

ORIGINAL ARTICLE

Development of the Oral Care Attitude Scale: A Validity and Reliability Study

Asena Köse  | Gülay İpek Çoban 

Fundamentals of Nursing Department, Faculty of Nursing, Atatürk University, Erzurum, Turkey

Correspondence: Asena Köse (asena.erge@atauni.edu.tr) | Gülay İpek Çoban (gulaycoban@atauni.edu.tr)**Received:** 3 March 2025 | **Revised:** 21 April 2026 | **Accepted:** 16 June 2026**Keywords:** attitude | oral care | scale development | validity and reliability

ABSTRACT

Background: Oral care, a fundamental aspect of nursing, is crucial for maintaining patient health but is often neglected in healthcare settings. Despite existing studies on nurses' attitudes towards oral care, there is a significant gap in the literature regarding developing a valid and reliable tool to assess these attitudes effectively.

Objectives: The research aims to create a valid and reliable measurement tool to evaluate attitudes towards oral care.

Methods: This methodological study was carried out with nurses working at Atatürk University Research Hospital. 'Introductory Information Form' and 'Oral Care Attitude Scale (OCAS)' were used to collect data.

Results: Cronbach's alpha coefficients for the sub-dimensions of the scale ranged from 0.726 to 0.924, while the overall Cronbach's alpha value was 0.904. Exploratory factor analysis of the 21-item scale revealed a four-factor structure explaining 62.487% of the total variance. As a result of content validity, these factors were named 'Importance of Oral Care', 'Sustainability of Oral Care', 'Effectiveness of Oral Care' and 'Reluctance to Oral Care'. Confirmatory factor analysis using AMOS confirmed the four-factor structure with acceptable fit indices.

Conclusions: The 'Oral Care Attitude Scale' is valid and reliable. Nurses' attitudes towards oral care can be assessed with this scale. According to the results obtained, the scale is expected to guide clinical practices or other studies to be conducted, raise the standards in patient care and increase awareness in this area.

1 | Introduction

Oral care is one of the personal cleaning practices that everyone routinely applies in their daily lives. Excellent and regular care is needed to maintain healthy oral mucosa [1]. The purpose of oral care, one of the most basic principles of nursing care, is to ensure the integrity of the oral mucosa, eliminate unpleasant odor and taste in the mouth and ensure the continuity of dental and gum health [2, 3].

Oral care is critical to maintaining and improving patient health, yet it is an area of care often overlooked in healthcare [4]. Nurses

should consider oral health an integral part of patient care. Because nurses' attitudes towards oral care directly affect the effectiveness and frequency of this critical care practice [5]. Various difficulties and obstacles may arise in the nurses' approach to oral care. For example, heavy workload, lack of knowledge and, in some cases, misunderstandings about the importance of oral care may negatively affect nurses' attitudes towards this issue [4]. As a result, oral care can become a neglected area, negatively impacting patients' quality of life and health [6]. Especially for patients who require long-term care or are struggling with critical illnesses, oral health is essential to reduce the risk of infection and maintain their overall well-being [7]. Improving nurses' attitudes towards oral care

improves patients' health and the overall quality of healthcare services. Therefore, understanding and improving nurses' attitudes towards oral care is essential to improving the quality of healthcare services [8].

Studies show nurses' positive or negative attitudes towards oral care [4, 5, 9–12] to protect and improve oral and dental health; it is necessary to determine the subject's knowledge, attitudes and habits [13]. When the literature is examined, although studies show nurses' attitudes towards oral care practices, a valid and reliable measurement tool has not been found to make this assessment. This research aims to increase awareness in this area, improve standards in patient care, fill the existing gap in the literature, develop a valid and reliable measurement tool to evaluate the attitudes of nurses towards oral care and shed light on other studies to be conducted in the future by examining the attitudes of nurses towards oral care and the factors behind these attitudes. However, the use of unverified or unstandardized measurement instruments can lead to limitations such as low generalizability, measurement bias and ambiguous dimensional structure. Therefore, developing a valid and reliable scale is crucial.

1.1 | Research Question

Is the Oral Care Attitude Scale (OCAS) valid and reliable?

2 | Methods

2.1 | Research Design

This research is of a methodological type.

2.2 | Location and Date of the Research

The research was carried out at Atatürk University Research Hospital between January and April 2022.

2.3 | Population and Sample of the Study

The study population consisted of nurses working at Atatürk University Research Hospital. Fifty-seven nurses participated in the initial phase of scale development. The scale development process began with 52 items. Given the recommendation of a sample size of 5–10 times the number of items for scale development, the sample size was deemed adequate [14, 15]. In this case, the sample size was predicted to be at least 260 or 520. Therefore, 339 nurses were reached for exploratory factor analysis (EFA) in the main implementation phase.

2.4 | Inclusion Criteria

- At least 1 year of professional experience.
- Actively working as a nurse.

2.5 | Data Collection

Research data were collected using the 'Descriptive Information Form' and the 'Oral Care Attitude Scale'.

2.5.1 | Descriptive Information Form

The researchers created the Descriptive Information Form by the literature [10, 16]. This form includes questions about the nurses' age, gender, education level, length of service and the clinic where they work.

2.5.2 | Oral Care Attitude Scale

This scale has three stages. The first stage provides scanning literature, definitions, item pool data, statements regarding expert opinion and preparation for preliminary application. In the second stage, pilot application and analysis of the obtained data can be used. The third stage involves actual application and publication analysis for EFA and CFA. The stages are explained in detail below.

2.6 | Development Stages of the 'Oral Care Attitude Scale'

2.6.1 | Phase 1: Item Generation

A comprehensive literature review used the keywords 'oral care and nurse' and 'oral care and attitude' in Scopus, PubMed, Web of Science, Google Scholar, Science Direct and Ulakbim databases. In-depth interviews were conducted with three nurses to enrich the conceptual framework. Based on the literature and interviews, an initial item pool of 56 items was developed. Expert feedback from three language experts, one scale development expert and eight field experts led to the elimination of four items. The remaining 52 items underwent content validity assessment using the Davis technique. Items with scores below 0.80 were removed, and necessary revisions were made based on expert recommendations. The refined scale was prepared for pilot testing.

Based on the literature review and expert consultations, it was anticipated that nurses' attitudes towards oral care may encompass multiple dimensions. These included the perceived importance of oral care, attitudes towards routine and preventive oral care practices, perceptions of the effectiveness of oral care and willingness or reluctance to perform oral care procedures. These conceptual domains were used as a theoretical framework to guide the development of the initial item pool. However, these dimensions were not imposed on the data, and the final factor structure was determined empirically through exploratory factor analysis.

2.6.2 | Phase 2: Pilot Testing

A 52-item item pool was used in the pilot implementation phase. Literature suggests a sample size of approximately 50 for scales with ≤ 20 items and 2–3 times the number for scales with more

than 20 items [15]. One hundred and twelve nurses participated in the pilot testing phase, which was determined to be an adequate sample size. Item-total correlations for all 52 items exceeded the 0.30 threshold, and Cronbach's alpha coefficient was calculated as 0.81. Given the large number of items in the draft scale (52 items), and considering that Cronbach's alpha coefficient might overestimate the reliability of large item pools, McDonald's omega coefficient was also calculated to provide a more robust estimate of internal consistency. The omega value was found to be 0.824, indicating good internal consistency. Based on these findings, the scale with 52 items proceeded to the main implementation phase.

2.6.3 | Phase 3: Exploratory Factor Analysis

In the third phase, exploratory factor analysis (EFA) was conducted to examine the underlying factor structure of the scale and to establish construct validity. The analysis was performed using data obtained from 339 nurses. Prior to factor analysis, the suitability of the data was assessed using the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. The KMO value was found to be 0.891, and Bartlett's test was statistically significant ($\chi^2 = 70751.891$, $df = 561$, $p < 0.001$), indicating that the data were appropriate for factor analysis.

Initially, the scale consisted of 52 items. Item-total correlation analysis revealed that 18 items (items 14, 20, 24, 25, 26, 27, 28, 29, 30, 31, 32, 37, 39, 42, 43, 44, 45 and 51) had values below the acceptable threshold of 0.30 and were therefore removed from the analysis. Subsequently, EFA was conducted with the remaining 34 items. Principal component analysis was employed as the extraction method. Factor rotation was performed using the Varimax method. Varimax rotation was preferred to obtain a simpler and more interpretable factor structure, in line with commonly adopted practices in the scale development literature [17, 18], particularly during the exploratory phase.

Item selection criteria included factor loadings of at least 0.30, absence of cross-loading items and eigenvalues > 1 . During the factor rotation process, 13 additional items (items 8, 10, 11, 12, 13, 15, 16, 18, 19, 22, 38, 41 and 52) were removed due to overlapping factor loadings. Following this stepwise elimination process, a total of 21 items were retained. The remaining 21 items were grouped under four factors, namely 'Importance of Oral Care', 'Sustainability of Oral Care', 'Effectiveness of Oral Care' and 'Reluctance to Oral Care'. The four-factor structure explained 62.487% of the total variance. Factor loadings ranged between 0.384 and 0.815. In addition, the scree plot supported the four-factor structure. The findings from EFA provided strong evidence for the construct validity of the scale and formed the basis for the subsequent confirmatory factor analysis.

2.6.4 | Phase 4: Confirmatory Factor Analysis (CFA)

In the fourth phase, confirmatory factor analysis (CFA) was conducted to validate the factor structure identified in the exploratory factor analysis (EFA). CFA was performed using a separate sample of 174 nurses to ensure the robustness and generalizability of the model. The analysis was carried out using the AMOS software

package. Model fit was evaluated using multiple fit indices, including chi-square/degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), Incremental Fit Index (IFI), Tucker–Lewis Index (TLI), Root Mean Square Residual (RMR), Standardized Root Mean Square Residual (SRMR), Normed Fit Index (NFI), Parsimony Goodness-of-Fit Index (PGFI) and Parsimony Normed Fit Index (PNFI). Acceptable model fit was determined based on established thresholds in the literature (e.g., $\chi^2/df < 5$, $CFI > 0.90$, $RMSEA < 0.08$). Modification indices were examined, and theoretically justifiable modifications were applied to improve model fit.

The CFA results confirmed the four-factor structure of the Oral Care Attitude Scale, indicating that the model demonstrated acceptable fit and supported the construct validity of the scale.

2.7 | Pre-Application

In scale adaptation studies, the internal consistency value of the scale should be 0.70 or higher, and the item-total correlation value should be checked to see if it is below 0.30 [15]. In the pre-application phase, it was determined that 52 items did not have an item correlation value below 0.30 and the Cronbach Alpha value was 0.81.

2.8 | Main Application

Data was collected through face-to-face interviews with 339 nurses who met the inclusion criteria and provided informed consent. The Oral Care Attitude Scale was administered, with researchers directly asking about each item and recording responses. Nurses reported no difficulty with the scale and adequate completion time. After data collection, validity and reliability analyses were conducted to evaluate the scale's psychometric properties [19]. The face-to-face data collection method was preferred to ensure the validity and reliability of the scale. The reason for preferring this method is to ensure that the participants can get direct explanations from the researchers when necessary. Although the online application can be considered in future studies, the reliability of the data was increased with a controlled face-to-face environment in this preliminary validation process.

2.9 | Language and Translation Process

The Oral Care Attitude Scale (OCAS) was initially developed in Turkey, and validation studies were conducted on Turkish-speaking nurses. For this article, a rigorous translation and back-translation process was applied to adapt the scale into English.

2.10 | Data Analysis

Data were analysed using SPSS 22 and AMOS software. Standardized estimates were used for the interpretation of factor loadings. Additionally, error covariances were added between some items based on modification indices and theoretical justification to improve model fit. The sample adequacy and suitability of the data set for analysis were determined using the KMO

(Kaiser-Meyer-Olkin) measure, Bartlett's Sphericity Test and Anti-image test. The KMO value was 0.60 or above, Bartlett's Sphericity Test was significant and the lowest anti-image correlation was 0.50, indicating a sufficient sample size and a suitable data set for analysis. Items were checked to ensure that their 'item correlation value' was not below 0.30 and that there were no overlapping items. The fit indexes χ^2/df , CFI, RMSEA, NFI, IFI, RMR, TLI, PNFI, SRMR, PGFI and the PATH diagram were evaluated in confirmatory factor analysis. Reliability analyses included Cronbach's α coefficient and McDonald's omega coefficient to assess internal consistency [15, 17, 20, 21].

2.11 | Ethical Aspects of the Research

Ethical approval was obtained from the Clinical Research Ethics Committee of University Atatürk (01.00/530). Institutional permission was obtained from the Research Hospital of University Atatürk to implement the study. Before starting the study, the 'Informed Consent Form of Volunteers' was presented to the nurses and informed consent was obtained from the participants. The purpose and method of the study were explained to the patients in detail. The study participants were told their data would not be shared with third parties or used for other purposes. Ethical principles were followed throughout the study.

3 | Results

The study's findings, which aimed to develop a valid and reliable measurement tool to evaluate nurses' attitudes towards oral care, are given below.

It was determined that 79.1% of the nurses participating in the study were between the ages of 18 and 30, 61.7% were female, 68.1% had a bachelor's degree, 69.3% had 1–5 years of professional experience, 39.5% worked in internal units and 62.5% chose their profession willingly (Table 1).

3.1 | Findings Related to Validity

3.1.1 | Exploratory Factor Analysis (EFA)

Reliability analysis was conducted to evaluate whether the items met appropriate standards [15, 22]. For the EFA sample ($n = 339$), the Cronbach's alpha value for the 52 items was 0.81 and McDonald's omega coefficient was 0.824, indicating good internal consistency. However, 18 items had a total item correlation value below 0.30, leading to their exclusion from the analysis. The exploratory factor analysis (EFA) was then performed with the remaining 34 items. The sample's adequacy and the data set's suitability were assessed using the Kaiser-Meyer-Olkin (KMO) test, Bartlett's Sphericity test and the Anti-image test. The KMO value was 0.891, Bartlett's Sphericity test result was $\chi^2 = 70751.891$, $\text{df} = 561$, $p = 0.001$ and the lowest Anti-image test value was 0.685, indicating that the data set and sample size were suitable for analysis. EFA was carried out to ensure construct validity. Criteria for item selection included the absence of overlapping items, a loading value of at least 0.30, and an eigenvalue of at least 1 [15]. Table 2 shows the item-total

TABLE 1 | Demographic characteristics of nurses ($n = 339$).

Sociodemographic characteristics	<i>n</i>	%
Age		
18–30	268	79.1
31–50	71	20.9
Gender		
Female	209	61.7
Male	130	38.3
Level of education		
High school	63	18.6
Licence	231	68.1
Master's degree	40	11.8
PhD	5	1.5
Professional experience		
1–5 year	235	69.3
6–10 year	76	22.4
11–15 year	22	6.5
16 years and more	6	1.8
Hospital unit worked		
Internal service	134	39.5
Surgical service	88	26
Intensive care unit	117	34.5
Whether they willingly chose the nursing profession		
Yes	212	62.5
No	127	37.5

correlations and Cronbach's α coefficients. Varimax rotation, a standard technique in scale development, was utilized to verify construct validity [23].

As a result of the Varimax rotation analysis, some items (items 18, 12, 15, 16, 19, 10, 11, 13, 41, 38, 52, 8, 22) were found to be overlapping. These items were removed from the analysis. KMO (0.878), Bartlett Sphericity test ($\chi^2 = 3980.192$, $\text{SD} = 210$, $p = 0.000$) and the lowest Anti-image matrix correlation value (0.766) for 21 items showed that the data set and sample size were suitable for analysis. The factor loadings of the scale items ranged between 0.384 and 0.815. The results of the 21-item Varimax rotation analysis are given in Table 3.

The analysis revealed that the sub-dimension 'Importance of Oral Care' comprised items 1, 2, 3, 4, 5, 6, 7 and 9, accounting for 25.466% of the total variance. The 'Sustainability of Oral Care' sub-dimension included items 46, 47, 48, 49 and 50, explaining 15.525% of the total variance. The 'Effectiveness of Oral Care' sub-dimension consisted of items 17, 21, 34, 35 and 40, which explained 11.686% of the total variance. The 'Oral Care Reluctance' sub-dimension included items 23, 33 and 36, accounting for 9.810% of the total variance. The 21-item scale exhibited a 4-factor structure, with these four factors collectively

TABLE 2 | OCAS item-total correlations and Cronbach α coefficients.

Scale items	Mean	SS	Item total correlation	Cronbach's alpha if the item is deleted
1. Oral care is important for intensive care patients	4.54	1.06	0.687	0.929
2. The duration of oral care should be patient-specific	4.15	1.14	0.611	0.930
3. Oral care affects the comfort of patients	4.38	1.08	0.661	0.929
4. Regular oral care will positively affect eating and drinking	4.47	1.04	0.700	0.929
5. I have sufficient knowledge of oral care	3.95	1.10	0.566	0.930
6. I need to be careful when practising oral care	4.35	1.01	0.681	0.929
7. Ensuring hand hygiene before applying oral care is important	4.48	1.11	0.708	0.929
8. The endotracheal tube interferes with oral care	3.14	1.26	0.332	0.933
9. The frequency of oral care should be patient-specific	4.14	1.06	0.613	0.930
10. I believe intubation changes the oral flora	3.97	1.03	0.563	0.930
11. I find the materials used for oral care in the unit where I work sufficiently	3.37	1.23	0.347	0.933
12. When practising oral care, I must elevate the patient's head at least 30 degrees	4.11	0.95	0.671	0.929
13. I provide my patients with regular oral care	3.65	1.24	0.464	0.932
15. I know that healthy oral mucosa should be pink	3.94	1.09	0.685	0.929
16. Providing oral care to patients gives me professional satisfaction	3.76	1.09	0.565	0.930
17. I find it important to learn about oral care	4.14	0.92	0.718	0.929
18. Oral health has an impact on general health	4.34	0.93	0.706	0.929
19. Ensuring hand hygiene after practising oral care is essential	4.52	0.94	0.687	0.929
21. I think oral care should be applied to all patients	3.63	1.36	0.384	0.933
22. Oral care is a priority for the individual's comfort	3.96	1.21	0.662	0.929
23. Clean the patient's oral cavity is unpleasant	3.55	1.30	0.311	0.934
33. I wouldn't say I like doing oral care	3.25	1.30	0.426	0.932
34. Oral care affects the patient's treatment process	4.17	0.96	0.509	0.931
35. Apart from standard daily oral care, I perform oral care again if the patient needs it	3.92	1.02	0.421	0.932
36. I do not find myself willing to practice oral care	3.21	1.26	0.399	0.932
38. There is no relationship between oral care and pneumonia in intensive care patients	3.36	1.28	0.316	0.933
40. I believe oral care is an important part of patient care	4.17	0.96	0.452	0.931
41. Oral health does not affect general health	4.04	1.27	0.482	0.931
46. I think oral assessment is important in oral care management	4.23	0.89	0.520	0.931
47. Choosing tools and equipment is essential in oral care management	4.34	0.79	0.598	0.930

(Continues)

TABLE 2 | (Continued)

Scale items	Mean	SS	Item total correlation	Cronbach's alpha if the item is deleted
48. I think the solution choice is important in oral care management	4.33	0.82	0.474	0.931
49. I find dry mouth is important for the development of oral mucositis	4.29	0.84	0.382	0.932
50. It would be helpful to evaluate the patient's oral mucosa daily to determine the frequency of oral care	4.28	0.86	0.357	0.932
52. I find it unnecessary to raise the patient's head and turn it to the side when giving oral care to an unconscious patient	3.71	1.32	0.473	0.932

TABLE 3 | OCAS EFA results ($n = 339$).

Scale items	Common factor variance	Component			
		1	2	3	4
1. Oral care is important for intensive care patients	0.815	0.888			
3. Oral care affects the comfort of patients	0.790	0.875			
4. Regular oral care will positively affect eating and drinking	0.779	0.853			
7. Ensuring hand hygiene before applying oral care is important	0.694	0.789			
2. The duration of oral care should be patient-specific	0.654	0.785			
6. I need to be careful when practising oral care	0.655	0.740			
9. The frequency of oral care should be patient-specific	0.519	0.676			
5. I have sufficient knowledge of oral care	0.482	0.555			
47. Choosing tools and equipment is essential in oral care management	0.796		0.810		
48. I think the solution choice is important in oral care management	0.713		0.804		
49. I find dry mouth is important for the development of oral mucositis	0.618		0.773		
46. I think oral assessment is important in oral care management	0.591		0.711		
50. It would be helpful to evaluate the patient's oral mucosa daily to determine the frequency of oral care	0.496		0.687		
34. Oral care affects the patient's treatment process	0.547			0.669	
35. Apart from standard daily oral care, I perform oral care again if the patient needs it	0.465			0.644	
40. I believe oral care is an important part of patient care	0.501			0.628	
17. I find it important to learn about oral care	0.670			0.626	
21. I think oral care should be applied to all patients	0.384			0.574	
36. I do not find myself willing to practice oral care	0.685				0.803
23. Clean the patient's oral cavity is unpleasant	0.630				0.770
33. I wouldn't say I like doing oral care	0.640				0.763
Eigenvalue (Total = 13.123)		7.589	2.435	1.773	1.326
Explained variance % Total = %62.487		25.466	15.525	11.686	9.810

explaining 62.487% of the total variance. The Scree Plot also confirmed the 4-factor structure (Figure 1).

3.1.2 | Confirmatory Factor Analysis (CFA)

CFA was conducted based on the structure identified in the EFA, using the AMOS Package Program. A suitable modification suggestion between items 7–9 and 47–48 was identified in the AMOS program, and these modifications were implemented. Details about the fit indexes resulting from the CFA are presented in Table 4. The fit values were assessed using various reference benchmarks [15, 18, 20, 24].

The path diagram was reviewed, and the obtained values regarding item-factor fit were found to be appropriate and acceptable. The revised and standardized CFA model with improved visual clarity is presented in Figure 2. For the CFA sample ($n=174$), the Cronbach's alpha coefficient for the entire 21-item scale is 0.904. In addition, the McDonald's omega coefficient was calculated as 0.884, indicating high internal consistency and supporting the reliability findings. All standardized factor loadings were generally within the acceptable range. Although one item had a relatively low factor loading (0.29), it was retained due to its theoretical relevance and contribution to content validity.

3.2 | Findings Related to Reliability

3.2.1 | Internal Consistency (Cronbach's Alpha and McDonald's Omega) Coefficients

When the Cronbach's Alpha values of the scale were examined, it was observed that the 'Importance of Oral Care' subscale had

a value of 0.924, the 'Sustainability of Oral Care' subscale had a value of 0.855, the 'Effectiveness of Oral Care' subscale had a value of 0.726 and the 'Reluctance to Use Oral Care' subscale had a value of 0.728. The Cronbach's Alpha value for the entire 21-item scale is 0.904. In addition, the McDonald's omega coefficient for the final 21-item scale was calculated as 0.884, which shows high internal consistency and supports the reliability findings obtained from the Cronbach's alpha values. These values indicate that the scale is reliable [17].

4 | Discussion

The study aimed to develop the OCAS to assess healthcare workers' attitudes towards oral care and discussed the findings in the context of existing literature. According to the literature, a newly developed measurement tool should meet specific validity and reliability criteria [19]. The Content Validity Index (CVI) should be greater than 0.67 for content validity [25, 26]. The CVI for the OCAS was calculated as 0.82, which is above the threshold, confirming content validity and indicating that the OCAS draft is suitable for evaluating the oral care attitudes of health professionals.

The scale's construct validity was assessed through factor analysis. Research suggests that exploratory factor analysis is appropriate for identifying the number of factors measured and understanding the factor structure rather than testing a specific hypothesis [27]. KMO was used to evaluate the sample adequacy and suitability for factor analysis. A significant Bartlett's test of sphericity ($p < 0.000$), KMO values between 1.00 and 0.90 and the lowest Anti-image correlation value above 0.50 indicate that the sample size and data set are suitable for analysis [28–30]. Shrestha recommended a KMO value of at least 0.70, with 0.80

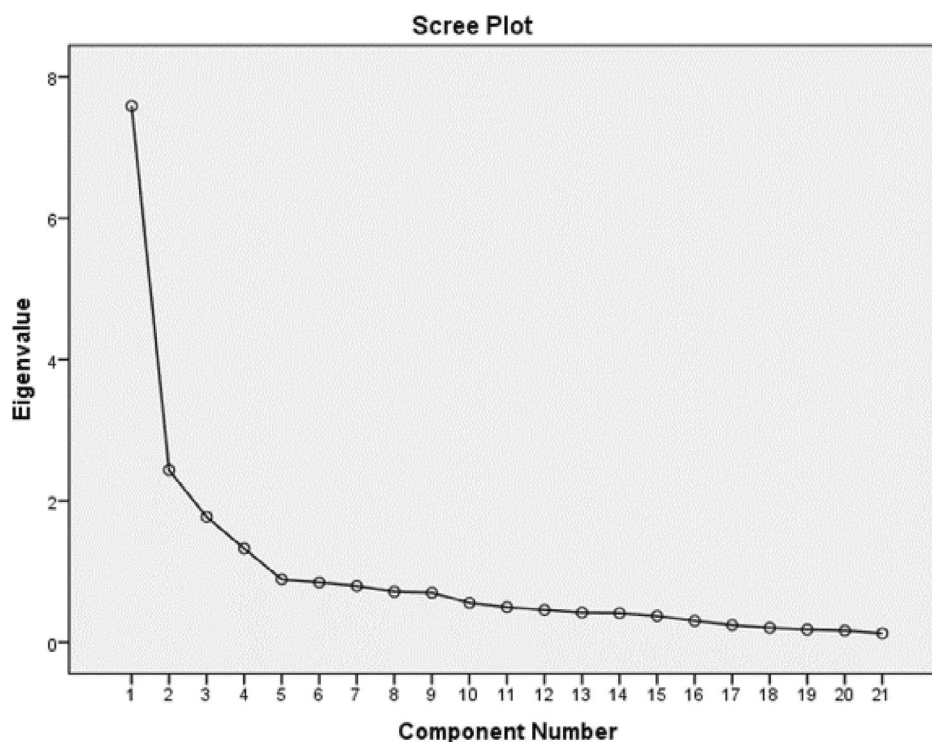


FIGURE 1 | Scree plot graph factor structure.

TABLE 4 | Confirmatory factor analysis goodness of fit indices and normal values.

Index	Normal value	Acceptable value	Measurement	Result
χ^2 'p' value	$p > 0.05$	—	0.001	Perfect fit
χ^2 /SD (CMIN/DF)	< 2	< 5	1.724	Perfect fit
CFI	> 0.95	> 0.90	0.934	Acceptable fit
RMSEA	< 0.05	< 0.10	0.065	Acceptable fit
RMR	< 0.05	< 0.08	0.031	Perfect fit
IFI	> 0.90	—	0.935	Perfect fit
TLI	$0.95 < \text{TLI} < 1$	$0.90 < \text{TLI} < 0.94$	0.924	Acceptable fit
PGFI	> 0.89	> 0.50	0.675	Acceptable fit
PNFI	> 0.89	> 0.50	0.740	Acceptable fit
SRMR	< 0.05	< 0.08	0.059	Acceptable fit
NFI	> 0.95	> 0.80	0.858	Acceptable fit

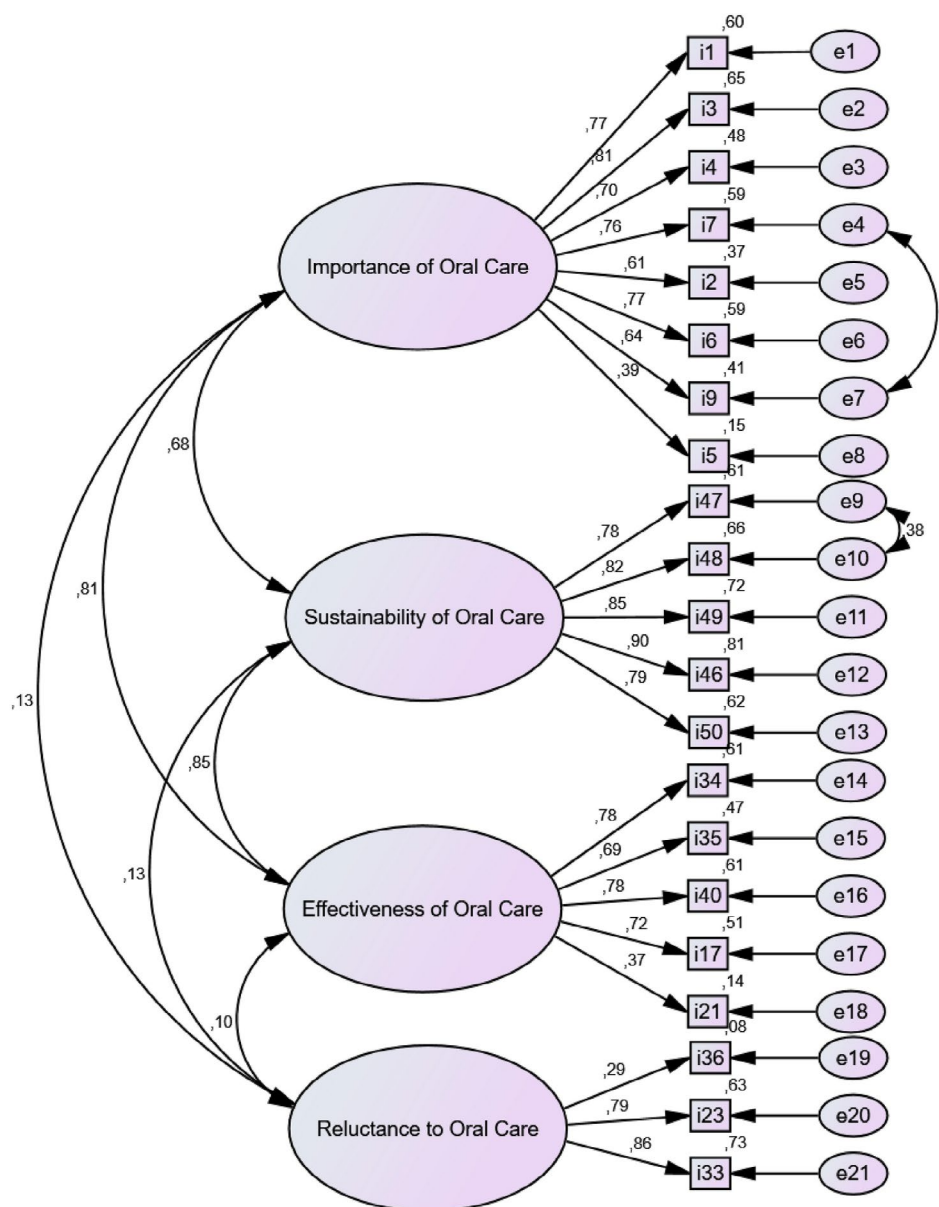


FIGURE 2 | Confirmatory factor analysis model of the Oral Care Attitude Scale. Standardized factor loadings are presented. Error covariances were added based on modification indices and theoretical justification.

or higher as an ideal criterion for factor analysis [31]. Exploratory factor analysis used principal component analysis and varimax rotation methods to facilitate interpretation. Internal consistency was assessed by ensuring that item correlation values were not below 0.30 and no overlapping items existed. Literature indicates that factor loadings should be 0.30 or higher [32]. The absence of loadings below 0.30 in the OCAS items suggested that participants understood the items correctly and responded objectively. Additionally, Cronbach's alpha reliability coefficient was used to evaluate item consistency and internal reliability [33].

According to the literature, scales with coefficients between 1.00 and 0.80 have very high reliability, those between 0.60 and 0.79 have high reliability and those between 0.40 and 0.59 have low reliability [14, 21]. The internal consistency coefficient for the OCAS is 0.904, indicating very high reliability. In addition, the McDonald's omega coefficient for the final scale was found to be 0.884, further supporting the strong internal consistency of the scale. The higher omega coefficient observed in the final version of the scale indicates that internal consistency improved following item reduction.

Although the present study provides evidence for content and construct validity, other important forms of validity, including convergent and divergent validity, were not examined. Convergent validity refers to the degree to which the scale is correlated with other instruments measuring similar constructs, whereas divergent validity assesses whether the scale is distinct from measures of unrelated constructs. The lack of evaluation of these validity types represents a limitation of the study. Future research is recommended to examine convergent and divergent validity by comparing the Oral Care Attitude Scale with related and unrelated measurement tools. Additionally, predictive validity should also be assessed in future studies to determine the extent to which the scale can predict relevant clinical outcomes and enhance the generalizability and applicability of the scale.

A high Cronbach's alpha coefficient suggests that the items in the scale are highly consistent [34]. The analyses identified four dimensions and 21 items, accounting for 62.487% of the total variance, exceeding the 40%–60% acceptable range [35]. Confirmatory factor analysis (CFA) conducted in the AMOS package program demonstrated adequate fit indices, supporting the scale's validity and reliability [24, 36, 37]. While various scales for oral health exist [38–40], they are generally focused on oral health. The lack of a scale specifically designed to measure healthcare professionals' attitudes towards oral care highlights the originality of this study.

4.1 | Limitations of the Study

One limitation of this study is that it was conducted in only one institution. Therefore, the results can only be generalized to the group in which the study was conducted. In addition, the scale was only developed and tested in Turkish, which limits its cultural compatibility. Face-to-face data collection may increase the risk of social desirability bias. Future studies with different health professionals and geographical regions may contribute to overcoming these limitations.

5 | Conclusion

The 'Oral Care Attitude Scale' consists of 21 items across four sub-dimensions: 'Importance of Oral Care', 'Sustainability of Oral Care', 'Effectiveness of Oral Care' and 'Reluctance to Oral Care'. The scale is a 5-point Likert type, with responses ranging from 'Strongly agree (5)' to 'Strongly disagree (1)'. The possible scores range from 21 to 105, with items 23, 33 and 36 being reverse-coded. The Cronbach's Alpha values for the sub-dimensions were 0.924 for 'Importance of Oral Care', 0.855 for 'Sustainability of Oral Care', 0.726 for 'Effectiveness of Oral Care', 0.728 for 'Reluctance of Oral Care' and 0.904 for the entire scale.

The obtained data confirmed the scale's content and construct validity and established its reliability. A high validity and reliability index enhances the scale's utility in clinical practice. This study demonstrates that the 'Oral Care Attitude Scale' has high concurrent validity and reliability in assessing health professionals' attitudes towards oral care. It can be used by all nurses and nursing students and, being unique in the literature, is expected to guide further studies in this area.

6 | Clinical Relevance

6.1 | Scientific Rationale for the Study

Although oral care is a fundamental component of nursing care, it is often neglected. Nurses' attitudes can directly affect patient health, and deficiencies can increase the risk of infection. The current literature does not provide a valid and reliable scale to assess these attitudes. This study aims to fill this gap.

6.2 | Main Findings

The developed 'Oral Care Attitude Scale' (OCAS) consists of four sub-dimensions. The scale's Cronbach's alpha coefficient is 0.904, indicating high reliability. Exploratory and confirmatory factor analyses confirmed that the scale is valid and reliable.

6.3 | Practical Implications

OCAS can contribute to improving clinical practices by providing a reliable tool to assess nurses' attitudes towards oral care. By being used in educational programs, it can increase awareness and improve the quality of patient care.

Author Contributions

Asena Köse and Gülay İpek Çoban were involved in the design of this research. Asena Köse collected data and Asena Köse and Gülay İpek Çoban conducted data analysis. Both authors drafted the manuscript and approved the final version.

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Disclosure

Limitations: The study was limited to one institution; thus, generalizing results to a larger population may not be appropriate.

Ethics Statement

Ethical approval was obtained from the Atatürk University Clinical Research Ethics Committee before commencing the data collection process. Written permission was also obtained from Atatürk University Research Hospital.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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