

Nigerian dental anxiety, fear, and phobia: A prevalence review

Chiedu Eseadi¹, Endang R. Surjaningrum²

¹Department of Educational Psychology, Faculty of Education, University of Johannesburg, Auckland Park 2006, Gauteng, South Africa

²Department of Psychology, Faculty of Psychology, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Background: Dental anxiety, dental fear, and dental phobia are psychological conditions that commonly affect individuals, making dental visits and treatments daunting and distressing. **Purpose:** This study aimed to evaluate dental anxiety, fear, and phobia among Nigerians through a literature review design. The main outcome of the study was to assess the prevalence of dental anxiety, fear, and phobia among Nigerians. **Methods:** The research databases used were Google Scholar, PubMed, PsycINFO, CINAHL, and Cochrane. After independent assessors read the full texts to ensure eligibility, 23 studies were selected for inclusion, while 65 papers were excluded. These studies documented the existence of dental anxiety, fear, and phobia among Nigerians from 2002 to 2022. **Results:** Among the selected studies, there were 21 dental anxiety studies, one dental fear study, and one dental phobia study. The prevalence of dental anxiety in these studies ranged from 7.43% to 62.8%, the prevalence of dental fear was 36.8%, and the prevalence of dental phobia was 30%. Notably, dental anxiety studies were more frequently carried out among residents of South-Western Nigeria than residents of other regions of the country. The Modified Dental Anxiety Scale was the most commonly used instrument for assessing dental anxiety among study participants. Dental anxiety, fear, and phobia were commonly associated with dental health concerns, past pain experiences, and previous traumatic dental treatment among Nigerians. **Conclusions:** Dental anxiety, dental fear, and dental phobia affect both Nigerian children, adolescents, and adults, though the prevalence and extent of investigation vary by group and region. Further empirical studies are needed across different regions of the country, particularly in the South-Eastern and North-Eastern regions, focusing on hospitals, schools, and community-based settings. Psychological services can be implemented alongside dental treatments to help alleviate anxiety, fear, and phobias in Nigerian dental patients.

Keywords: dental anxiety; dental fear; dental phobia; odontophobia; Nigeria

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Correspondence: Endang R. Surjaningrum, Department of Psychology, Faculty of Psychology, Universitas Airlangga, Surabaya, Indonesia. Email: endang.surjaningrum@psikologi.unair.ac.id

INTRODUCTION

Dental anxiety, dental fear, and dental phobia are psychological conditions that commonly affect individuals, making dental visits and treatments daunting and distressing. These conditions can vary in severity, often leading to the avoidance of dental care and a subsequent decline in oral health. In fact, untreated dental anxiety, fear, and phobia have negative consequences for both oral health and overall well-being. Anxiety refers to a reaction to an uncertain or ambiguous threat, while fear refers to a response to a known danger. The term “phobia” describes the intense, persistent, and unreasonable fear of a particular stimulus that compels an individual to avoid that stimulus at all costs. Apprehension regarding dental procedures can be

described by three different terms—dental anxiety, dental fear, and dental phobia—all of which are psychological reactions characterized by unpleasant stimuli.¹ Unlike fear, anxiety is diffuse rather than specific and manifests in a variety of situations and events. Patients with negative oral health beliefs are more likely to develop dental anxiety, fear, and phobia.² It is common for anxious, fearful, and phobic individuals to avoid dental treatment because they believe something dreadful will happen. When these individuals do present to their dentists with acute dental problems needing intricate and excruciating treatment modalities, their fear significantly exacerbates and promotes their anxiety, causing them to avoid any future dental care.

Anxiety disorders, including dental anxiety, consist of sustained anxiety states that have associated impairments

in functioning.³ Anxiety related to dental treatment is defined as feeling uneasy and worried and experiencing prolonged fear when confronted with dental treatment.⁴ A person with dental anxiety is more likely to evade dental care, thereby limiting their access to and use of dental care.⁵ Unfortunately, many individuals suffering from dental anxiety have poor oral health conditions that adversely affect their quality of life.^{6,7} It can also be very difficult for dentally anxious patients to escape a vicious cycle caused by negative expectations for their treatment because of their inability to build up coping mechanisms within the dental care environment.⁶ Stress among the dental team also negatively impacts the patient–dentist relationship, leading to longer treatment times.⁸ According to previous studies,^{9,10} those who have had previous exposure to dental procedures are likely to experience dental anxiety. Dental anxiety and fear are considered the primary obstacles to successful treatment completion.¹¹

Dental fear is most commonly a response to specific threatening stimuli that can be encountered during dental treatment, causing an unpleasant emotional reaction. In simple terms, the fear of receiving dental treatment or being treated by a dentist is known as dental fear.^{12,13} A patient's fear can be based on the tools and equipment the dentist uses to treat them. Depending on the patient, it can be mild or severe. One adult out of six suffers from severe dental fear.¹⁴ Children may be afraid of visiting the dentist for the first time due to various factors, such as being separated from their caregiver, not understanding dental procedures, associating them with other procedures, and other age-appropriate concerns. Different groups of people may have different levels of dental fear, though it is more common when teeth are decayed or missing than when they are filled. The mental distress and social consequences of dental anxiety are more severe in patients with a high degree of fear.¹⁵

Dental phobia may start as ordinary nervousness, resulting from a little bit of fear. If the sensation of fear does not disappear spontaneously or intensifies, it is defined as dental anxiety.^{12,13} Dental phobia, also referred to as “odontophobia,” is an irrational, overwhelming fear of dentists and dental procedures that is accompanied by trepidation, terror, and unease. It is characterized by a persistent and extreme fear of dental procedures and stimuli that are assumed to cause considerable distress.¹⁵ An individual with a dental phobia may feel a loss of control or may have had negative experiences in the past. Relaxation techniques, exposure therapy, and guided imagery can help a patient overcome this disorder.

Individuals who experience dental anxiety, fear, and phobia often avoid seeking dental care, leading to delayed or neglected treatment. Unfortunately, this avoidance can lead to the development of serious oral health issues, such as gum disease, tooth decay, and even tooth loss. Dental anxiety, fear, and phobia and inadequate awareness are among the reasons why many individuals do not seek dental treatment.¹⁶ These conditions can be treated using

various methods, including psychological management, sedatives, anxiolytics, and general anesthesia.¹⁷ Dental health problems can affect children, adolescents, and adult patients across cultures.^{4,5,10,18,19} The prevalence of dental anxiety, fear, and phobia among Nigerians is particularly concerning. Several studies appear to show that a significant portion of the population in Nigeria experiences some level of dental anxiety, fear, or phobia,^{16,17,19–23} but findings seem to be mixed regarding how these conditions affect the Nigerian people across various regions of the country.

Poverty and inadequate access to dental treatment are two socioeconomic factors that may be associated with dental anxiety, fear, and phobia among Nigerians.¹⁹ As a result, most Nigerians who cannot afford dental treatment or reside in places with inadequate dental services may develop dental anxiety, fear, or phobia. Ignorance and insufficient social awareness and understanding of dental health benefits may exacerbate dental anxiety, fear, and phobia in Nigerians.^{16,24} This lack of information and awareness about dental hygiene may increase the risk of developing dental illnesses.²⁵ Changing cultural attitudes, practices, beliefs, and traditions can also have a significant impact on how Nigerians perceive dental care.²⁶ It is therefore crucial to investigate the extent of these problems in Nigeria in order to develop effective approaches to address them, improve the oral health of this population, and influence research, dental health care policy, and service delivery. The objective of this scoping review is to identify and examine the literature on dental anxiety, dental fear, and dental phobia among Nigerians. Through this study, we can gain a better understanding of the impact of these problems on Nigerians. This will, in turn, enable us to emphasize the importance of early interventions and deploy effective strategies to mitigate their negative effects.

The specific objectives of this review article are as follows. The first is to explore prior Nigerian literature on dental anxiety, fear, and phobia by study region, design, targeted population, and frequency of investigation. The second is to examine Nigerian dental anxiety, fear, and phobia based on reported prevalence.

METHODS

Study design

This study investigated dental anxiety, dental fear, and dental phobia in the Nigerian population using a review literature design. Recognizing that reviews are an effective method of demonstrating how research on a particular topic was designed and conducted, this review was conducted using recommended guidelines and frameworks, including the Joanna Briggs Institute scoping review methodology,^{27,28} the PRISMA extension for scoping reviews,²⁹ and the PRISMA flowchart.³⁰ Ethics approval was not necessary for this study since it was based on an empirical literature review.

Data sources and guidelines

The research databases used were Google Scholar, MEDLINE, PubMed, PsycINFO, CINAHL, and Cochrane. The reference list of all relevant studies was also screened for additional studies. The literature search was conducted using specific keywords with Boolean operators (i.e., “OR” and “AND”). The search queries were applied to various fields of the respective databases, including the title, abstract, field-specific keywords, and topic fields. Table 1 provides a list of keywords selected. Following the preliminary search, which ended on August 17th, 2023, the researchers added additional search terms to the list based on the results of the first search.

Eligibility criteria

The review included studies that attempted to treat Nigerian participants of any age with dental anxiety, fear, and phobia. It considered studies’ levels of prevalence; studies conducted in any state, tribe, or region within Nigeria; peer-reviewed journal articles, and studies with full text available in English were considered. However, the exclusion criteria included opinion articles, articles with no prevalence data, and reviews.

Study selection and data extraction

After completing the database search, the screening results were moved to Zotero citation software version 6.0.35 (Corporation for Digital Scholarship, Virginia, United States),³¹ where duplicates were eliminated. The authors further utilized the Rayyan mobile application for systematic reviews (Rayyan Enterprise, Cambridge, United States)³² to evaluate all the citations retrieved. The titles were then screened to eliminate unwanted publications such as opinion articles. Two independent assessors critically assessed all paper titles and abstracts following the pre-established inclusion and exclusion criteria. Data were extracted and synthesized using all citations eligible for review. While the assessment process was in progress, articles with an unclear eligibility status were kept aside for further consideration.

Taking into account the inclusion and exclusion criteria, the selection was carried out by reading the full-text articles. The full texts of all selected articles were independently reviewed by two assessors, who collaborated to resolve potential conflicts regarding eligibility through discussion with a third assessor. Final papers were selected for data extraction after discrepancies were resolved.

Table 1. The search strategy used in this scoping review

Search query	Search keywords applied on titles, abstracts, topics, and subject headings
1	“Children” OR “pupils” OR “teenagers” OR “adolescents” OR “students” OR “young* people” OR “adult” OR “elderly” OR “aged” OR “older adult*” OR “elder* people” OR “aging” OR “old* people”
2	“dental anxiety” OR “dental fear” OR “dental phobia” OR “dental health” OR “dental well-being” OR “dental well-being” OR “oral health” OR “oral wellbeing” OR “oral well-being” OR “oral disorder*” OR “tooth extraction anxiety” OR “tooth extraction fear” OR “tooth extraction phobia”
3	“Nigeria” OR “Southern Nigeria” OR “Eastern Nigeria” OR “Western Nigeria” OR “Northern Nigeria”
Final search query	1 AND 2 AND 3

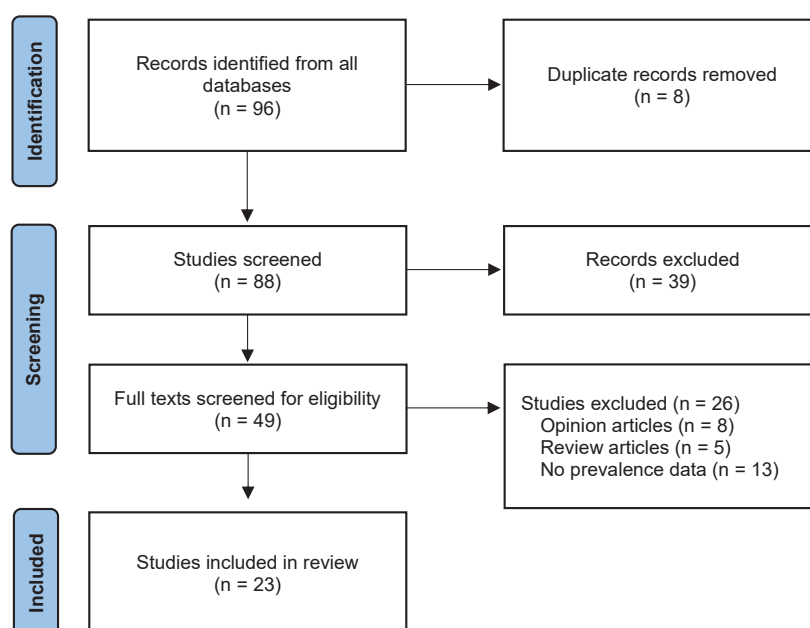


Figure 1. Flow chart illustrating the screening and selection process of articles for this scoping review.

Table 2. Literature on dental anxiety, dental fear and dental phobia among Nigerians

Authors	Study objective	Study setting / Region	Dental problems and Study instruments	Type of study	Sample and sampling technique	Approach to measuring dental anxiety, fear and phobia	Prevalence
Bashiru and Omotola ⁵	To determine the prevalence and determinants of dental anxiety among adult patients.	University of Benin Teaching Hospital, Edo State, Nigeria. (South-South)	Dental anxiety; questionnaire based on the Coral Dental Anxiety Scale (CDAS).	A cross-sectional study	390 respondents. Aged 16-89years-old. A systematic sampling.	Quantitative approach	The prevalence of dental anxiety was low (8.7%). Dental anxiety was significantly associated with age, gender, and educational status. The prevalence of dental anxiety was 35.6%. Prevalence across age was: 16-24 (49.5%), and 25-60(50.5%). Prevalence by marital status was: single (37.5%), and married (26.9%). Prevalence by income level was: low earners (37.5%) and high earners (26.9%). Prevalence in respect of oral health literacy level was: low (41.3%) and high (58.7%).
Azodo and Umoh ⁷	To examine the association between oral health literacy and dental anxiety among dental outpatients.	University of Benin Teaching Hospital Benin City, Edo state, Nigeria. (South-South)	Dental anxiety; Modified Dental Anxiety Scale (MDAS)	A cross-sectional study	208 patients. Aged 16 to 60 years. A systematic sampling technique.	Quantitative approach	Males reported significantly lower dental anxiety than females. Older respondents (≥ 28 years) did not score significantly less on dental anxiety than their younger (≤ 28 years) counterparts.
Akhiigbe and Koleoso ⁹	To investigate the influence of trait anxiety, sex, age and previous dental treatment experience on dental anxiety.	University of Benin Teaching Hospital Benin City, Edo state, Nigeria. (South-South)	Dental anxiety; The instrument was a questionnaire that incorporated a Dental Anxiety Scale (DAS) and a Spielberger 's State-Trait Anxiety Inventory (STAI-T)	A cross-sectional study	255 respondents. Mean age was 28.59 years. A purposive sampling technique.	Quantitative approach	Total dental anxiety score was generally low. Women demonstrated higher score for dental anxiety than men.
Udoeye at al. ¹⁶	To evaluate the levels of dental anxiety among patients receiving different dental treatments and compare these levels with those in similar studies of patients from diverse socio-cultural settings.	Dental Hospital Obafemi Awolowo University, Ile-Ife, Nigeria. (Southwest)	Dental Anxiety; A questionnaire based on Corah's Dental Anxiety Scale (DAS) was used for data collection.	A cross-sectional study	40 participants. Age range was <24->50years. Systematic sampling technique	Quantitative approach	The prevalence of severe dental fear among participants who visited dental clinics was 36.8%.
Ogbebor and Azodo ¹⁸	To determine the prevalence of dental fear and to compare oral health knowledge and dental attendance among adolescents in the north-central zone of Nigeria with and without dental fear.	State-owned secondary schools in Minna, Niger State, Nigeria. (North-Central)	Dental fear; A self-administered questionnaire (Modified Dental Anxiety Scale, MDAS).	A cross-sectional study.	350 children. Aged 15-19 years. A multistage sampling technique.	Quantitative approach	

Folayan et al. ¹⁹	To determine the sociodemographic factors that relate to dental anxiety in suburban African children.	Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State. (Southwest)	Dental anxiety; A short form of the Dental subscale of the Child Fear Survey Schedule (DFSS_SF)	A cross-sectional study.	81 patients. Aged 8-13 years. Consecutive sampling technique	14.8% of the children were described as having high levels of dental anxiety.
Arighede et al. ²⁰	To determine the prevalence and factors associated with dental anxiety among patients visiting a University Dental Centre in Nigeria	University College Hospital Dental Centre, Ibadan. (Southwest)	Dental anxiety; An anonymous self-administered structured questionnaire which incorporated the Modified Dental Anxiety Scale (MDAS) was used for the study.	A cross-sectional study	471 respondents. Age range was 16-75 years. A convenience sampling technique.	Prevalence of dental anxiety was 7.43%. There were more respondents with high dental anxiety among the females
Coker et al. ²¹	To estimate the prevalence of dental anxiety in Nigeria.	Lagos State University Teaching Hospital, Ikeja Lagos, Nigeria. (Southwest)	Dental anxiety; Modified Dental Anxiety Scale (MDAS) and Hamilton Anxiety Rating Scale	A cross-sectional study	190 adult participants; Age range was 18-76 years. Consecutive sampling technique.	48.6% of the participants experienced high dental anxiety.
Olawole et al. ²²	To explore the associations between previous dental visits and dental anxiety among patients.	Federal Medical Centre, Birnin Kebbi, Nigeria. (North-West)	Dental anxiety; structured questionnaire	A cross-sectional study	172 participants. Age range was 16-35 years. Leslie sampling formula and only consenting patients.	47.7% of the participants experienced dental anxiety. A higher proportion of the female participants had dental anxiety when compared with the male participants.
Ekua et al. ²³	To determine patients' perception of pain during scaling and determine its relationship with their level of dental anxiety	Lagos State University Teaching Hospital. (Southwest)	Dental anxiety; The Visual Analog Scale (VAS) was used to record the patient's pain level while the Modified Dental Anxiety Scale (MDAS) was used to measure dental anxiety.	A cross-sectional study	94 participants. Age was ≥18 years. Consenting participants who met other inclusion criteria were sampled.	Females had higher overall mean MDAS scores. Respondents aged 18-40 years had higher mean MDAS scores than those aged 41-85 years.
Agbelusi et al. ³³	To determine the prevalence, aetiology and factors associated with dental anxiety in Nigerian patients.	Lagos University Teaching Hospital. (Southwest)	Dental anxiety; A questionnaire, The Modified Dental Anxiety Scale (MDAS) and the Dental Concerns Assessment (DCA) were the instruments used for the study.	A cross-sectional study	202 respondents participated. Age range was 18-60 years. Consecutive sampling technique.	Prevalence of dental anxiety was high (62.8%).

Azodo and Ogbebor ³⁴	To determine the relationship between dental anxiety, expected social outcome and halitosis among undergraduates.	University of Benin, Benin City, Nigeria. (South-South)	Dental anxiety; self-administered questionnaire	A cross-sectional study	150 students. Approximately half were older than 22 years. Voluntary sampling technique.	Quantitative approach Males, older participants, those who clean their teeth more than once daily, tobacco users, those with gingival bleeding, and those with halitosis were more likely to experience dental anxiety.
Eghor and Akpata ³⁵	To analyze the sociodemographic determinants of dental anxiety in patients scheduled for intra-alveolar extraction	University of Benin Teaching Hospital. (South-South)	Dental anxiety; An interview-based questionnaire, Corah Dental Anxiety Scale Revised (DAS-R), was administered	A cross-sectional study.	93 patients. Aged 18-54 years. Consecutive sampling technique.	Dental anxiety and participants' age showed a significant inverse relationship. Females had a higher dental anxiety score than the males. Residential location was not statistically significant. Singles reported the highest DAS score. The educational level attained was significantly related to dental anxiety. Those with secondary school education had the highest DAS score.
Koleoso and Akhigbe ³⁶	To determine the prevalence of dental anxiety and assess the psychometric properties in a Nigerian population.	University of Benin Teaching Hospital, Benin City, Nigeria. (South-South)	Dental anxiety; MDAS	A cross-sectional study	619 participants. The age range was 18-75 years. Convenience sampling was employed.	The prevalence of dental anxiety was found to be 10.7%. A higher and significant proportion of females (8.1%) than males (2.6%) were highly anxious about dental treatment.
Oyeleke et al. ³⁷	To investigate demographic factors and dental anxiety as predictors of oral health-related quality of life among dental patients	Obafemi Awolowo University Teaching Hospital (OAUTH), Ile-Ife, Nigeria. (Southwest)	Dental anxiety; self-report questionnaire - The Index of Dental Anxiety and Fear (IDA).	A cross-sectional study.	454 patients. Age ranged 18-61 years. Accidental sampling technique.	Dental patients who were high on dental anxiety scored significantly lower on oral quality of life than dental patients who are low on dental anxiety.
Braimah and Umanah ³⁸	To evaluate the psychometric properties of the Modified Dental Anxiety Scale and the prevalence of dental anxiety in an adult population in Nigeria.	The University of Port Harcourt, Rivers State. (South-South)	Dental Anxiety; A Modified Dental Anxiety Scale questionnaire was used for data collection.	A cross-sectional study.	160 undergraduate students. Age was ≥16 years. Convenience sampling technique.	The prevalence of dental anxiety was 21.2%. This was higher in females (11.2%) than in males (10.0%). Dental anxiety was also higher in people with lower age than those with higher age.
Folayan et al. ³⁹	To ascertain whether digit sucking predicts general anxiety and dental anxiety, as well as whether general anxiety and dental anxiety affect caries and oral hygiene status among children in sub-urban Nigeria.	Ile-Ife in Osun State, Nigeria; Hospital setting. (Southwest)	Dental anxiety; Dental Subscale of the Child Fear Survey Schedule (CFSS-DS)	A cross-sectional study	345 children with oral habits and caries. Age range was 6–12 years. A multi-stage cluster sampling technique.	47.3% of the respondents were classified as having low dental anxiety and 52.7% as having high dental anxiety.

Sorunke et al. ⁴⁰	To determine the relationship between dental anxiety and self-reported periodontal status.	Lagos State University Teaching Hospital (LASUTH), Ikeja, Lagos, Nigeria. (Southwest)	Dental anxiety; The Modified Dental Anxiety Scale (MDAS) was used to collect data for the study.	A cross-sectional study.	263 patients. Aged 18 years of age and above. Consecutive sampling technique.	Quantitative approach	There was a significantly higher prevalence of very high dental anxiety among respondents who had never visited the dentist (23.2%). Females (19.4%), middle-class respondents (30.8%), and those with a primary school education (23.5%) had a higher prevalence of high dental anxiety.
Suleiman et al. ⁴¹	To determine the effect of dental anxiety on surgical time of mandibular third molar (M3) disimpactions	Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria. (North-West)	Dental anxiety; Modified Dental Anxiety Scale (MDAS).	A cross-sectional study.	116 participants. Aged 18-50 years of age. Purposive sampling technique	Quantitative approach	36.2% of participants reported mild anxiety, 57.8% reported moderate anxiety, and 6.0% reported high anxiety. The females were more anxious.
Taiwo and Umoh ⁴²	To identify the causes of dental phobia in a Nigerian Dental Clinic.	Regional Centre for Oral Health, Jos, Plateau State, Nigeria. (North-Central)	Dental Phobia; A structured questionnaire (Dental Concerns Assessment Form).	A cross-sectional study.	150 adult participants. Consecutive sampling.	Quantitative approach	Dental phobia was recorded in 30% of respondents. Female patients and those who had severe dental pain at presentation had more phobia.
Oyapero and Ogunbiyi ⁴³	To assess the level of dental anxiety in dental patients.	Lagos State University Teaching Hospital, Ikeja (LASUTH). (Southwest)	Dental anxiety; A structured researcher-administered questionnaire comprising of Modified Dental Anxiety Scale (MDAS) questions.	A cross-sectional study.	122 patients. Aged 18 to 40 years. A simple random sampling technique.	Quantitative approach	The prevalence of dental anxiety was 20.5%.
Folayan et al. ⁴⁴	To assess the prevalence of sexual abuse among adolescents, oral health factors associated with this history, and to investigate whether sexual abuse was a risk indicator for dental anxiety, caries experience and poor oral hygiene.	Ile-Ife, in the Ife Central Local Government Area, is a semiurban community of Osun State. (Southwest).	Dental anxiety; Corah dental anxiety scale	A cross-sectional study.	1,056 adolescents. Aged 10–19 years. A multi-stage sampling technique.		20.6% of the participants had severe dental anxiety. Those with normal levels of dental anxiety were more likely to report a history of sexual abuse (45.2% vs. 27.6%).
Folayan et al. ⁴⁵	To determine the relationship between parents' anxiety level and that of the child patient.	Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State. (Southwest)	Dental anxiety; The Dental Anxiety Scale (DAS) and Dental Subscale of the Child Fear Survey Schedule (CFSS-DS).	A cross-sectional study	81 children. Age range was 8–13 years. Consecutive sampling technique.		High levels of dental anxiety (DAS scores of 15 or more) were found in 7.5% of mothers and 1.2% of fathers.

The extraction of data from articles was conducted independently. A predesigned data extraction form, which included items related to study characteristics, was used to obtain relevant information from all included papers. Two independent assessors and a third assessor reviewed the extracted data to ensure that it was accurate and reliable. The assessors discussed the observed discrepancies during data extraction in order to reach a consensus.

Data synthesis

During a scoping review, the collective body of evidence is analyzed to develop an evidence map and identify any gaps in the evidence. In this regard, several key findings concerning the variables of interest were highlighted by the authors. The results of existing studies were tabulated according to the study variables.

RESULTS

Selection of sources of evidence

The electronic search of the five databases initially identified articles related to dental anxiety, dental fear, and dental phobia in Nigeria. Screening the article titles resulted in the identification of 96 potentially relevant articles. After removing duplicate articles, 88 remained. Initially, an independent screening process involved reading titles and abstracts to identify 49 potential articles for inclusion. After reading the full text a second time and considering the inclusion criteria, 23 articles were selected for data extraction from the remaining 49 papers. Figure 1 shows the reasons for excluding over 26 articles from the full-text assessment.

Study characteristics

Table 2 summarizes the studies included in this review. The 23 studies included in this review were published between 2002 and 2022. Out of these 23 studies, 12 were conducted in Nigeria's South-Western states of Osun and Lagos, 7 were conducted in the South-Southern states of Edo and Rivers, 2 were conducted in the North-Central states of Plateau and Niger, and 2 were conducted in the North-Western states of Kebbi and Kano.

Of the 23 studies, 21 focused on dental anxiety, 1 focused on dental fear, and 1 studied dental phobia. In terms of measurement tools, 11 studies used the Modified Dental Anxiety Scale (MDAS), 2 studies used the Dental Subscale of the Child Fear Survey Schedule (CFSS-DS), 3 studies used the Coral Dental Anxiety Scale (CDAS), 2 studies used a structured questionnaire, 1 study used a combination of the DAS and Spielberger's State-Trait Anxiety Inventory (STAI-T), 1 study used a combination of MDAS and the Hamilton Anxiety Rating Scale (HAM-A), 1 study used a combination of DAS and CFSS-DS, and the remaining 2 studies used a self-administered questionnaire and The Index of Dental Anxiety and Fear (IDA), respectively.

In terms of study design, all the studies used cross-sectional designs. Three studies reported participants' history of dental health issues, 1 reported past pain experience, 1 reported previous traumatic dental treatment, and 18 studies did not report participants' dental histories or previous dental experiences. All the articles included employed a quantitative approach to measuring dental anxiety, fear, and phobia among Nigerians.

Out of the 23 studies, 18 assessed adults (mostly 16 years and above), 2 assessed children (mostly 6–13 years of age), 2 assessed adolescents (10–19 years of age), and 1 assessed both children and adults. The average number of study participants was 269, ranging from 81 to 1056, with a median of 81 and 150. All studies included both male and female participants.

The main outcome of this study was to assess the prevalence of dental anxiety, fear, and phobia among Nigerians. Across the studies, the prevalence of dental anxiety was reported as follows: 7.43%,²⁰ 8.7%,⁵ 10.7%,³⁶ 20.5%,⁴³ 20.6%,⁴⁴ 21.2%,³⁸ 35.6%,⁷ 47.7%,²² 48.6%,²¹ and 62.8%.³³ One study examined dental anxiety prevalence in terms of low or high prevalence and reported that 47.3% of respondents had low dental anxiety, whereas 52.7% had high dental anxiety.³⁹ In a similar vein, another dental anxiety study reported that 36.2% of respondents were mildly anxious, 57.8% were moderately anxious, and 6.0% were highly anxious.⁴¹ The prevalence of severe dental fear among participants was 36.8%.¹⁸ The prevalence of dental phobia was 30%.⁴²

DISCUSSION

This scoping review examined and mapped research on dental anxiety, dental fear, and dental phobia among Nigerians. It assessed the prevalence of these issues and the unique characteristics of individuals with dental anxiety, fear, or phobia in Nigeria. The findings revealed that the studies,^{5,7,20–23,33–37} which used cross-sectional approaches, found a prevalence of dental anxiety among the participants. In this regard, a study conducted on 160 undergraduate students in Rivers State revealed a dental anxiety prevalence of 21.2%. This was higher in females (11.2%) than in males (10.0%).³⁸ Dental anxiety was also higher in younger people compared to older people. Another set of studies^{39,40} conducted in hospitals in Osun and Lagos states, respectively, found a high level of dental anxiety among the participants. Additionally, another study was conducted in Kano (North-West Nigeria) among 116 participants aged 18 to 50 years, and the prevalence of dental anxiety was shown to be at a moderate level.⁴¹ A study including 350 school children aged 15–19 years in Minna, Niger State, found that 128 of the 346 participants reported dental fear and the prevalence of severe dental fear among participants who visited dental clinics was 36.8%.¹⁸ Furthermore, a cross-sectional study⁴² aimed at determining the prevalence of dental phobia among 150 adults in Jos,

Plateau State, revealed that dental phobia was recorded in 30% of the participants, with female patients (75%) and those experiencing severe dental pain at presentation (81%) having more phobia. However, the majority of these studies focused on dental anxiety rather than dental fear and dental phobia. Some authors^{39,40} found dental anxiety to be high among the study participants, while others⁴¹ found a moderate level of dental anxiety prevalence.

The literature reviewed in this study established that more females than males are affected by dental anxiety, dental fear, and dental phobia. This is because the studies included in this review found that females exhibit the highest and most severe dental anxiety, fear, and phobia.^{35,43,44} This may not be surprising, as females are more likely to report their anxieties than males. Women have a lower pain threshold than men and a low tolerance for painful stimuli, which can lead to dental anxiety, fear, or phobia.^{44,45} A study investigating the differences in brain structure between males and females noted that females have a greater grey matter volume in the cognitive regions associated with emotional regulation.⁴⁶ Some of the reviewed studies showed that dental anxiety is highly prevalent in younger people, less educated individuals, and those with low to moderate incomes compared to their older, more educated, and higher-income counterparts. Though these differences were not significant, the reason may be that younger people have a lower tolerance for painful stimuli, which predisposes them to dental anxiety, fear, or phobia. It may also be because older people are better at rationalizing the situation, so groundless anxiety, fear, or phobia does not manifest as often.³⁵ However, opposing results were found by other researchers who reported higher dental anxiety.^{9,43} For less educated people, the high anxiety prevalence may be related to low knowledge of or exposure to oral health hygiene or low oral health literacy. Conflicting results were found regarding the impact of education on dental anxiety, fear, and phobia. Some of the studies examined showed that people with a low level of education are most affected by dental anxiety, fear, and phobia, with the exception of one study,⁴³ which showed that people with a high level of education are more affected by dental anxiety, fear, and/or phobia. These conflicting results may be due to the use of measurement scales that are not specific to dental procedures. For low to moderate income earners, the reason may be a result of the combined influence of monetary charges attached to visiting dental hospitals and other psychological instabilities.

Marital status was assessed in two of the reviewed studies, but there was no significant difference in dental anxiety levels between married and single respondents in one study;³⁷ however, another study reported that divorced individuals appear to be less anxious than single individuals.³⁵ One study also revealed that dental anxiety, fear, and phobia are high among those who consume alcohol and tobacco, visit dental hospitals regularly, and routinely consume refined carbohydrates between meals more than once daily.⁴⁴ Additionally, one of the reviewed

studies found that a higher number of individuals with high or severe levels of dental anxiety had a history of sexual abuse.⁴⁴ However, this finding may be a result of general anxiety, fear, and phobia that usually accompany sexual abuse and affect various aspects of the victim's daily activities.

Out of the 23 studies reviewed, 12 were conducted in Nigeria's South-Western states of Osun and Lagos, 7 were conducted in South-Southern states of Edo and Rivers, 2 were conducted in the North-Central states of Plateau and Niger, and the remaining 2 were conducted in North-Western Kebbi and Kano. These results imply that dental anxiety has been more researched among residents in the South-Western part of Nigeria, followed by the South-Southern part, and then the North-Central and North-Western regions. However, no empirical study has been carried out in the South-Eastern and North-Eastern parts of Nigeria to specifically ascertain the prevalence of dental anxiety, fear, and phobia among people from these zones. This may be due to a lack of scientific evidence in the development of dental healthcare policies, a lack of research funding, and inadequate institutional collaborations and capacities. Therefore, further empirical research is needed in the South-Eastern and North-Eastern regions, involving individuals of various age ranges, socioeconomic statuses, and marital statuses, to establish the prevalence of dental anxiety, fear, and phobia in these areas.

The reviewed studies used different instruments and techniques to identify anxiety, fear, and phobia levels. Most studies used only one specific measurement scale, while a few used a combination of two different scales. The MDAS was the most commonly used scale, followed by the Dental Subscale of the CFSS-DS, Corah's DAS, the STAI-T, the HAM-A, and the IDA. The prevalence of dental anxiety, fear, and phobia was mostly assessed using the MDAS, indicating a focus on dental anxiety rather than dental fear and phobia.

Some of the reviewed studies reported participants' dental history or previous dental experiences, while others did not. The studies that reported a history of past dental visits, pain experiences, and traumatic dental treatment found high levels of dental anxiety.^{20,22,39} This suggests that a previous negative dental experience has a significant impact on a patient's dental anxiety. Dental anxiety, fear, and phobia are often triggered by excruciating and terrifying dental experiences. Therefore, the prevalence of dental anxiety, fear, and phobia can be influenced by factors such as past dental experiences. Further research is needed to clarify the exact contribution of these factors to the prevalence levels. Also, the findings showed that the prevalence data corresponds with global research, indicating that dental anxiety and fear affect people of all ages and act as a hindrance to good dental health behaviors and practices.^{47–51} Specifically, a previous study reported prevalence rates of 16.3% and 36.1% for moderate and high dental anxiety and fear, respectively.⁵¹ These studies suggest the need for psychoeducational interventions to alleviate

dental anxiety in patients. Another prior study suggests that children receiving dental treatment may experience less anxiety when they are treated with pandan leaf aromatherapy and relaxing music.⁵² Zubaidah et al.⁵³ assert that music therapy can be used as a nonpharmacological strategy to overcome dental anxiety.

Significance of the study

This study on dental anxiety, fear, and phobia among Nigerians is significant because these psychological conditions can significantly affect a person's well-being and quality of life. Furthermore, understanding the prevalence of and factors that contribute to these conditions can help the development of targeted interventions and strategies to alleviate them in Nigerian dental care settings. Dentists can also improve the accessibility and effectiveness of dental care to promote better oral health among Nigerians by addressing these issues if their prevalence is well understood.

Limitations

This research utilized a scoping review approach, which may limit its effectiveness as a decision-making resource. This is because it only documents the available studies conducted on dental anxiety, dental fear, and dental phobia in Nigeria, as well as the unique characteristics of individuals with these conditions in Nigeria, without evaluating the reliability of the studies. Additionally, the guidelines followed for this research did not recommend a critical appraisal or risk of bias assessment. We also only included peer-reviewed articles from reputable databases, excluding unpublished studies from other databases. Consequently, the exclusion of non-English language articles may also have resulted in a lack of comprehensive evidence regarding dental anxiety, fear, and phobia in Nigeria.

Practical and policy implications

Dental care providers must pay particular attention to the psychological management of dental anxiety, fear, and phobia among patients at every dental appointment. Nigerian dental care providers should strive to make all dental procedures as painless and non-traumatic as possible to alleviate anxiety, fear, and phobia among their patients. Every time a patient with a history of painful treatments visits the dentist, dental care providers should always pay extra attention to the psychological management of dental anxiety, fear, and phobia. In light of the limitations associated with the use of MDAS, future research must develop culturally relevant and age-appropriate dental health assessment tools that address the unique dental care needs of the Nigerian population. Efforts must be increased by dental health experts to generate data about these conditions from other regions of the country to help with the development of an effective national policy on dental healthcare that takes into account any peculiarities across regions. A nationwide survey would be useful in

this regard. Based on the findings, public health policy must embrace an inclusive approach to dental healthcare where every Nigerian, irrespective of their age group, can have equal and equitable access to optimal dental health care assistance.

Future research directions

The studies that were reviewed focused predominantly on hospital settings, while studies on prevalence in the community and school settings were scarce. To effectively assess the prevalence of Nigerian dental anxiety, fear, and phobia, future studies conducted in community and school-based settings are needed. The adaptation of suitable psychological therapies for the treatment of dental anxiety in the Nigerian context is recommended for future research. Psychological interventions can be helpful in ameliorating anxiety symptoms and traumatic experiences linked to dental treatment in patients. The fact that dental anxiety is highly prevalent among residents of South-Western Nigeria may only imply that limited empirical research has been conducted in the South-Eastern and North-Eastern parts of the country. Therefore, more empirical research on people residing in the South-Eastern and North-Eastern parts of Nigeria and of varying ages, socioeconomic statuses, and marital statuses is needed in order to determine the prevalence of dental anxiety, fear, and phobia, as well as other dental health disorders. As there was a lack of clarity in most studies with regard to how the survey design was implemented and how confounding variables could have impacted their results, robust studies that will account for this issue are required. Future studies should explore Nigerian dental anxiety, fear, and phobia among school-aged children, young people, and adults using qualitative research approaches to explore the lived experiences of this population in depth and should consider the influences of ethnic- and culture-based factors.

Socioeconomic and cultural considerations

There are cultural and socioeconomic aspects that might influence perceptions and experiences of dental anxiety, fear, and phobia among Nigerians. There may be some Nigerians who believe that dental procedures are a cause of physical frailty and they may be less inclined to seek dental treatment, while others may decline such procedures due to treatment costs.⁵⁴ Those Nigerians who have had bad experiences with dental care or do not trust dental specialists are more likely to avoid it.^{42,55} Those Nigerians who are self-conscious of their dental appearance or who are fearful of being examined by a dental healthcare provider may be less inclined to seek dental treatment.⁵⁶ There may be a higher risk of dental anxiety and phobia among Nigerians who are unfamiliar with dental treatments or are not sure what to expect during dental care and consequently feel insecure during the treatment procedure.⁵⁵ It is also possible that Nigerians who do not speak the same language as their dental healthcare provider experience communication challenges and misconceptions, resulting

in anxiety and phobia. Nigerians who are afraid of injection needles may also avoid dental care.⁴² These cultural and socioeconomic barriers must be taken into consideration when providing dental care to Nigerians across different age groups and regions. Likewise, these inferences about how socioeconomic and cultural variables might influence the dental health behaviors and anxiety and phobia levels of Nigerians should be substantiated through evidence-based observational and qualitative studies.

Patient education and awareness

Given the present findings, the authors would like to provide some recommendations for managing patients with dental anxiety, fear, and phobia and suggestions for improving patient experiences in Nigerian dental care settings. Some Nigerian patients have dental anxiety, fear, and phobias, which can have a detrimental influence on their oral health and overall quality of life. Most of these patients struggle to obtain the essential dental care as a result of limited services and a lack of patient education and awareness.¹⁶ Nigerian dental healthcare providers must treat these patients with kindness and care, assisting them in coping with their anxiety and providing a more positive overall experience in dental settings. Understanding these patients' dental concerns is critical when assisting them. This may include obtaining a full dental health history, learning about their previous dental care experiences, and determining any underlying causes of their concerns so that they can be offered personalized care that alleviates them. Clear and efficient communication is essential for properly managing patients with dental anxiety, fear, or phobia. Nigerian dental healthcare providers should take the time to gently and nonjudgmentally explain the processes, options, and expected outcomes of dental treatments to their patients. Allowing these patients to ask questions, reassuring them about the benefits of the treatments, and providing them with relevant information can help to alleviate their concerns and create trust.

Because each patient is unique, addressing dental anxiety, fear, and phobia requires a personalized approach. Dental healthcare providers should tailor their approaches and plans of care to each patient's specific needs and concerns. This could include introducing new therapeutic options, putting relaxation techniques into practice, or discussing underlying issues. Prior to treatment, comfort measures can be implemented by dental care providers to make Nigerian patients feel more comfortable. They should provide comfortable seating and use soothing music to help create a relaxing treatment atmosphere for Nigerian patients. Of course, giving patients some control over their environment, such as providing them access to their favorite genre of music,^{49,57,58} may make them feel more relaxed. Also, the use of reminder sticker books by dentists can improve patients' dental health knowledge.⁵⁹ Audiovisual distraction techniques can be employed to reduce dental anxiety in children as they undergo dental procedures with dentists.⁶⁰ The use of psychological and educational

interventions can help improve parental knowledge of dental hygiene in children,⁶¹ as well as reduce levels of dental fear in children.⁶²

Furthermore, regular evaluation and feedback are essential for ensuring that patient experiences in dental settings continue to improve.³⁶ This information can be used to make changes to patient care protocols, as well as identify areas for improvement.⁶³ To stay up to date, Nigerian dental healthcare providers must regularly update their knowledge and skills in dental anxiety and phobia management approaches.⁵⁶

Conclusions

Nigerian children, adolescents, and adults all experience dental fear, phobia, and anxiety, although the prevalence of these conditions varies among these groups and across regions in Nigeria. We recommend conducting more empirical studies throughout the country, particularly in the South-Eastern and North-Eastern regions in both hospital and community-based settings, to better understand the prevalence of these dental issues. Additionally, we encourage the government and other stakeholders to expand access to dental healthcare coverage through health insurance plans for Nigerians.

Summary of key findings: (1) The prevalence of Nigerian dental anxiety ranged from 7.43% to 62.8%, the prevalence of dental fear was 36.8%, and the prevalence of dental phobia was 30%. (2) There were more studies on dental anxiety than dental fear and phobia. (3) Cross-sectional studies were conducted to explore these issues in Nigeria. (4) These conditions are prevalent in Nigerian children, adolescents, and adults. (5) The most commonly used tool for assessing dental anxiety was the MDAS. (6) Studies on Nigerian dental anxiety were conducted more in the South-West of Nigeria.

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