



Oral Health Related Quality Of Life Following Intra-Alveolar Exodontia In Patients Attending A Nigerian Tertiary Facility.

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Abstract:

Background: This prospective study describes patients' perceptions on changes in the oral health-related quality of life (OHRQoL) following intra-alveolar exodontia.

Methods: 204 patients who required intra-alveolar exodontia under local anaesthesia, and whose baseline Quality of Life (QoL) were considered unaffected (total score ≤ 14) by indication for tooth extraction were included in the study. Respondents completed a modified "health related QoL" (OHIP-14) questionnaire by the POD3.

Result: 53.4% of subjects were aged 18-44 years, and 56.9% of them were females. Apical periodontitis was the indication for 39.2% of extractions, 69% of subjects reported a deterioration in QoL, though, the majority were mild (52%), 14.2% were reported as "quite a lot affected" and only a 2% were reported as "very much affected". The combined percentage of subjects affected mildly, moderately and severely was 81.4% for difficulty with chewing; 76.9% for altered ability to swallow; 82% experienced changes in diet variation. Enjoyment of food was altered in 79.4%; 87.2% of subjects had difficulty in speaking / voice alteration; tasting of food was affected in 75%, and only 41.4% expressed challenge with ability to be understood. Only a range of 19.2 to 31% of these subjects were affected significantly (moderate to severe).

Only 3.6% reported changes in physical appearance due to swelling. Sleep and duty impairment were rarely encountered (9.3% had interrupted sleep and 11.4% had problem falling asleep). 20.7% of the respondents were not able to perform their duties at work while 20% of them lost 1-3 days at work and 22.9% did not keep up with social activities.

Conclusion: A guide to answering patients' enquiries around expectations following intra alveolar extractions is provided. Chewing and eating are most likely to be affected by intra alveolar extraction, Speech, sleep and social activities are least affected. 2 in 10 patients may need one to 3 days off work. A prospective study designed to identify the specific risk factors contributing to the deterioration in each domain of subjects' QoL on a larger sample size is desirable.

Keywords: Intra-alveolar, Dental Extraction, Oral health related quality of life

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Introduction

Intra-alveolar extraction is the commonest procedure in most Oral Surgery clinics [1]. It is a painless removal of teeth from the dental alveolar portion of the maxilla or mandible [2] performed on clinically visible teeth, usually under local anaesthesia. It requires the use of instruments to luxate and extract the tooth. Typically, luxation is done using an elevator, while the extraction itself is done using an appropriate dental extraction forceps.

Although the hallmark of modern dentistry is tooth conservation, extraction is indicated when all conservative attempts have failed [3] or occasionally when patients cannot afford conservative alternatives [4]. Indications for extraction in the Nigerian population include dental caries, periapical pathology, periodontal disease, tooth fracture, malocclusion, among others. The effect of routine extraction on a patient's quality of life (QoL) deserves proper evaluation especially among Nigerians where a significant proportion of the population continue to experience routine extraction.

During dental extraction, local anesthesia eliminates pain sensation,

but the mechanical maneuvers accompanying exodontia are still felt. In some patients, pain sensation persists despite the administration of local anesthesia [5]. Additionally, some visible teeth prove difficult to extract for reasons, such as unfavourable root morphology, gross carries, or other intra-operative complications of routine extraction. A more invasive approach, (trans-alveolar which involves raising a mucoperiosteal flap, and bone removal) is often resorted to. Following exodontia, post-operative instructions are delivered to the patients with the primary aim of securing the blood clot in the socket, keeping the extraction socket clean, and promoting healing. Smoking for instance (a factor proven to impair wound healing and significantly increases the chances of having a dry socket), is discouraged, while most clinicians mandate warm saline mouth baths commencing 24 hours post extraction to maintain health and promote healing of the socket [6]. Alveolar osteitis (dry socket), a common complication of exodontia is a very painful clinical condition, often attributed to dislodged or disintegrated blood clot, and leads to delayed healing of the extraction socket [7]. Other complaints such as postoperative discomfort and pain, inability to perform daily activities and altered pattern of feeding may accompany exodontia. Functional limitation, discomfort and disability are prominent indicators of deterioration in QoL [8], which should be put into consideration while planning for extraction. QoL, described as a comprehensive total satisfaction or dissatisfaction of a patient's life [9] is a widely known concept that has been investigated in many areas, with a number of medical instruments for its subjective assessment [10]. One of such instruments for the subjective assessment of oral health and QoL after oral surgical procedures is the adapted version of the questionnaire Oral Health Impact Profile-14 (OHIP-14) [11]. The OHIP-14 is a 14-item questionnaire designed to measure self-reported functional limitation, discomfort and disability attributed to oral conditions [12]. In this model the consequences of oral disease are hierarchically linked from a biological level (impairment) to a behavioural level (functional limitation, discomfort and disability) and lastly to the social level (handicap). The OHIP-14, is a short, and reliable-questionnaire, sensitive to changes and with adequate cross-cultural consistency [13]. Deterioration in QoL following surgical extraction of lower third molar has been studied widely and documented in literature [4,14] but there are very few publications on QoL after intra-alveolar exodontia [15]. In practice, when preparing informed consents and postoperative instructions, clinicians stress the likelihood of pain, haemorrhage, dry socket etc but are often silent on deterioration in QoL following intra-alveolar tooth extraction. This study seeks to know if and how intra-alveolar exodontia alter the QoL in patients undergoing the procedure. We opine that our findings will help meet patients' demand for more participation in their health care decisions, and provide patients with a higher level of understanding before consenting to treatment [16].

Materials and Methods

This was a descriptive, prospective, cross-sectional study, designed to determine the changes in OHRQoL following intra-alveolar exodontia in patients attending Obafemi Awolowo University Dental Hospital, Ile-Ife, Nigeria. We targeted all consenting patients aged 18-72 years who required intra-alveolar extraction of one or more teeth under local anaesthesia. Additional inclusion criterion; was absence of underlying systemic condition. Exclusion criteria were; non-consenting patients, elective trans-alveolar extraction cases, patients aged <18 years or > 72years, presence of underlying systemic diseases and pregnancy. All patients presenting at the clinic over a 7 month period who

met the inclusion criteria were enlisted. Proposed sample size was deduced from the pattern of clinic records, an average of 50 patients undergo intra-alveolar exodontia per month. Expected target population for 7 months (50×7) was 350patients. Sample size was calculated using Taro Yamane's formula by Yamane Taro(1967) [17] which is:

$$n = \frac{N}{1 + N(e)^2}$$

Where n= Sample size; N=Target population (350 patients), and e=Sample error (0.05)

Calculated sample size therefore equals 187 patients and 206 patients giving room for 10% attrition.

Two questionnaires (preoperative questionnaire (baseline QoL OHIP14) and postoperative questionnaire (modified form of OHIP14 [11] as shown in **Appendix 1**) were employed in the study.

Patients attending the oral and maxillofacial surgery clinic at Obafemi Awolowo University dental hospital in Ile-Ife, who required intra-alveolar extraction of one or more teeth under local anaesthesia (2% lignocaine with 1:80,000 adrenaline) were provided with pre-operative QoL questionnaire(oral health impact profile). Literate patients were required to complete the questionnaire just before surgery, while illiterates were assisted to complete theirs. Respondents considered to have unaffected OHRQoL (with a score ≤14) were included in the study.

Routine dental extractions are carried out in our hospital sometimes by undergraduates, but mostly by interns and registrars after a diagnostic radiograph, and thorough pre-surgical assessment. Patients are placed on analgesics routinely (Acetaminophen 1000 mg 8 hourly prn x 2-3 days). Prescription of antibiotics is reserved for infected cases or traumatic extractions. Routinely our patients commence use of warm saline mouth bath 24 hours after surgery and carry on in this till POD 7 -14 depending on rate of healing. Postoperative review takes place on POD 7 unless otherwise indicated ie. Presence of any complaint.

The postoperative questionnaire comprised of two sections. Section A sought information on patients' age, sex, indication for extraction, type of extraction, tooth or teeth extracted, number of teeth extracted, duration of the extraction, intra-operative and postoperative complication(s). Section B was based on constructed questions on impairment with eating/diet variation, speech, physical appearance and duty. On the 3rd post-operative day, patients in study group were required to complete the modified instrument, they were reminded to do so through phone calls. Illiterate patients were assisted by appointed literate relatives or individuals around them. On the POD 7, when attending the clinic for routine post-operative review, subjects were offered an opportunity to review their completed questionnaires.

Data was analyzed using SPSS for Windows (version 16) statistical software package [18]. Oral health impact profile (OHIP) scores were computed using simple proportions and percentages, the results obtained were presented in form of tables and figures. Ethical clearance was obtained from the Institute of Public Health (Obafemi Awolowo University, Ile-Ife).

Results

A total of 213 subjects were enrolled in the study and 204(95.8%) returned their completed questionnaires for analysis. 43.1% of subjects that had routine tooth extraction were males while 56.9% were

Acknowledgement: The authors acknowledge that the source of Appendix 1 is WL Adeyemo et al 2012

females. Majority (53.4%) of them were aged 18-44 years followed by 30.9% aged 45-64 years and 15.7% aged 65-72 years. The female preponderance observed among our subjects did not attain statistical significance ($p=0.14$).

The most prevalent indications for extractions were acute apical periodontitis secondary to dental caries (39.2%) and chronic periodontitis 23.0%. Fracture (6.4%) and orthodontic treatment (3.9%) accounted for the least extractions. A total of 271 teeth were extracted in 204 patients with multiple teeth extracted in 42 patients (40.4%). The molars were the most (55.4%) extracted ranging from the 1st to 3rd molars and followed by the premolars (25.8%) (Table 2).

Figure 1 shows the summation of oral health impact profile-14 score, with 64(31%) subjects reporting no influence on their QoL while 107(52%) subjects were affected mildly; 30(15%) moderately and 3(2%) severely. We considered moderate and severe effects as being significant, i.e, a score of 29-56.

Table 3 shows variations in eating/diet, speech, physical appearance, and sleep. The combined percentage of subjects affected mildly, moderately and severely was 81.4% for difficulty with chewing; 76.9% for altered ability to swallow; and 82% experienced changes in diet variation. Enjoyment of food was altered in 79.4%; while 87.2% of subjects had difficulty in speaking / voice alteration; tasting of food was affected in 75%, and only 41.4% expressed challenge with ability to be understood. A range of 19.2 to 31% of these subjects were affected significantly (moderate to severe).

62.9% reported some form of changes in physical appearance but only 3.6% were rated significant, 16.4% of the studied population expected changes in their appearance.

There were more reports of problem falling asleep (72.1%) than sleep interruption (44.1%). Only 11.4% and 9.3% of these subjects respectively had significant alterations.

Figure 2 shows subjects' absence from work and pattern of their sleep disturbance,

Only 20.1% of the respondents were not able to perform their work or daily activities while 20% of this lost 1-3 day at work (Figure 3).

Table 4 shows 70.6% of the respondents continued with their

favourite sport and 76.9% continued with their social activities after extraction while 29.4% and 22.1% respectively stopped their favourite sport and social activities after the extraction.

Pain (28.4%) and malaise (12.7%) were the major reason for isolating themselves after tooth extraction.

Table 5 shows an analysis of variant with Difficulty with Eating as independent variable and age groups (18-44 years, 45-64 years, 65-72 years) as dependent Variable. There is a significant joint effect of age groups on difficulty in chewing ability ($p=0.01$).

Figures 4a and 4b respectively show sharp increase in difficulty with chewing ability with increasing age (beyond 44 years) and male respondents reporting more difficulty with chewing than females.

Age(years)	Males No (%)	Females No (%)	Total No (%)
18-44	52(25.5)	57(27.9)	109(53.4)
45-64	27(13.2)	36(17.7)	63(30.9)
65-72	9 (4.4)	23(11.3)	32(15.7%)
Total	61(43.1)	79(56.9)	204(100%)

$$\chi^2 = 3.87, df=2, p=0.14$$

Table 1: Characteristics of the respondents

	Indications for Extraction							TOTAL
	Irreversible pulpitis	Acute apical Periodontitis	Chronic Periodontitis	Dento-alveolar abscess	Orthodontic treatment	Retained root	Fracture	
	No (%) N=18	No (%) N=80	No (%) N=87	No (%) N=32	No (%) N=16	No (%) N=21	No (%) N=17	
	18(6.6)	80(29.5)	87(32.1)	32(11.8)	16(5.9)	21(7.7)	17(6.3)	271(100.0)
Age(years)								
18-44	11(5.4)	50(24.5)	8(3.9)	14(6.9)	8(3.9)	5(2.5)	13(6.4)	109(53.4)
45-64	6(2.9)	19(9.3)	22(10.9)	9(4.4)	0(0.0)	7(3.4)	0(0.0)	63(30.9)
65-72	1(0.5)	10(4.9)	18(8.8)	0(0.0)	0(0.0)	3(1.5)	0(0.0)	32(15.7)
Gender								
Male	9(4.4)	31(15.2)	17(8.3)	12(5.9)	2(1.0)	10(4.9)	7(3.4)	88(43.1)
Female	9(4.4)	48(23.5)	31(15.2)	11(5.4)	6(2.9)	5(2.5)	6(2.9)	11(56.9)
Tooth type								
Incisor	0(0.0)	7(2.6)	14(5.0)	0(0.0)	0(0.0)	5(1.8)	13(4.8)	39(14.4)
Canines	0(0.0)	2(0.74)	6(2.2)	0(0.0)	0(0.0)	4(1.5)	0(0.0)	12(4.4)
Premolars	2(0.7)	22(8.2)	22(8.2)	4(1.5)	16(5.9)	2(0.74)	2(0.7)	70(25.8)
Molars	16(5.9)	49(18.0)	45(16.7)	28(10.3)	0(0.0)	10(3.5)	2(0.7)	150(55.3)

Table 2: Teeth extracted by patients’ age groups, gender and indications for extraction

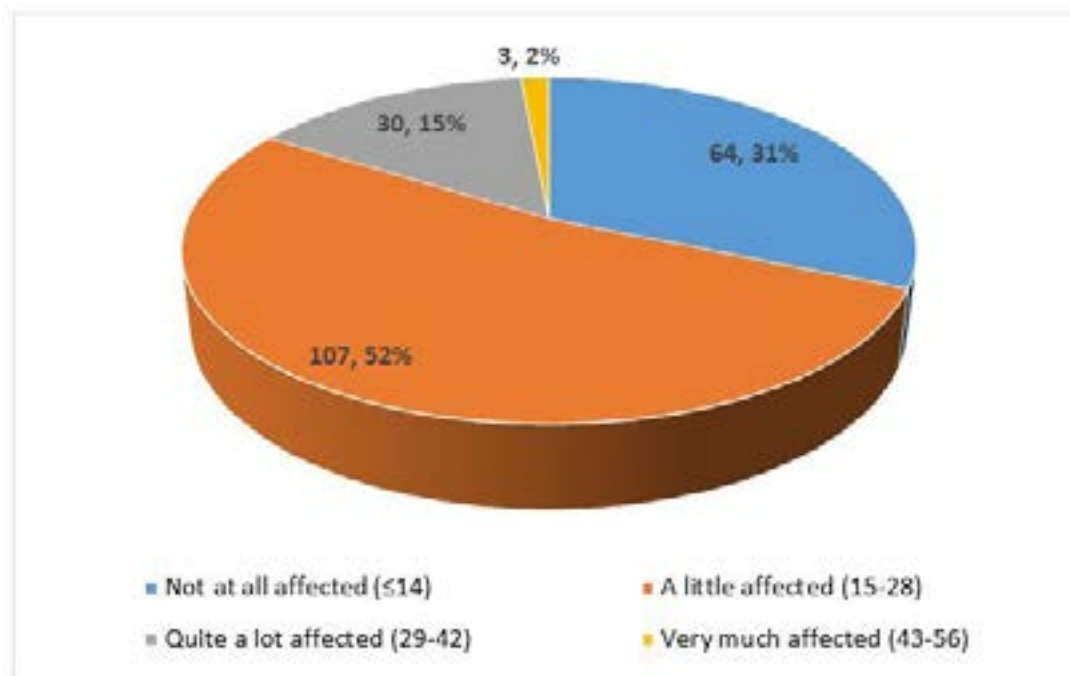
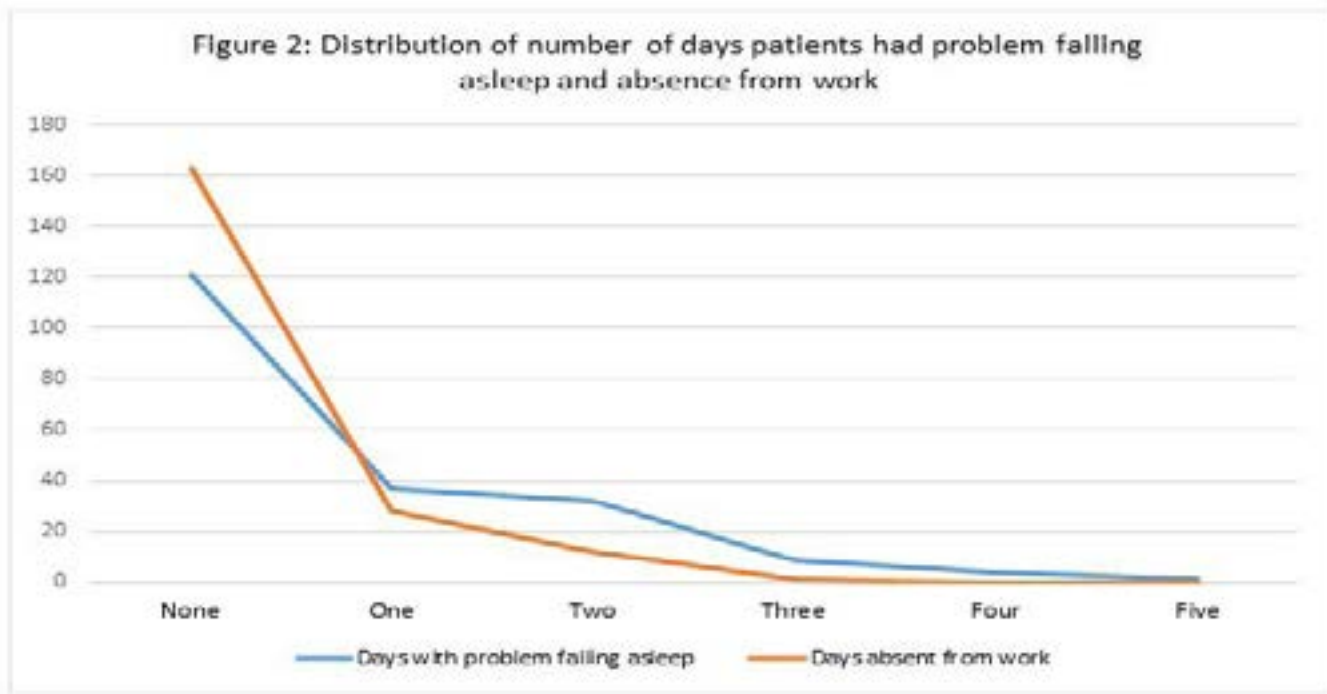


Figure 1: Summation of oral health profile-14

S/No	Variables	Expressed effects of exodontia (n=204)			
		Nil No (%)	Mild No (%)	Moderate No (%)	Severe No (%)
Eating/diet variation					
1	Ability to chew	38 (18.6)	103(50.5)	54(26.5)	9 (4.4)
2	Ability to swallow	47 (23.0)	112 (55.0)	39 (19.1)	6(2.9)
3	Diet variation	37(18.1)	122(59.8)	38 (18.6)	7 (3.4)
4	Enjoyment of food	42(20.6)	112(54.9)	44 (21.6)	6(2.9)
5	Ability to open month	57(27.9)	108(52.9)	35(17.2)	4 (2.0)
6	Tasting of food	51(25.0)	111(54.4)	38(18.6)	4(2.0)
Speech variation					
1	Voice alteration	25(12.2)	141(69.1)	35(17.2)	3(1.5)
2	Ability to speak	26(12.7)	152 (74.5)	26(12.7)	0(0.0)
3	Ability to be understood	119(58.6)	63(30.8)	19(9.3)	3(1.5)
Physical appearance					
1	Changes in appearance	76(37.3)	121(59.3)	6(2.9)	1(0.5)
2	Expectation of changes in appearance	171(83.8)	24(11.8)	7(3.4)	2(1.0)
Sleep impairment					
1	Problem falling asleep	57(27.9)	124(60.8)	23(11.3)	0(0.0)
2	Experience sleep interruption	114(55.9)	71(34.8)	19(9.3)	0(0.0)

Table 3: Eating/diet variation, speech variation and physical appearance.



Did the extraction affect your daily activities and number of days lost at work ?

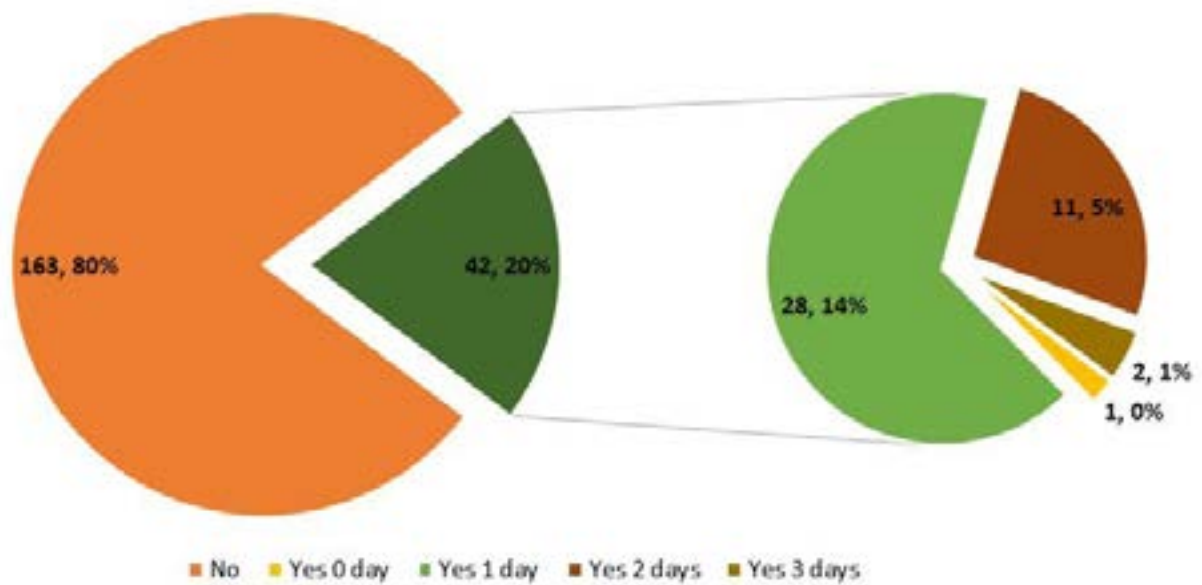


FIGURE 3: Impact of Tooth Extraction on Daily activities

PATIENTS' RESPONSE TO QUERIES ON SOCIAL ACTIVITIES AND SPORTS	Yes	No
	No (%)	No (%)
Continued with favorite sport or hobbies	144 (70.6)	60 (29.4)
Kept social activities	157 (76.9)	47 (22.1)
REASONS FOR SOCIAL ISOLATION	Yes	No
	No (%)	No (%)
Pain	58(28.4)	146(71.6)
Swelling	19 (9.3)	185 (90.7)
Physical appearance	19 (9.3)	185 (90.7)
Malaise (Feeling sick)	26(12.7)	178 (87.3)

Table 4: Patients' response to queries on social activities and favorite sport/hobbies

Source	Sum of Squares	df	Mean of Square	f	p
Regression	5.529	2	2.765	4.713	.010
Residual	80.357	137	.587		
Total	85.886	139			

Table 5: Analysis of Variance showing the joint effect of the age groups on difficulty with chewing ability among intra-alveolar exodontia patients.

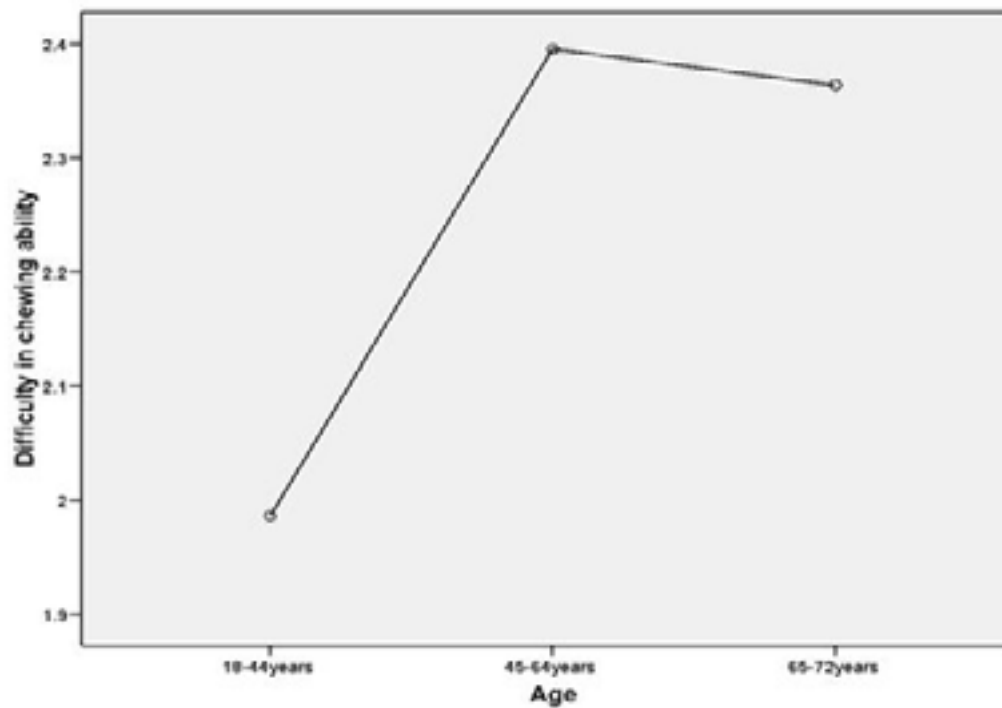


Figure 4a: A graph showing relationship between age group and difficulty in chewing ability

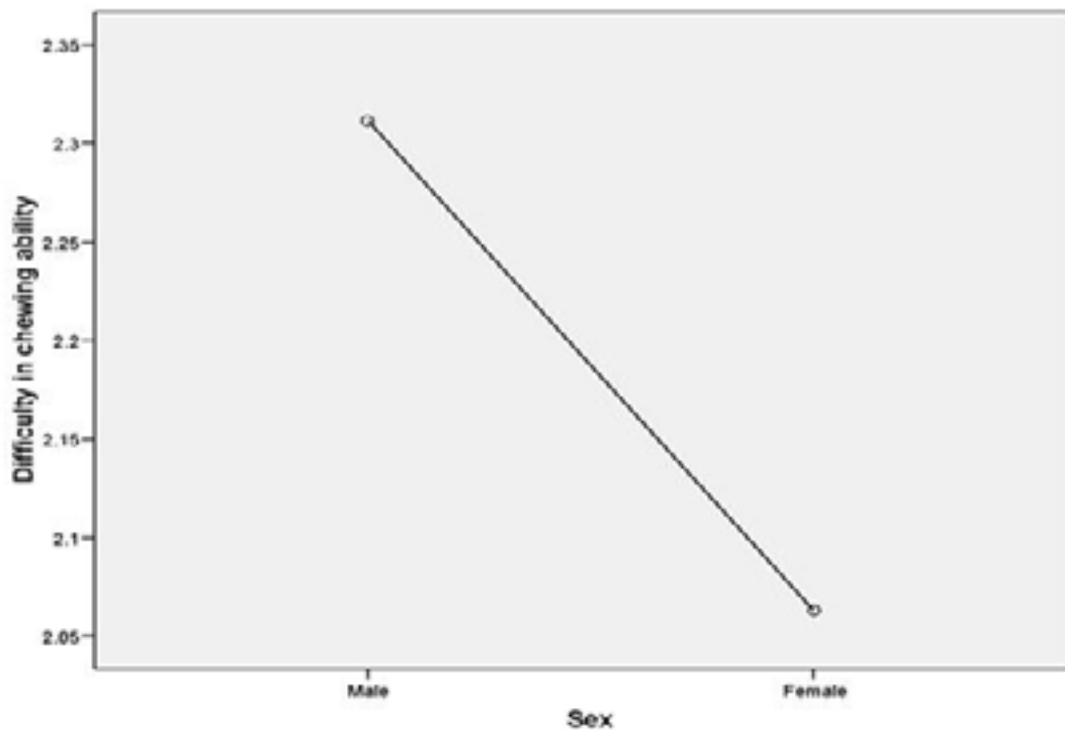


Figure 4b: A graph showing relationship between gender and difficulty in chewing ability

Discussion

In line with the Hippocratic oath, the Physician is required to first “do no harm” [19] but sometimes ‘cure’ is worse than ‘disease’ in terms of impact on quality of life; hence it is important to identify such scenarios to inform policies and guidelines and in promoting evidence based practice [20]. Understanding the sequel of dental extractions in a particular population is germane to addressing the day to day questions and inquiries from routine exodontia patients. Furthermore, patients’ contribution to their own care can be predicated largely on an evidence based knowledge of expectations and sequel of a particular procedure.

The demographics of the subjects studied are largely in keeping with findings of a retrospective study from the same study location [4] and C. McGrath et al’s documentation with third molar surgery [12].

Similarly, the pattern of reasons for intra alveolar extraction being mainly sequelae of dental caries was in concordance with previous Nigerian studies [4, 21]. These studies implicated excessive consumption of refined carbohydrate among the younger age group in the frequent occurrence of apical periodontitis as a sequela of carious lesion; unlike the older age group in which periodontal disease accounted for most extraction. A female preponderance with periodontal disease in this series is at variance with Oginni’s finding [4]; we attribute this simply to chance.

40.4 % of our patients extracted multiple teeth, ranging from 2-4 teeth; we view this as a worrisome trend that deserve some dental public health attention. Although like in the previous studies [4, 21], molars were the most extracted tooth type in the present study, this happened at a much lower frequency (55.4%) compared with an average of 67.4% [4, 21]. This may be a fall out of additive effect of tooth loss over a long period of time studied by Oginni, [4], the sub-urban nature of Ile-Ife and a much more dynamic urban nature of the Lagos population studied by Adeyemo et al [21].

With 69% of respondents in this survey reporting a deterioration in their OHRQoL, and a majority of them (52%) laying claim to mild deterioration; this contrast with Adeyemo’s values of 94% total and 60% mild deterioration which seems to reflect a similar pattern [22]. While 17% of our respondents had significant deterioration, twice as much (34%) did in Adeyemo’s group. Possible reasons for this difference could be traced to some subtle differences in our methodologies. While we excluded patients with underlying systemic diseases from the study and retained difficult extractions; Adeyemo et al did the contrary. We opine that in particular, the inclusion of patients with underlying systemic diseases in Adeyemo et al’s cases may have accounted for the marked difference observed. However other subtle factors may have also contributed. Quite expectedly, a much marked deterioration in OHRQoL has been reported in studies that examined trans-alveolar exodontia of impacted third molar [12]. This has been related to the more invasive act of raising surgical flaps, bone cutting, and sequelae such as post-operative trimus, swelling and mod-

erate to severe pain [23, 24] that accompany trans-alveolar exodontia unlike intra-alveolar.

Like other studies we examined various elements of QoL, and found eating /diet variation domain of OHIP-14 to be the most commonly affected following intra-alveolar exodontia [22]. Perhaps this is not farfetched as the act of exodontia creates a wound in the oral cavity; however the extent to which patients’ QoL is affected may be influenced by multiple factors. We opine that factors related to patients socio demographics, tooth type (anterior or posterior), pre-extraction diagnosis and pain threshold/tolerance may influence the outcome reported.

Difficulty in swallowing and chewing as well as lack of enjoyment of food were the factors indicated for the dietary changes observed in the studied population. This is in agreement with the study by Adeyemo et al (2013) [22] who reported that 24-32% of the respondents had their eating /diet variation affected. Expectedly, this is far less than the picture following third molar surgery where 81% of the respondents had difficulties in eating variation [12].

Males had more difficulty in chewing than the females, while difficulty in eating ability increased with increasing age up to 44 years. We attribute this change to the nature and frequency of feeding in this age group. A slight decline observed beyond 44 years may be due to the older patients’ potential to resort to softer diet naturally by virtue of their age and therefore less likely to be affected by the extraction.

Like Savin J et al (1997) [25] in their study following third molar surgery, and earlier intra-alveolar extraction studies we found little interference with speech variation, voice alteration, or being understood by people after intra alveolar extractions. Unlike third molar surgery where change in physical appearance with postoperative oedema is common (up to 76%), [12], only 3.6% of our cases expressed change in appearance as a result of swelling which was not pre-existing. We may attribute this to possible traumatic extractions, and varying patients’ inflammatory responses.

Sleep disturbance and loss of work hours are important components of QoL in any patient but particularly the young or middle aged patient. Minimal sleep and duty impairment were encountered in the studied population but none of these can be attributed to any of the variable we explored. We believe that a long term prospective study of a larger population size would provide more information on the risk factors for deterioration in QoL in patients undergoing intra alveolar exodontia. Nevertheless, the pattern we found suggest that 2 out of 10 intra alveolar extraction patients may require 1-3 days off work; and averagely 1 in 10 may experience problem falling asleep or interruption with sleep. Additionally 2-3 out of 10 respondents may not be able to carry on with sporting or social activities. The reasons for not keeping up with social activities are majorly pain and feeling of malaise.

Conclusion

This study provides a guide to answering patients' enquiries around expectations following intra alveolar extractions. Our findings suggest that chewing and eating are most likely to be affected by intra alveolar extraction, Speech, sleep and social activities are least affected. 2 in 10 patients may need one to 3 days off work. A prospective study designed to identify the specific risk factor contributing to the deterioration in each domain of subjects' QoL on a larger sample size is desirable.

LIMITATION OF THE STUDY

A few uncontrolled variables may affect this study outcome and limit its generalizability. Bias on the part of the respondents in filling the questionnaire and non-respondents and limited time for data gathering.

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