

## KNOWLEDGE OF CONSEQUENCES OF MISSING TEETH IN PATIENTS ATTENDING PROSTHETIC CLINIC IN U.C.H. IBADAN

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### SUMMARY

**Background and Objective:** Various causes of tooth loss such as caries, trauma, periodontal diseases, and cancer have been documented in the literature. In addition, factors that can modify these causes such as level of education, age and sex have been studied. There is however paucity of information on whether patients or people with missing teeth are aware of the side effects of tooth loss on them or on the remaining teeth. This study investigated the knowledge of consequences of missing teeth among partially edentulous patients in a teaching hospital.

**Patients and Method:** Self-administered questionnaires were distributed to the patients to collect information relating to demography, cause and duration of tooth loss, awareness of the consequences of tooth loss and their sources of information. Four clinical conditions including supra-eruption, mastication, teeth drifting, and facial collapse were used to assess the level of awareness of consequences of missing teeth.

**Result:** Two hundred and three participants were included in the study. Their mean age was  $45.5 \pm 1.8$  years. There was no significant difference between the knowledge of the consequences of missing teeth and sex or on level of education ( $p > 0.05$ ). Dentists constituted the largest source of information to these patients (25.6%) while the media constituted the least (0.5%).

**Conclusion:** The result of this study showed poor knowledge of the consequences of missing teeth among partially edentulous patients and the media that should be of assistance were equally unaware, signifying urgent need for public awareness on this subject.

**Key words:** Tooth loss, Level of awareness, Consequence of missing teeth.

### INTRODUCTION

Tooth loss could result from caries, periodontal disease, trauma, infection, malignancies, or failed endodontic treatments<sup>1,2,3,4</sup> and can present adverse consequences on the remaining dentition and on the patients' general wellbeing.<sup>3,4</sup>

Petridis *et al*<sup>5</sup> reported drifting of adjacent teeth and supra-eruption of the opposing teeth to the edentulous space in their study which looked at positional changes of adjacent teeth to edentulous spaces. Also, Kini and Muliya<sup>6</sup> observed in a case report supra-eruption of a first mandibular premolar into the space left by an upper first premolar whose coronal tissue had broken down although the whole tooth was not lost.

In addition to the drifting and supra-eruption mentioned above is a possible facial/oral asymmetry

or collapse that may result following loss of teeth. Martins-Junior and Marques<sup>7</sup> showed that premature loss of a lower right deciduous canine in an 8-year old patient resulted in deviation of the lower arch from the midline to the affected side just as Tallgren *et al*<sup>8</sup> reported facial collapse in patients with teeth and alveolar bone loss.

Mastication as a consequence of tooth loss are known by many patients<sup>9</sup> and this may be why people in this class of condition impose dietary restriction upon themselves and thereby incurring health risk.<sup>10</sup> In addition, loss of posterior teeth has been associated with impaired chewing and inadequate nutrition, the patients having the tendency to over-prepare food in an attempt to make it soft thereby losing important nutrients.<sup>11</sup>

Some studies recorded more than one consequence of tooth loss at a time. Rosenstiel *et al*<sup>2</sup> reported that failure to replace a posterior missing tooth may disrupt balance in stomatognathic system and trigger chains of adverse reaction such as drifting, rotation or supra-eruption of teeth. The consequences of these loss of teeth on the patient include altered speech, ineffective mastication, loss of self confidence, concern about appearance, and feeling of bereavement,<sup>3,4</sup> while a study<sup>13</sup> reported higher likelihood of developing ischemic stroke among study subjects with periodontal disease and less than 24 teeth in the mouth compared with those with more than 25 teeth.

Despite the enormous adverse effects of tooth loss on functional, social and psychological wellbeing of the patients as well as on the remaining dentition, many patients in our environment do not replace their missing teeth. This could be due to poor awareness that failure to replace missing teeth may cause the remaining dentition to further deteriorate. Studies have been done on socio-psychological effects of tooth loss on patient<sup>14,15,16</sup> but there is dearth of information on patients' awareness of the consequences of tooth loss on the remaining dentition. The purpose of this study therefore was to determine the knowledge of consequences of tooth loss among partially edentulous patients in a teaching hospital in Nigeria.

#### PATIENTS AND METHOD

This study was carried out among consecutive consenting patients who presented or were referred to the prosthetic clinic of the University College Hospital, Ibadan, Nigeria for replacement of their missing teeth between 2011 and 2013. Self-administered questionnaires were used to collect information from the patients. The survey questions enquired about their demography, the cause and duration of tooth loss, their knowledge of the consequences of tooth loss, four clinical conditions were used to assess patients' level of knowledge and these were supra-eruption, mastication, tooth drifting and facial collapse.

All data from the questionnaires were entered into a computer and analyzed with statistical package for Social Sciences (SPSS) version 19. Analysis included calculation of range and mean values, Chi square test was used to compare level of awareness of consequences of tooth loss against age, sex, and education. In calculating Chi square for education and level of awareness, those who did not respond were excluded from the number. Those with no education, primary and secondary education were combined into pre-tertiary education. P-values less than 0.05 was considered statistically significant.

#### RESULTS

Two hundred and three patients consisting of 99 (48.8%) female and 104(51.2%) males participated in the study. The age ranged from 11-80 years with mean age of  $45.5 \pm 1.8$  years. The majority of respondents were within the age group 21-30 years (21.2%) and 31 - 40 years (19.7%). One hundred and twenty eight (63%) of the respondents had tertiary education while only one (0.5%) had no formal education (Table 1).

**Table 1:** Socio-demographic characteristics of the respondents

	Frequency	Percentage (%)
<b>Gender</b>		
Male	104	51.7
Female	99	48.8
<b>Age (years)</b>		
11-20	12	5.9
21-30	43	21.2
31-40	40	19.7
41-50	37	18.2
51-60	27	13.3
61-70	21	10.3
71-80	3	9.9
No response	20	9.8
Total	203	100
<b>Education</b>		
Primary	16	7.9
Secondary	41	20.2
Tertiary	128	63.0
Not educated	1	0.5
No response	17	8.4
Total	203	100.0

The most common cause of tooth loss in this study was trauma 83 (40.9%), followed by tooth decay 63 (31.0%). Periodontal disease was responsible for 39(19.2%) cases of tooth loss while 18 (8.9%) participants did not indicate the causes of their tooth loss (Fig. 1).

A large majority of the respondents stated that they were aware of difficulty in mastication (41.9%) and collapse of the face (35.5%) as consequences of tooth loss relative to teeth drifting and supra-eruption which were 16.3% and 13.8% respectively (Fig. 2).

Table 2 shows the relationship between gender and awareness of consequences of tooth loss. For males, the highest level of awareness of consequence of tooth loss (23.6%) was on mastication while for females (20.2%), it was on facial collapse. Supra-eruption as a consequence of tooth loss had the lowest level of awareness for both male (5.9%) and female (7.9%). However, there was no significant relationship between gender and awareness of consequences of tooth loss (Supra-eruption,  $p=0.34$ ; Mastication,  $p=0.21$ ; Teeth drifting,  $p=0.73$  and Facial collapse  $p=0.08$ )

Table 3 shows the relationship between educational level and consequences of tooth loss. Those with tertiary education had the highest response (63%) for all the parameters. For this group of respondent, the highest level of awareness of consequences of tooth loss was on mastication (24.1%), while the highest level of unawareness was in respect of supra-eruption (54.2%). Furthermore, using chi square, there was no significant relationship between educational level and level of awareness of consequences of tooth loss (Supra-eruption,  $p=0.79$ ; Mastication,  $p=0.29$ ; Teeth drifting,  $p=0.77$ ; and Facial collapse,  $p=0.60$ )

The commonest source of information of consequences of tooth loss to the respondents was from the dentists (25.6%) followed by medical doctors and friends (3%) Fig. 3.

## DISCUSSION

In this study, trauma accounts for highest causes of tooth loss (40.9%) followed by caries (31.0%) while periodontal diseases came behind with 19.2%. This is in contrast to studies by Phipps and Stevens<sup>17</sup> and Aderinokun and Dosumu<sup>18</sup> who reported periodontal diseases and caries as the leading causes of tooth loss, although Phipps and Stevens<sup>17</sup> examined adult subjects aged 40-69 years where periodontal diseases was common. That trauma is the leading cause of missing teeth in this study may be a result of the greater number of young adults who participated in the study. The youth are known to be more outgoing, participating more in sport and consequently being involved in accidents and violence. This is in agreement with a study by Fasola *et al*<sup>9</sup> who found those in the age group 21-30 years having the highest involvement (45%) in maxillofacial injury in Nigeria.

The periodontal disease which contributed the least (19.2%) to the cause of the missing teeth in the present study may be as a result of lower participation of the adult respondents or increased awareness of oral hygiene in the young adult or both, unlike in the study by Aderinokun and Dosumu<sup>18</sup> where the major indication for extraction was periodontal disease (61.9%) in which a single episode can lead to loss of

**Table 2:** Relationship between sex and awareness of consequences of tooth loss

Gender	Supra-eruption (%)		Total N(%)	P value
	Yes n(%)	No n(%)		
Male	12(5.9)	92(45.3)	104(51.2)	0.34
Female	16(7.9)	83(40.9)	99(48.4)	
<b>Total</b>	28(13.8)	175(86.2)	203(100)	
<b>Mastication</b>				
Male	48(23.6)	56(27.6)	104(51.2)	0.21
Female	37(18.2)	62(30.6)	99(48.8)	
<b>Total</b>	85(41.8)	118(58.2)	203(100)	
<b>Teeth Drifting</b>				
Male	16(7.9)	88(43.3)	104(51.2)	0.73
Female	17(8.4)	82(40.4)	99(48.8)	
<b>Total</b>	33(16.3)	170(83.7)	203(100)	
<b>Facial Collapse</b>				
Male	31(15.3)	73 (35.9)	104(51.2)	0.08
Female	41(20.2)	58(28.6)	99(48.8)	
<b>Total</b>	72(35.5)	131(64.5)	203(100)	

**Table 3:** Relationship between educational level and knowledge of consequences of tooth loss

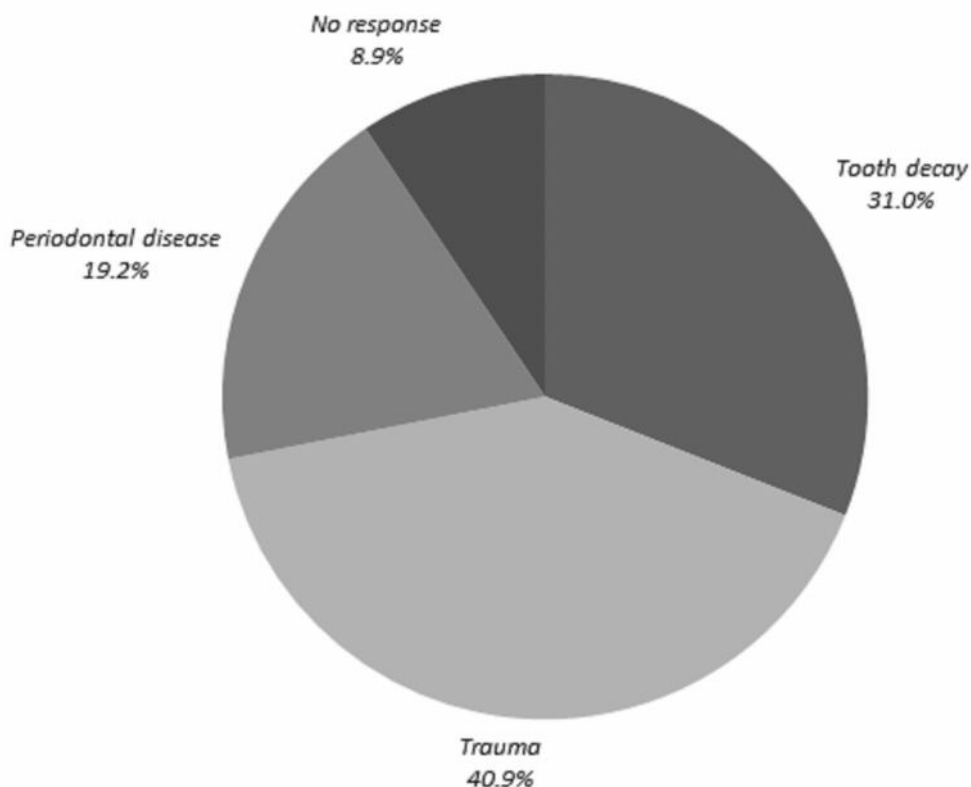
	yes	no	Total
<b>Supra-eruption n(%)</b>			
<b>Educational level</b>			
Pre-tertiary	9(4.8)	49(26.4)	58(31.2)
Tertiary	18(9.7)	110(59.1)	128(68.8)
Total	27(14.5)	159(85.5)	186(100)
			P=0.79
<b>Mastication n(%)</b>			
<b>Educational level</b>	<b>yes</b>	<b>no</b>	<b>total</b>
Pre-tertiary	27(14.5)	31(16.7)	58(31.2)
Tertiary	49(26.4)	79(42.7)	128(68.8)
Total	76(40.9)	110(59.1)	186(100)
			P=0.29
<b>Teeth drifting n(%)</b>			
<b>Educational level</b>	<b>yes</b>	<b>no</b>	<b>total</b>
Pre-tertiary	11(5.9)	47(25.3)	58(31.2)
Tertiary	22(11.8)	106(57.0)	128(68.8)
Total	33(17.7)	153(82.3)	186(100)
			P=0.77
<b>Facial collapse n(%)</b>			
<b>Educational level</b>	<b>yes</b>	<b>no</b>	<b>total</b>
Pre-tertiary	19(10.2)	39(21.0)	58(31.2)
Tertiary	47	81	128(68.8)
Total	72	120	203(100)
			P=0.60

multiple teeth as opposed to trauma where even a single tooth can be involved in multiple trauma before it is eventually lost.

In this study, mastication had the highest level of awareness (41.9%) while supra-eruption had the least level of awareness (13.8%). This is because it is easier to detect reduced masticatory efficiency depending on the number and position of missing teeth as one eats practically everyday than it is to notice supra-eruption and teeth drifting especially if minimal. The facial collapse is usually more pronounced in totally edentulous patients which are excluded from this study. Although awareness is generally low in all of the four parameters, men are more aware than women that mastication is a possible consequence, probably because the chewing function in female has been found to be

lower than in males<sup>20</sup> leading to quicker and greater awareness of missing teeth in male while in all the other three parameters, females are more aware possibly because women are more concerned about their appearance than men. However, there are no statistically significant relationships between gender and knowledge of consequence of missing teeth from this study, consistent with a study by African *et al*<sup>21</sup> who found out also that gender has no association with tooth loss is a rural South African community.

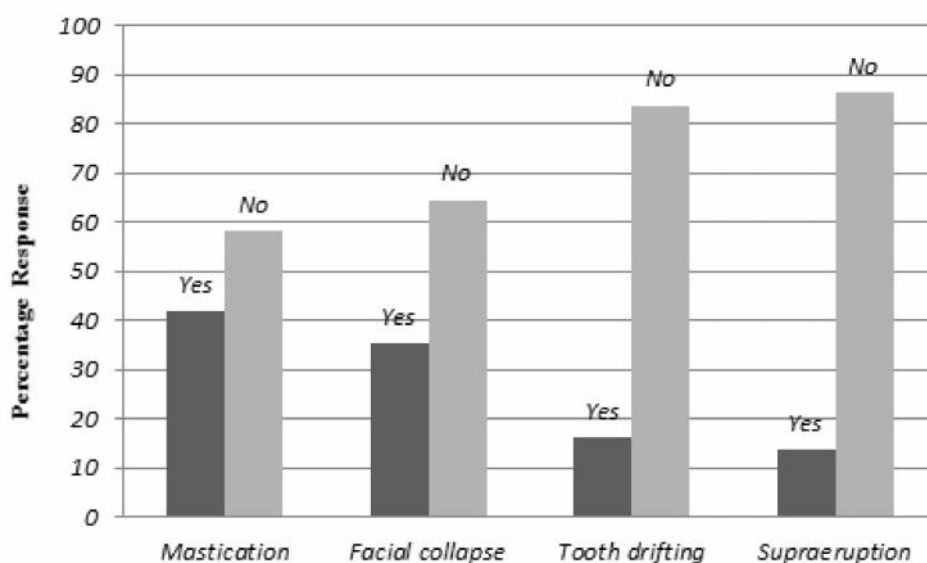
In assessing the role of education on the subjects' knowledge of consequences of tooth loss, the same four parameters of supra-eruption, mastication, tooth drifting, and facial collapse were used. The percentage responses of those who attended higher institution were the highest (63%) probably because of their



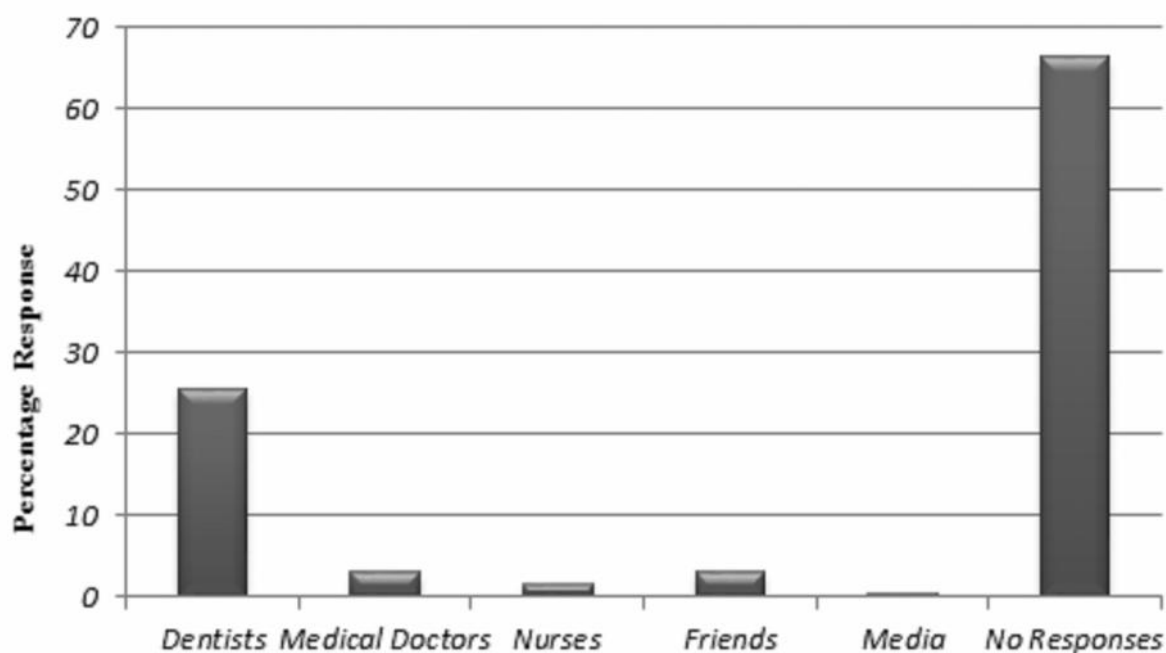
**Fig. 1:** Percentage distribution of cause of tooth loss among the respondents

higher participation which may have been occasioned by their better access to information from various sources. Their highest awareness was on mastication (24.1%) while their least awareness was on supra-eruption (8.9%). In addition, they had the highest awareness response in all the other three parameters compare to those who had primary and secondary education and those who were not educated at all. Furthermore, using non-parametric chi-square because

of the skewness of the responses, there was significant relationship between the level of education and awareness of consequences of tooth loss ( $p < 0.05$ ) using the four clinical parameters. This may suggest that those who are well educated were able to access information better by making use of various information technologies available such as by android, I-Pad, tablet etc, while those without education or little education could not. In addition, those with little or



**Fig. 2:** Knowledge of consequences of tooth loss by the participant



**Fig. 3:** Sources of knowledge of consequences of tooth loss

no education may not be able to afford such technologies further limiting the amount of information they are exposed to. In addition, majority of the well-educated people live in the urban cities affording them the opportunities to access the dentists, who themselves are concentrated in urban cities, and from whom they may gain first-hand information.

There is paucity of information relating the level of education to degree of awareness of consequences of tooth loss. Studies<sup>22,23</sup> available only related level of education to tooth loss. However, our study found no significant relationship between level of education and awareness of consequence of tooth loss, which means peoples' level of education has not helped in ensuring they are properly informed that toothloss can have adverse effects on them. This is reasonable as the sources where they could have got the information such as medical doctors and the media are also not informed.

Regarding patients' sources of information about consequences of tooth loss, the percentage responses of the study subjects to medical doctors and general public as their sources of education were the same and were even lower for the nurses. These low responses may be as a result of little or no exposure of medical doctors and the nurses to dentistry during their undergraduate and/or diploma training. To worsen this situation is the even fewer dental nurses including dental surgery assistants whose impacts are now not enough to curtail this situation.

The media outlets as a source of such information is surprisingly the least despite its wide coverage and influence at informing and impacting the public. Although the number of Prosthodontists in the country is very few (less than 15), it also shows that they are not doing well enough on the public health dimension of restorative dentistry to inform these media houses. This may mean that the staff and management of the various media houses were not well informed of the effect of missing teeth, let alone of drawing programmes that will inform the public. In related studies, Okoje *et al*<sup>24</sup> and Davies *et al*<sup>24</sup> pointed out that 33.1% and 45% respectively of their participants were not prepared for tooth loss aftermath and would have appreciated if a dentist had told them, signifying their lack of awareness before the teeth were lost.

Although, tooth loss is said to be declining,<sup>25,26</sup> low awareness of the consequences of tooth loss or missing teeth means that any of the consequences with potential to encourage further loss of teeth such as tooth drifting, can be indirectly encouraged. Furthermore, the issue of inadequate nutrition<sup>11</sup> which can affect the kidney of fetuses in pregnant women, and association of tooth loss with ischaemic stroke<sup>13</sup>, depicts the task of awareness of tooth loss consequences is an urgent one.

## CONCLUSION

This study showed poor knowledge of consequences of missing teeth among the subjects studied.

The dentists and dental nurses in particular will need to renew efforts in educating the general public about the effects of missing teeth. In addition, it can be included in such programme as CME (continue medical education) to afford other medical colleagues the opportunity to be informed and to also help in disseminating the information to the general public.

The role of media in dental awareness is relatively increasing but much is still needed to be done.

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