization experience in Turkey. Since individuals with inpatient treatment experience are in direct and continuous contact with nurses, it was assumed that their professional perception levels would be more significant

and measurable. The sample of the study consisted of individuals selected through the snowball sampling method and who voluntarily participated in the study. The participants were invited to participate in the study through a Google Forms link on Instagram and WhatsApp. The initial 'seeds' for the snowball sampling were selected from the researchers' professional and social networks, representing diverse educational and occupational backgrounds to ensure initial heterogeneity. This strategy was chosen to maximize outreach across varied demographic segments using social media in Turkey, consistent with the exploratory nature of the cross-cultural adaptation.

The inclusion criteria were being over 18 years of age, having at least one previous inpatient experience, volunteering to participate in the study, and having read and accepted the consent form. To ensure that all participants met the inclusion criterion of having experienced at least one inpatient hospitalization, an initial screening question ("Have you ever been hospitalized for at least one night in a healthcare facility?") was included at the beginning of the survey. Only respondents who answered "Yes" were allowed to proceed to the main questionnaire. Individuals who did not consent to participate, were younger than 18 years of age, or answered "No" to the screening question were automatically excluded from the dataset prior to analysis.

Data collection

Since this study involves scale adaptation, factor analysis techniques should be employed to analyze the data. According to the literature, a sample of 300 participants is considered a suitable sample size for factor analysis [18, 19]. To adapt the scale to Turkish culture and examine its psychometric properties, data were collected from 692 participants between June 1, 2025, and June 15, 2025. Of the sample, 55.4% were female, 45.4% were married, and 53.4% were students or graduates with higher education. The mean age of the sample was 31.9 ± 11.1 years (minimum: 18, maximum: 70).

The data were collected online through the "Google Forms" platform using the Sociodemographic Data Collection Form and the Nurse Occupational Stigma Scale (NOSS) [2]. On the opening page of the web-based questionnaire tool, participants were provided with information about the study, including informed consent, the method, the importance of participation, and details about the researchers involved. It was explained that the information obtained would be kept confidential.

To ensure data quality and minimize potential issues, the Google Forms settings were configured to prevent submissions with missing responses and limit participation to one response per IP address, thereby immediately preventing incomplete and duplicate data entries

at the point of submission. As a result, the initial dataset received no missing, incomplete, or duplicate responses.

Sociodemographic Data Collection Form

The Sociodemographic Data Collection Form used in this study was developed by the researchers. The form consisted of 11 items (e.g., age, gender, marital status, and educational level) that were selected based on variables commonly reported in the literature for describing participant characteristics. The form was therefore tailored to the context of the present study while adhering to general methodological guidance on the development of sociodemographic questionnaires [20].

Nurse Occupational Stigma Scale (NOSS)

The scale, initially named the "Nurse Occupational Stigma Scale (NOSS)" and developed by Yang et al. [2], was designed to measure occupational stigma toward nurses. Validity and reliability analyses were performed on an adult patient sample in China. In the scale development process, items created as a result of a literature review and open-ended interviews were tested through expert evaluations and factor analysis. The scale consists of 16 items and three subdimensions (negative label, nurse-patient relationship, devaluation, and discrimination). The fit indices of the model obtained via confirmatory factor analysis were satisfactory ($\chi^2/df = 2.635$; RMSEA = 0.064; CFI = 0.962). The total internal consistency coefficient of the scale was 0.920 and ranged between 0.827 and 0.919 for the subdimensions. Criterion validity was assessed via the Caring Behaviors Inventory (CBI-24), and significant negative relationships were observed [2].

The original scale comprises 16 items, each rated on a 5-point Likert scale: 1 = "Strongly Disagree"; 2 = "Partially Disagree"; 3 = "Neither Disagree nor Agree"; 4 = "Partially Agree"; and 5 = "Strongly Agree". The scale consists of three subdimensions: negative label (five items), nurse-patient relationship (six items), devaluation and discrimination (five items). In the original study, the scores that can be obtained from the scale range between 16 and 80. Higher scores indicate a higher level of stigmatization of the nursing profession [2].

Translation and cultural adaptation process

The scale adaptation process was based on the six-step structural framework proposed by Beaton et al. [21]. Throughout the process, full compliance with the recommendations specified in the COSMIN guidelines was ensured. This methodological approach enabled the study to be carried out with scientific rigor and aligned with internationally recognized principles for measurement development.

Step 1-Forward translation

The translation of the NOSS into Turkish was performed by two independent expert translators. Translator 1 was a language expert in English language and literature, focusing on the cultural and linguistic nuances of English. Translator 2 was an academic expert in nursing with high English language proficiency. Both translators worked independently, and their translations were compared item by item in terms of conceptual equivalence and linguistic appropriateness. After the necessary linguistic adjustments, a synthesized Turkish draft of the scale was produced.

Step 2 - Synthesis of translations

To ensure cultural adaptation and conceptual equivalence, a committee of five nursing experts reviewed both translations and the synthesized draft. In a consensus meeting, they discussed each item's linguistic clarity and cultural relevance, resulting in a single harmonized Turkish version (NOSS-TR Draft).

Step 3-Back translation

Back translation was conducted to verify the accuracy and consistency of the translated version with the original scale. Two independent, native English-speaking language specialists fluent in Turkish, who had no involvement in the forward translation, performed the back translation separately. The expert committee compared the back-translated versions with the original scale line by line. Only minor grammatical variations were found, which did not alter the meaning or context of any item. These results verified the conceptual accuracy of the Turkish version.

Step 4 - Expert committee review

Expert opinions should be obtained after translation to identify inadequate concepts in the translation and to identify inconsistencies between the two languages, particularly in further translations [22]. The translated and linguistically validated draft was reviewed by a panel of 10 academic nursing experts, including specialists in nursing education, clinical nursing, and research methodology. All panel members were proficient in English, which facilitated the evaluation of both linguistic accuracy and conceptual equivalence across the two languages. They rated each item for “clarity,” “relatedness,” and “importance” on a 4-point Likert scale (1 = not clear/important, 4 = very clear/important), and provided additional qualitative feedback. The content validity ratio (CVR) and content validity index (CVI) were calculated on the basis of expert opinions [23–26]. The critical Content Validity Ratio (CVR) for 10 experts was 0.62, while the calculated Content Validity Index (CVI) was 0.925

(CVI > CVR). These findings indicate that the scale demonstrated adequate content validity.

Step 5-Pretest

The final version of the NOSS-TR was prepared based on expert feedback. To assess its comprehensibility and conceptual suitability, a pilot study was conducted with 30 participants who were not part of the main sample but had similar demographic characteristics. Participants rated each item's comprehensibility on a 4-point scale (1 = not comprehensible, 4 = completely comprehensible). Over 90% of participants rated the items as “comprehensible” or “completely comprehensible,” and no issues of ambiguity or cultural incompatibility were reported. Based on participant feedback, minor linguistic refinements were made to enhance naturalness and cultural relevance (e.g., substituting formal academic terms with expressions more commonly used in clinical practice). No items were removed, and the conceptual meaning of all statements was retained. These findings confirmed that the scale had sufficient face validity and practical applicability.

Step 6-Presentation to developers and psychometric testing

The adapted Turkish version, along with detailed documentation of the translation, synthesis, back translation, expert review, and pilot testing processes, was submitted to the original scale developers. They confirmed the methodological integrity of the adaptation process and did not request any modifications, indicating that the Turkish version remained faithful to the source content and was developed with methodological transparency.

Data evaluation

Data analysis was conducted using SPSS 26 and AMOS 23. Number, mean, and percentage values were provided for descriptive statistics. Correlation analysis was performed to examine relationships between variables. The construct validity of the scale was realized via confirmatory factor analysis (CFA). As the original scale's factor structure was previously established by Yang et al. [2], an exploratory factor analysis (EFA) was not deemed necessary; instead, confirmatory factor analysis (CFA) was conducted to verify the construct validity of the adapted version, in accordance with COSMIN guidelines [17]. The reliability of the scale was assessed using Cronbach's alpha coefficient and a split-half test reliability.

Ethical principles

The research was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. The data of the study were collected through the “Google Forms” platform, which allows access to the data collection tools with a direct link, and on the opening page of

the web-based survey tool, the participants' informed consent was included, and only those who agreed to participate in the research could answer the questions by providing the necessary information about the purpose, scope, voluntary participation principles and confidentiality conditions of the research. The personal information of the participants was kept confidential, and the data obtained were used only for scientific purposes. The participants had the right to withdraw from the study at any time.

Results

Content validity

For content validity, the content validity ratio (CVR) and content validity index (CVI) were calculated using the Lawshe technique.

In this study, 10 experts were consulted for content validity. The critical value calculated for 10 experts is 0.62. The CVR value of all the items in the scale was above the threshold value of 0.62 for 10 experts. The CVI value of the scale was calculated as 0.925, and the CVI value was greater than the CVR value ($CVI > CVR$) (Table 1).

Construct validity

To adapt the NOSS-TR, the data obtained from a sample of 335 participants were subjected to CFA. For this purpose, goodness-of-fit values and significance levels of the items were examined. In the proposed model, χ^2 (chi-square fit test), RMSEA (root mean square error of approximation), GFI (goodness-of-fit index), CFI (comparative fit index), NFI (normed fit index), and AGFI (adjusted goodness-of-fit index) were used as fit indicators.

The three-factor structure of the NOSS in the original scale was tested with second-level multifactor CFA. The factor loadings of items i_6 , i_9 , and i_{11} from the "nurse-patient relationship" factor and items i_{14} and i_{16} from

the "devaluation and discrimination" factor were low. In addition, when the goodness of fit values of the construct were examined, χ^2/df : 7.307, RMSEA: 0.097, CFI: 0.80, GFI: 0.88, AGFI: 0.84, and NFI: 0.78 (Fig. 1). Since the goodness of fit values obtained did not meet the minimum acceptable goodness of fit values recommended in the literature, some corrections were made to the scale. It was decided to retest the model by removing the items with low factor loadings from the scale.

The three-factor construct validity of the NOSS was tested with second-level multifactor CFA. A significant improvement was observed in the model as a result of removing items i_6 , i_9 , and i_{11} from the "nurse-patient relationship" factor and items i_{14} and i_{16} from the "devaluation and discrimination" factor, which had low factor loadings in the initial model. When the modification indices were examined, it was observed that the covariances between items i_1 and i_2 in the "negative label" factor were high; therefore, it was decided to combine the error variances of these items. After removing the items with low factor loadings, the goodness-of-fit values of the structure were examined. The error variances were combined, χ^2/df : 2.923, RMSEA: 0.054, CFI: 0.97, GFI: 0.97, AGFI: 0.95, and NFI: 0.95. As shown in Table 2, these goodness-of-fit indices met the minimum acceptable threshold values reported in the literature, confirming that the model demonstrated an adequate fit to the data (see also Fig. 2).

The results of the item analysis of the scale are presented in Table 3. The item-total correlations indicate the consistency and discriminative power of each item in relation to the overall scale. The analysis showed that all items had acceptable item-total correlations ($r = 0.32 - 0.62$).

Table 1 Content validity findings

No	Nu	N	CVR	Critical Value	No	Nu	N	CVR	Critical Value
i1	10	10	1.00	0.62	i9	10	10	1.00	0.62
i2	10	10	1.00	0.62	i10	9	10	0.80	0.62
i3	9	10	0.80	0.62	i11	10	10	1.00	0.62
i4	10	10	1.00	0.62	i12	10	10	1.00	0.62
i5	9	10	0.80	0.62	i13	9	10	0.80	0.62
i6	10	10	1.00	0.62	i14	9	10	0.80	0.62
i7	9	10	0.80	0.62	i15	10	10	1.00	0.62
i8	10	10	1.00	0.62	i16	10	10	1.00	0.62

Number of Experts = 10

Critical Value = 0.62

CVI = 0.925

Nu: Number of experts who gave "Necessary" opinion on the item; N: Number of experts who gave an opinions on the item; CVR $(Nu - N/2) / (N/2)$: Content validity ratio; CVI: Content validity index

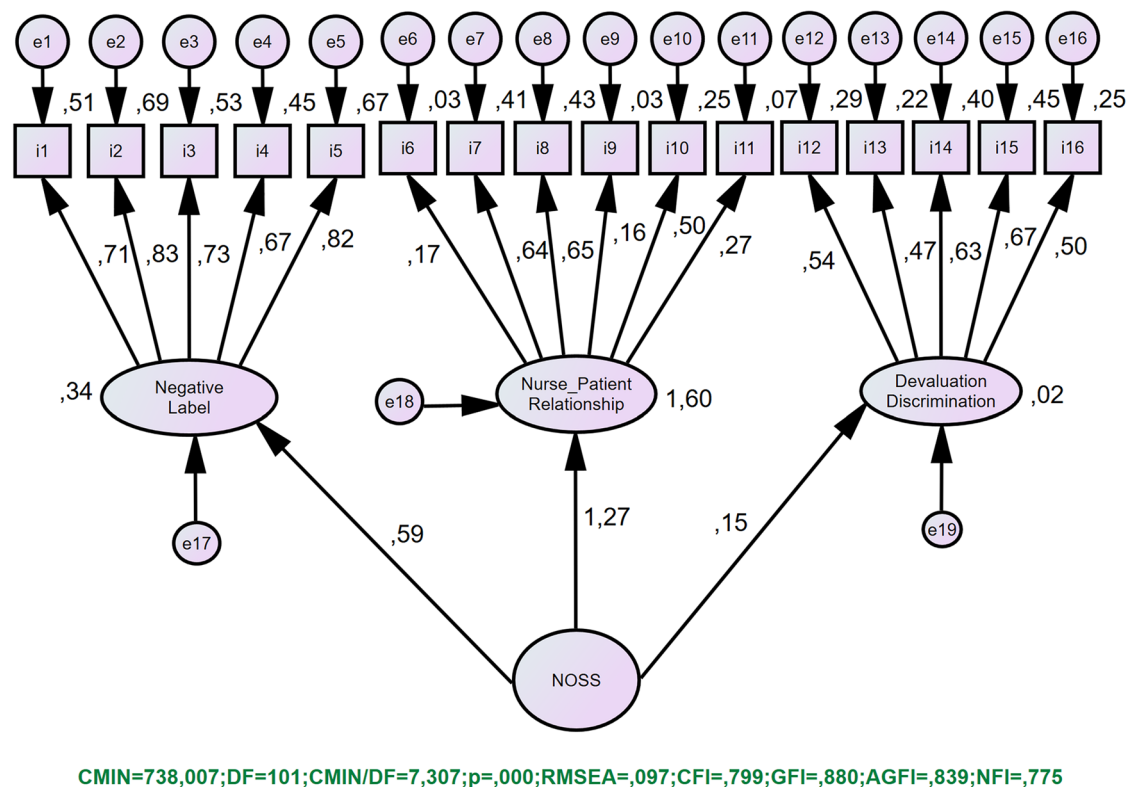


Fig. 1 NOSS initial model

Table 2 Goodness-of-fit indices of the noss and recommended threshold values from the literature

Variable	χ^2/df	RMSEA	CFI	GFI	AGFI	NFI
NOSS-TR	2.923	0.054	0.97	0.97	0.95	0.95
*Good Fit	$\chi^2 < 2$	$0 < RMSEA < 0.05$	$0.95 \leq CFI \leq 1$	$0.95 \leq GFI \leq 1$	$AGFI > 0.95$	$0.95 \leq NFI \leq 1$
*Acceptable Compatibility	$\chi^2 < 5$	$0.05 < RMSEA < 0.10$	$0.90 \leq CFI \leq 0.95$	$0.90 \leq GFI \leq .95$	$AGFI > 0.90$	$0.90 \leq NFI \leq 0.95$

RMSEA:Root Mean Square Error of Approximation; CFI:Comparative Fit Indices; GFI:Goodness-of-Fit Index; AGFI:Adjusted Goodness of Fit Index; NFI:Normed Fit Index; *[27–29]

Internal validity

The internal validity of the items that comprise the scale's structure was assessed using a 27% lower-upper group comparison.

The mean scores of the upper and lower groups differed significantly in both the factors and the total scale ($p < 0.001$). The obtained structure demonstrates that it accurately separates individuals with high stigma levels from those with low stigma levels, indicating internal validity (Table 4).

Reliability

To test the reliability of the construct obtained in this study, Cronbach's α reliability coefficient, Guttman's coefficient, and Spearman-Brown two-thirds test consistency were calculated.

According to the findings, there was a moderate to high level of correlation between the two halves of the scale's factors and the total scale (Spearman-Brown: 0.66–0.72

range). The Cronbach's α values of the two halves of the scale ranged between 0.61 and 0.87, whereas Omega ω values ranged between 0.60 and 0.89 (Table 5).

Discussion

The aim of this study was to adapt the Nurse Occupational Stigma Scale (NOSS), which was developed to assess stigma toward the nursing profession, into Turkish and to examine its psychometric properties. The cultural adaptation process and psychometric evaluation procedures were conducted according to the COSMIN guidelines [17], which are widely accepted in the scale development and adaptation literature.

For a measurement tool to be used validly and reliably in a different culture, not only linguistic but also conceptual and cultural compatibility must be ensured [21]. In this study, the recommended forward-backward translation method was applied, with both translation and back-translation performed by independent experts in

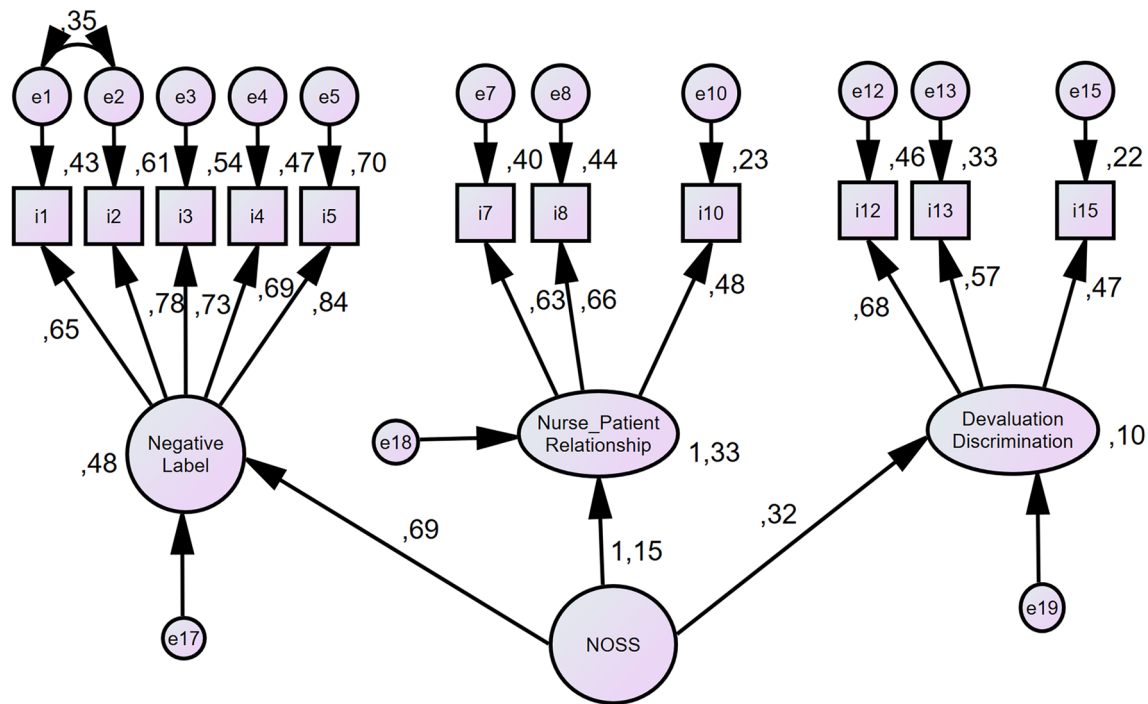


Fig. 2 NOSS final model

English and nursing to minimize meaning shifts. Beaton et al. [21] emphasize the importance of expert opinions in the translation process and state that panel evaluation is mandatory to ensure the validity of the concepts in the cultural context [21]. In scale adaptation studies, content validity is an important step in addition to cultural adaptation. In this study, content validity was tested by calculating the content validity index (CVI) and content validity ratio (CVR) based on expert evaluations [26, 30]. Lawshe's (1975) method allows for a statistical evaluation of item appropriateness and ensures sensitivity to cultural differences. In this study, the CVR values of all the items were found to be above the critical value, and the CVI value was calculated as 0.92. This result indicates that the items of the scale are appropriate in terms of cultural validity [31]. These meticulous methodological processes contributed to ensuring content validity by strictly following the COSMIN guidelines and significantly strengthened the scientific validity of the study.

The construct validity was tested via CFA. CFA is a powerful technique used to assess the fit of an instrument's theoretical construct to the data. In the original study, the NOSS consisted of 3 factors and a total of 16 items. However, in the analyses conducted with the Turkish sample, five items (i6, i9, i11, i14, and i16) were removed due to low factor loadings, and a three-factor structure with eleven items was confirmed. Although these items were psychometrically valid in the original

(Chinese) version of the scale, their conceptual and linguistic equivalence appeared to be weak within the Turkish cultural context. Differences in cultural context may lead to variations in how the stigmatization of the nursing profession is perceived across societies. During the pilot study and data collection phases, it was observed that some items reflecting the hierarchical nature of the nurse–patient relationship or expressing explicit devaluation of nurses were perceived differently by participants. In recent years, the increasing educational level and professional status of the nursing profession in Turkish society have reduced the perceived relevance of certain stigmatizing expressions. Furthermore, linguistic adaptations made to preserve semantic integrity during the translation process may have caused some items to be perceived with less emphasis compared to the original cultural context. Therefore, these five items did not fully correspond conceptually in the Turkish context, were interpreted differently by participants, or did not make a statistically significant contribution. Their removal was deemed appropriate to maintain the psychometric robustness and the validity–reliability level of the scale. Such occurrences are frequently encountered in cross-cultural scale adaptations [22, 32].

Additionally, the modification indices suggested a correlation between the error variances of item 1 and item 2 under the “Negative Labeling” dimension. This statistical indication was also conceptually meaningful. Both items

Table 3 Item-total correlations

No	x	sd	s	k	α	ITC	No	x	sd	s	k	α	ITC
i1	2.83	1.29	0.01	-1.36	0.757	0.571	i8	2.22	1.23	0.64	1.00	0.758	0.572
i2	2.46	1.25	0.40	-1.19	0.753	0.612	i10	2.45	1.10	1.06	1.19	0.781	0.345
i3	2.08	1.26	0.84	-0.61	0.759	0.556	i12	2.31	1.44	0.53	1.14	0.793	0.371
i4	2.54	1.36	0.36	-1.20	0.758	0.555	i13	2.25	1.40	0.72	0.83	0.797	0.321
i5	2.35	1.30	0.73	-0.71	0.751	0.624	i15	2.91	1.50	0.08	1.44	0.803	0.396
i7	2.63	1.33	1.45	1.42	0.770	0.481	-	-	-	-	-	-	-

ITC: item-total correlation; s: skewness; k: kurtosis

similarly reflect tendencies toward social labeling and stereotyping of the nursing profession. Specifically, they assess attitudes related to perceiving nursing as a low-status or gender-based occupation within society. Therefore, it is reasonable that participants may have interpreted these two statements as closely related indicators of the same underlying stigma construct.

The scale adaptation process used in this study yielded satisfactory results in terms of both content and construct validity within the Turkish cultural context. However, the removal of some items due to cultural incompatibility indicates that societal perceptions of the nursing profession may vary across cultures. In recent years, the increasing educational level and professional standards of the nursing profession in Turkish society may have contributed to enhancing its visibility and respectability, thereby weakening certain negative perceptions.

The model fit indices obtained in the CFA ($\chi^2/df=2.923$; RMSEA=0.054; CFI=0.97; GFI=0.97; AGFI=0.95; NFI=0.95) are within the limits recommended by the literature [27–29, 33] and are mainly in line with the values in the original study ($\chi^2/df=2.635$; RMSEA=0.064; CFI=0.962). This finding suggests that the factor structure of the scale was largely preserved in the Turkish sample, and that its construct validity meets the adequacy criteria set by the COSMIN guidelines. Also, the item analysis results indicate that the items of the adapted scale are generally consistent with the overall construct and contribute positively to internal consistency. The item-total correlations ($r=0.32-0.62$) suggest that the scale reliably measures the intended construct.

This study is based on a reliability analysis in line with the COSMIN guidelines, which emphasize the need to assess the consistency of the measurement instrument across different samples and contexts. The reliability of the scale was assessed using the internal consistency coefficient (Cronbach's alpha) and item-total correlations. Cronbach's alpha coefficient is a statistical indicator of how consistent the items in the scale are with each other, and values above 0.70 are generally considered acceptable [34, 35].

The overall Cronbach's alpha of the adapted scale in this study was 0.80, exceeding the generally accepted threshold for adequacy, though lower than the 0.92 reported in the original study. This difference may reflect variations in the sample, cultural and linguistic adaptation processes, or differences in item interpretation. Sub-dimension reliability values ranged from 0.61 to 0.87, with some subscales showing lower reliability than in the original study (0.827–0.919), consistent with evidence that low alpha values often result from a small number of items and cultural differences in perception [36]. While the 11-item Turkish version largely preserves the factor structure of the original NOSS, direct comparisons with

Table 4 27% lower-upper group comparison

Factor	Group	N	X	Sd.	t	p
F1. Negative label	Subgroup	188	6.16	1.22	-60.007	.000
	Top Group		18.89	2.64		
F2. Nurse patientrelationship	Subgroup	188	3.00	0.60	-42.790	.000
	Top Group		8.58	1.79		
F3. Devaulation anddiscrimination	Subgroup	188	3.69	0.78	-57.525	.000
	Top Group		11.36	1.66		
NOSS-TR	Subgroup	188	15.34	2.66	-52.962	.000
	Top Group		35.07	4.36		

Table 5 NOSS-TR reliability findings

Factor	R	Gutman	Cron-bach α	Omega (ω)
F1. Negative Label	0.72	0.85	0.87	0.86
F2. Nurse-Patient Relationship	0.66	0.60	0.61	0.62
F3. Devaluation and Discrimination	0.67	0.60	0.62	0.60
NOSS-TR	0.70	0.83	0.80	0.89

r: Spearman Brown Coefficient

the 16-item original scale should be made cautiously, as some constructs are represented by fewer items. Notably, the “Nurse-Patient Relationship” ($\alpha=0.61$) and “Devaluation and Discrimination” ($\alpha=0.62$) subscales fall below the conventional threshold of 0.70, likely due to the limited number of items and cultural nuances in interpretation. These subscales can still provide valuable insights into general trends but should be interpreted cautiously, particularly in individual-level or high-stakes contexts. Overall, the findings support the reliability of the adapted scale, and it is recommended to use the total scale score rather than interpreting scores from the subscales.

In addition, split-half reliability analyses were conducted, and the Spearman-Brown coefficient was found to be 0.69. A split-half test reliability coefficient close to 0.70 indicates an acceptable level of reliability [37]. Although this is lower than the 0.942 reported in the original study, the difference may be due to variations in item interpretation during the cultural adaptation process or sample characteristics. Nonetheless, it remains within an acceptable range.

Although this study has certain limitations, its findings carry important implications for nursing education, clinical practice, professional image, and health policy. The NOSS-TR provides a valid and reliable tool to assess perceptions of occupational stigma toward nurses within the Turkish cultural context. In clinical settings, hospital administrators and nurse managers can use the NOSS-TR to identify stigma-related attitudes among healthcare teams, patients, or the community, and to design targeted educational or awareness interventions that promote mutual respect and professional collaboration.

In nursing education, the NOSS-TR can be used as both an evaluative and educational instrument. Nursing

schools may integrate the scale into curricula to help students recognize internalized stigma, reflect on professional values, and develop coping mechanisms to manage negative societal attitudes. The insights derived from the NOSS-TR can guide the development of training modules aimed at strengthening professional identity and resilience.

At the policy and institutional level, the systematic use of the NOSS-TR can support evidence-based planning by revealing areas where stigma remains prevalent. Findings can inform organizational strategies to promote equity, visibility, and empowerment of nurses in decision-making roles. Furthermore, tracking changes in stigma perceptions over time through periodic assessments may allow institutions to evaluate the impact of public awareness campaigns or policy reforms.

Ultimately, the application of the NOSS-TR in educational, clinical, and policy contexts can contribute to reducing occupational stigma, enhancing job satisfaction, and improving the quality of patient care through a more respectful and inclusive healthcare environment.

Limitations

This study has several limitations that should be acknowledged for accurate interpretation of the findings. Potential selection bias due to online recruitment and voluntary participation should be noted. Data were collected through social media using the snowball sampling method, which allowed a relatively large sample ($N=692$) across multiple platforms. First, the reliance on non-probability sampling may have introduced selection bias, as participants were not randomly selected and recruitment likely favored individuals with particular social media networks or demographic profiles. Moreover, because recruitment was conducted via social media, the sample may have been biased toward younger, more educated, and urban participants, which could further limit the representativeness of the broader Turkish population and the generalizability of the findings. Consequently, the sample may not fully reflect the characteristics of the general population.

Second, the online nature of the data collection raises the possibility of response bias, since participation was

voluntary and responses may have been influenced by participants' motivation, attentiveness, or willingness to provide accurate information. Furthermore, because the study relied on self-report measures, participants might have provided socially desirable rather than fully accurate responses. In addition, individuals without consistent internet access or who are not active on social media could not be included in the sample, which further constrains the representativeness and generalizability of the findings.

Another limitation is that the Cronbach's α coefficients for the Nurse–Patient Relationship and Devaluation and Discrimination subscales did not reach sufficient psychometric reliability, indicating restricted reliability for these subdimensions. Therefore, future studies should interpret results based on these subscales with caution and, where possible, consider using the total scale score.

Test–retest reliability was not examined in the current study, which is a significant limitation on the evidence supporting the temporal stability of the NOSS-TR. Future studies should prioritize longitudinal assessments to confirm this stability over time. Similarly, convergent or discriminant validity was not evaluated through correlations with related constructs such as general stigma or social desirability, representing another area for future research. While the 27% upper–lower group comparison provided preliminary evidence for internal validity, future studies could employ advanced psychometric techniques, such as Item Response Theory (IRT) or Rasch analysis, to obtain more precise estimates of item-level performance and discrimination.

Finally, convergent validity was not examined through comparison with external measures, and criterion validity was also not assessed by comparing NOSS-TR scores with an external scale, which limits the strength of the evidence supporting the construct validity of the instrument. Nevertheless, the relatively large sample size provided sufficient statistical power for the analyses, and the study contributes valuable insights that should be interpreted with caution. Overall, these limitations indicate that the current study represents an initial step in the cross-cultural adaptation of the NOSS-TR, and future research should address these aspects to provide a more comprehensive validation.

Recommendations for future research

Based on the limitations identified in this study and the need for comprehensive psychometric validation, the following recommendations are proposed for future research:

- **Enhancing Reliability and Item Structure:** To address the restricted reliability observed in the “Nurse–Patient Relationship” and “Devaluation and

Discrimination” subscales, future validation studies should focus on increasing the number of items within these subdimensions. This process should involve reviewing their cultural and contextual appropriateness and refining them through rigorous pilot testing to strengthen the psychometric properties of the scale.

- **Assessing Temporal Stability:** Given that test–retest reliability was not examined, future studies must prioritize longitudinal assessments to confirm the temporal stability of the NOSS-TR over time, which is crucial for a reliable measurement tool.
- **Evaluating External Validity:** To strengthen the evidence for construct validity, future research should assess convergent and discriminant validity by examining the correlation of NOSS-TR scores with external measures, such as established scales measuring general stigma, professional self-concept, or social desirability.
- **Utilizing Advanced Psychometrics:** While preliminary internal validity was established, subsequent studies should employ advanced psychometric techniques, such as Item Response Theory (IRT) or Rasch analysis, to obtain more precise estimates of item-level performance and discrimination capacity.
- **Increasing Generalizability:** To enhance the generalizability of the findings, validity and reliability analyses should be conducted again using different probability sampling methods, across various demographic groups, and in diverse cultural contexts beyond the current sample base.

These future research endeavors are essential for fully validating the NOSS-TR and ensuring its robust applicability in both research and clinical practice across the Turkish context.

Conclusions

In this study, the validity and reliability of the Nursing Occupational Stigma Scale (NOSS) were evaluated for the first time in a different cultural context, Turkish culture. The findings revealed that the scale was adequate in terms of language, content, and construct validity and was in parallel with the original scale. Thus, the NOSS-TR was validated as a valid and reliable measurement tool that can be used in Turkish society to assess the perception of stigmatization toward the nursing profession (ANNEX 1).

One of the important contributions of the study was that it was able to measure occupational stigmatization through both social and professional perceptions. Considering the limited number of valid and reliable scales assessing occupational stigma toward the nursing

profession in Turkey, the NOSS-TR fills an important gap for both academic research and clinical and educational applications. The NOSS-TR is a functional tool in guiding social awareness studies, vocational education content, and anti-stigmatization interventions by enabling objective evaluations of perceptions toward the nursing profession.

Supplementary information

The online version contains supplementary material available at <https://doi.org/10.1186/s12912-025-04164-9>.

Supplementary Material 1

Acknowledgements

The authors thank the participants who agreed to participate in this study.

Author contributions

All authors contributed to the study conception and design. Material preparation and data collection were performed by IA. The full manuscript was written by IA, BA & YK and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding

The author(s) received no financial support for the research, authorship and/or publication of this article.

Data availability

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

Declaration

Ethics approval and consent to participate

The necessary permissions for adapting the Nurse Occupational Stigma Scale (NOSS) into Turkish were obtained via email by the original developers of the scale. This study was performed in line with the principles of the Declaration of Helsinki and approved by the Health Sciences Research and Publication Ethics Committee of Bursa Uludağ University (Date: 2025-05, Ethics Committee Decision No: 2). Written informed consent was obtained from participants. Participation in the study was voluntary and participants were informed about the study before answering the questionnaire. The information included details of the purpose and implementation of the study and a statement that participants could stop answering the questionnaire at any stage.

Consent for publication

N/A.

Competing interests

The authors declare no competing interests.

Received: 25 July 2025 / Accepted: 21 November 2025

Published online: 01 December 2025

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