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PARENTAL KNOWLEDGE AND PERCEPTION TOWARDS THE USE OF CONSCIOUS SEDATION: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Behavioural management alleviates dental anxiety and instills a positive dental attitude. Conscious sedation is a pharmacological behavioural management technique wherein medications are administered to achieve a minimally depressed level of consciousness, allowing the patient to independently maintain their airway and sustain verbal contact.

Aim: To assess Nigerian parental knowledge and perception towards the use of conscious sedation in the dental management of children.

Methods: This was a descriptive cross-sectional study of 150 parents of children who presented at the Paediatric Dental Clinic of LUTH from March 2021 to February 2023. Questionnaires on knowledge and perception of conscious sedation were administered to parents who met the inclusion criteria using a consecutive non-probability sampling technique. SPSS version 25 was used for data analysis. Numeric variables were presented using mean and standard deviation. Frequencies and percentages were presented for categorical variables. All tests were carried out at a 5% level of significance and 95% confidence interval.

Results: A total of 150 parents with a mean age of 38.13 ± 8.37 years were recruited. More than half of the participants (56.7%) had not heard of conscious sedation prior to this study. Of the 65 participants who had heard of conscious sedation, 38 (58.5%) demonstrated good knowledge, while 67.4% had a positive perception of conscious sedation. However, overall, 112 (75%) of the 150 participants had poor knowledge of conscious sedation.

Conclusion: The majority of study participants had poor knowledge of conscious sedation. However, most parents who had heard of conscious sedation prior to the study demonstrated good knowledge and a positive perception of the technique.

Keywords: Nigerian, conscious sedation, parental perception, parental knowledge

INTRODUCTION

Dental anxiety is common among children in the dental setting; hence, behavioural management is key to successfully carrying out dental treatments.[1-3] Behavioural management alleviates dental anxiety and instills a positive dental attitude.[4] It is classified into non-pharmacological and pharmacological techniques. Non-pharmacological techniques include tell-show-do, desensitization, positive reinforcement, modeling, and distraction, while pharmacological techniques include sedation and general anaesthesia.[1] The use of pharmacological behavioural techniques as the first line of behavioural management is considered inappropriate dental practice, as this does not facilitate behavioural shaping.[5] However, when various non-pharmacological behavioural management techniques fail or become insufficient to achieve successful treatment, pharmacological behavioural techniques are employed.[3,6,7]

Conscious sedation is the administration of medications to achieve a minimally depressed level of consciousness, wherein the patient can independently maintain their airway and verbal contact can be sustained.[8] The inhalational route (nitrous oxide) of conscious sedation has been recommended as the first choice for conscious sedation in children compared with other routes (oral, intravenous, etc.).[9] Nitrous oxide/oxygen (N_2O/O_2) sedation is an effective technique with rapid onset, speedy recovery, and minimal risk compared to general anaesthesia.[10] Anxiolysis and analgesia are achieved with nitrous oxide sedation when 30–40 percent nitrous oxide is administered via standard titration: 100 percent oxygen is delivered for 1–2 minutes, then nitrous oxide is given at 10 percent intervals, or a rapid induction with a fixed dose of N_2O/O_2 is used[11] Children with American Society of Anesthesiologists (ASA) I and II status are considered appropriate for conscious sedation.[11]

Conscious sedation has been accepted as part of standard practice in pharmacological behavioural management worldwide; however, its use is limited in most African countries.[7,12] A survey of Nigerian dentists on the use of sedation showed that the majority used the oral route of administration when sedation was required for their patients.[13] The inhalational route of sedation is not widely practiced in dental settings in Nigeria due to the high cost of purchasing the required armamentarium.[3,7]

Consent is required from parents for their children to undergo conscious sedation if it is indicated for their dental treatment. Inappropriate knowledge or misperceptions among parents may therefore affect the management of the child.[6] This could lead them to object to consenting for the procedure, harbour incorrect expectations, or insist on other pharmacological methods even when not required. However, due to information available on the internet, including various social media platforms, there may be

varying degrees of perception and knowledge among parents depending on their level of exposure to adequate information.
This study aimed to assess Nigerian parental knowledge and perception towards the use of conscious sedation in the dental management of children.

METHODS

Study location: The study was conducted at the Paediatric Dental Clinic of the Lagos University Teaching Hospital (LUTH), Idi-Araba, Lagos, Nigeria. LUTH is a federal teaching hospital and tertiary institution established in 1962. It is affiliated with the University of Lagos College of Medicine.

Study design: This was a descriptive cross-sectional survey designed to assess parental perception of conscious sedation among parents of paediatric patients attending a once-weekly specialist Paediatric Dental Clinic at LUTH from March 2021 to February 2023. Study participants who met the inclusion criteria were recruited using a consecutive non-probability sampling technique.

Study population: The study population comprised primary caregivers and parents of paediatric patients attending the Paediatric Dental Clinic of the Lagos University Teaching Hospital (LUTH).

Inclusion criteria: Being a primary caregiver of a paediatric patient presenting at the clinic.

Exclusion criteria: Parents of paediatric patients with mental or physical disabilities, and parents or guardians of children who did not provide consent.

Sample size determination: The sample size was scientifically calculated, and a total of 154 participants were recruited for the study. However, data from 150 participants were analyzed.

STROBE Study flow chart

Parents attending Paediatric Dental Clinic, LUTH
↓
Assessed for eligibility (n = 200)
↓
Eligible and invited (n = 154)
↓
Provided consent and completed questionnaire (n = 154)
↓
Excluded (e.g., lost/wrongly imputed data) (n = 4)
↓
Analyzed (n = 150)

Sampling Technique: A consecutive non-probability sampling technique was used to select subjects for this study.

Outcome variables: The outcome variables were parental knowledge and perception towards the use of conscious sedation. Parental knowledge and perception were evaluated and dichotomized into good and poor. Every correct response was awarded 1 mark, while no mark was recorded for each incorrect response.

Data collection tool reliability and validity: A pilot study was carried out on 20 parents to assess ease of administration and correct any ambiguity. The pre-tested questionnaire was administered. Parents in the pilot study were not included in the final analysis. Questionnaires were administered by a trained and calibrated researcher (AOS). The intra-examiner reliability Kappa score was 0.90.

Ethical considerations: Ethical approval was obtained from the Health Research and Ethics Committee (HREC) of the Lagos University Teaching Hospital with approval number: ADM/DCST/HREC/APP/4144. Written informed consent forms containing a detailed explanation of the study and its benefits were given to parents and guardians. Consent forms were signed by them before inclusion in the study.

Confidentiality: Data were collected using examiner-administered questionnaires and treated with utmost confidentiality. All information collected during this study was assigned code (identification) numbers, and no names were recorded. The

information was transferred to a password-protected personal computer, and all articles arising from this study bear no information that reveals the identity of participants.

Benefit/Fairness to participants: All participants in this study received oral health education. The outcome of this study shall be used to advocate for better management of children.

Non-malfeasance to participants: There was no health risk to participants as a result of their involvement in this clinical research.

Right to decline or withdraw: Participants were informed that they had the right to decline participation in the study or to withdraw at any time during the course of the study without any loss of benefit or reduction in the quality of care received by their children at the Paediatric Dental Clinic.
Parents of children attending the Paediatric Dental Clinic were administered the questionnaire, which had been pretested for validity and reliability.

Variables and outcome measurements: Knowledge and perception were assessed and graded using examiner-administered questionnaires developed for the purpose of this study. A score of 50% or more positive responses was adjudged good, while a response score lower than 50% was adjudged poor.

Data analysis: The Statistical Package for Social Sciences (SPSS) version 25.0 IBM software (version 25.0; IBM Corporation, Armonk, NY, USA) was used for data analysis. Age was presented using mean and standard deviation. Frequencies and percentages were presented for categorical variables. Association between categorical variables was carried out using Chi-square. The significance level was set at $p \leq 0.05$ for all statistical tests.

RESULTS

Demographic characteristics of participants: A total of 154 participants met the inclusion criteria and were recruited for the study. Following data cleaning, 150 participants were analyzed. The mean age of parents was 38.13 ± 8.37 years. Twenty-four males and 126 females participated, giving a male-to-female ratio of 1:5.25. Ninety-four percent of participants were the biological parents of the children. Only one participant had no formal education. The majority of participants had tertiary education (40.0%) and postgraduate education (23.3%), respectively. Most participants (64.7%) had a monthly income of ≤80,000 Naira, while only nine participants (6.0%) earned more than 150,000 Naira per month.

Table 1 Socio-demographic variable

Variable	Frequency (n=150)	Percentage (%)
Relationship to child		
Father	20	13.3
Mother	121	80.7
Others	9	6.0
Caregiver age (years)		
21-30	24	16.0
31-40	79	52.7
41-50	38	25.3
51-60	5	3.3
61-70	4	2.7
Mean age =38.13±8.37years		
Gender of caregiver		
Female	126	84.0
Male	24	16.0
Education		
None	1	0.7
Primary	7	4.7
Secondary	47	31.3
Tertiary	60	40.0
Postgraduate	35	23.3

Monthly Income(Naira)		
None	28	18.7
<20000	34	22.7
20000-80000	35	23.3
80001-150000	44	29.3
>150000	9	6.0
Ethnicity		
Hausa	1	0.7
Igbo	53	35.3
Yoruba	63	42.0
Others	33	22.0

Parental Knowledge of conscious sedation: More than half of the participants (56.7%) had not heard of conscious sedation prior to this study. Of the 65 participants who had heard of conscious sedation, 24 (36.9%) first heard about it from a dental clinic (see Table 2). Among those who had heard of conscious sedation prior to this study, 58% demonstrated good knowledge of conscious sedation (Fig 2).

Table 2 Knowledge of conscious sedation

Variable	Frequency (n=150)	Percentage (%)
Heard of conscious sedation		
Yes	65	43.3
No	85	56.7
Source of conscious sedation knowledge (n=65)		
Dental clinic	24	36.9
Family and friends	14	21.5
Internet	6	9.2
Television	3	4.6
Others	18	27.7
Reason for the use of conscious sedation		
Dental fear	21	32.3
Dental anxiety	10	15.4
Uncooperativeness	17	26.2
Long dental procedure	10	15.4
Routine use	7	10.8
Conscious sedation done in the dental clinic		
Yes	44	67.7
No	2	3.1
Don't know	19	29.2
Beneficial for dental treatment		
Yes	53	81.5
No	2	3.1
Don't know	10	15.4
Conscious sedation is a complex procedure		
Yes	7	10.8
No	24	36.9
Don't know	34	52.3
Will the child be awake during treatment using conscious sedation		
Yes	30	46.2
No	13	20.0
Don't know	22	33.8
Will the child be responsive to speech during conscious sedation		
Yes	25	38.5
No	17	26.2
Don't know	23	35.4
Will the child be admitted to the ward before treatment		
Yes	5	7.7
No	34	52.3
Don't know	26	40.0

Will the child be admitted to the ward after treatment		
Yes	5	7.7
No	29	44.6
Don't know	31	47.7
Side effects include		
Headache	6	7.1
Fever	3	3.5
Nausea	7	8.2
Vomiting	4	4.7
Don't know	28	32.9

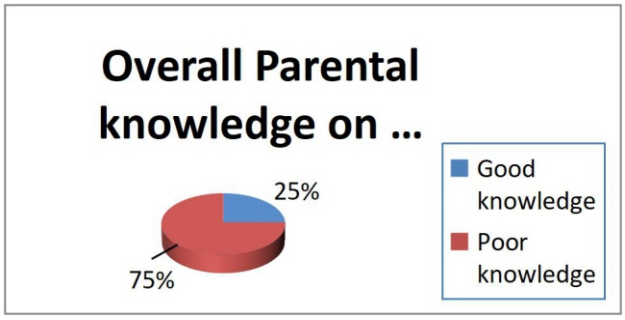

Fig 1: Overall parental knowledge of conscious sedation

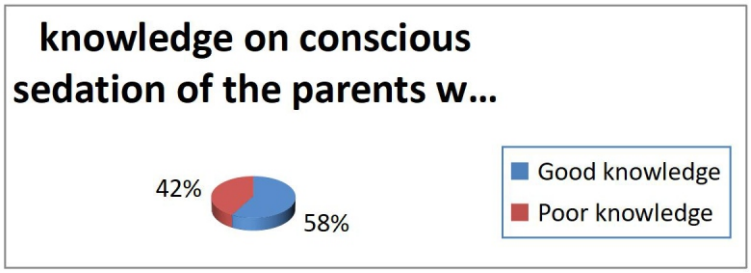

Fig 2: knowledge of conscious sedation among the parents who have heard of conscious sedation

Forty-eight participants (73.8%) thought conscious sedation should be used in the dental clinic because it is safe. These 48 participants (73.8%) were also willing to give consent for conscious sedation if the dentist recommended it for their children. However, only 28 (43.1%) were willing to pay an additional cost for conscious sedation (see Table 3). Overall, the majority (72%) of participants had a good perception of the use of conscious sedation (Fig 3).

Table 3 : Caregiver Attitudes and Practices Toward Conscious Sedation (n=65)

Variable	Frequency (n=65)	Percentage (%)
Think conscious sedation should be used in dental clinic		
Yes	48	73.8
No	17	26.2
Think conscious sedation is safe in the dental clinic		
Yes	48	73.8
No	17	26.2
Allow child to undergo conscious sedation		
Yes	41	63.1
No	24	36.9
Which dental treatment will the child need conscious sedation? *Multiple responses allowed*		
Preventive	8	19.5
Restorative	11	26.8
Extraction	18	43.9
All	11	26.8
None	2	4.9

Think conscious sedation makes the dental procedure faster		
Yes	46	70.8
No	19	29.2
Will allow child undergo conscious sedation if dentist recommends		
Yes	47	72.3
No	18	27.7
Think conscious sedation makes the dental treatment outcome more effective		
Yes	44	67.7
No	21	32.3
Will pay extra cost for child to undergo conscious sedation		
Yes	28	43.1
No	24	36.9
Depends on how much	13	20.0
Bothered about the side effects of conscious sedation		
Yes	21	32.3
No	44	67.7

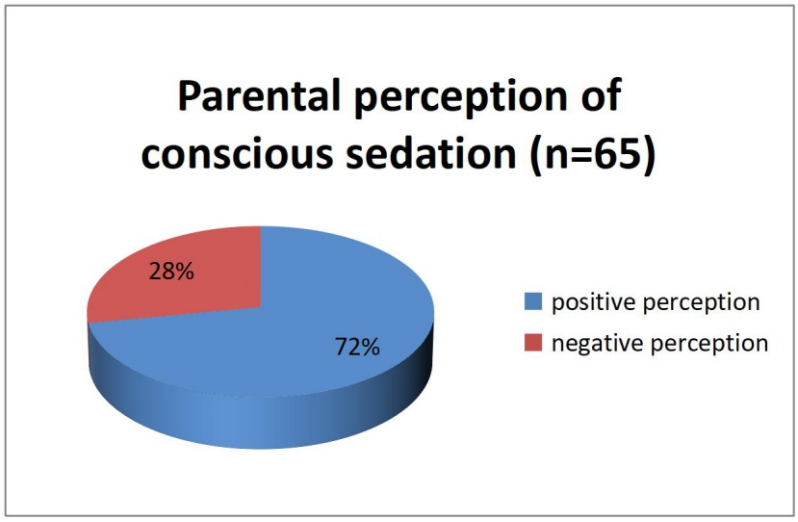

Fig 3: Parental perception of conscious sedation

Association between knowledge of conscious sedation and socio-demographic variables: A significant association was found between caregiver age group and knowledge of conscious sedation. Participants in the youngest age group (20–30 years) all demonstrated poor knowledge of conscious sedation (100%), while 14 (82.4%) of those aged 40–50 years had good knowledge. All participants in the 60–70 years age group (100%) also demonstrated good knowledge of conscious sedation.

A significant association was also found between knowledge of conscious sedation and income level, with five (83.3%) of participants in the highest income bracket (>150,000 Naira) demonstrating good knowledge of conscious sedation (see Table 4).

Table 4 Association between knowledge of conscious sedation and socio-demographic variables

Variable	Knowledge of conscious sedation		χ^2	p-value
	Good (n=38)	**Poor (n=27)**		
Relationship to child				
Father	6(66.7)	3(33.3)	0.954	0.621
Mother	30(58.8)	21(41.2)		
Others	2(40.0)	3(60.0)		
Caregiver age group				
21-30	0(0.0)	5(100.0)	14.914	**0.005**
31-40	21(53.8)	18(46.2)		
41-50	14(82.4)	3(17.6)		
51-60	3(100.0)	0(0.0)		
61-70	0(0.0)	1(100.0)		

Education				
Postgraduate	19(70.4)	8(29.6)	7.493	0.058
Primary	1(100.0)	0(0.0)		
Secondary	4(28.6)	10(71.4)		
Tertiary	14(60.9)	9(39.1)		
Income				
None	1(16.7)	5(83.3)	10.088	**0.039**
<20000	3(37.5)	5(62.5)		
20000-80000	8(50.0)	8(50.0)		
80000-150000	21(72.4)	8(27.6)		
>150000	5(83.3)	1(16.7)		
Ethnicity				
Hausa	0(0.0)	1(100.0)	6.688	0.083
Igbo	11(42.3)	15(57.7)		
Yoruba	20(71.4)	8(28.6)		
Others	7(70.0)	3(30.0)		

Association between perception of conscious sedation and socio-demographic variables: A significant association was found between perception of conscious sedation and age group. Younger age groups demonstrated more positive perceptions of conscious sedation, while older age groups demonstrated more negative perceptions. Specifically, 80% of participants within the 20–30 years age group had a positive perception, whereas all participants (100%) above 50 years of age had a negative perception of conscious sedation (see Table 5).

Table 5: Association between perception of conscious sedation and socio-demographic variables

Variable	Perception of conscious sedation		χ^2	p value
	Positive (n=20)	**Negative (n=45)**		
Relationship to child				
Father	1(11.1)	8(88.9)	2.395	0.302
Mother	18(35.3)	33(64.7)		
Others	1(20.0)	4(80.0)		
Caregiver age group				
21-30	4(80.0)	1(20.0)	10.831	**0.029**
31-40	14(35.9)	25(64.1)		
41-50	2(11.8)	15(88.2)		
51-60	0(0.0)	3(100.0)		
61-70	0(0.0)	1(100.0)		
Education				
Primary	1(100.0)	0(0.0)	4.107	0.250
Secondary	6(42.9)	8(57.1)		
Tertiary	5(21.7)	18(78.3)		
Postgraduate	8(29.6)	19(70.4)		
Income				
None	3(50.0)	3(50.0)	3.379	0.497
<20000	4(50.0)	4(50.0)		
20000-80000	4(25.0)	12(75.0)		
80000-150000	8(27.6)	21(72.4)		
>150000	1(16.7)	5(83.3)		
Ethnicity				
Hausa	1(100.0)	0(0.0)	5.061	0.167
Igbo	10(38.5)	16(61.5)		
Yoruba	8(28.6)	20(71.4)		
Other	1(10.0)	9(90.0)		

DISCUSSION

Findings: Parents participating in this study had poor knowledge and perception of conscious sedation, as most had never heard of it. This indicates a significant knowledge gap, underscoring the need to increase parental awareness of conscious sedation in Nigeria. This finding is similar to a study by Thimmegowda et al.[14] involving 400 parents in India, where 98% were unaware of conscious sedation. Similarly, a study by Alkandari et al.[3] in Kuwait reported that 79% of parents had no prior knowledge of conscious sedation. However, this contrasts with studies conducted in the USA by Almarwan et al.,[15] where most participants had information about conscious sedation, although few knew of its use in dentistry.[15] Additionally, shortage of skilled dental personnel may be a major factor contributing to poor knowledge in this study population, as well as the fact that nitrous oxide/oxygen conscious sedation is not routinely available to dental patients in this environment. Oral and intravenous sedation is always carried out in collaboration with either anaesthetists or oral surgeons in our setting, unlike in Western countries where sedation is fully administered by dental sedationists.

In our study, even though less than half of the participants had heard of conscious sedation, those who had demonstrated good knowledge and a positive perception. This suggests that increasing awareness of conscious sedation in Nigeria will likely improve acceptance and perception, enabling parents to make informed decisions. This also reflects a peculiarity of our society, where general knowledge and exposure may be high despite a paucity of specialised knowledge.

Implications: This study revealed poor knowledge of conscious sedation among the study population. Over recent years, parenting styles have evolved, with permissive parenting becoming more common in Western societies, where parents often prefer pharmacological approaches to prevent their children from confronting fear.[16,17] This trend is predominant in developed countries; however, Africans still predominantly practice authoritative and authoritarian parenting styles.[18] This cultural difference may explain why pharmacological techniques are less frequently required or accepted in African countries, where some parents prefer not to spend extra money on such approaches when indicated and instead expect their children to cooperate. The unavailability of sedation flow meters in dental clinics may also be a contributing factor. Nitrous oxide gas is highly controlled in most African countries due to its explosive properties and its potential misuse by outlawed terrorist organizations. The scarcity of this sedation gas drives costs beyond the reach of most dentists.

Older parents have been reported to employ more authoritative parenting styles, while younger parents tend toward permissive parenting.[19] This may explain why, in our study, older parents exhibited more negative perceptions of conscious sedation, whereas younger parents held more positive views. Recent studies have, however, demonstrated good acceptance of conscious sedation among parents willing to provide consent.[1,16,20]

Trade-offs (Limitations): Although the 150 participants provided adequate power for this study, the relatively small sample size and the single-centre design may limit the generalizability of our findings. The possibility of recall and interviewer bias could also be limitations. Future studies should include multiple dental clinics across different regions of the country and increase the sample size accordingly.

Take-Home (Conclusion): The majority of study participants had poor knowledge of conscious sedation. However, most parents who had heard of conscious sedation prior to the study demonstrated good knowledge and a positive perception of the technique.

Expectation for Future Research: Future studies should explore the effects of pharmacological agents used in conscious sedation on African children.

Recommendations: Sedation-based education should be targeted at parents—especially young parents—to improve their knowledge. A national policy on the use of conscious sedation in dental clinics should be developed.

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CONFLICTS OF INTEREST: The authors declare no conflict of interest.

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