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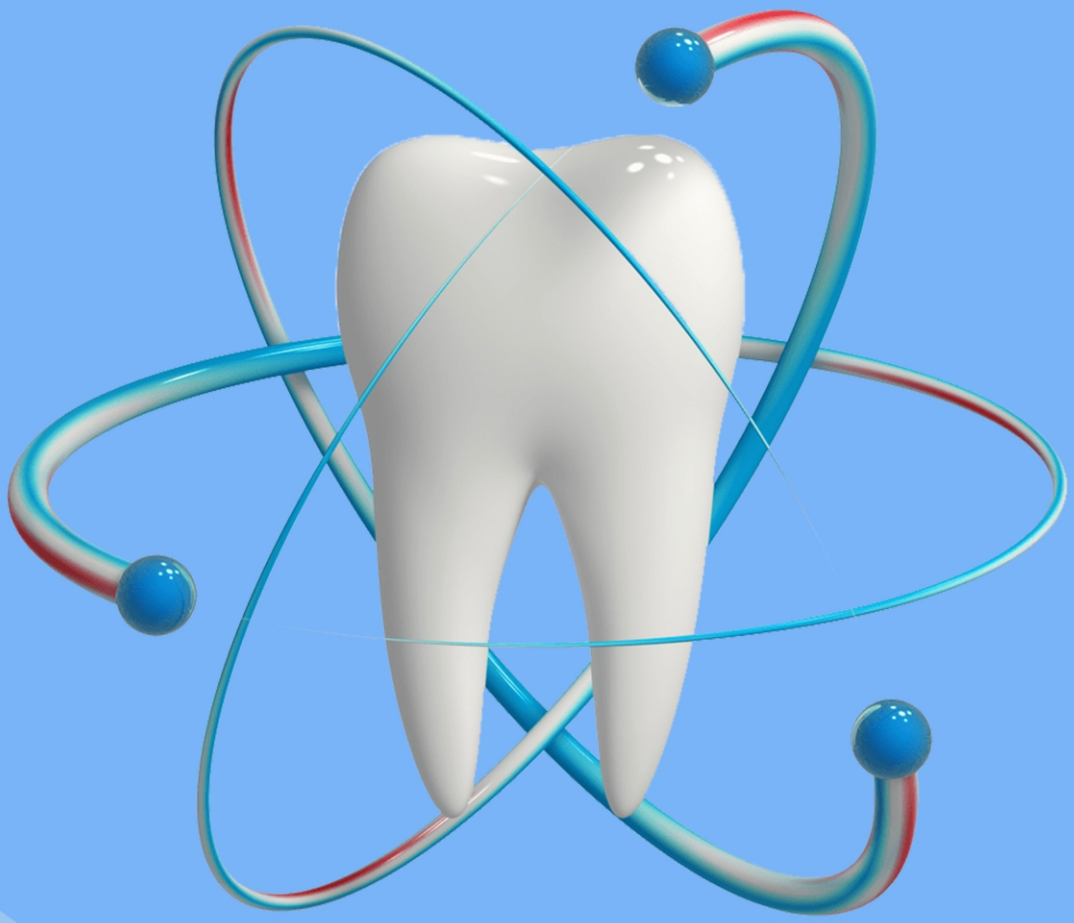

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S. Olusegun Nwhator
Editor-in-Chief

Comparison of Pre-Emptive Analgesic Effect of Paracetamol, Ibuprofen, and Placebo in Reducing Post-Operative Pain in Intra-Alveolar Tooth Extraction at the University of Benin Teaching Hospital, Benin City. A randomized Trial

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Key words: Intra-alveolar extraction, Pain, Paracetamol, Ibuprofen, Placebo

ABSTRACT

Objective: Pain is one of the most common postoperative complications of extraction. Thus, this study is aimed at determining the effectiveness of pre-emptive paracetamol and ibuprofen in the management of post extraction pain.

Materials and Methods: A randomized, placebo-controlled, single-blinded comparative study of patients who needed intra-alveolar extraction of posterior teeth. Sixty-nine patients aged 18 years and above were randomly assigned to one of three groups: (A) paracetamol 1g; (B) ibuprofen 400mg; and (C) (calcium lactate) 300mg. Each of the three tablets was given 30 minutes before administration of the local anesthetic agent. The pain level was assessed using the visual analogue scale®. Chi-square (X^2) test, one-way analysis of variance (ANOVA) with an appropriate post-hoc test was used. Level of significance was set at 95% (p-value < 0.05).

Results: Ibuprofen and paracetamol groups showed lower pain scores compared to placebo. Although, there was no significant difference between the VAS scores at the post-operative period (P= 0.080). There was a significant difference in time taken for use of rescue medication among the three groups (p = 0.022), with those in placebo group 8 times more likely to use rescue medication relative to the analgesics.

Conclusion: The use of preemptive analgesics showed lower pain scores compared to placebo, and significantly increased the time for use of rescue medication postoperatively.

INTRODUCTION

Pain is one of the most common postoperative complications of extraction and can be caused by the release of pain mediators, mainly prostaglandins and others such as bradykinin, adenosine triphosphate[1], from the injured tissues, which could discourage patients from seeking dental treatment.[2-6] In particular, postoperative pain increases the patient's suffering and anxiety, and can disrupt the homeostatis of the circulatory and endocrine systems. Since it has been reported that postoperative pain can have a negative influence on wound healing, reliable and fast-onset analgesia is needed.[7,8]

Pre-emptive analgesic intervention is aimed at attenuating or entirely blocking both peripheral and central pain sensitization, leading to reduced pain in the postoperative period.[9,10]Post extraction pain could be a

problem for the patients during the first few hours after tooth extraction because of both soft and hard tissue trauma during the operation, despite the use of local anesthesia.[9,11] Thus, some studies[1,5] have shown that pre-emptive analgesia, due to the analgesic drug before nociception, would be more effective than the same intervention if commenced afterwards. This advantageous effect would outlast the pharmacological duration of action of the analgesic concerned.

Paracetamol and nonsteroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen are common analgesics used post-operatively as pain relief for tooth extraction.[1,12-14] Although, a few studies[1,15-17]have evaluated the postoperative action of ibuprofen and paracetamol alone or in comparison with other types of drugs when used pre-emptively, these studies were done on primary tooth extraction. Thus, this study is designed to determine the pre-emptive effectiveness of paracetamol and ibuprofen in the management of post extraction pain. It is also intended to be used to establish a protocol in the study location for the use of these drugs pre-emptively in a bid to appropriately manage post extraction pain in permanent tooth extraction.

MATERIALS AND METHODS

Study Design: This study conforms to guidelines from the Consolidated Standards of Reporting Trials (CONSORT Statement).[18] This was a single blinded, parallel, placebo-controlled, randomized clinical trial. The allocation ratio used was 1:1. Informed consent was obtained from the study participants, and approval was obtained from the Research and Ethics Committee of the University of Benin Teaching Hospital (UBTH)with protocol number (ADM/E 22/A/VOL.VII/14831023). This study was conducted in compliance with international statutes and national legislation on ethics in research involving human subjects. The present trial was retrospectively registered in February 2023, under the Pan African Clinical Trial Registry, with the registration number PACTR202302774048699.

The study was conducted at the Department of Oral and Maxillofacial Surgery, UBTH, Benin City, Edo state, from August 2021 to July 2022, on patients undergoing intra-alveolar extraction, who met the inclusion criteria of minimum age of 18 years, with indications for tooth extraction of non-mobile posterior teeth notably the molars, and could read and understand the pain score sheet. Patients allergic to NASIDs, paracetamol, or local anaesthetic agents with history of gastrointestinal disorders, active asthma, hemorrhagic disorder, kidney stones and pregnant/nursing mothers were excluded.Out of the 75-sample size estimated based on the formula for a comparison study of equal sample sizes with a continuous measurement endpoint,[19] only 69took part, with23 subjects per group, namely paracetamol group (A), Ibuprofen group (B) and placebo group (C).

Assessments: The patients' demographic details were recorded, and each diagnosis made after careful history with relevant investigations. Pain assessment was done using the visual analogue scale (VAS). The VAS consists of an interval scale ranging from 0, representing no pain to 10cm, representing maximum possible pain experienced by the concerned individual. Clinical assessments were done using the VAS at one hour, two hours, and six hours after extraction. The drugs administered (1000mg paracetamol, 400mg ibuprofen, and 300mg calcium lactate tablet as placebo) were enclosed in white dispensing sachet with the codes (A, B, and C). Consecutive patientswho fulfilled the inclusion criteria were, through simple randomization according to the CONSORT flow-diagram (fig 1),selected into the three groups: (i) Group A: Paracetamol 1000mg (Panadol®, Glaxo Smith Kline (GSK) Pharmaceutical Company); (ii) Group B: Ibuprofen 400 mg (Brustan-N®, Ranbaxy Pharmacy); and (iii) Group C: Calcium lactate: 300mg (Meyer Organics Pvt limited). The VAS form was explained, pre-emptive drug administered 30 minutes before the extraction, and local anaesthesia(LA) injection given 10 minutes before extraction.

The intra-alveolar technique or forceps' extraction method was used in tooth extraction 10 minutes after the administration of 1.8ml of 2% lignocaine hydrochloride with 1:80,000 adrenaline as reported in previous studies[7,20]. Thereafter, the patient was given a form that contained the VAS to evaluate the post-extraction pain

afterone, two, and six hours. All the participants in this study were observed for the 1st hour in the hospital and the VAS recorded, and then given the VAS form to evaluate the post-extraction pain experienced aftertwo and six hours while at home. Patients were monitored via phone calls to remind them to fill the forms and ensure adherence to instructions given to them. The patients were given 1000mg of paracetamol as an 'escape analgesic' which they were instructed to take should the pain become unbearable, and the time noted on the form (this represents the duration of analgesia of the administered drugs). Also, each patient was instructed to note down on the form any side effects from the medication taken. Chi-square (X^2) test, a one-way analysis of variance (ANOVA) with an appropriate post-hoc test was used. Level of significance was set at 95% (p-value < 0.05).

RESULTS

Overall, 75 participants were enrolled for this study and evaluated for eligibility criteria, and 69 were recruited and included in the analyses (Figure 1) with 23 in each group.

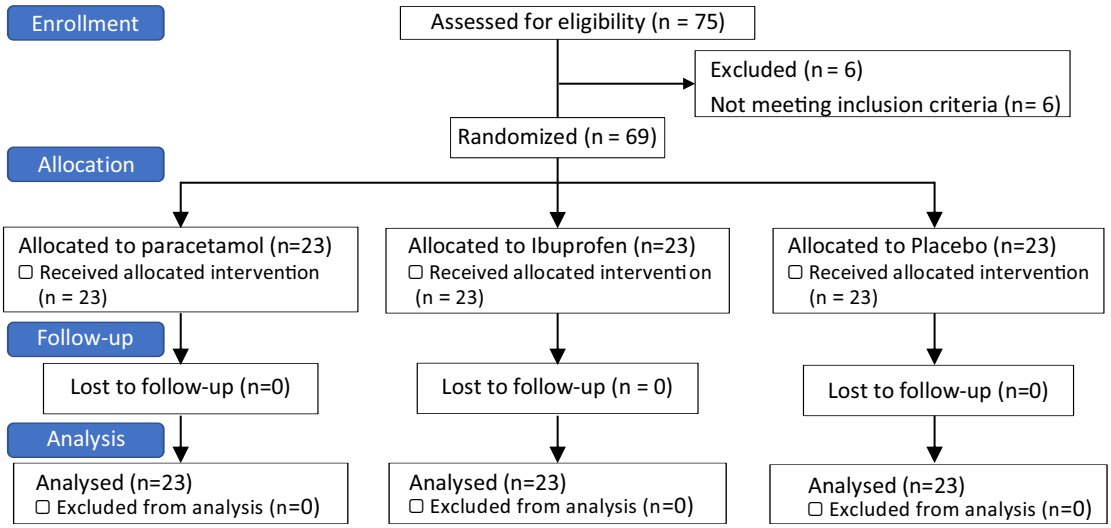

Figure 1: Flowchart adapted from CONSORT

Table 1 showed the demographic characteristics of the participants characterized by groups A, B, and C. The average age of the participants in groups A (Paracetamol), B (Ibuprofen), and C (Placebo) was 40.3 ± 17.8 years, 37.6 ± 16.9, and 40.7 ± 15.8 years respectively.

Characteristic	Paracetamol (A)(n= 23)	Ibuprofen (B)(n= 23)	Placebo (C)(n=23)	p-value
Age (years)				0.794
Mean (**S.D**)	40.3 (17.8)	37.6 (16.9)	40.7 (15.8)	
Range	18.0, 78.0	19.0, 75.0	18.0, 69.0	
Gender				0.840
Male	11 (47.83%)	12 (52.17%)	13 (56.52%)	
Female	12 (52.17%)	11 (47.83%)	10 (43.48%)	
Occupation				0.681
Business	1 (4.35%)	3 (13.04%)	6 (26.08%)	
Civil servant	7 (30.43%)	5 (21.74%)	5 (21.74%)	
Student	7 (30.43%)	9 (39.13%)	5 (21.74%)	
Trader	2 (8.70%)	1 (4.35%)	2 (8.70%)	
Others	6 (26.09%)	5 (21.74%)	5 (21.74%)	
Education Level				0.976
Primary	2 (8.70%)	1 (4.35%)	2 (8.70%)	
Secondary	6 (26.08%)	7 (30.43%)	5 (21.74%)	
Tertiary	15 (65.22%)	15 (65.22%)	16 (69.56%)	

A side-by-side comparison of the average VAS of the groups at different time periods indicates that at one and two hours after surgery, the highest VAS scores were recorded in placebo group C (1.8, 2.6) while the least was recorded in paracetamol group A (0.9, 1.2). However, there were no statistically significant differences between the groups one and two-hour post-surgery (F = 1.499, p = 0.231) (F = 2.311, p = 0.107). Six hours post-surgery, group A (paracetamol) had the highest VAS score while group B (Ibuprofen) had the least VAS score. However, there was also no significant difference between the VAS scores during this period (F = 2.630, p = 0.08). (Table 2)

Table 2: Comparing the average VAS score of the groups at the different post-surgery periods.

	VAS Score			
Post-surgery period	**Paracetamol (S.D)**	**Ibuprofen (S.D)**	**Placebo (S.D)**	**P-value**
1 Hour	0.9 ± 1.7	1.0 ± 1.9	1.8 ± 2.3	0.231
2 Hours	1.2 ± 1.7	1.4 ± 2.3	2.6 ± 2.8	0.107
6 Hours	3.0 ± 2.4	1.5 ± 1.8	1.9 ± 2.4	0.080

In paracetamol group (A), the average VAS score one hour post-operation was 0.9 ± 1.7. This increased to 1.2 ± 1.7 after two (2) hours. After six (6) hours post-operation, the highest average VAS score, 3.0 ± 2.4 was observed. A one-way repeated measures ANOVA showed that there was a significant difference among the VAS scores (p = 0.002). BonferroniPost hoc testshowed that the VAS score at six hours post-surgery was responsible for the significant difference observed. This implies significant reduction in pain control for the paracetamol group at 6 hours postoperatively. In groups B (Ibuprofen) and C (Placebo), the average VAS score at one, two, and six hours were not significantly different from one another(Table 3).

Table 3: Effect of time on the analgesic effect of the drugs

Code	Time	n	MeanVAS	S. D	SEM	F	p-value [1]
Paracetamol	1h	23	0.9	1.7	0.4	10.385	**0.002***
	2h	23	1.2	1.7	0.4		
	6h	23	3.0	2.4	0.5		
Ibuprofen	1h	23	1.0	1.9	0.4	0.678	0.453
	2h	23	1.4	2.3	0.5		
	6h	23	1.5	1.8	0.4		
Placebo	1h	23	1.8	2.3	0.5	0.704	0.500
	2h	23	2.6	2.8	0.6		
	6h	23	1.9	2.4	0.5		

[1]One-way repeated measures ANOVA

*There was significant reduction in pain control for the paracetamol group at 6 hours post-operation.However, one significant observation was that at six hours post-operation, the mean VAS values for the paracetamol group was 3.0, while that of the placebo group was 1.9 (Table 3).The only plausible deduction is that at six hours post-surgery, over half of the population (60.9%) in the placebo group had used as much as twice as many rescue analgesics as the paracetamol group (Table 4).

Table 4: Descriptive statistics of use and time of rescue medication characterized by the group

Characteristic	Paracetamol N = 9	Ibuprofen N = 8	Placebo N = 14	p-value1
Use of rescue Medication (%)	39.1	34.8	60.9	0.163
Maximum time (minutes)				0.022*
Mean (S.D)	341.7 (85.5)	346.2 (135.8)	222.3 (116.0)	
Range	180 – 420	154 – 600	60 – 480	

1One-way ANOVA*Significant difference in time taken for rescue medication use among the 3 groups (p = 0.022). Placebo differed significantly from analgesic groups.

Concerning the proportion of participants who took rescue medication, majority (60.9%) of group C (Placebo), 39.1% and 34.8% in groups A (paracetamol) and B (ibuprofen) respectively used rescue medication (Table 4).An investigation into the maximum time taken to use rescue medication showed that in the paracetamol group (n = 9), the time ranged from 180 – 420 minutes, with the average time being 341.7 ± 85.5 minutes. In ibuprofen group (n = 8), the average time was 346.2 ± 135.8 minutes. Placebo (group C)had the lowest average time of 222.3 ± 116 minutes. Therefore, there was a significant difference in the time taken before use of rescue medication among the three groups (p = 0.022). The post hoc test revealed that group C differed significantly from group A (p = 0.0205) and group B (p = 0.0204). (Table 4)

Table 5 is an outcome of a binary logistic regression that investigated the association between demographic factors and the use of rescue medication. Concerning gender, females were 7 times more likely to use a rescue medication relative to the males (OR = 7.04, 95% CI = 0.95 - 1.10, P = 0.033), and those in group C (placebo) were 8 times more likely to use a rescue medication relative to group A (paracetamol) (OR = 8.22, 95% CI = 1.29 - 92.6, P = 0.047). (Table 5)

Table 5: Factors associated with the use of rescue medication

Characteristic	OR[1]	95% CI[1]	p-value
Age (years)	1.02	0.95, 1.10	0.5
Gender			
Male	—	—	
Female	7.04	1.33, 52.4	**0.033**
Occupation			
Business	—	—	
Civil servant	14.3	0.93, 428	0.080
Student	10.6	0.67, 300	0.12
Trader	0.09	0.00, 3.19	0.2
Others	5.28	0.48, 85.8	0.2
Education level			
Primary	—	—	
Secondary	0.06	0.00, 1.36	0.10
Tertiary	0.17	0.00, 4.26	0.3
Group			
Paracetamol (A)	—	—	
Ibuprofen (B)	1.49	0.30, 7.60	0.6
Placebo (C)	8.22	1.29, 92.6	**0.047**

[1]OR = Odds Ratio, CI = Confidence Interval

DISCUSSION

Adequate pain management is of utmost importance when treating dental patients.[5, 7, 20-22] It encourages patients' attendance at the dental clinic for future dental care. Clinically, the findings of this study revealed that the pre-emptive analgesics (at a dosage of 1000mg paracetamol and 400mg ibuprofen tablets) reduced the post intra-alveolar extraction pain intensity and the need for rescue analgesic as compared with the placebo (300mg calcium lactate tablet). This alignswith a recent study,[1] whereby the use of pre-emptive ibuprofen or paracetamol showed lower pain scores compared to placebo in a randomized clinical trial.

In the present study, there were only 34.8% of patients in ibuprofen group and 39.1% in the paracetamol group who requested rescue medication postoperatively as against 60.9% of patients in the placebo group. This finding is relatively similar to a previous study,[12] where 35% of patients each in paracetamol and ibuprofen groups required supplementary rescue analgesia respectively. Interestingly, pre-emptive analgesics resulted in increased time to first rescue analgesic. There was also a significant difference in time taken for the use of rescue medication among the three groups ($p = 0.022$). The placebo group differed significantly from the analgesics'. Rescue medication was used at the earliest at I hour postoperatively in the placebo group, 3 hours in the paracetamol group, and 2:34 hours in the ibuprofen group. This replicates a previous study[23] in which rescue medication for those in the paracetamol group was first used at 3 hours postoperatively and earliest in the placebo. This reflects poor pain control in the placebo group as **compared** to the analgesics'.

Although, the ibuprofen group had better pain control 6 hours postoperatively in comparison with the paracetamol and placebo groups using the VAS, there was no significant difference in pain control among the three groups. Our findings are inconsistent with previous studies[1,12,15,23,24] which reported that pre-emptive administration of ibuprofen and paracetamol significantly decreased pain scores compared to a placebo. However, the present study is consistent with another report,[16] which did not show significant differences in pain scores among the three groups, though there was better pain control with the analgesics with ibuprofen having the best pain control with the least VAS score at 6 hours post-operatively.

Tooth extraction is a dental procedure that produces inflammation and pain. Ibuprofen and paracetamol are the most regularly prescribed analgesics in post-extraction pain control.[14, 15] In this study, pre-treatment with ibuprofen and paracetamol exhibited differences in pain scores although, this was not statistically significant. This finding alignswith that of an earlier study[17] in which both analgesics seemed to have a positive effect in reducing post-operative pain when applied pre-emptively, although the reduction was not statistically significant. However, this is in contrast to the findings in another study,[25] where 400mg ibuprofen was significantly more effective than 1000mg paracetamol in all three ratings.

The analgesic effect of paracetamol in this studyseemed to reduce over time with significant reduction in pain control ($p=0.002$) at 6 hours post extraction. The VAS score was higher in the paracetamol group compared to the ibuprofen group at 6 hours postoperatively. This may be because paracetamol is an analgesic with efficacy for mild to moderate pain, and completely devoid of anti-inflammatory activity,[26,27] whereas, ibuprofen has excellent analgesic and anti-inflammatory properties, which are especially important following dental extractions.[1,28,29] This notwithstanding, paracetamol remains a viable alternative to the NSAIDs and should be preferred in patients prone to side effects from the NSAIDs.

Among the factors investigated for use of rescue medication, gender and the drug groups were significant. This may be due to the fact that females,more than males, tend to self-medicate for pain due to their lower tolerance for pain as exemplified by previousstudies.[30-32] This finding is in contrast to another study[17] that reported no

statistically significant difference in gender perception of pain. The reason for this contrasting view may be due to the fact that the previous study was carried out on a much younger group with higher tolerance to pain[33] in comparison to this present study.

This study recorded no adverse effects in the patients studied. This is a pointer to the degree of safety of the drugs administered with careful application of the exclusion and inclusion criteria for the study.

CONCLUSION

The use of pre-emptive analgesics showed lower pain scores compared to the placebo, and significantly increased the time for use of rescue medication postoperatively. Additionally, the reduction in post intra-alveolar extraction pain intensity in the paracetamol and ibuprofen groups were comparable using the VAS, although there was a significant increase in pain intensity among the paracetamol group 6-hours postoperatively.

Conflict of Interest:

The authors declare no conflict of interest.

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Dental Attendance Among the Elderly in Benin-city, Edo state

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Key words: Dental clinic, attendance, elderly

ABSTRACT

Background:
There appears to be little or no focus on the dental clinic attendance by the elderly despite the global increase in the elderly population. This study therefore aimed to determine the pattern of dental clinic attendance among the elderly in Benin-city.

Materials and Methods:
This was a six-monthmulti-centre, cross-sectional study. The study was conducted among dental patients at the outpatient departments of two tertiary health facilities in Benin-city. Data comprised of participants' sex, age, level of education, marital status,, religion, and ethnicity were collected using a questionnaire. Other data collected included co-morbidities, previous dental clinic visits, time of last visit, reason for last visit, intention to visit the clinic again, presenting complaints, and barriers to dental attendance. Both descriptive and inferential statistics were performed.

Results:
Four hundred and one elderly patients were seen, giving a prevalence of27.7 %. The mean age of the patientswas 70.4 ± 5.7 years with an age range of 65–97 years. The female elderly were more (52.9%) than their male counterparts. More than half (56.9%) of the elderly patients had never visited the dental clinic. Toothache was the most common (18.5%) presenting complaints. More than half (53.6%) of the respondentswerehypertensive. Less than a third (30.2%) rated their dental health as good. The cost of transportation and long distance were the barriers to attendance to the dental clinic reported by majority (71.3%) of the patients.

Conclusion:
There was a poor pattern of dental clinic attendance among the elderly in Benin City, mainly due to cost of transportation and long distance.

INTRODUCTION

Regular attendance at the dental clinic helps to improve and maintain good oral health, quality of life and general well-being. [1-4]However, good oral health depends on the availability of dental services and care.[5] Poor oral health is often linked with limited to dental care with negative outcomes on an individual's general health such as diabetes, hypertension, ulcers and malnutrition.[6,7]The elderly, individuals aged or older than 65 years[8], are particularly vulnerable to barriers to regular dental attendance often resulting in unmet dental needs.[9]Despite beingmore vulnerable to dental conditions

such as tooth loss, dental caries and periodontal diseases[10], older patients seldom utilise dental services. [11]However, educated elderly patients report regular dental attendance[12,13].

A study by the London National Health Service (NHS) showed that the use of dental services is prevalent amongst middle-aged adults and decreases with the aged, with the rate of registration dropping from 56% in those aged 45-54 years or lower to 29% in older persons 75 years and above.[13]Similarly, in spite of the necessity of oral care for the elderly, the utilisation of dental service is limited and the rate of dental attendance is less determined in sub-Saharan populations like Nigeria's. Some barriers such as cost of dental services, rigorous nature of getting dental appointments, phobia for dentists, scarcity of dental services, and accessibility to dental services affect the utilisation of dental services by the elderly[15-17].

Attaining and maintaining optimal oral health in older persons is a common knowledge among health care providers[18]. Life expectancy around the world, in both developing and developed countries, is increasing[19,20], so the elderly constitute an increasingly significant proportion of the population with oral health problems. Hence, there is a need for specialized care in relation to their oral health morbidities after ascertaining their health problems and their rate of dental clinic attendance, hence this study. More so, the global increase in the elderly population[13,21]and the paucity of studies[22,23] relating to the dental clinic attendance, further justify this study.

MATERIALS AND METHODS

Ethical consideration:

Ethical approval for this study was granted by the Research and Ethics Committee of the University of Benin Teaching Hospital with protocol number: ADM/E/A/VOL.VII148311670. This study was conducted between December 2022 and June 2023 at the dental outpatient department of University of Benin Teaching Hospital, Benin city, and Central Hospital, Benin city. Both hospitals are tertiary health facilities with a high population of dental patients.

Study design:

This was a multi-centre, cross-sectional study conducted over a six -month period, involving 401 respondents ecruited following sample size estimation using the statistical formula of Cochrane[24.]Included in the study were all consenting elderly dental patients older than 64 years who attended the study centres for treatment and were capable of answering the questions either in writing or by interview. All consecutive patients that met the inclusion criteria were recruited. . Those who did not give consent to participate in the study were excluded.

Study instrument:

The tool used in this study was aself- and interviewer-administered pre-tested and pre-validated structured, close-ended questionnaire. The questionnaire was written in English and consisted of three sections. The first section elicited demographics, the second, dental clinic attendance, while the third identified barriers to dental attendance. The questionnaire was pilot-tested among ten respondents who were not included in the study. The questionnaire had a good reliability score (Cronbach's Alpha = 0.8)

Data analysis:

Data were analysed using the statistical package for the social sciences (SPSS), version 26 (IBM, Armonk, NY, United States of America).The information collected included sex, age, level of education, marital status, occupational level, religion, and ethnicity. Other collected data were co-morbidities, previous visit to dental clinic, time of last visit, reason for last visit, intention to visit the clinic again, presenting complaints and barriers to dental attendance. Both descriptive and inferential statistics were performed. In the descriptive statistics, categorical variables were presented in frequency and percentages. Numerical variables wereexpressed as mean and standard deviation. Significance was set at 95% confidence level.

RESULTS

Four hundred and one elderly patients were

seen giving a prevalence of 27%. All elderly patients willingly filled or were assisted to fill the questionnaires and returnedthem, giving a response rate of 100%. The meanage of the patients was 70.4 ± 5.7 years with an age range of 65–97years. Table 1 shows the demographic characteristics of the participants. The female elderly were more (52.9%) than their male counterparts. Thehighest (57.9%) proportions of them were in the age group of 65–69 years. Just a little over half (50.4%) had just primary school leaving certificates and almost (86.8%) all of them were married. The occupation level of slightly more than half (57.4%) of the elderly sampled was ISCO level 11. Almost (95.5%) all respondents were Christians, as just (50.1%) more than half were Binis.

Table 1: Demographic characteristics of the study respondents (n = 401)

Variable	Frequency (%)
Sex	
Male	189(47.1%)
Female	212(52.9%)
Age category	
65-69	232(57.9%)
70-74	67(16.7%)
75-79	61(15.2%)
≥ 80	41(10.2%)
Highest level of educational qualification	
No formal	93(23.2%)
Primary	202(50.4%)
Secondary	52(13%)
Tertiary	54(13.5%)
Marital status	
Married	348(86.8%)
Widow/Widowed	53(13.2%)
Highest occupational level	
ISCO Level I	139(34.7%)
ISCO Level II	230(57.4%)
ISCO Level III	32(8%)
Religion	
Christianity	383(95.5%)
Islam	13(3.2%)
Others	5(1.2%)
Ethnic group	
Binis	201(50.1%)
Esan	124(30.9%)
Etsako	0(0%)
Others	76(18.9%)

Table 2 shows the morbidities among the elderly patients. More than half (53.6%) had hypertension which was followed (42.4%) by diabetes mellitus,while the least morbidity was hepatic diseases.

Table 2: Co-morbidities in the elderly patients (n = 401)

Co-morbidities*	Frequency (n%)
Hypertension	215(53.6%)
Diabetes mellitus	170(42.4%)
Musculoskeletal disorders	86(21.4%)
Hepatic disorders	18(4.5%)
Urological disorders	39(9.7%)
Respiratory disorders	34(8.5%)
Cardiac disorder	157(39.2%)

*The co-morbidities had multiple entries

Figure 2 showed the self-rating of dental health by the elders. Less than half (30.2%) rate their dental health as good.

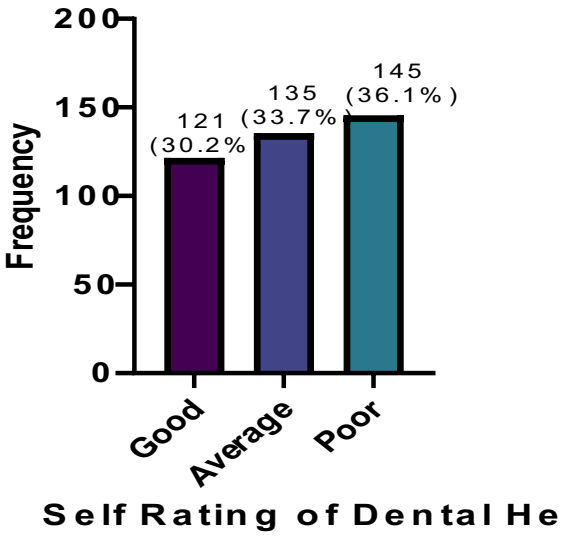

Figure 2: Self-rating of Dental health

Table 3 shows the attendance of elderly patients in the dental clinics. More than half (56.9%) had never visited the dental clinic. The mean time since last visits for those that had ever-visited was12.67±4.76 years and the highest number of participants visited for tooth extraction. Interestingly, close to two-thirds (60.8%) agreed to visit again. The highest (18.5%) presenting complaint was

toothache.

Table 3: Dental clinical attendance parameters among respondents (n = 401)

Parameters	Frequency (n %)
Previous visit to dental clinic	
Within 1 year	51(12.7%)
1-3 years	110(27.4%)
4-6	12(3%)
Never	228(56.9%)
Mean time to last visit	12.67±4.76 years
Reason for last visit:	
Cleaning	21(12.1%)
Filling	24(13.9%)
Denature installation	24(13.9%)
Inflammation	15(8.7%)
Extractions	67(38.7%)
Mobile teeth	22(12.7%)
Intention to visit the clinic aga	
Yes	244(60.8%)
No	3(0.7%)
I don't know	164(40.9%)
Presenting complaints	
Halitosis	33(8.2%)
Facial pain	63(15.7%)
Dry mouth	51(12.7%)
Filling	30(7.5%)
Tooth ache	74(18.5%)
Extractions	49(12.2%)
TMJ pain	27(6.7%)
Gingival bleeding	42(10.5%)
Inflammation	32(8%)

Table 4 shows the perceived barrier to dental clinical attendance among the respondents. Majority (71.3%) of the respondents affirmed that cost of transportation and long distance were major barriers hindering them from attending dental clinic, while the least (5.5%) barrier was bad previous experience.

Table 4: Barriers to dental clinic attendance among the respondents (n = 401)

Barriers to dentalclinic utilisation	(n %)
Cost of transportation/ long distance	286(71.3%)
Cost of dental services	197 (49.1%)
Awareness of dental services	67(16.7%)
Previous bad experience	22(5.5%)
Pain of procedure	121(30.2%)

DISCUSSION

A total of 401 geriatric patients were recruited from the outpatient dental clinics in two major tertiary health institutions in Benin City. The socio-demographic characteristics of the participants are indicative as recognized in the literature. Demographic, social, economic and political factors influence the demand and availability of dental care services.[27] As such, there were more females, with a ratio of 1.2:1.This is similar to a similar study by Molete et al[26] in South Africa where almost two thirds (65.2%) were females. This finding is in contrast to the study by Saleh et al[14], where males constituted 54.1% of the study subjects. The slight preponderance of females may indicate a slightly higher dental health seeking behaviour among the females than males. The population in this study was older than the cohort of dental elderly patients in the study conducted in South-East Asia where the mean age was 67.91±6.56 years.[12] The low dental attendance rate may be attributed to the older age distribution of our study subjects as studies have shown that the utilization of dental services is prevalent in middle-aged adults while it decreases with increasing age. However, the mean age in this study was lower than the mean age of the population in the study among the elderly in Johannesburg[27].

Majority of respondents in the study had at most, primary school education. This finding

is similar to that observed in Asia where most of the participants had a reduced level of education as 46.3 % of the study subjects were illiterate, and 24.6% onlyhad basic education[9]. The South African study[27], however,reported a higher level of educational attainment among the elderly as majority (56.8%) had secondary school education as highest level of educational status. Thisindicates that education has a powerful effect on the health status of the individuals through awareness of health benefitswhich in turn enables them to take positive decisions regarding their health problems.It is interesting to note that a great majority of the study respondents were not living alone. This is in contrast to the study conducted in London by Borreani et al[28] wheremost of the elderly participants lived alone without social support from friends and family. The evidence of family support system observed inthis study could be due to the traditional nature of society in Africa. Most of the study respondents were ChristianBinis, which reflects the socio-demographic and socio-cultural background of the study area.

Regular dental visits encourages prevention and easly diagnosis of oral/dental diseases. Results in this current study indicates that only 51(12.7%)of the elderly patients had previous visits to the dental clinic within the preceding year. Thus, it is clear that most of the study participantsrarely visited the dentist while just a handful of them maintained dental visitsvery often. This result is in agreement with aUSstudy conducted by Manski et al[28] which reportedan inverse relationship between increasing age and the uptake of dental services and consultations.Another study in Ibadan, South West, Nigeria, was also in line with the present study findings.[29] In contrast, another study[10] done in the US demonstrated that two-fifths of older persons responded that they present for dental care regularly and over half of them reported visiting the dentist when there is a dental issue. Differences in circumstances of the patients and dental insurance in the affluent world may partly explain the differences. Our study also revealed toothache asthe major reasondental clinic attendance. This is highlighted by the fact that elderly persons have higher pain threshold which may be the explanation for not using dental services except when the pain becomes severe and unbearable. Findings from this study are in agreement with another study carried out in Mansoura, Egypt. Salehet al[14]who reported that most of the study participants cited tooth extraction for the relief of toothache as the reason for their last dental visit. Zhu et al[30] in another study revealed that prosthetics and dental extraction were the most common reasons for dental visits, as opposed to Nagarjuna et al[31] who reported pain or dental emergency as the most common objective for uptake of dental services.

The cost of transportation was the most frequent barrier of dental clinic attendance recorded in thisstudy, which corroborates the findings of reported in Saleh et al.[14]Saleh and coworkers showed that most of the elderly respondents reported difficulty of transportation and traversing long distances to access dental services as part of thebarriers to seeking dental checkup, a finding corroborated by several studies.[31,32,33]This trend, as observed in this study, may be attributable to the recent economic downturn in the country which was further compounded by the cash swap and fuel shortages. This study also revealed that about 197 (49.1%) of the respondents stated the high cost of dental care ad an important challenge thataffected their uptake of dental care. This may also have being compounded by the low socioeconomicstatus and earning opportunities of the respondents.[34,35,36] Moreover, thisstudy demonstrated that the relatively significant number of the respondents [121(30.2%)] indicated that phobia of dental pain is among the barriersresponsible for their under-utilizationof dental services thus corroborating several previous studies[12,30,37]but is at variance with Nitschke et al[38] but the reasons for the difference are not clear! Finally, we found a significant difference in the mean time of last visit between the geriatric and younger patients, indicating that geriatric patients seen in this study took a long time to visit the dental

clinics, coupled with low d3ntal service utilization.

In conclusion, there was poor attendance to dental clinic by elderly in Benin City due, mainly, to the cost of transportation and the long distance. Age was related to poor attendance and time of visitation for attendance.

Limitations:
This study is limited by its short duration of six months. In addition, current events like the currency shortages and restriction of movement due to election issues as well as fuel scarcity may have hindered the patients from attending the dental clinics, which, in turn, may have affected the study outcomes**.**

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Contributory Factors to Prolonged Hospital Stay After Discharge Among Surgical Patients in a Tertiary Hospital in North Central Nigeria

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***Key words**: Surgical patients, Patient discharge, Health care cost.*

ABSTRACT

Background:
Hospitalization of patients for treatment is an inherent aspect of surgical practice, after which patients are discharged when found fit to go home. There is, however, a group of patients who remain on the bed, even after being deemed fit for discharge. This study aimed to determine the number of days involved in prolonged hospital stay of surgical patients, and to identify the factors associated with such prolonged stay.

Methods: Surgical patients still on the bed more than 48 hours after being discharged, who consented to participate in the study, were recruited. Forty-eight hours was chosen as the benchmark, beyond which patients were considered to have had a prolonged stay after been deemed fit for discharge.

Results:
Three hundred and forty-one patients were recruited. The mean duration of stay after discharge was 17.6± 13 days. The speciality with the highest number of patients was Neurosurgery. Lack of finance and absence of a caregiver were the main causes of prolonged stay(96.5% and 3.5% respectively). The top three suggestions to reduce prolonged hospital stay (as proffered by patients) were bill waiver for indigent patients, reduced cost of health care services, and financial aid by philanthropists.

Conclusion:
Financial reasons and the absence of a caregiver were the major reasons for prolonged hospital stay in this study. Since finance was part of the major factor for hospital stay, a multi-sectorial approach to improve enrolment in the National Health Insurance Scheme is recommended. The provision of social support for patients in need of care post-discharge is also advocated.

INTRODUCTION

Hospitalization for surgical treatment is a normal part of surgical practice. Patients stay in the hospital for varying lengths of time, depending on the complexity of the case, surgical complications as well as

circumstances before, during, and after surgery.[1] Aside these factors, patients often stay longer than necessary in the hospital after being found fit for discharge. Prolonged hospital stay increases both the cost of treatment and susceptibility to nosocomial infections in tertiary care centres.[1,2] In Nigeria, most payments for healthcare services are made out-of-pocket which places a significant strain on the finances of patients and their families. The strain could be so severe as to drive some patients and their families into poverty. Prolonged hospital stay also results in economic loss to the hospital arising from sub-optimal use of bed spaces. Length of hospital stay (LOHS) is therefore an important marker of resource consumption in our tertiary hospitals[1,2] Ascertaining the determinants of increased LOHS and identifying potentially modifiable risk factors could directly influence intervention strategies aimed at cost reduction and improved healthcare delivery.[1] Many previous studies in this regard[2-5] addressed LOHS in association with patient conditions and complications of treatment. To our knowledge, this study is the first Nigerian study to examine increased LOHS of patients even after being deemed fit for discharge.

Materials and Methods

Ethical approval for this study was obtained from the institutional review board of the Jos University Teaching Hospital (JUTH/DCS/ADM/127/XXIX/1714). Written informed consent was obtained from all adult patients and parents/guardians of paediatric patients while assent was obtained from children aged 7 years and above. The study was conducted in a tertiary hospital located in North Central Nigeria, which has a large patronage of the surgical specialities, with 320 beds in the surgical wards. The patients were recruited from the surgical wards viz, male surgical, female surgical, paediatric surgical, orthopaedic, neurosurgical ward, urology, cardio-thoracic, oral/maxillofacial surgical, and the ophthalmological wards. We adopted a descriptive, cross-sectional design in conducting this study which lasted from August 2019 to May 2022.

The study population consisted of consenting surgical patients who stayed in hospital for more than 48 hours after being deemed fit for discharge. Prolonged hospital stay after discharge was defined as a situation where a patient still occupied the hospital bed for more than 48 hours, after been deemed fit for discharge. Our selection of 48 hours was an arbitrary cut-off in the absence of a predefined clinically acceptable value in the English literature.[1] The sample size of 341 patients was determined using the modification for Cochran formula for sample size calculation in smaller populations.[6] The inclusion criteria were being a consenting surgical patient still on bed after 48 hours of been discharged, irrespective of the type of surgery. Surgical patients being managed by several disciplines that discharge their patient on different days were excluded. If the patient was discharged by the specialities on the same day, they were still included in the study.

Nurses in the respective wards were notified of the study and they contacted the research team once a patient discharged from the ward met the inclusion criterion of still being on bed 48 hours after discharge. A member of the research team also visited the surgical wards once a day to check the admissions and discharge summary records to ensure that no patient was missed. The patients who met the inclusion criteria and consented to participate in the study were then recruited until the desired sample size was met.

Data were collected using an interviewer-administered questionnaire which included socio-demographic characteristics, surgical speciality, length of stay after discharge, reasons for prolonged stay, and patients' suggestions on ways to prevent prolonged stay after discharge. After the patients were interviewed, the outstanding amount owed (direct medical cost) by each patient such as cost of surgery, investigations and treatments were also obtained from the accounts department of the hospital. The data obtained were entered into SPSS version 22 and analyzed.Univariate analysis of the socio-demographic characteristics,

surgical speciality, and days on admission after discharge of the study participants were carried out and basic summary statistics produced for each variable. Quantitative variables were described using mean and standard deviation, while qualitative variables were presented as frequencies and tables.

RESULTS

The study population consisted of 341 patients --262 males and 79 females giving a M: F sex ratio of 3.3:1, with 26.1% being in the 31–40 years age range. Other information on age, sex and duration of hospital stay post-discharge are presented. (Table 1).

Table 1: Socio-demographic characteristics and duration of hospital stay after discharge

Variable	frequency (%)	mean ± SD
Sex		
Males	262 (76.8)	
Females	79 (23.2)	
Age group(years)		**32±14.7**
1-10	26 (7.6)	
11-20	67 (19.6)	
21- 30	80 (23.5)	
31-40	89 (26.1)	
41-50	37 (10.9)	
51-60	32 (9.4)	
61-70	6 (1.8)	
>70	4 (1.2)	
Educational level		
Primary	89 (26.1)	
Secondary	197 (57.8)	
Tertiary	14 (4.1)	
Uneducated	41 (12.0)	
Duration of hospital stay post discharge		**17.6 ± 13(days)**
3-7	82 (24.0)	
8-14	93 (27.3)	
15-21	65 (19.1)	
22-28	67 (19.1)	
29-35	16 (4.7)	
36-42 days	0 (0)	
Greater than 6 weeks	18 (5.3)	

Lack of finance was the commonest cause of prolonged hospital stay, accounting for 96.5% of the patients. (Table 2).

Table 2- Reason for prolonged hospital stay

Variable	frequency (%)
No care giver	12 (3.5)
Lack of finance	329 (96.5)
Total	341 (100)

The amount of money owed ranged from #31,000 to over #500,000, with 19.1 % of the patients owing between #200,000 and 250,000. (See table 3)

Table 3: Amount of money involved

Amount in Naira	frequency (%)
31,00-40,000	8 (2.3)
41,000-50,000	10 (2.9)
51,00-60,000	12 (3.5)
61,000-70,000	12 (3.5)
71,000 - 80,000	15 (4.4)
81,000- 90,000	11 (3.2)
101,000-150,000	56 (16.4)
151,000- 200,000	54 (15.8)
201,000-250,000	65 (19.1)
251,000- 300,000	36 (10.6)
301,000-350,000	26 (7.6)
401,000-450,000	10 (2.9)
>500,000	14 (4.1)
not applicable	12 (3.5)

The surgical speciality with the highest level of prolonged hospital stay was neurosurgery, followed by general surgery; urology had the least number of patients with prolonged hospital stay. Table 4).

Table 4: Prolonged-hospital-stay by specialty

Variable Specialty	frequency (%)
Neurosurgery	119 (34.9)
General surgery	72 (21.1)
Orthopaedics and Neurosurgery	26 (7.6)
Plastic surgery	26 (7.6)
Paediatric surgery	22 (6.5)
Orthopaedics	20 (5.9)
Cardiothoracic Unit	14 (4.1)
Orthopaedics + plastic	13 (3.8)
3 or more specialties	11 (3.2)
Oral and Maxillofacial surgery	8 (2.3)
Neurology + Ophthalmology	6 (1.8)
Urology	4 (1.2)
Total	341 (100)

When asked, the patients had some suggestions on how to reduce prolonged hospital stay. (Table 5).

Table 5: Patients' suggestions on how to avoid prolonged hospital stay

Suggestions	Frequency (%)
Bill waiver for indigent patients	96 (28.2)
Reduce cost of health care services	78 (22.9)
Financial aid by philanthropist	48 (14.1)
No idea	41 (12.0)
Free health care for children involved in accidents	29 (8.5)
Bill waiver for long stay patients	17 (5.0)
Bill waiver for severely injured patients	16 (4.7)
Free health care for the elderly	10 (2.9)
Give patients enough notice to source for funds before discharge	6 (1.8)
Total	341 (100)

DISCUSSION

This study examined the reasons for prolonged hospital stay after discharge among patients who were considered fit for discharge. The study population was made up of 341 patients. This study found that 27.3% of the patients stayed 1–2 weeks extra after discharge, followed by 38.2 % of the patients staying between 2–4 weeks on admission, and 5.3% staying up to 6 weeks on admission after discharge. This translates to long periods of bed occupancy by patients whose presence would prevent new admissions for the period when they occupied the bed. This leads to loss of revenue for the hospital as the patients no longer pay for occupying the beds. It gives the false impression of an increased hospital bed occupancy rate while reducing the extent to which the hospital would meet the health needs of the people in its catchment area. This view was also shared by other authors [7,8] who noted that reducing inappropriate hospital stay would reduce cost, improve hospital performance, reduce false bed occupancy rate, and increase hospital productivity. The current situation where patients occupied hospital beds without paying, for an average of 17.6 days after discharge is far from productive! The overall loss of income to the health care facility is enormous, considering the hospital daily charges NGN1,500 for bed space and nursing services excluding other miscellaneous service fees which vary based on the type of treatment, extent of injury, among other.

Prolonged hospital stay increases the risk for nosocomial infections especially among vulnerable groups-- the young and the elderly. Hassan et al[9], found that extending the length of hospital stay by one day increases the probability of acquiring an infection by 1.37 percent. With a mean duration of hospital stay after discharge of 17.6 days, the risk of infection is increased by 21.3 %. Lack of finance and absence of a caregiver (whose responsibility would be to look after the patient at home and bring to the hospital for follow up visits[10]) were the reasons for prolonged hospital stay after discharge. Of these, lack of finance was the overwhelming (96.5%) cause of prolonged hospital stay after discharge. This could be because most people still pay out of pocket for health care services in Nigeria. This finding is at variance with other studies. [11,12] Rosenfeld et al,[11] for example, found that the main reasons for prolonged hospital stay were unsuitability of the patient's home and reluctance of the family to accept the

patient, among others. Similarly, Towle et al[12] found that the reasons for prolonged hospital stay in 'medically fit' patients were waiting for a new caregiver, waiting for community hospital bed, and undecided on discharge disposition. The reasons for the variance between their studies and ours might be the fact that their studies were conducted in climes with effective and well-subscribed health insurance schemes. The fact that neurosurgery and general surgery with the most expensive investigations and treatments accounted for the longest LOHS with neurosurgery alone contributing about 35% cases, supports this position and corroborates previous studies within and outside Nigeria.[13,14]

The top three suggestions by patients on how to reduce prolonged hospital stay were bill waiver for indigent patients, reduced cost of health care services and financial aid by philanthropists. However, these suggestions may not be the way forward; the hospital needs to look into long-term sustainable ways to reduce prolonged hospital stay. The solution is more than what one hospital could manage. It would involve the collective efforts of the hospital administration, the Ministry of Health, and the Federal Government. The National health insurance scheme is a programme which, if properly implemented, could help overcome this problem. However, currently, only 3%[15] of Nigerians are covered by the health insurance scheme despite the extension of its selective coverage to universal coverage. A lot of work still needs to be done to improve awareness of health insurance amongst Nigerians. To make a meaningful impact, the solution will have to be multipronged-- involving the political, social, educational, and economic sectors, The poor insurance coverage is not peculiar to Nigeria alone but seen in most African countries. This is made worse by the fact that most African countries have a large informal sector that makes professional statuses and tax bases difficult to identify. Hence, the ability to fund the health insurance scheme is affected.[16]

Limitation of the study

This study was carried out in a single health care facility. A multicentre study with a larger population would be recommended to further support or refute the findings of this study.

Conclusion

The mean number of days patients remained in the hospital after discharge was 17.6 days. Financial reasons and absence of a caregiver were the major reasons for prolonged hospital stay after discharge with finances been the overarching factor. There is a need for a multi-sectorial approach to improve enrolment in the National Health Insurance Scheme and provide social support for patients in need of care post-discharge in order to reduce the adverse effects of prolonged hospital stay on hospitals and patients.

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Knowledge of Oral Prophylaxis and Dental Check-Up Among Primary School Teachers In Lagos State

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Key words*:* Primary school teachers, oral prophylaxis, oral health knowledge.

ABSTRACT

Background:
Theoral health knowledge of school teachers influences the success of the National Oral Health Policy at the community level, hence, this study aimed to assess and compare the oral health knowledge of school teachers in urban and rural areas of Lagos State.

Materials and methods:
A cross-sectional study was carried out, using a multistage sampling technique to select 200 primary school teachers in both urban and rural areas. A pretested, self-administered questionnaire was used. Data were analysed using SPSS version 20. Descriptive statistics, Chi-square and logistic regression were used, and *p*-value <0.05 considered significant.

Results: The survey showed that the average age of respondents in rural and urban areas was 39±10.92 and 47±7.56, respectively. In both areas, more female teachers were surveyed than males. The majority of respondents in both rural and urban areas were married. Additionally, most respondents had earned a National Certificate of Education. However, there was a significant difference between rural and urban teachers regarding oral health knowledge. Over half (55%) of urban teachers had adequate oral health knowledge, while only 37% of rural teachers did. The survey also revealed a significant association between oral health knowledge and geographical location (p=0.0102; OR=2.081), marital status (p=0.0204; OR=0.26), and teaching experience (p=0.0442; ≤10 years, OR=1.533; ≤15 years, OR=2.130 and >16 years, OR=3.179).

Conclusion:
Primary school teachers in urban area showed averagely better oral health knowledge than their counterparts in the rural area of Lagos State. Hence, there should be, intensive oral health workshops and trainings for primary school teachers, both in rural and urban areas of Lagos State, so that the National Oral Health Policy may be a success.

INTRODUCTION:

Microbial dental plaque has been established as the primary aetiological factor in the establishment and progression of dental caries and periodontal diseases.[1] Dental plaque can be removed by professional oral prophylaxis or by homecare oral prophylactic aids like chemical plaque removal (chlorhexidine) and mechanical aids (toothbrushes, chewing sticks, dental flossing, etc). These help in plaque control by inhibiting oral

biofilm and plaque formation.[2,3] Periodic professional oral prophylaxis is needed to enhance long-term inhibition of gingivitis since many patients are neither well-motivated nor skilful at maintaining a plaque-free oral environment for an extended period of time.[1] Twice daily regular tooth brushing with professional oral prophylaxis are the main public health measures available for the control and prevention of periodontal diseases and dental caries. These preventive measures can, therefore, improve the quality of life of patients.[4]

Several studies[5,7] have shown the negative impact of oral disease on school children's quality of life, emphasizing its effect on school attendance. The incidence of gingivitis in pupils peaks around 6-7 years when permanent teeth erupt. Pupils with dental diseases are twelve times more likely to be absent from school than those with good oral health. The earlier quoted survey estimated school time lost is about 50 million hours annually.[5–7]However, a more recent survey by Naaval and Kelekar[8] estimated the school time lost to be around 142 million hours annually, of which 34.4 million hours was due to sudden dental care, 79.8 million hours was due to routine/orthodontic care, while the rest 27.8 million hours was due to cosmetic care. This burden is no doubt huge. School teachers are role models and may influence oral hygiene habit change by reinforcing oral health education to their pupils, thus making them central to controlling preventable oral diseases.[5,9–12] Good oral health practices like dietary change, regular tooth brushing, dental flossing, and dental check-ups are best acquired in childhood with other developing habits.[5–7]Thus, imparting school children is a potential way to positively affect child's attitude, values and behaviour, as well as the community at large.[7]

In the light of the above, the National School Health Program[13] and National Oral Health Policy[14]saddled school teachers at the community level with the responsibility of identifying, implementing, monitoring, evaluating, and mobilizing for healthy school environment and oral health promotion in their village or ward. The school health program has among its objectives the promotion of healthy practices among learners and staff in order to prevent diseases through organization of school health days.[12] On the other hand, the oral health policy aims to achieve optimum oral health for at least 50% of Nigerians through sustainable awareness creation, strategic research, workforce development, coordination of oral health activities, institutionalization of modern dental practices and integration of oral health into national health programs.[14] Studies by Ehizele et al,[15]Nyandindi et al[16] and Sofola et al[17] have revealed that school teachers have poor oral health knowledge. It is crucial to know if there has been improvement in their oral health knowledge since the enactment of the national oral health policy and if location is a factor in accessing oral health knowledge. This study, therefore, aimed to assess and compare the knowledge of oral health among primary school teachers in both urban and rural areas of Lagos state.

MATERIALS AND METHODS

Study Design: A cross-sectional study was conducted to compare the oral health knowledge of primary school teachers in urban and rural areas of Lagos state. The sample size was calculated using the formula for comparing proportions[18]giving a total of 200 and this was derived using proportions of oral health knowledge of primary school teachers from past prevalence in the rural[3] and urban[10]areas. A multi-stage sampling technique was used to consecutively recruit a sample size of 100 urban primary school teachers in Oshodi local council development area. Another sample size of 100 rural primary school teachers was also recruited in Agbowa local council development area. Administrative permission was obtained from both Lagos State Universal Basic Education Board and the head teachers. Consent of each participating teacher was were obtained. Ethical approval was sought and obtained from Lagos State University Teaching Hospital health research and ethical committee.

Study Instrument and Procedure:

A pretested self-administered questionnaire was used to collect relevant data from the teachers. The questionnaire was divided into five sections: Section 1 elicited for demographic data; Section 2 assessed knowledge of oral prophylaxis and hygiene; Section 3 assessed knowledge about dental check-up andcommon childhood dental problems; Section 4 evaluated the willingness of teachers to impart knowledge of oral health to their pupils; and Section 5 assessedthe knowledge of existing dental clinicsin the local government where their school is located as well as the local government where they resided. Sections two, three, and five contained 34 itemsthat were used to assess and score oral health knowledge.

Data Management:

Data was [1]cleaned and entered into SPSS version 20 software. Frequency tables were generated for categorical variables. Means and standard deviations were computed for continuous variables. Chi square was used to compare categorical variables. The odd ratio was determined.

A score of one (1) point was awarded for each correct answer and zero (0) for an incorrect answer giving a total obtainable score of 34 points; this was adapted from Jegede et al.[19] The points were then converted to percentages and the median (68%) of the total score of the group was collated. Each respondent's aggregate score was inadequate knowledge if it was less than 68% of the median score of the group, or adequate knowledge if it was more than 68% of the median score of the group.

The median dichotomy into inadequate and adequate knowledge was adapted from Folayan et al.[20] The bi-variate associations were tested using chi-square test for all categorical variables. The outcome variable (dependent variable) was knowledge of teachers about oral health knowledge about dental check-up. There were 34 questions that assessed the oral health knowledge of teachers. The grouping variable (independent variable) was the local council development area (LCDA) where teachers were located at the time the data was being collected. The independent variable was dichotomized as Rural if the teacher was teaching in Agbowa-Ikosi-Ejirin LCDA or Urban if the teacher was teaching in Oshodi LCDA. Bivariate comparison between the dependent and independent variables were tested using chi-square, and *p*-value <0.05 was considered statistically significant.

RESULTS

Descriptive Analysis

Most respondents were females in rural (59%) and urban (87%) areas. The study found that rural and urban areas had a high percentage of ever-married teachers (83% and 97%, respectively). Most respondents had attained a National Certificate of Education (NCE) in both areas, with 57% rural and 49% urban areas. However, more teachers in urban areas had a first degree (42%) and a second degree (8%) compared to those in rural areas. Urban teachers were also older, with a mean age of 47±7.56 years compared to 39±10.92 years in rural areas.

Regarding oral health knowledge, most teachers in urban areas (55%) had adequate knowledge, while the majority in rural areas (63%) had inadequate knowledge. Urban teachers also had more experience, with a mean of 20±8.38 years compared to 13±0.42 years in rural areas. Most respondents in both areas had started teaching between the ages of 21–30. Most respondents were willing to impart oral health knowledge, with 98% in urban areas and 96% in rural areas. An average number of respondents (54% in rural areas and 52% in urban areas) were aware of the availability of dental clinics in their local government areas. However, most respondents in rural (61%) and urban (67%) areas were not aware of the presence of dental clinics in the local councils where their schools were situated. Table 1 is a summary of the demographic characteristics of the study population (Table 1).

Table 1: Descriptive Characteristics of Participants (n=200)

CHARACTERISTICS	FREQUENCY	
	Rural (n = 100)	Urban (n =100)
Knowledge OP,DC & CDP		
Inadequate knowledge (<68%)	63 (63%)	45 (45%)
Adequate knowledge (>68%)	37 (37%)	55 (55%)
Age group		
34 and below	39 (39%)	4 (4%)
35 – 44	24 (24%)	34 (34%)
45and above	37 (37%)	62 (62%)
Mean (Age ± SD	39 ± 10.92	47 ± 7.56
Sex		
Male	41 (41%)	13 (13%)
Female	59 (59%)	87 (87%)
Tribe		
Yoruba	89 (89%)	85 (85%)
Igbo	4 (4%)	9 (9%)
Others	7 (7%)	6 (6%)
Marital status		
Ever Married	83 (83%)	97 (97%)
Single	17 (17%)	3 (3%)
Educational attainment		
SSCE	12 (12%)	1 (1%)
NCE	57 (57%)	49 (49%)
BSc	28 (28%)	42 (42%)
MSc	3 (3%)	8 (8%)
Years of teaching experience		
0 – 5 years	31 (31%)	1 (1%)
6 – 10 years	19 (19%)	13 (13%)
11 – 15 years	19 (19%)	25 (25%)
> 16 years	31 (31%)	61 (61%)
Mean (Years teaching experience)	13 ± 0.42	20 ± 8.38
Age at teaching debut		

OP: Oral Prophylaxis; **DC:** Dental checkup; **CDP:** Childhood Dental Problems; **LCDA**: Local Council Development Area; **SSCE**: Senior Secondary Certificate; **NCE**: National Certificate of Education; **BSc**: Bachelor of Science; **MSc**: Master of Science.

BIVARIATE ANALYSIS

Table 2 shows the bivariate relationship between oral health knowledge {knowledge of oral prophylaxis, knowledge about oral hygiene practice, childhood dental problems, and dental check-up); it revealed a significant association with our primary exposure (independent variable} of teaching location of teachers (rural or urban), age, marital status, and years of teaching experience (p<0.05). The significant predictors include the location of teachers {p=0.0102, CI=95%, OR=2.081(1.182-3.664)}.The teachers in urban areas were twice as likely to have adequate oral health knowledge as those in the rural areas. Marital status of the teachers was another significant predictor {p=0.0204, CI =95%, OR=0.26(0.084-0.0812)}. Single teachers are less likely to be knowledgeable than the ever married. Lastly, teaching experience was another significant predictor {p=0.0442, CI=95%; OR=1.533(0.536-4.389); OR=2.130(0.805-5.633); OR=3.179(1.327-7.614)}. Age was a borderline predictor {p=0.05, CI=95%; OR=2.009(0.876-4.610); OR=2.552(1.192-5.463)}. (Table 2)

Table 2: Bivariate Analysis of Variables between Adequate and Inadequate Knowledge of Participants

VARIABLE	Inadequate knowledge n (%)	Adequate n (%)	Knowledge P-value	Adequate knowledge (95% CI)
LCDA*				
Agbowa LCDA	63 (58.33%)	45 (41.67%)	0.0102	1
Oshodi LCDA	37 (40.22%)	55 (59.78%)		2.081(1.182-3.664)
Age Group				
34 and below	30 (27.78%)	13 (14.13%)	0.05	1
35 – 44	31 (28.70%)	27 (29.35%)		2.009 (0.876 – 4.610)
> 45	47 (43.52%)	52 (56.52%)		2.552 (1.192 – 5.463)
Sex				
Male	32 (29.63%)	22 (23.91%)	0.3648	1
Female	76(70.37%)	70(76.09%)		0.746 (0.397-1.405)
Marital Status*				
Ever Married	92(85.19%)	88(95.65%)	0.0204	1
Single	16(14.81%)	4(4.35%)		0.26(0.084-0.812)
Educational Attainment				
SSCE	9 (8.33%)	4(4.35%)	0.3416	1
NCE	61(56.48%)	45(48.91%)		1.659(0.481-5.729)
BSc	33(30.56%)	37(40.22%)		2.522(0.710-8.961)
MSc	5(4.63%)	6(6.52%)		2.699(0.507-14.366)
Years of Teaching Experience*				
0 -5 years	23(21.30%)	9(9.78%)	0.0442	1
6 -10 years	20(18.52%)	12(13.04%)		1.533(0.536-4.389)
11 -15 years	24(22.22%)	20(21.74%)		2.130(0.805-5.633)
≥ 16 years	41(37.96%)	51(55.43%)		3.179(1.327-7.614)
Age at Teaching Debut				
≤ 20 years	12(11.11%)	9(9.78%)	0.9388	1
21 - 30 years	80(74.04%)	70(76.09%)		1.67(0.464-2.933)
31 years and above	16(14.81%)	13(14.13%)		1.083(0.349-3.362)
Willingness to Impart OHP to Pupils				
Yes	4(3.70%)	2(2.17%)	0.5321	1.731(0.310-9.671)
No	104(96.30%)	90(97.83%)		1

LCDA: Local Council Development Area; * p< 0.05; 1 = Reference level; **OR**: Odd Ratio; **SSCE**: senior secondary school; **NCE**: National Certificate of Education; **BSc**: Bachelor of Science; **MSc**: Master of Science

DISCUSSION:

Primary school teachers are pivotal in the success of the National Oral Health Policy and School Health Program of the Federal Republic of Nigeria.[13,14] This was corroborated by Edomwonyi et al[21] in a quasi-experimental survey done in urban area of Lagos which revealed that teachers were as effective as dentists in delivering oral health knowledge to their pupils. They are role models and, as such, exert great influence on their pupils as reported by a study[9] in Uganda. Besides, children in this age group, being in their formative years, begin to cultivate long-lasting habits and behaviour which may positively impart their adult life leading to a healthy oral lifestyle.[5,6,9]Primary school teachers in this study generally showed poor oral health knowledge. Although, larger proportions of teachers in the urban area (55%) were averagely more knowledgeable than those in the rural area (37%). This finding is consistent with studies done by Lawal et al[12], Adebayo et al[5], Ehizele et al[15], and Sofola et al[17] who found that primary school teachers in their studies had poor oral health knowledge. This is particularly disturbing in that this research was conducted 15+ years after Sofola et al[17] carried out their survey in Lagos State. This, in our view, should have served as a policy basis to improve oral health knowledge of the primary school teachers, which in turn would have positively impacted their pupils.

Also, with the introduction of both School Health Program and National Oral Health Policy[5,11,13,14] there has been no real improvement in the oral health knowledge or impactful intervention to stem oral health ignorance among primary school teachers in Lagos State as at the time this study was conducted. Plausible reasons may be due to acute shortage of dental therapists in the employment of the state government who support dentists as oral health educators. Adeniyi et al[22] reported that in 2012, the ratio of dental therapists to patients nationally was 1:127,273, that is one dental therapist serving over one hundred and twenty thousand patients. Furthermore, in year 2023, the Dental Therapist Registration Board has a total of 5250[23] registered therapists to serve a population of about 225 million[24] Nigerians, translating to a ratio 1:416,000, meaning one dental therapist serves about four hundred and sixteen thousand patients, and unpublished records from Lagos State Health Service Commission have 43 dental therapists who are in the public service of the state. This workload may in no small measure overwhelm and discourage this cadre of dental staff from carrying out this duty of oral enlightenment. Most of this cadre of dental staff may also prefer to work in dental clinics in the urban centres, leading to inequitable distribution dental staff manpower.[25]

Besides, the annual World Oral Health Day (WOHD) celebration may be more often restricted to the urban centres because of limited sponsorship, so rural primary school teachers may not be privileged to this oral health knowledge awareness. Governmental funding in Nigeria for health is about 5% of the national budget, of which a meagre 0.41% is for oral health care delivery,[22] this may further stifle the funds needed to assist the dental therapists in emphasising oral health education and on these primary school teachers. Teachers in the urban area in this study had average better oral health knowledge than their rural counterparts. This might be due to in addition to the above likely reasons, the enlightening effects of the various social media advertorials, and visits by toothpaste manufacturing companies and Community Dentistry Registrars to these urban primary schools, thus reinforcing oral health knowledge. It is noteworthy that more teachers in the urban area had higher educational qualifications than those in the rural area, which may impact the willingness of urban primary school teachers to acquire new knowledge. These reasons may account for why urban teachers are twice more likely to be more knowledgeable than those in rural area.

Marital status was positively significantly related to oral health knowledge and this is consistent with observation by Lawal et al.[12] Adducible reason could be that married teachers, who are parents, have been

involved in children training of which oral hygiene is daily enforced on their wards. Teaching experience was also positively and significantly related to oral health knowledge; this corroborated the studies by Lawal et al [12] and Shodan et al.[6] It might be that over the years, due the routine inspection of their pupils' hygiene habits like fingernails, hair, and dentition, these teachers have seen increased absenteeism from schools occasioned by the incidence of periodontal diseases among pupils especially bleeding gums, probably have realised the need for thorough oral hygiene, and could have been emphasising same on their pupils. According to Nigerian National Oral Health Policy 2012[14]school teachers are part of the community-level oral health education committee. This present study established that these teachers, who are very willing to be oral health educators, could serve as alternative oral health personnel in reinforcing oral health knowledge and thus reduce the burden of oral diseases. This agrees with Akera et al[9] that primary school teachers contributed in no small measure to reinforcing oral health knowledge and practice. The average knowledge of primary school teachers in the urban area and the poor knowledge of those in the rural area may explain one of the likely reasons for the failure to attain the goal of the National Oral Health Policy, which is achieving optimum oral health in at least 50% of Nigerians by 2015.

Lastly, age is another predictor of oral health knowledge and this is so because oral health knowledge and practices acquired through life experiencestend to improve with age. This agrees with Folayan et al[20]that adherence to self-care oral health practice tends to improve with age.

The limitation of this study is that it did not inquire from the teachers if they had been given any previous oral health education and training ever since the National Oral Health Policy was signed into law.

CONCLUSION AND RECOMMENDATION:

Public primary school teachers in urban areas have adequate oral health knowledge than their counterparts in rural areas. There is, therefore, a need to organise training and workshop for these teachers on oral health education so that the goal of the National Oral Policy may be actualized.

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Mentoring Perceptions and Experiences among Nigerian Undergraduate Dental Students

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Key words: mentoring, perceptions, experiences, dental students, Nigerian undergraduates

ABSTRACT

Introduction:
Mentoring among undergraduate dental students in Nigeria has never been evaluated, despite being well reported, to improve academic performance and the learning process globally. This study assessed the perceptions and experiences of Nigerian undergraduate dental students about mentoring.

Materials and Methods:
A sample of 382 students was recruited across all thirteen Nigerian dental faculties. A self-administered online questionnaire prepared on Google forms was sent to the students for completion. The completed forms were analysed using SPSS version 20. Descriptive and analytical statistics were applied and set the statistical significance level at P<0.05.

Results:
The students showed a very good knowledge of mentoring (99.0%) and an adequate understanding of the role of a mentor (67.3%).Many students had experienced mentoring prior to their dental training, mainly from religious institutions(60.0%).The majority (96.1%) of the students would have preferred to be mentored at the start of their training, however, only 21.2% had assigned mentors. More than half (57.6%) of the students would have preferred to choose their mentor, and the majority (43.2%) were indifferent about the gender preference of a mentor. About two-thirds of the students perceived career development as the most important reason for mentoring. The benefits of mentoring were ranked very highly, especially among the female students. Gender was the only predictor for successful mentoring (P< 0.05).

Conclusions:
Dental students reported low faculty mentoring. Career development was perceived as the most important factor in mentoring. Students recommended that mentoring should be incorporated into the dental curriculum right from the commencement of their training.

INTRODUCTION

In recent years, increased emphasis has been placed on mentoring as an important process of improving academic performance and the learning process.[1-2]Historically, the term 'mentor' originated from Greek mythology in which Odysseus entrusted the care of his child to a friend called Mentor.[3]Also, traditionally, mentoring can simply be described as a trusted relationship between an older, more knowledgeable, and experienced person (mentor) and a younger, less experienced protégé [mentee] to help and develop the protégé.[4-7]With regards to the dental profession, mentoring could be referred to as a formal or informal relationship or pairing

of an experienced dentist (the mentor) with a less experienced dentist or dentist-in-training (the mentee), to help the latter attain their professional goals and to progress throughout their career by sharing knowledge, information, and perspective.[8]

Extant literature has shown that mentoring plays an important and vital role in helping students to achieve excellence academically, as it provides guidance and enhances the mentee's learning.[9-12] In a meta-analysis of 116 pieces of literature from 1985-2006, Eby et al.[13] found that academic mentoring was highly related to good performance, improved attitude towards school work, and reduced withdrawal tendencies. Similarly, in a study comparing two groups of mentored and non-mentored students from two Scottish universities, Fox et al,[10] reported that mentored students had a better and more impressive academic performance, especially among first-year students. Volt and Ladwa[14] also affirmed the need for mentoring as a tool to ensure excellent performance among dentists-in-training. This was supported by Brooks[15] who, however, proposed that for more effective results, mentors should have the necessary skills and training required for successful mentoring, as the required skill is different from professional or clinical skills. Anderson and Shannon[16] also opined that mentoring becomes more effective when the specific roles and modes of operation of mentors and mentees are well stated.

Mentoring is not restricted to academics only, but is applicable in other fields, especially in the workplace, politics, sport, music, business, religious life, and other walks of life, and should be differentiated from supervision.[3,13,17] While supervision occurs in a formal setting and involves assessment of work by a senior faculty member, mentoring could occur in a formal or informal setting that may likely influence the mentee or protégé personally and/or professionally.[2,18] Though different, both are not mutually exclusive because a mentor could serve as a supervisor and vice versa.[19] Mentoring experiences and perceptions of undergraduate dental students have sparingly been documented despite seven decades of dental training in Nigeria. This study, therefore, aimed to assess dental students' perceptions and experiences of mentoring in Nigerian dental faculties.

MATERIALS AND METHODS

Ethical approval for the study was obtained from the Health Research Ethics Committee (HREC) of the Institute of Public Health, Obafemi Awolowo University Ile-Ife, Nigeria (HREC No. IPHOAU/12/1589). The study was a cross-sectional survey conducted across all 13 dental schools in Nigeria. These dental schools were grouped into four generations, and the generational age was pegged at 15 years from the date of establishment of the dental school. Dental students were recruited from 100 level (year 1) to 600 level (year 6) through the tutorial class list generated by either the students' class representatives or the faculty's executive council members for each university. Informed consent and assent were obtained from the students after duly explaining the research objectives, risks, and benefits. The voluntary nature of participation was also highlighted to all the students. Confidentiality was ensured and the students did not receive any cash compensation. The sample size was determined using Yamane's formula[20] for sample size determination. A minimum sample size of 376 was determined, and a total number of 382 students were eventually recruited for the study.

A pretested questionnaire was designed and sent to the students in all the dental faculties via email using Google Forms or WhatsApp platforms as tools for data collection (*appendix I*). The questionnaire was divided into four sections; the first was on socio-demographic information of the students, the second section assessed the students' general knowledge of mentoring,

the third section assessed students' preferences for mentoring, and the fourth section was a Likert's scale (1-strongly disagree, 2-disagree, 3-indifferent, 4-agree and 5-strongly agree) that assessed students perceived roles of mentor/mentee, benefits of mentoring, sources of enhancing and hindrance factors to mentoring. Data were analysed using descriptive and analytical statistics with SPSS software (Version 20; IBM). The statistical significance was set at $P< 0.05$.

RESULTS

Table 1 shows the socio-demographics of the respondents. There were more male students, accounting for 56.5% of the total responses. Most of the students (88.5%) were less than or equal to 25 years of age, with an overall mean age of 21.9±3.2. Pre-clinical and clinical dental students were 54.7% and 45.3% respectively. Most of the students belonged to the first and fourth generations of Nigerian dental faculties at 38.5% and 29.6% respectively. (Table 1)

Table 1: Distribution of dental students according to socio-demographic characteristics

Variable		
Gender	Frequency	Percentage
Male	216	56.5
Female	166	43.5
Age group		
≤25	338	88.5
>25	44	11.5
Educational level		
Pre-clinical (100-300) level	209	54.7
Clinical(400-600) level	173	45.3
Generation of dental faculty		
1st Gen.	147	38.5
2nd Gen.	53	13.9
3rd Gen	69	18.1
4th Gen.	113	29.6
Total	382	100.0

Table 2 shows dental students' knowledge and perceptions of mentoring. Most of the students (99.0%) had a good understanding of the term 'mentoring'. The role of a mentor was also clearly understood by 67.3% of the students. Religious institutions and students' homes accounted for 60.5% and 26.4% respectively for places they had been exposed to mentoring. Only 9.7% of the students were mentored at previous workplaces. At the time of the study, only 21.2% of the students had a mentor officially assigned to them by their faculty. A significant number (96.1%) of the students would like to be mentored in the dental faculty during their undergraduate training. Similarly, 88.7% of these students would also like mentoring to be included in the dental curriculum. Most of the students believed that mentoring should begin during the pre-clinical years, with 73% suggesting 100 level as the most preferred time of commencement. However, only one student believed that mentoring should start at 600 level. The preference of students concerning appointment of a mentor was also assessed. While a majority (57.6%) preferred to choose their mentor, about one-fifth (19.6%) desired to have their mentor appointed for them by the faculty and 3.4% were indifferent about either choosing for themselves or by the faculty. About one-fifth (20.4%) of the male students preferred to have a female mentor while 6.6% preferred a male mentor. Similarly, almost an equal number of female students would prefer to have either a female or male mentor, with 15.7% and 14.1% respectively. Generally, about one-fifth (20.7%) of the students would prefer to have mentors of the same gender, while about one-third (36.1%) of them preferred mentors of cross-gender. Furthermore, 43.2% of the dental students were, however, indifferent about gender preference in their mentors. (Table2)

Table 2: Dental students' knowledge and perceptions of mentoring

Variable	Frequency	Percentage
Knowledge of the term 'mentoring'		
Yes	378	99.0
No	4	1.0
Knowledge of the role of a mentor		
Yes	257	67.3
No	125	32.7
Mentoring experience before university education		
Yes	257	67.3
No	125	32.7
Exposure to mentoring aside dental faculty		
Religious institution	231	60.5
Work	37	9.7
At home	101	26.4
Willingness to be mentored in dental faculty		
Yes	367	96.1
No	15	3.9
Need for inclusion of mentoring in dental curriculum		
Yes	339	88.7
No	43	11.3
Level at which mentoring should begin in dental faculty		
100	279	73.0
200	85	22.3
300	9	2.4
400	6	1.6
500	2	0.5
600	1	0.3
Official appointment of mentor by the faculty		
Yes	81	21.2
No	301	78.8
Preference for appointment of a mentor		
A mentor should be appointed for me	75	19.6
I will prefer to choose the mentor myself	220	57.6
Others	13	3.4
Gender preference for mentor		
Male mentee-male mentor	25	6.6
Male mentee-female mentor	78	20.4
Female mentee-male mentor	60	15.7
Female mentee-female mentor	54	14.1
Indifferent	165	43.2

Table 3 shows the perceived benefits of mentoring by students according to age group and gender. Generally, students scored benefits accrued to mentoring very highly on a Likert scale. While making career choices was ranked significantly higher in females ($p<0.05$), the impact on personal life was, however, higher in the older age group (>25 years), and the difference was found to be statistically significant ($P<0.05$). (Table 3)

Table 3: Benefits of mentoring by students according to gender and age group

Variables	Male Mean ±SD	Female Mean ±SD	p-value	≤ 25 years Mean ±SD	>25 years Mean ±SD	p-value
Improvement in my academic performance	4.54 ±0.62	4.63 ±0.56	0.165	4.56 ±0.60	4.70 ±0.51	0.133
Improvement in clinical performance	4.65 ±0.48	4.66 ±0.48	0.864	4.64 ±0.48	4.73 ±0.45	0.265
Make better career choice considering specialisation	4.48 ±0.65	4.61 ±0.55	0.035*	4.53 ±0.62	4.64 ±0.53	0.264
Impact on personal life and development	4.25 ±0.74	4.22 ±0.76	0.726	4.21 ±0.75	4.48 ±0.70	0.024*

p>0.05;*p<0.05

Table 4 shows dental students' perception of the mentee/mentors' responsibilities according to age group and gender. Generally, the responsibilities of the mentee towards mentoring practices were highly ranked, except for the provision of advice and direction which was ranked very low, according to age group and gender. Concerning perception on actively listening, asking questions, and respecting mentor's time and resources during mentoring, female students ranked these responsibilities significantly higher than their male counterparts (P<0.05). Similarly, the older students ranked higher the perception to ask the mentor for advice, opinion, feedback, and direction than the younger group (P< 0.05). A significant gender difference was also reported in the perception of the mentor's responsibilities to willingly share personal or professional experiences, provide open and candid feedback, and offer encouragement by genuine reinforcement with the female gender rating it higher(P<0.05). With respect to age group, the younger age group ranked higher the students' perception of the method of mentoring, either physically or online, as well as the mentor's ability to stay accessible and committed, than their older counterparts (P< 0.05). (Table 4)

Table 4: Dental students' perceptions of mentee/mentor responsibilities according to gender and age group.

Mentee	Male Mean±SD	Female Mean±SD	p-value	≤25 years Mean±SD	>25 years Mean±SD	p-value
Meet mentor at the agreed time and the venue	4.34±0.68	4.43±0.65	0.187	4.36±0.68	4.55±0.59	0.085
Proactive about contacting mentor and rescheduling	4.33±0.58	4.36±0.63	0.709	4.33±0.61	4.50±0.59	0.078
Actively listening and asking questions	4.49±0.54	4.61±0.53	0.026*	4.53±0.53	4.64±0.53	0.201
Respect the mentor's time and resources	4.53±0.55	4.66±0.49	0.017*	4.57±0.53	4.73±0.50	0.065
Commit to self-development	4.58±0.52	4.64±0.52	0.266	4.60±0.52	4.66±0.53	0.462
Advice, opinion, feedback and direction from mentor	2.59±1.53	2.58±1.59	0.959	2.67±1.56	1.93±1.35	0.003*
Mentor						
Meet with me in person or on phone for mentoring	3.05±1.41	3.17±1.54	0.437	3.17±1.45	2.61±1.53	0.019*
Willing to share personal or professional experience	4.31±0.83	4.50±0.64	0.013*	4.38±0.77	4.48±0.63	0.418
Stay accessible and committed to me	3.17±1.42	3.26±1.46	0.554	3.30±1.39	2.48±1.53	0.000*
Provide open and candid feedback	4.40±0.62	4.53±0.52	0.035*	4.45±0.56	4.52±0.76	0.438
Offer encouragement by genuine reinforcement	4.44±0.57	4.55±0.53	0.038*	4.47±0.56	4.59±0.54	0.187
Keep our conversation confidential	4.50±0.65	4.53±0.68	0.710	4.54±0.67	4.59±0.58	0.621

p>0.05;*p<0.05

Possible enhancement and inhibiting factors (hindrances) to mentoring as perceived by students according to age group and gender are shown in Table 5.

Table 5: Enhancement and hindrances to mentoring as perceived by dental students according to gender and age group

Enhancement	Male Mean ±SD	Female Mean ±SD	p-value	≤ 25 years Mean ±SD	>25years Mean ±SD	p-value
Enabling and supportive environment	4.51±0.57	4.60±0.54	0.152	4.54±0.55	4.61±0.62	0.420
Responsive mentees who reaches out for help	4.42±0.60	4.55±0.59	0.026*	4.48±0.59	4.43±0.70	0.601
Well knowledgeable and experienced mentor	4.55±0.57	4.63±0.53	0.132	4.58±0.55	4.59±0.58	0.928
Ability of the mentor to motivate the mentee	4.48±0.62	4.62±0.52	0.021*	4.53±0.58	4.61±0.58	0.389
Mentor with emotional intelligence	4.50±0.65	4.53±0.57	0.584	4.50±0.61	4.57±0.62	0.508
Incorporation of formal mentoring in curriculum	2.98±1.40	3.16±3.18	0.211	3.06±1.38	3.02±1.47	0.870
Formally encouraging senior to junior students' mentorship	3.03±1.39	3.38±1.29	0.031*	3.22±1.33	2.93±1.52	0.192
Informally encouraging senior to junior students mentorship	3.86±0.93	3.78±0.95	0.421	3.83±0.94	3.84±0.91	0.918
Freedom and flexibility of mentees to choose mentor	4.26±0.69	4.23±0.75	0.637	4.25±0.70	4.27±0.82	0.813
Training of mentors to enhance effective mentorship	4.32±0.63	4.46±0.57	0.026*	4.39±0.59	4.34±0.71	0.611
Availability of mentorship guideline from mentor and mentee	4.31±0.66	4.38±0.63	0.300	4.33±0.65	4.41±0.66	0.455
Hindrances						
Limited time available with mentor due to workload	4.19±0.78	4.19±0.80	0.925	4.19±0.79	4.23±0.80	0.748
Faculty appointing mentor and not by student's choice	3.63±1.01	3.70±1.05	0.514	3.61±1.04	4.02±0.85	0.012*
Unavailability of mentor due to busy schedule	4.15±0.78	4.28±0.74	0.114	4.19±0.78	4.36±0.53	0.146
Attitudinal challenge from my mentor	4.00±0.78	4.13±0.80	0.136	4.04±0.81	4.16±0.61	0.367
Lack of responsiveness from my mentor	4.00±0.82	4.18±0.84	0.035*	4.07±0.84	4.09±0.80	0.917
Lack of motivation and zeal from mentor and mentees	3.06±1.42	3.22±1.48	0.295	3.17±1.44	2.80±1.46	0.105
Low achievement of goals	3.74±0,94	3.98±0.95	0.012*	3.85±0.95	3.80±0.95	0.725
Lack of structured mentoring programs	4.03±0.92	4.16±0.84	0.141	4.08±0.90	4.11±0.81	0.829
Inaccessibility to needed facility	3.96±0.90	4.17±0.83	0.016*	4.07±0.87	3.95±0.89	0.431

p>0.05; *p<0.05

Generally, the female students ranked both the enhancing and inhibiting factors higher than their male counterparts. Female students believed that the responsiveness of the mentee, and the ability of the mentor to motivate, as well as their mentorship training, will enhance mentoring significantly, compared to their male counterparts (P< 0.05). However, no significant differences in terms of enhancement to mentoring were reported among the age groups (P>0.05). Female students ranked lack of responsiveness of mentors and low achievement of goals significantly as hindrances to mentoring (P< 0.05), as opposed to their male counterparts, while the older dental students believed that the appointment of mentors by the faculty was more of a hindrance, than the younger students (P< 0.05).

Table 6 shows the multiple regression analysis of factors affecting successful mentoring according to socio-demographic characteristics. Results showed that gender was the only predictor of successful mentoring amidst other socio-demographic factors (P< 0.05).

Table 6: Multiple regression analysis of factors affecting successful mentoring according to socio-demographics.

Variables	Standardised Coefficient B	t	Sig	F	P	95% CI for B	
Constant		30.17	0.000	3.409	0.009	Lower bound	Upper bound
Age group	0.014	0.191	0.849			-0.126	0.153
Gender	0.151	3.359	0.001*			0.062	0.239
Educational level	-0.070	-1.462	0.145			-0.164	0.024
Generation of dental faculty	-0.007	-0.390	0.697			-0.043	0.029

F=3.409, P=0.009, R^2 =0.025, Adjusted R^2 = 0.03

Figure 1 shows the perceived importance of mentoring to the students. Most of the respondents (64.4%) believed that mentoring would help them in their career development, others believed it would help in research work (28.8%), on personal and social issues (5.2%), on religious issues (1.3%),and ethical issues (0.3%). (Figure 1)

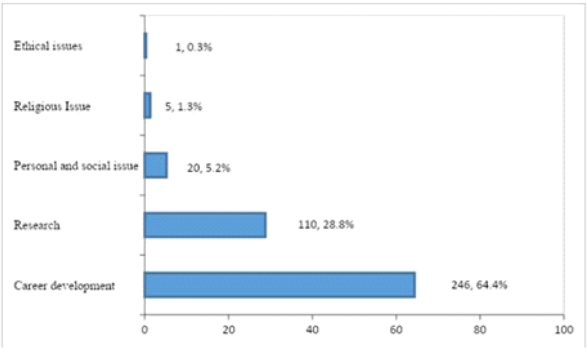

Figure 1: Perceived important issues of mentoring according to dental students

DISCUSSION

To the best of our knowledge, this study is the first and the only nationwide survey to document Nigerian undergraduate dental students' perceptions and experiences of mentoring. In this study, the vast majority of students demonstrated a very good understanding of the concept of 'mentoring' and had good knowledge of the role of a mentor. This may be because most of the students have had previous mentoring experiences in other social organisations and structures such as religious institutions, homes, and workplaces, which is consistent with the findings of Penner[3] and Eby et al[13] that mentoring is not restricted to academic institutions. In many of our local universities, formalisation and institutionalisation of mentoring programmes are still at the pedestrian level as only about one-fifth of the dental students had mentors assigned to them by their training institutions. The low level of mentoring in the Nigerian dental schools may largely be attributed to the

volume of work, limited time, and the busy schedule of both mentors and mentees. This view was supported by Hauer et al [21]who showed that the frequent shift from classroom work to the clinics could be a major hindrance to effective mentoring. This is also in consonance with previous reports[22-24] which observed that formal mentoring programmes are lacking in many universities.

There is a need, therefore, to include mentoring into students' activities as part of the university culture. According to some other studies,[2,25,26] the formalisation of mentoring may not necessarily eliminate the interpersonal, institutional, and socio-cultural barriers that hinder mentoring practices in resource-limited settings. It is also interesting to note that students in this study would like mentoring practices to commence at a very early stage of their training (100 level), with the privilege of nominating their mentors rather than being assigned by the faculty. According to Hauer et al,[21] this will allow for good rapport between the mentee and mentor as the choice made would be based on the mentee's standards and desired attributes in the mentor. Many other studies [27-29] have also reported that mentoring relationships are more effective when mentees are given the option of selecting their mentors. Interestingly, a greater proportion of the students showed no gender preference for mentoring. This is consistent with the findings by Leck et al [30]that most of the respondents in their study were indifferent concerning preference for same-gender or cross-gender mentors.

Across the globe, the importance of mentoring practices cannot be overemphasised. In our study, the perceived benefits of mentoring were ranked very highly on a five-point Likert scale by undergraduate dental students. This is supported by Fox et al [10]who found that in two Scottish universities, mentored students had a more impressive academic performance, especially among the first year students, when compared with the non-mentored students. Apart from improving the general academic performance of students, mentoring in dental education facilitates mentee's professional development, success in the teaching and learning process, as well as in their research work.[22,31] In a meta-analysis involving 116 publications from 1985-2006, Eby et al.,[13] found that academic mentoring was directly related to good performance, improved attitude towards school work, and reduced withdrawal tendencies. These authors reported a positive relationship between mentoring and academic performance, however, the duration, quality, and degree of mentoring received could not be ascertained.

Consistently in this report, the sexes and ages were generally in agreement with most of the mentorship benefits, enhancements and hindrances to mentorship. However, female and older students perceived more mentoring benefits, stakeholders' responsibilities, effective enhancing factors as well as hindrances than their male and younger counterparts respectively. No obvious reason could be advanced to support these observations, but a number of factors, like the attitude of mentees, access, and willingness of mentors to initiate mentoring programs may be responsible for the findings. In a related study, Scandura and Williams [32]showed that a protégé may benefit more from the same-gender relationship than a cross-gender relationship as regards role modelling. Also, largely, the participants in this study believed that mentoring would affect not only improve their academic performance but their clinical skill attainment. While the older students acknowledged that mentoring will impact on their personal life and development, the idea of being controlled by mentors was frowned at. Therefore, the need for advice, feedback and direction from mentors was ranked low. This is probably because this group of students are more independent and experienced in facing life issues.

There is no gainsaying the fact that, for effective mentoring, both mentor and mentee should be conversant with their roles. Anderson and Shannon[16]proposed that mentoring will become more effective

when specific roles and modes of operation of mentors and mentees are recognised and well-defined. Most of the students in this survey perceived that mentors should be trained to enhance effective mentoring. This is supported by Brooks[15] who suggested that mentors should have the necessary skills and training required for successful mentoring.

In this survey, gender was the only socio-demographic factor capable of predicting the effectiveness of mentoring with the female students showing more interest than their male counterparts. In contrast, male students were more inclined to be in charge of their academic activities and fend for themselves as opposed to females who would rather seek assistance.

CONCLUSION:

Nigerian dental students showed a low level of faculty mentoring despite their desire to be mentored. Career development was perceived as the most important benefit of mentoring by the students. Students, therefore, recommended that mentoring should be incorporated into the dental curriculum right from the beginning of their undergraduate dental training. Further studies need to be carried out to examine the perception of mentors.

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Relationship between Quality of Marriages, Marital Counselling, and Oral Health Status of Married Female Worshippers Attending Religious Worship Centers in a Southwestern Nigerian Population

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Key words: Quality of marriages, periodontitis, xerostomia, marital counselling

ABSTRACT

BACKGROUND

Quality of marriage is a strong indicator of human general and oral health. Scientific reports have shown that happily married people tend to show signs of better health when compared to those with poor quality marriages. Women in unhappy marriages are exposed to chronic emotional stress with signs of impaired social behaviour, mental stress disorders, cardiovascular diseases, xerostomia, and orofacial pain disorders. Information on the effects of marriage on oral health is very scanty despite the huge influence of oral health on the quality of life. The objective of this study, therefore, was to highlight the impact of oral health care on the quality of marriage.

MATERIALS AND METHODS

This was a longitudinal study of female religious worshippers in a south-western state of Nigeria. Major Religion Worship Centres (RWCs) in the chosen city were contacted through their leaders. Each RWC where consent was obtained from its leader was listed in each of the five local government areas in the city. One RWC was selected from the listed centres in each local government area using a simple random method, hence, a total of five local RWCs were selected. Married females in the selected RWCs were contacted through their leaders on the scheduled date. They were offered general and oral health education, and were asked to complete a structured questionnaire on their oral health and the quality of their marriages. Extra oral and intra-oral examinations were also carried out and the findings, recorded. Scaling and polishing was performed for all participants in a nearby state hospital, and also, non-operative routine dental treatments were delivered onsite. Thereafter, comprehensive marital counselling was delivered to each participant. Participants were reviewed weekly via telephone calls and at the eight week, they were physically visited in their RWCs for assessments following the initial intervention, and the reports were also recorded. Data analysis was done with STATA 16 software. The relationship between the frequency of oral lesions before and after the intervention was analysed usingT-test.

RESULTS

A total of 113 married female religious worshippers participated in the study. Their mean age was 57.9 years SD 12.8. The majority (101, 92%) currently reside with

their husbands, 2(2%) are divorced, and 7% are widowed. Eighty-one (71.7%) reported good quality of marriages while 32 (28.3%) had poor quality of marriages. Oral lesions seen before intervention were periodontitis (30, 26.5%), xerostomia (25, 22.1%), mouth odour (22, 19.1%), and Orofacial/TMJ pain (27, 23.3%). Lesions were significantly more prevalent among those with poor quality of marriages. After intervention, the prevalence of mouth odour, periodontitis, xerostomia, and extra marital romantic relationship reduced significantly by 82% (p=0.04), 53% (p=0.001), 76% (p=0.001) and 89 % (p=0.024) respectively.

CONCLUSION

One-third of married, self-employed women in their fifth decade of life had poor quality of marriages. Oral lesions such as periodontitis, mouth odour, and xerostomia were more prevalent among married women with poor quality of marriage. Women with poor quality of marriage have 94.4% chance of getting involved in extramarital romantic relationships. Routine oral care and marital counselling produced better oral health status, and an enhanced marital life eight weeks after intervention.

INTRODUCTION

Health is highly influenced by social factors and is critical to life fulfilment and productivity.[1] According to the constitution of the World Health Organisation (1948), health is defined as a complete state of physical, mental and social well-being and not the mere absence of illness and diseases.[2,3] Therefore, the determinants of health are multifactorial, commonly affected by physical, mental, and social factors. Marital status and quality of marriages are powerful social factors affecting health.[4]Scientific reports have shown that married people and especially those with good lquality of marriages show signs of better health since marriage provides a strong social network that shape physical and mental health.[4]

Marriage quality is defined as a subjective global evaluation of how partners relate in a relationship; it is a product of self-reported altitude of the partners in the relationship and marriage, and assessing the individuals acceptability of the partners behaviour or both.[5, 6] Reasons for better health among married individuals include economic benefit, emotional help, and mental support during health challenges. Other reasons include assistance to comply with health instructions, persistent concerns and mutual respect for each other.[4]Reports have it that many men tend to stop anti health social habits such as smoking and risky behaviours after getting married as a sign of respect for their wives and to be able to satisfy their wives.[7]Conversely, marriage also comes with health challenges: health implications of hormonal changes during pregnancy (e.g. pregnancy epulis), prolonged period of psychosocial stress from unresolved conflicts, and cardiovascular diseases have been documented.[4]Good quality marriages bring happiness and peace of mind. Individuals are therefore free from depression, chronic mental stress, oxidative stress and internalising problems, as they enjoy longevity of life, quick recovery from illnesses and excellent metabolic control of Type I Diabetic mellitus.[8]

Hormonal changes in women is a critical factor that affect their physiology and the effects are increased during puberty, menstruation, pregnancy and menopause. The effects are not limited to the reproductive system, but also affect the oral and maxillofacial region which is often neglected.[4,6]Oral problems may result from the effects of prolonged mental stress, hormonal imbalance, medications, and as manifestations of the associated systemic diseases.[9] Like systemic health effects, oral problems are more prevalent among those with bad quality of marriages. The common oral lesions are periodontitis, xerostomia, and temporomandibular joint pain, burning mouth syndrome, atypical odontalgia, and delusional halitosis. Consequently, oral

lesions affect the quality of life of affected individuals, and impair their productivity and social behaviour in the community.

Religion plays major roles in social behaviour and it is a strong factor that determines the viability of physical and mental health.[10] Church worshippers cast their burden on the supreme God they believe, and, in many cases, exhibit reduced stress of life. Also, their strong belief make them to accept marriage when it is better or/and when there are challenges, and subsequently, they show lesser signs of psychopathy from home challenges, although the mechanism remains unclear.[11] Religious counselling generally helps believers in relieving mental stress and achieving general and oral health. However, data relating oral problems with the combined effects of religious counselling and dental intervention for married women have not been reported among the African population.

This study was therefore designed to investigate the effects of dental intervention and religious counselling among married female church worshippers in a south-western Nigerian population, and to compare the burden of the oral problems before and after the intervention. Data generated from this study supplied information on oral needs among married women, and justification for the need for special attention on oral health care of married women with a view to preventing more devastating oral complications in the population.

MATERIALS AND METHODS

This was a longitudinal study showing the relationship between qualities of marriages, oral health care and marital counselling among married female worshippers attending religious worship centres (RWC) in a South Western city of Nigeria. The study was conducted in a capital city of a south-western state in Nigeria. The surface area of the city is 47km^2 with a population of 395,500 people. As reported by Lucchettiet al[11], dwellers are affected by religious activities. Study participants were consecutive, consented, married women volunteers who attend selected religious worship centres in the chosen city.

Permission to carry out the study was sought and obtained from the ethical committee of the institution. Each participant also gave their consent before recruitment into the study. Patients' information was handled with respect and utmost confidentiality. All the major RWCs domiciled in each of the local government areas in the city were identified and their leaders were contacted to seek permission to conduct the research in their respective centres. The centres where the leaders gave positive consent were collated in each local government area. Simple random sampling technique was used to select one RWC from each of the five major local government areas in the city. A total of five RWCs from five local government area were thus selected. All consecutive consenting married women in the selected RWSs were recruited into this study.

Included in the study were all consented, married, apparently healthy women with no sign of mental diseases or chronic medical or emotional stress. Participants with debilitating underlying systemic conditions such as movement disorders, hypertension, diabetes, and mental disorders were excluded. Also excluded were women on oral contraceptives or hormonal therapy and young ladies who were forced into marriage.

Data were collected using structured questionnaires which were administered by the researcher to the participants after obtaining their consent. The first part of the questionnaire (Section 1) was used to collect information about participants' bio data such as name, church of worship, age, address, ethnicity, marital status, and present occupation. In section two (2), participants were asked questions on the quality of their marriages and the

relationship between them and their respective spouses.

Sections 3 records clinical oral examination findings. The participants were gathered in the worship hall in the respective RWCs where interactive seminars on oral health education and the importance of maintaining happy homes were explained to the participants by the researcher.

Examination of the patients

Each participants was made to relax and sit down comfortably on a consulting chair for oral examination. Extra oral examination was done by checking for facial asymmetry, facial swellings, temporomandibular joint and checking for integrity of submandibular nymph nodes. Intra oral examination was performed by asking the patient to gently open the mouth for oral examinations as follows: inspection of the oral mucosa was done to check for colour, swelling, discharge, appearance, evidence of or dryness and presence of ulcers on the mucosa was done under natural light. Oral hygiene was assessed with the oral hygiene index.

The presence or the absence of halitosis was assessed by using organoleptic method. No odour was scored 0, mild malodour scored 1, mild malodour scored 2, and moderate malodour 3 and severe malodour scored 4. Candidates with scores 2 and above were marked present for halitosis. Gingival health status was assessed using gingival index Loe and Silness[12]while periodontitis was checked for by assessing tooth mobility of the teeth with digital manual palpation method and by measuring the established pocket. Those with periodontal pockets of more than 3 mm depth were marked positive with periodontitis. Xerostomia was diagnosed based on patients' subjective feeling of oral dryness, and any presence of at least one of the following signs: loss of shinning appearance of the oral mucosa, presence of ropy saliva, loss of salivary bubbles at the floor of the mouth, and reduced saliva flow follow external stimulation of parotid gland. The findings were recorded accordingly.

Assessment of Quality of Marriages

Quality of marriage was assessed by obtaining self-reported data on how best the women assessed the altitude and behaviour of their husbands towards them on various aspects such as finance, emotional support, companionship, sex life, and religious support as reported by Finchamet al[5]. The women were asked to give overall ratings of their husbands in any of the following four categories: poor, fair, good and excellent. The information was collected with strict confidentiality in a conducive environment by the author.

For the purpose of this study, those who rated the overall relationship with their husbands as poor and fair were regarded as **poor** quality of marriage and those who rated their relationship as good and excellent were taken as **good** quality of marriage.

INTERVENTIONS

HEALTH EDUCATION: After oral examinations, all participants were actively motivated to make keeping good oral hygiene a priority for them and every member of their family. Tooth cleaning packages were freely distributed to them and their compliance with instructions was monitored via phone calls. They were also taught tooth brushing techniques, use of dental floss, good diets for maintaining good oral health, and general skills on how to recognize and provide home care for common oral problems.

SCALING AND POLISHING: All participants were conveyed to the dental hospital in the state where scaling and polishing was done for all participants. .

TREATMENT OF SPECIFIC ORAL PROBLEMS: Specific oral problems that

were clinically diagnosed were treated, and those requiring operative procedures were referred to nearby standard dental hospitals. Xerostomia was treated with frequent oral sips of water and regular lime water 0.1% oral rinse twice daily, for a week. Halitosis was treated with scaling and polishing, warm saline mouth bath, and referral to Oral Medicine Clinic in the nearby hospital. Candidiasis was treated with Nystatin lozenges (pastilles) given three times daily.TMJ pain was treated with jaw rest, tabs nolgesic 2 tabs 8 hourly for a week and tabs lexotan 1.5 mg for 3 days

MARITAL COUNSELLING

Interactive sessions of marital counselling were privately conducted for all participants by the researcher. The counselling was designed to be in strong agreement with their respective religious beliefs and faith. They were made to see reasons why they should continually strive to be at peace with their spouses using their holy book as the practical guide. Health benefits of good quality marriages were also explained to them in clear terms.

REVIEW AFTER INITIAL INTERVENTION

Review was done weekly via telephone calls, during which they were asked about the symptoms and relationship with their spouses. At the eighth week after the initial visit, patients were physically visited at the same worship centre and were reviewed. Oral examinations as was earlier done on the first physical visit was also done and the findings recorded in section 4 of the questionnaire, some patients were however, unable to get to this stage, they were lost to follow up.

DATA ANALYSIS:

Data were analysed using STATA 16 statistical software (StataCorp, College Station, Texas). Percentages and proportions were used to describe qualitative variables, such as the distribution of participants with specific oral and dental problem before and after intervention. Other qualitative variables that were analysed with frequency are: occupation, age group and marital status. The only continuous variable was age, which was analysed using mean, median, mode, and standard deviation. Comparison of frequency of oral lesions before and after intervention in different age groups and in those with good and bad quality of marriage was done using t test. Statistical significance was set at $p < 0.05$.

RESULTS

A total of 130 married women were recruited into the study at the first visit;17 participants were lost to follow up, therefore, complete data of only 113 participants who were available for the second visit were analysed. Of the 113 participants, 81 (71.7%) had good quality of marriage while 32 (28.3) had poor quality of marriage using the criteria stated in the Materials and Methods section.

Socio-demographic and health-seeking behaviour of the of respondents

The mean age of participants was 57.9, SD=12.8, and more than one-third (41, 36.6%)were in their fifth decade. About a third of participants (6, 30%) within that age bracket had poor quality of marital relationship. Majority (101, 92%) presently reside with their husbands, 2(2%) are divorced, and 7 (6.2%) widowed. About one-third, 16 (30.5%), of the self-employed participants had poor quality of marriage, closely followed by civil servants (11, 28.2%). Most of those with poor quality of marriages had not checked their blood pressure, weight nor their blood sugar in the last six months. However, the differences are not statistically significant: blood pressure check (p=1.000), weight check (0.517) and blood sugar check (0.214). Also, 10.7% % of all participants had never had dental check-up. (Table 1)

Table 1: Socio-demography of Respondents

Characteristics	Good quality Marriage	Poor quality Marriage	Total (%)	P value
Age Group (Mean age 57.9 SD 12.8)	1 (50)	1 (50)	2 (1.3)	0.533
21-30	5 (83.3)	1 (16.7)	6 (5.3)	
31-40	14 (70)	6 (30)	20 (17.7)	
41-50	26 (89.3)	15 (10.7)	41 (36.3)	
51-60	23 (82.1)	5 (17.9)	28 (24.8)	
61-70	12 (75	4 (25)	16 (14.2)	
>70				
Marital status				
Married	76 (73.1)	28 (26.9)	104 (92)	0.338
Divorced	0 (0)	2 (100)	2 (1.8)	
Widow	4 (57.1)	3 (42.9)	7 (6.2)	
Occupation				
Civil Servant	28 (71.8)	11 (28.2)	39 (34.5)	0.742
Self employed	41 (69.5)	16 (30.5)	59 (50.5)	
Retired	6 (60)	4 (40)	10 (8.9)	
Dependent	1 (14.3)	6 (85.7)	7 (6.1)	
Blood pressure check				
<6 month	29 (72.5)	11 (27.5)	40 (35.40)	1.000
>6 month	48 (71.6)	19 (28.4	67 (59.3)	
Can't remember	4 (66.7)	2 (33.3)	6 (5.3)	
Blood sugar check				
<6 month	16 (76.2)	5 (23.8)	21 (18.6)	0.517
>6 month	32 (76.2)	10 (23.8)	42 (37.2)	
	33 (66)	17 (34)	50 (44.3)	
Can't remember				
Weight check				0.214
<6 month	48 (72.7)	18 (27.3)	66 (58.4)	
>6 month	30 (75)	10 (25)	40 (35.4)	
	3 (42.9)	4 (57.1)	7 (6.2)	
Can't remember				
Have you ever a dental check-up?	8 (66.2)	4 (33.3)	12 (10.7)	0.001*
Yes	73 (72.3)	28 (27.7)	101 (89.3)	
No				

Fischer's exalt. * Statistically significant

Prevalence of Systemic Diseases among Participants

More than one third of all the participants (41, 36.3%) were known hypertensive patients, while 17 (15.1%) were known diabetes mellitus patients. Furthermore, more than two-third of subjects with poor quality of marriage were known hypertensive patients (20, 62.5%, n=32) while 6 (18.6%, n=32) were patients with diabetes mellitus. Only 1(13.7%, n=81) of all patients with good quality of marriage had diabetes mellitus. (Fig 1).

Fig 1: Prevalence of Systemic Diseases among the Participants

Objective rating of Participants' Spouses

More than half of the participants (52%) rated their husbands' attitude towards them as good, 38 % rated the attitude as poor and 31% of participants rated the attitude of their husbands towards them as excellent. (Fig 2)

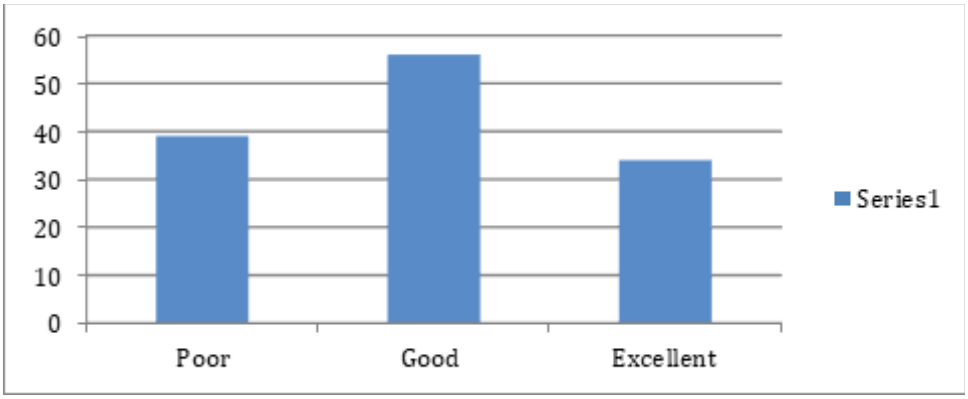

Fig 2: Participants' Subjective Rating of Their Spouses' Attitude towards Them

Table 2: Participants' subjective Rating of the Relationship with their Spouses

Question	Frequency (%)
Does your husband spend enough time with you at hom	
No	49 (43.5%))
Yes	64 (56.6)
Are you enjoying your marriage?	
No	34 (30.1)
Yes	79 (69.9)
Do you think your husband is hiding something from yo	
Yes	48 (42.5)
No	65 (57.5)
Do you prefer to stay alone if you have the option now?	
Yes	32 (28.3)
No	81 (71.7)

Relationship between Prevalence of Oral Lesions, social activities and Quality of marriage before intervention

Oral lesions were statistically significantly higher among participants with poor quality of marriage. Periodontitis was the most frequent lesion (p=0.001), followed by orofacial pain (p=0.001), bleeding gum (p=0.001), mouth odour (p=0.004), xerostomia (p=0.001) and taste impairment (p=0.001). Extra marital relationship was also more prevalent among those with poor quality of marriage (p=001). Table 3

Table 3: Relationship between Prevalence of Oral Lesions, social activities and Quality of marriage before intervention

	Participants with Good Quality of Marriage	Participants with Poor Quality of Marriage	Total	P value
Symptoms	Frequency/%	Frequency/%	Frequency/%	
Mouth odour				
Present	10 (45.5)	12 (54.6)	22 (100)	0.004*
Absent	71 (78.0)	20 (21.98)	91 (100)	
Bleeding on Brushing				0.001*
Present	10 (41.7)	14 (58.3)	24 (100)	
Absent	71 (79.8)	18 (20.2)	89 (100)	
Mobile teeth/periodontitis				0.0001*
Present	13 (43.3)	17 (56.7)	30 (100)	
Absent	68 (81.5)	93 (15.1)	83 (100)	
Orofacial Pain				0.001*
Present	13 (48.2)	14 (51.9)	27 (100)	
Absent	68(79.1)	18 (20.9)	86 (100)	
Taste impairment				0.001*
Present	7 (35%)	13 (65)	20 (100)	
Absent	74 (79.6%)	19 (20.4)	93 (100)	
Xerostomia				0.001*
Present	11 (44)	14 (56%)	25 (100)	
Absent	70 (79.5)	18 (20.5)	88	
Dental caries				0.001*
Present	12 (48)	13 (52)	25 (100)	
Absent	69 (61.1)	19 (38.9)	88 9100)	
Extra marital relationship	1 (5.56)	17 (94.4)	18 (100)	0.0001*
Present	80 (84.2)	15 (15.8)	95 (100)	
Absent				

Prevalence of Oral Symptoms and associated Behavioural changes among Participants before and After Intervention.

Periodontitis was the most frequent oral problem before intervention (30, 26.5%), followed by bleeding gums during tooth brushing (24, 20.3%), mouth odour (22, 19.4%, dental**/**orofacial pain (27, 23.9%), and taste impairment 20 (17.6%). Also 17 (15%) of all participants had extra marital relationships before intervention. After the intervention, there were significant reduction in frequency of oral symptoms (periodontitis, p=0/001, mouth odour p=0.001, xerostomia, p=0.001 and bleeding gum, p=0.001) and extra marital relationships (p=0.001) (Table 4).

Table 4: Prevalence of Oral Symptoms and behavioural changes among study Participants Before and after intervention

	Before intervention	After intervention	P value
Symptoms	**Frequency(%)**	**Frequency(%)**	
Mouth odour			**0.004***
Present	**22 (19.4)**	**5 (4.4)**	
Absent	**91 (80.5)**	**108 (95.6)**	
Bleeding on Brushing			**0.204**
Present	**24 (20.3)**	**1 (0.8)**	
Absent	**89 (79.7)**	**112 (99.2)**	
Mobile teeth/periodontitis			**0.001***
Present	**30 (26.5)**	**14 (12.4)**	
Absent	**83 (73.5)**	**99 (87.6)**	
Orofacial Pain			**0.055**
Present	**27 (23.9)**	**2 (1.8)**	
Absent	**86 (76.1)**	**111 (98.2)**	
Taste impairment			**0.0001***
Present	**20 (17.6)**	**12 (10.6)**	
Absent	**93 (82.3)**	**101 (89.4)**	
Xerostomia			**0.0001***
Present	**25 (22.1)**	**6 (5.3)**	
Absent	**88 (77.9)**	**107 (94.7)**	
Dental Caries			**0.047***
Present	**12 (10.7)**	**2 (1.8)**	
Absent	**69 (89.4)**	**111 (98.2)**	
Extra marital relationship			
Present	**18 (15.9%)**	**2 (1.8)**	**0.024***
Absent	**95 (84.1%)**	**111 (98.2)**	

ttest * statistically significant

Oral Hygiene status of participants before and after Intervention

Majority of the participants had good oral hygiene at the start of the study; only 14 (12.3) had poor oral hygiene. After the intervention, the percentage of those with good oral hygiene increased to 93.8% while those with poor oral hygiene significantly reduced to only 2.7% (Table 5).

Table 5: Oral Hygiene status of participants before and after Intervention

Oral Hygiene Status	Before Intervention (%)	After Intervention (%)
Good	81 (71.6)	106 (93.8)
Fair	18 (15.9)	5 (4.5)
Poor	14 (12.3)	3 (2.7)

P<0.001

Relationship between age, oral symptoms and extra marital romantic relationships

Majority of participants involved in extra marital relationships were divorced women in their fifth and sixth decade of life. Prevalence of oral lesions was significantly higher among those women in extra marital relationships than those who were not, and common lesions were xerostomia (83.7%), halitosis (61.1%) and periodontitis (55.6%). (Table 6)

Table 6: Relationship between age, Oral symptoms and extra marital romantic relationship

Variable	Extra marital romantic relationship (%	P value
Age group		0.037*
21-30	0(0)	
31-40	1 (5.6)	
41-50	6 (33.3)	
51-60	8(44.3)	
60	3 (3)	
Marital status		0.654
Married	5 (27.7)	
Divorced	11 (61.1)	
Widowed	2 (11.1)	
Xerostomia		
Present	15 (83.7)	0.001*
Absent	3 (17.7)	
Halitosis		
Present	11 (61.1)	0.001*
Absent	7 (38.9)	
Periodontitis		
Present	10 (55.6)	0.003*
Absent	8 (44.4)	
Oral Hygiene status		0.004*
Good	10 (55.6)	
Fair	1 (5.6)	
Poor	7 (38.9)	

Fisher's exact, * statistically significant

DISCUSSION

This study was conducted among married female religious worshippers in a southwestern Nigerian state to determine the relationship between quality of marriages and pattern of presentation of oral lesions before and after professional intervention. In the present study, the mean age of the participants (married women) was 57.9 years and most of them were in their six decade of life. This result is at variance with the report of Omodeyi et al that showed age range of married females in the Nigerian population as 10-19 years.[13] Parity is a descrete indicator of motherhood and marriage, Oziegbe *et al* studied the relationship between parity among women and oral problems, they reported parity (motherhood) among 13 years old girls in Northern Nigeria.[14] Unlike Omodey *et al* and Oziegbe *et al*s' researches, the present study was conducted in southern Nigeria where early marriage is not encouraged, and most females are exposed to western education early in life.[15] Also, women who were forced into marriage by circumstances were also excluded from this study. Marriage provides a strong social network for health promotion and recovery from illnesses. Thus, good health behaviours have been reported to be better among the participnats with good, quality marital relationships.

Majority of particpants who have not checked their blood pressure, weight, and/or had a dental check up in the last six months are those with poor-quality,old marriages. In addition to the fact that health education is still groslly deficient in Nigeria, females with poor quality of marriage are under intense pressure whichtends to take their attention away from their immediate health needs.[4]Also, the economic situation and access to health facilities may play

some roles. At variance with this study is a Japanese study that reported improved access to oral health care among the married because of the strong social networks provided by the their spouses.[16]This study showed that poor quality of marriage is most frequent among self-employed married women in their fifth decade of life. This is in agreement to anAmerican study which reported that self - employed females have challenges coping with their families and tend to have marital issues.[17] They are also less dependent on their husbands, and are always deficient in spending quality time to satisfy their husbands. Some of them are also being lured into having extra marital affairs in their work places. They, however, offer great assistance for home support.[17]

Poor quality of homes has profound effects on physical health. The associated emotional and chronic stress play critical roles in the pathogenesis of some systemic diseases, such as cardiovascular diseases.[6]In this study, more than two-third (62.5%) of patients with poor quality of marriages are hypertensive patients. Marital challenges canalso lead to cardiovascularproblems which, if not properly managed, can lead to loss of life. As found in this study, about 20% of patients with poor quality of marriage are known diabetes mellitus patients, a value that was higher than those with good quality of marriage. Emotional support, and financial surport for those with good homes have been reported to contribute to better health of those in good quality marriages.[6]

In this study, common oral lesions seen were peridontitis (30,26.5%), bleeding while brushing (24,20.3%), orofacial pain/TMJ disorders (30, 26.5%), xerostomia (25. 22.5%), and taste impairmement (27, 23.9%). Unlike Oziegbe et al study that reported a dental caries pravalence of 41.11% among married women in Northern part of Nigeria,[14] only 10.7% of the women in this study had dental caries. This may be due to differences in the environment, genetic factors, and types of local food consumption.[18]This study showed that the prevalence of oral lesions are higher among those with poor quality of marriages when compared to those with goodmarital relationship.[16]

Oral lesions can occur due to the presence of chronic stress, emotional imbalance, poor dental hygiene, poor accessibility to dental care and finacial constrains.[5]Emotional factors modulate neuronal and hormonal influences on the production of neurotransmitters, which play vital roles in the pathogenesis of some oral diseases such as TMJ pain, taste impairement, xerostomia, and halitosis. These oral lesions are significantly more prevalent among those with poor quality of marriages and is consistent with scientific studies.[4,6] The higher prevalence of these oral conditions recorded among those with poor quality of marriages may be due to the effects of cummulative chronic stress, reduced assesibility to care, lack of home support for health care and mental psychopathy among the participants.[16]Persistent emotional stress, a consistent feature of spouses in poor marital relationships, is also associated with mental disoders, hormonal imbalance, abnormal salivary gland function, and developemt of pathogenic pain.[19]Relationship between stress and immune supression has been long estalished in the literature, as stress mediators easily pass through the blood-brain barrier to inactivate immune cells.[20]Stress causes physical diseases by interfering with physiological pathways in the amygdala, the hypothalamus, and the brainstem.[21]

The relationship between a husband and a wife is dynamic and it provides the much needed social networking for the assessment and affordability of health needs.[4]The quality of their marriage is generally measured by self reported subjective discription of the altitudes of

sposuses to each other.[5]In the present study, almost half of the partcipants (43.5%) reported that their spouses do not spend quality time at home, and 34 (30.1%) were not enjoying their marriage to the level they desired.In addition, 32 (28.3%) preferred to always be alone without their husbands if permitted. Thismay result from the fact that men are constantly exposed to more work load in the recent times and are becoming more engaged at work while trying to make ends meet due to the impaired economy in the country.[22]

The bi-directional relationship between oral and systemic health has been well documented.[23, 24]The management of oral problems has been widely reported to assist in allieviating systemic diseases such as chronic kidney diseases, diabetic mellitus, and patients with high Prostatic Surface Antigen (PSA) concentration.[23,25]In this study, after intervention which involved health education, counselling and management of identified oral lesions, there iwas significant reduction of oral lesions and extra marital involvement of participants. The prevalence of mouth odour, orofacial/TMJ pain bleeding on brushing and xerostomia as evaluated with normative assessment were reduced by 77%, 93%, 96 and 76% respectively after intervention.

Health education and moltivation are viable adjuncts to the succesful treatment of oral and systemic diseases.[26]When patientscomply with oral hygiene instructions and are encouraged on the intake of oral health improving foods, their oral health status becomes better. This was also observed in this study where the proportion of participants with good oral hygiene significantly increased by 30% after intervention. Total compliance with oral health instructions not only prevents oral diseases, but also improves general body physiology and enhance productivity.[27]The presence of sound oral health reduces inflammtaory mediatiors in the systemic circulation and impairs the patrhogenesis of some systemic problems such as cardiovascular diseases, chronic kidney diseases, and diabetes mellitus.[28]The present study showed a significant reduction in the percentage of married women with poor quality of marriage after oral health intervention. This finding further stresses the need for proper oral health education during pre marital marriage counselling as reported by Fazli *et al*.[29]

Intimacy enhancing interventions, in addition to practical efforts at maintaing good oral health status, is therefore crucial to having a good, quality marriage.[30]The above instructions constitute a major part of the marital counselling package that was offered to married women in this study which fetched a significant reduction of poor quality of marriag relationship among married women by 88.9%. This is a descrete pointer to the roles of good oral health care as a potential tool for having good marriages, families, and societies at large.

CONCLUSION

There was a significant positive correlation between quality of marriages and oral health lesions in this study with significant alleviation intervention evidenced by 77%, 93%, 96%, and 76% reduction of mouth odour, orofacial/TMJ pain disorders, bleeding on brushing, and xerostomia respectively.

Self--employed women in their fifth decade of life showed the highest tendency to develop poor quality of marriages but specific interventions comprising of provision of good oral health care and marital counselling, significantly improved oral health status and their quality of marriage by 88.9%.

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Head and Neck Lymphoma: Clinico-demographic Profile and Pattern of Presentations in a South-Western Nigerian Tertiary Institution

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Key words*:* head and neck lymphoma, non-Hodgkin lymphoma, cervical lymph node, jaws

ABSTRACT

Objectives:
Lymphoma is the second commonest malignancy of the head and neck region, broadly classified into Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL), and affecting nodal and extra-nodal sites. The clinical presentation is largely determined by the anatomical distribution of the disease, the clinical stage of the disease, the age of the patient, and the presence of underlying diseases. This study analyzed the presentation of head and neck lymphomas over a fifteen-year period at the Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife. The objectives were to determine the prevalence and demographic indices (age and sex) of the head and neck regions, document the histopathologic types, and determine the association between the anatomical sites and histopathologic subtypes of lymphomas.

Materials and Methods:
This was a retrospective study among patients seen and diagnosed histologically with head and neck lymphomas between 2005 and 2019 at the departments of Oral Medicine and Pathology and Morbid Anatomy and Forensic Medicine, OAUTHC. Relevant records were retrieved from patients' records and the histological register from the hospital registry. Patients with incomplete data were excluded. The study was conducted in accordance with the Declaration of Helsinki and approved by our institution's Ethics Committee Board.

Results:
A total of 54 cases of head and neck lymphoma were analyzed, with a prevalence of 30.9%. Out of the 54 cases, 46 were NHL and 8 cases were HL, with a ratio of 5.8:1, respectively. A male preponderance was observed (M: F; 2.4:1). The lesion commonly affected patients in their 3rd and 4th decades of life. All the histologic variants seen affected males more than females, except the unclassified variant of HL, which affected both sexes equally. Low-grade and intermediate-grade NHL affected the older patients more, while high-grade and miscellaneous subtypes affected the younger males. The cervical lymph nodes were the most common nodal sites, while the jaw was the most common extra-nodal site. Eighteen (39.1%) of the NHL cases were diagnosed histologically as miscellaneous,

while there were seven (15.2%) cases a piece of the high and low grade varieties.

Conclusion:
Head and neck lymphomas remain relatively rare. One of every six lymphomas seen in our center was a HL, with a male preponderance. High-grade lymphoma was commoner among younger patients. Also, lymphoma predominantly affected the cervical lymph nodes, while the jaw was the most common extra-nodal site. However, while obesity may be a predisposing factor in our environment, it requires future study to confirm.

INTRODUCTION

Lymphomas are the most common neoplastic cause of lymphadenopathy, affecting lymph nodes and extra-nodal structures such as tonsils, major salivary glands, the sino-nasal system, and the hypopharynx in the head and neck regions.[1,2] Approximately 287,000 new cases of lymphoma are reported globally each year,[3] with 100,000 new cases reported annually in the United States.[4] Local studies[5-7] also show that lymphomas are the second-commonest malignancy of the head and neck, with an incidence ranging between 17.5% and 21.5%. Also, lymphoma generally affects more males than females, with incidence increasing with age and predilection for the third, fourth, and fifth decades. [8]Lymphoma is broadly classified into Hodgkin lymphoma (HL) and non-Hodgkin lymphoma (NHL). Non-Hodgkin lymphoma is commoner in younger patients and more aggressive when compared with Hodgkin lymphoma. [2]Hodgkin lymphoma primarily affects the lymphoid tissue, and it is characterized by Reed-sternberg cells. HL is rarely seen in the oral cavity.[9] NHL, on the other hand, is usually found in lymph nodes or extra-nodal organs, especially the gastrointestinal tract and the head and neck regions. [10]Non-Hodgkin lymphoma is relatively rare among Africans, but the high incidence of Burkitt's lymphoma (BL) in children in north and sub-Saharan Africa makes the overall lymphoma prevalence higher than the world average. [3, 11]Burkitt's lymphoma (BL) is also endemic in Nigeria, accounting for 39% of all childhood malignancies, with a male predilection.[12]

The clinical presentation is largely determined by the anatomical distribution of the disease, the clinical stage of the disease, the age of the patients, and the presence of underlying diseases.[9] Two-thirds of NHL and virtually all HL present as enlarged, non-tender lymph nodes, usually greater than 2cm.[8] The remaining one-third of NHLs show heterogeneous extra-nodal manifestations such as in the major salivary glands, paranasal sinuses, mandible, maxilla, skin, brain, and Waldeyer's ring, which is greatly dependent and often characteristic of the specific NHL subtype. [4,9,13] Staging of lymphomas helps define the location and extent of the disease, forecast prognosis, and provide a baseline for evaluation of disease progression or otherwise and comparison between different studies.[14] The Ann Arbor classification is a widely accepted clinical staging system and includes four stages with sub-classification based on the absence (A) or presence (B) of the following symptoms: unexplained fever (greater than 101degree F), drenching night sweats, and/or unexplained weight loss of greater than 10% of normal body weight.[4]

Hodgkin lymphoma is characterized by the appearance of Reed-Sternberg (RS) cells, a specific type of lymphoid precursor cell identified on lymph node biopsies of patients with a peculiar morphological appearance, bi- or multinucleated, with large round to oval nuclei.[10] Histologically, it is classified into nodular lymphocyte predominant and classical HL, which includes lymphocyte predominant, nodular sclerosing, mixed cellularity, and lymphocyte depleted based on the ratio of RS cells to the lymphocytic population. In addition, NHLs are characterized by diffuse or nodular sheets of lymphocytes or lymphoblasts without Reed-Sternberg cells.[8] The proliferating lymphocytic-appearing cells show varying degrees of differentiation: low-grade, intermediate-

grade, and high-grade lesions. The management of head and neck lymphomas depends on a detailed history and examination, the clinical stage, and the histological grade of the lesion. Chemotherapy alone will often suffice for patients with stages I and II of Hodgkin lymphoma. However, stage III or IV disease requires chemotherapy with adjuvant radiation therapy if significant mediastinal involvement or residual disease is detected. The prognosis is therefore better for patients with stage I and II disease.

Lymphomas of the head and neck are rare. Studies [12, 15]in Nigeria have focused more on NHL because Burkitt lymphoma is endemic in Africa. However, only a few studies have been done on lymphoma with a focus on the head and neck in low- and middle-income countries. Furthermore, there is a dearth of information on the pattern of presentation of lymphomas in the head and neck. [1]Meanwhile, findings about patterns of presentation are important in order to draw the attention of the clinician, raise awareness of the common sites of occurrence and the common age groups affected, raise early suspicion, and ensure early diagnosis and a good prognosis. This study therefore aimed to analyze the presentation of head and neck lymphomas spanning over fifteen years at the Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) with respect to demographics, anatomical sites, and histopathologic parameters to determine the prevalence of disease and possibly add to the existing body of knowledge. The objectives include: to determine the prevalence and demographic indices (age and sex) of head and neck lymphoma cases seen over the study period; to document the histopathologic subtypes; and to determine the association between the anatomical sites and histopathologic subtypes of lymphomas.

MATERIALS AND METHODS

This was a retrospective study of fifty-four (54) consecutive patients with histologically diagnosed lymphomas seen between 2005 and 2019 at the departments of oral medicine, oral pathology, and morbid anatomy and forensic medicine at the Obafemi Awolowo University Teaching Hospital Complex, Nigeria. The study was conducted in accordance with the Declaration of Helsinki and approved by our institution's Ethics Committee Board with protocol number IPH/OAU/12/1638. Histologically diagnosed lymphoma of the head and neck within the study period (2005–2019) was retrieved from hospital records in September 2021. Data collected include: patients' age, sex, anatomical site of the lesion, histologic diagnosis, and the year of diagnosis. The findings were carefully recorded on a spread sheet. Patients' records with incomplete data were excluded from the study. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 21. Descriptive analysis was done for age, sex, anatomic sites, and histologic diagnosis using frequency tables and line graphs. The analysis of continuous variables—ages of the patients—was done using mean, median, mode, and standard deviation. The association between the site of presentation and histologic diagnosis was tested using the Fisher's exact test, with a p-value of 0.05 (5% level of significance) as the acceptable level of significance.

Results: The clinico-demographic profile of patients with head and neck lymphoma

The total number of lymphomas diagnosed between 2005 and 2019 was **175**. Head and neck lymphoma accounted for 54 of the cases; thus, the prevalence of head and neck lymphoma was **30.9%**. Non-Hodgkin lymphoma (46) was more common than Hodgkin lymphoma (8), with a ratio of 5.8:1, respectively. The occurrence of head and neck lymphoma showed sex predilection, with a twice-occurrence in males for every female (M: F, 2.4:1), with lesions mostly reported in the third to fourth decade of life (35.2%). More than half of the lesion

occurred in the cervical lymph node (51.8%), with over three-quarters of the lesion diagnosed as non-Hodgkin lymphomas (85.2%), as shown in Table 1. In addition, the cervical lymph node was most involved with both types of lymphoma (HL and NHL), while the supraclavicular lymph node and jaw were commonly involved with NHL. (Table 1)

Table 1: Clinico-demographic profile of patients with head and neck lymphoma

Variable		Frequency	Percentage (%)
Agegroup	0-19	10	18.5
	20-39	19	35.2
	40-59	14	25.9
	60-79	11	20.4
	Total	54	100.0
Sex	Male	38	70.4
	Female	16	29.6
	Total	54	100.0
Anatomic Site	Cervical lymph node	28	51.8
	Submandibular lymph node	1	1.9
	Supraclavicular lymph node	8	14.8
	Submandibular gland	1	1.9
	Scalp	1	1.9
	Sinonasal	1	1.9
	Oropharynx	2	3.8
	Neck	3	5.6
	Jaws	6	11.1
	Frontal skull	1	1.9
	Infraclavicular lymph node	1	1.9
	Tonsils	1	1.9
	Total	54	100.0
Diagnosis	HL	8	14.8
	NHL	46	85.2
	Total	54	100.0

Figure 1, shows the change in patterns of presentation over time. The number of cases nose-dived from 2008 to 2009 and rose steadily with a peak in 2012. Two-thirds of the cases of NHL were seen between 2012 and 2019.

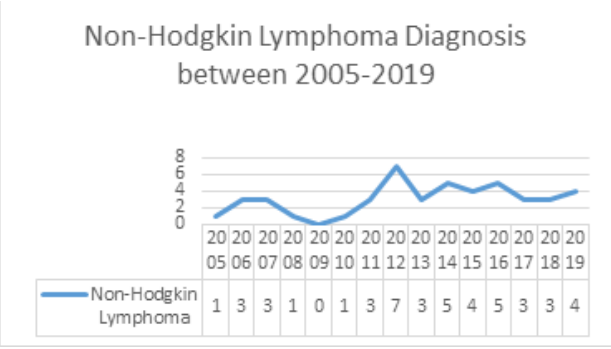

Figure 1: Pattern of patient presentation diagnosed with NHL over the study period

Eight cases of HL were seen within the study period. The line graphs showed the change in the pattern of presentation over time, with most cases seen between 2010 and 2012.

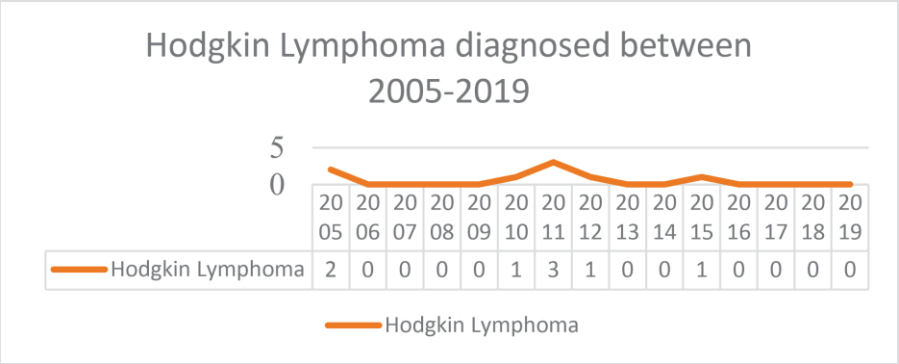

Figure 2:Pattern of patient presentation diagnosed with HL over the study period.

Age and Sex Structure of Patients Diagnosed with Non-Hodgkin Lymphoma and Hodgkin Lymphoma

All the histologic variants of lymphoma were seen to affect males than females except for the unclassified variant of HL which affected males and females equally. Low grade and intermediate grade NHL affected older individuals (mean age 52.9 years, 46.0years respectively) while High grade and Miscellaneous subtypes affected younger individuals (39.3 years, 38.7 years respectively). HL generally affected younger individuals. (Table 2)

Table 2: Age and Sex Structure of Patients Diagnosed with Non-Hodgkin Lymphoma and Hodgkin Lymphoma

	NHL			
	Low grade	Intermediategrad	High grade	Miscellaneous
No of patients	7	14	7	18
Females	2	4	3	5
Males	5	10	4	13
Ages	No. of cases	No. of cases	No. of cases	No. of cases
7-19	1	1	1	3
20-29	0	3	2	1
30-39	0	1	1	7
40-49	2	1	0	3
50-59	0	5	1	2
60-69	3	2	2	1
70-79	1	1	0	1
Mean age	52.9	46.0	39.2	38.7
Mean age F	45.5± 0.7	45.5± 4.7	60.0±6.5	37.6±24.0
Mean age M	55.8±22.5	46.0±14.0	23.5±7.0	39.0±15.7
	HL			
	Lymphocyte depleted	Lymphocyte Rich	Nodular sclerosis	Unclassified
No of patients	1	2	1	4
Sex (F:M)	0:1	0:2	0:1	1:1
Age range	24	9-24	9	6-30
Mean age	24	16.5	9	17.8
Mean age F	-	-	-	18±16.9
Mean age M	24	16.5±10.6	9	17.5±13.4

Table 3 reveals the relationship between histologic behaviour and involved anatomic sites of patient diagnosed of NHL. The cervical lymph node (23; 50.0%) was the most common nodal site. The most common extra-nodal site was the jaw (5; 10.9%). Eighteen (39.1%) cases of NHL were diagnosed histological as miscellaneous while high and low grade had seven (15.2%) cases each. The relationship between the histologic behaviour and anatomic site was statistically significant (p<0,001). (Table 3)

Table 3: Relationship between the histologic behaviour and anatomic sites of NHL

Variable	Biologic behaviour (NHL)						
		Miscellaneous	Intermediate grade	High grade	Low grade	Total	P value
Anatomic sites	Cervical lymph node	10	9	1	3	23	0.001
	Frontal skull	0	0	0	1	1	
	Infraclavicular Lymph node	1	0	0	0	5	
	Jaw	1	1	3	0	5	
	Neck	1	1	0	1	2	
	Oropharynx	1	0	1	0	1	
	scalp	1	0	0	0	1	
	Sinonasal	1	0	0	0	1	
	Submandibular gland	0	1	0	0	1	
	Tonsil	0	0	1	0	1	
	Supraclavicul ar Lymph node	2	2	1	2	7	
		18 (39.1%)	14 (30.4%)	7 (15.2%)	7 (15.2%)	46	

p-value: <0.001*** Fisher's Exact Test = 73.466 ***Significant at 1% level

Table 4 depicts the relationship between histologic behaviour and involved anatomic sites of the patients with Hodgkin Lymphoma. The cervical lymph node (62,5%) is the mostly affected, with the jaw (12.5%) being the only extra-nodal site involved. The unclassified HL was most common histological diagnosis (3; 37.5%), while lymphocyte depleted was seen in only one patient (12.5%).(Table 4)

Table 4: Relationship between the histologic behaviour and anatomic sites of HL

Variable		Biologic behaviour HL					
		Lymphocyte depleted	Lymphocyte Rich	Nodular sclerosis	Unclassified	Total	P value
Anatomic site	Cervical lymph node	1	0	1	3	5 (62.5%)	0.001
	Jaw	0	1	0	0	1 (12.5%)	
	Submandibular Lymph node	0	0	0	1	1 (12.5%)	
	Supraclavicular	0	1	0	0	1 (12.5%)	
		1 (12.5%)	2 (25.0%)	2 (25.0%)	3 (37.5%)	8	

Fisher's Exact Test = 69.946. ***Significant at 1% level

DISCUSSION

We reported a higher prevalence of lymphoma (30.9%), which contrasted with other studies.[6, 16] However, this is lower than the prevalence (40.2%) reported by Amusa et al.[17] While their study focused on head and neck malignancy, irrespective of any specific cancer, we considered the incidence of lymphoma sited in the head and neck among all the lymphoma cases seen within the study period. This may account for the dissimilarity. Most studies[1,3,18] found a male predilection for head and neck lymphoma, though the sex incidence varies between studies. However, our findings revealed that most patients presented within the third to fourth decade. While we found a peak incidence in the third decade, in contrast, a similar local study[3] found a peak incidence of head and neck lymphoma in the second decade. This discrepancy could be explained by the different methodology adopted. Their study was not specific to head and neck lymphoma. It also considered environmental exposures and working conditions that are often linked to uncontrolled lymphoproliferation, which tends to occur in male-driven careers such as industrial or engineering work.[19] This may be responsible for the bias toward males. However, the occupation of the patients was not assessed in this study.

Non-Hodgkin lymphoma was commoner than Hodgkin lymphoma in this study. This is consistent with previous studies.[2,3,20] Lymphoma progresses as a slow lesion of the lymph node, with non-Hodgkin lymphoma having more extra-nodal spread compared to Hodgkin lymphoma, which may be responsible for this finding. Besides, Hodgkin lymphoma is almost always limited to the lymph node, with more systemic dissemination. The cervical lymph node was the most common site of presentation of lymphoma in the head and neck,[1,2] while the jaw bone was the most common extra-nodal site of presentation. Other similar studies[12, 15, 21] have reported this finding, which is also consistent by our findings. A study[18] in north-eastern Nigeria, however, found the maxilla as the commonest site of presentation of lymphoma. Other studies[2, 22] showed palatine tonsils as the commonest extra-nodal site. There are several risk factors identified as being associated with the risk of lymphoma. HIV is highly associated with the risk of both HL and NHL.[23] A report of the Joint United Nations Programme on HIV/AIDS (UNAIDS) predicted that new HIV infections would increase by 31% from 2001 to 2013.[23] However, Nigeria has experienced a steady decline in the prevalence of HIV since 2005 (4.4%) to 2013 (3.4%), attributed to effective reporting and an interventional system.

The spike noticed in both types of lymphoma in this study could not be attributed to HIV/AIDS, as none of the patients included in the current study were HIV positive at the time of routine screening. This finding is comparable to an earlier study[15] conducted in Nigeria. However, Epstein-Barr virus and Helicobacter pylori remain two well-known risk factors for lymphoma. These pathogens were not assessed in this study. Larrson et al,[24] also found an increase in body mass to be positively associated with the risk of NHL and HL, as well as with NHL mortality. However, a more recent study[25] found no association between obesity and lymphoma-specific survival in patients with diffuse large B-cell lymphoma and small lymphocytic lymphoma. Obesity has been on the increase in Nigeria, with more prevalence in the southern region. [26]But while this may be responsible for the increase in the number of cases seen, it will require future studies to confirm this observation. Non-Hodgkin lymphoma is more prevalent than Hodgkin lymphoma in both sexes.[6,7] In contrast to our findings, Abdel Sater et al[20], in a comparative study of Hodgkin and non-Hodgkin lymphoma in Lebanon, reported non-Hodgkin lymphoma to be more prevalent in both sexes but showed a significant male predilection in Hodgkin lymphoma. Interestingly, in the Hodgkin lymphoma group, all the subtypes of HL were seen in males except the mixed

cellularity. This should be interpreted with caution due to the limited number of HL seen within the study period.

Although the majority of NHL arises in the lymph node, primary extra-nodal lymphomas of the head and neck are relatively rare[17], with the involvement of the oral cavity being particularly rare, accounting for 0.1–5%. [13, 15]When lymphoma occurs in the oral cavity, it could either involve the soft tissue or arise centrally within bone. Gusenbauer et al[27], reported a case of NHL of the mandible. We also found more jaw involvement (33.3%; 5 of 15) of all extra-nodal NHL seen within the study period. One of the five cases of jaw involvement involved both the maxilla and mandible. Involvement of only the mandible was seen in one case, supporting the rarity of NHL in the mandible[27]. The other three cases involved the maxilla only.Burkitt lymphoma is endemic in Africa and accounts for the high prevalence of NHL seen in low- and middle-income countries. Three of the five cases of NHL affecting the jaw are high-grade NHL, and all were histologically diagnosed as Burkitt lymphoma. BL is a small-cell non-cleave malignant lymphoma classified as high-grade NHL. NHL is also commonly seen in adults, although the more aggressive high-grade NHL is mostly reported in children.[28] Burkitt lymphoma is the most common malignant jaw tumor among Nigerian children. [21,29]

A group of American pathologists devised the Working Formulation (1982) for grading NHL. NHL was broadly classified into low, intermediate, high, and miscellaneous-grade lymphomas. Although the working formulation was simple to use and generally acceptable, many recently described lesions were not considered in this classification. The Revised European American Lymphoma (REAL) classification was proposed in the early 1990s. This system of classification employed a combination of histopathologic features, immunologic cell surface markers, and gene rearrangement studies to categorize lymphoma. The World Health Organization (WHO) also recently revised its lymphoma classification based on the REAL system of classification, with the modified REAL classification. These classifications appear to be more precise than the working formulation. However, we adopted the Working Formulation due to the unavailability of molecular studies in our center. Thus, HL in this study was classified into nodular sclerosis, lymphocyte-rich, lymphocyte-depleted, and unclassified based on the ratio of RS cells to the lymphocytic population. Most of the non-Hodgkin lymphoma cases fell into the miscellaneous category. This is due to the fact that many of the NHL diagnoses were unclassified, which could be related to the limited diagnostic resources in the facility. Intermediate-grade NHL was the second-commonest class, of which diffuse large B-cell lymphoma accounted for the majority of the cases. This is in agreement with what is found in the literature.[18]

Advancements in diagnostic technique (light morphologic, phenotypic, and genotypic) as well as distinct clinical findings have led to the recent classification of HL. Nodular lymphocyte-predominant Hodgkin's lymphoma is regarded as a separate entity from classic Hodgkin's lymphoma (CHL).[13] CHL comprises the following subtypes: nodular sclerosing, mixed cellularity, lymphocyte-depleted, and the diffused form of lymphocyte-rich. However, this classification was not used due to the retrospective nature of this study, as the diagnosis was made using the old classification. So, patients with nodular sclerosis or lymphocyte predominance types of HL have stage I-II disease and are usually free of systemic manifestations. However, patients with disseminated disease (stages III–IV) or the mixed cellularity or lymphocyte depletion subtypes are more likely to have constitutional symptoms such as fever, night sweats, and weight loss.[4]

High-grade and miscellaneous NHL were associated with poor prognosis. In the NHL

group, the mean age declined (4th decade) as the grade of the disease increased or became more severe. This is in agreement with an earlier local study. [12,18] A similar study [2] conducted in Germany also reported a similar result. Ironically, there is a marked decline in the incidence of high-grade non-Hodgkin lymphoma compared to what was earlier reported in Ile-Ife, Nigeria.[12] Such a decline was also observed in a similar study[3] conducted in Ibadan and was attributed to improved living conditions and greater control of malaria, which is a predisposing factor for developing the disease.[3] HL disease has a bimodal age distribution, with a first peak between 15 and 35 years and a second peak at 65 years and a slight male preponderance. [30,31] but we could not confirm this assertion due to the limited number of cases. Poor health financing and insurance remain a major hindrance to access to quality health care. This may be responsible for poor utilization of advanced diagnostic techniques, as patients are required to pay out of pocket. A future study on the prognosis and survival trends of patients with head and neck lymphoma in low- or middle-income country settings is therefore desirable.

Conclusion

Non-Hodgkin lymphoma was more common than Hodgkin lymphoma in the head and neck regions in this study. Cervical lymphoma nodes were the commonest sites in both HL and NHL, while the commonest extra-nodal site of involvement remains the jaw bone, with the maxilla being mostly involved. In addition, high-grade lymphomas were mostly seen in younger patients.

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Seizures Associated with Povidone-Iodine-Impregnated Antral Pack in a Child: a Case Report and Review of the Literature

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ABSTRACT

This is a case of an 11-year-old patient diagnosed of suppurative osteomyelitis of the right maxilla. He had incision and drainage with sequestrectomy under general anaesthesia, and povidone-iodine-impregnated antral pack. About 60 hours after surgery, the patient started having generalized, tonic-clonic seizures, with six episodes on the first night-- each lasting about one minute with post-ictal vomiting. An initial assessment of meningitis (to rule out cerebral abscess) was made. The seizure episodes which lasted for three days gradually reduced, and completely subsided 24 hours after the removal of the antral pack. However, when the patient had a CT scan with iodine-based contrast as requested by the paediatric neurologist (to rule out cerebral abscess), the episodes went up significantly again for another 24 hours, after which they reduced and finally subsided 48 hours after contrast administration. Povidone-Iodine (PVI) slowly liberates free iodine to exhibit its broad range of microbicidal activity. However, depending on the amount of iodine absorbed, there is a possibility of iodine toxicity, with different systemic manifestations including seizures, especially in children. The seizure is believed to be a result of disruption in the blood-brain barrier by free iodine from PVI and the iodine-based contrast medium. Therefore, caution should be taken in using PVI as an antiseptic agent in antral packs or on any mucosa surface, especially in children.

INTRODUCTION

Povidone-Iodine (polyvinylpyrrolidone iodine) is an iodophor solution, a combination of 9- 12.0% elemental iodine and polyvinylpyrrolidone.[1] Being a potent antiseptic agent effective against strains known to be resistant to other agents, [2,3], it its use for different purposes, including preoperative preparation of the skin and mucous membranes, and as an antiseptic for the treatment of contaminated wounds and disinfection of surgical equipment[2] is not surprising. However, caution is advised in its use because some adverse systemic effects of iodine have been reported with povidone-iodine (PVI) use. These include anaphylaxis, dermatosis, diarrhoea, renal failure, metabolic acidosis, abnormal thyroid function, hypernatremia, neutropenia, and mental status changes (rarely), seizures and death.[2,4,5,6] Systemic toxicity is usually attributable to the absorption of iodine into the systemic circulation.[2,7] We present a case of a patient who had sequestrectomy on account of maxillary osteomyelitis, with episodes of seizures following the use of a PVI-impregnated antral pack.

CASE REPORT

An 11-year-old male patient presented to the oral and maxillofacial surgery clinic with a

chief complaint of recurrent left-sided facial swelling and pus discharge from the left eye and cheek of one-week duration. There was a prior history of toothache on the same side of more than 1 year duration, for which the patient has used different kinds of unnamed over-the-counter drugs. He had a similar condition on the right side about six years prior to this presentation for which he underwent surgery under general anaesthesia. The departmental protocol for antral packing then was the use of tincture of benzoin compound (TBC) as the antiseptic. No known medical condition was reported.

Examination revealed a young patient in no obvious distress, pale, not dehydrated, acyanosed, anicteric, but with palpable tender cervical lymph nodes. There was obvious facial asymmetry, evidenced by a diffused left-sided facial swelling with pus discharge from the lateral canthus of the left eye and cutaneous discharging sinus around the left zygomatic arch, just about 2cm anterior to the tragus of the ear. Temporomandibular joints were palpable, not tender but with limited movement. Intra-oral examination revealed limited mouth opening with very poor oral hygiene and fetor oris. There were anterior, left and right maxillary wall defects with free oro-antral communications, and pus discharge from the left side. There were also retained roots of canine, first and second primary molars on the left maxillary arch.

A craniofacial CT scan showed erosion and sclerosis of the left maxillary, nasal, and zygomatic bones, suggestive of osteomyelitis. Further investigations showed haematocrit of 13.9%, and the microbial culture result revealed staphylococcus aureus, sensitive to ceftriaxone and augmentin. A diagnosis of chronic suppurative osteomyelitis of the maxilla in an anaemic patient was made. The patient was optimized with four units of blood and had incision and drainage with sequestrectomy under general anaesthesia via an upper vestibular incision. The retained roots were extracted and the maxillary defects were closed and packed with a povidone-iodine-impregnated single roll of gauze. Intravenous antibiotics were administered based on the sensitivity results. However, about 60 hours after surgery, the patient started having generalized, tonic-clonic seizures with about six episodes on the first night, each lasting about one minute with post-ictal vomiting. Subsequent breakthrough seizures were controlled with IM diazepam. The patient was reviewed by the paediatric neurologist and an assessment of meningitis (to rule out cerebral abscess) was made. He was commenced on IV chloramphenicol 100mg/kg/day in addition to already prescribed antibiotics, and a fresh CT scan was requested.

The seizure episodes lasted till the antral pack was removed five days post-operatively. Afterwards, the episodes of seizure subsided significantly at about 24 hours after antral pack removal. Nonetheless, the patient still went for the CT scan as requested by the paediatric neurologist (about 48 hours after antral pack removal), which required the administration of a contrast, and an iodine-based contrast was used. The brain CT scan showed no demonstrable intracranial abscess or features suggestive of inflammation. However, the episodes of seizure went up again after the CT scan for another 24 hours, after which it gradually subsided, till none was recorded 48 hours after contrast administration. The patient's condition improved significantly; he recommenced feeding orally, and was subsequently discharged.

DISCUSSION

Povidone-Iodine (Polyvinylpyrrolidone iodine (PVI) is an iodophor solution that slowly liberates free iodine to exhibit a broad range of microbicidal activity against bacteria, fungi, protozoa, and viruses.[1] It has strong pharmacological activity against S.

aureus, N.gonorrhoea, syphilis, P. aeruginosa, hepatitis B virus, HIV, and T. vaginalis.[1] PVI has been used safely and effectively for various purposes for many years, including continuous irrigation to treat mediastinitis after median sternotomy.[2,8.] Its mechanism of action involves free iodine release and penetration of the cell wall of microorganisms and a quick lethal effect through the lipid iodination and oxidation of the cytoplasmic membrane of compounds. This disrupts protein and nucleic acid synthesis.[1] Though PVI is mostly generally considered safe for clinical use, a literature search showed that there is a possibility of iodine toxicity, which is often dependent on the amount of iodine absorbed.[4,9]

The absorbable quantity of iodine is a function of the concentration of the solution, the route of administration, and the duration of contact.[4,9] Iodine is more easily absorbed through the mucosa compared to skin. In our case, the concentration was 10%, and it is believed that the antral mucosa as well as the raw surfaces following the sequestrectomy most likely provided a faster absorption route for the free iodine. Also, the first two days of antral packing seemed to have provided enough duration of contact, as the first episodes of the seizures were recorded about 60 hours after surgery.

Meningitis as an initial differential diagnosis by the pediatric neurologist was very important as it is usually the first diagnosis to be considered in patients with fever, headache, altered mental status and neck stiffness.[10] Being a medical emergency, delays in instituting effective antimicrobial treatment of acute bacterial meningitis may worsen morbidity or mortality.[10] Similarly, cerebral abscess is a potentially fatal injury that must be treated promptly to avoid further complications.[11] Though the clinical presentation is usually non-specific, raised intracranial pressure, seizures, and focal neurological deficits (as was evident in this case) are the most common forms of presentation.[11] Therefore, early diagnosis with the aid of radiologic investigation using contrast enhanced CT scan or MRI, and with adequate subsequent treatment, is vital to the patient's full recovery.

The reduction in the seizure episodes at about 24 hours after the removal of the pack gave the first hint on the link between the PVI and the symptom in this case. While the surge in the seizure episodes after taking the requested CT scan (with the administration of iodine–based contrast agent) suggested that a similar substance was responsible, iodine-based contrast media for radiology imaging induces neurologic adverse effects, including seizures.[4,12] This supported our suspicion that the surge in the episodes of seizures was likely due to the increase in the serum levels of iodine and the known neurotoxicity induced by the injected iodine-based contrast medium.

Serum iodine levels was requested, but could not be done due to the patient's financial incapacity. However, the fact that the episodes of seizure completely subsided 48 hours after contrast administration, gave us reason to believe that the initial episodes were most likely precipitated by the high concentration of iodine in the bloodstream. The seizure may be explained by the ability of free iodine from PVI and the iodine-based contrast media to disrupt the blood–brain barrier through either the osmotic and hydrophilic qualities of the agent or the presence of ionic changes and lipid solubility.[2] Other studies have corroborated the adverse effects of using PVI in children.[5,9] We therefore recommend caution in using PVI as an antral pack or any other mucosal surface, especially in children. Alternatively, further dilution of the solution should be done to reduce the concentration of absorbable iodine through the mucosa, or, better still, a totally different antiseptic should be used.

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