

Primary School Teachers' Knowledge of Immediate Management of Permanent Tooth Avulsion

Emmanuel Obiajulu Amobi¹, Nneka Kate Onyejaka¹, Chidozie Ifechi Onwuka², Linda Oge Okoye³

Departments of ¹Child Dental Health, ²Oral and Maxillofacial Surgery and ³Restorative Dentistry, University of Nigeria, Ituku Ozalla, Enugu, Nigeria

Abstract

Background: This study assessed primary school teachers' knowledge of immediate management of tooth avulsion in Enugu, Nigeria. **Methods:** This was a cross-sectional study of 135 primary school teachers in Enugu metropolis of Enugu State, Nigeria. Data on sex, age, academic qualification, school type, years of service, and the knowledge of immediate management of avulsed tooth among primary school teachers were collected using a self-administered questionnaire. The data were analyzed using the SPSS software version 18. The level of significance was set at $P < 0.05$. **Results:** The age of study participants ranged from 20 to 58 years. Many teachers in public schools 73 (54.1%) and those with bachelor degree in education 69 (51.1%) participated in the study, They were mostly females 123 (91.1%). The year of service of the teachers ranged from 1 year to 35 years. Only 25 (18.5%) of the teachers had good knowledge of the immediate management of avulsed teeth. Six (4.4%) knew that re-implantation was the immediate treatment for an avulsed permanent tooth. However, there was a significant association between sex ($P < 0.001$) and having good knowledge of the management of avulsion, but there was no significant association between age ($P = 0.42$), school type ($P = 0.27$) qualification ($P = 0.09$), year of service ($P = 0.42$), and having good knowledge of the management of avulsion. **Conclusion:** Few primary school teachers had good knowledge of immediate management of avulsed tooth indicating the need for increased oral health awareness among teachers in the study area.

Keywords: First aid, immediate management, knowledge, permanent tooth avulsion, school teachers, transport media

INTRODUCTION

Tooth avulsion is a type of traumatic dental injury (TDI) and a public health condition.^[1] It is the complete displacement of a tooth from its socket due to accidental or non-accidental injuries.^[2] It has a psychological impact on both child and parent, and it affects the quality of life of the affected child.^[3,4] It can occur at home or the school environment,^[5] and etiology includes falls, fights, sports, and road traffic accident.^[6-8]

The commonly avulsed tooth is the maxillary central incisor which has an important role to play in esthetics.^[3]

Studies have shown that TDI occurs more in children aged 7–12 years who are still in the primary level of education.^[5,8] A study by Ajayi *et al.*,^[9] showed that patients with avulsed teeth presented within 1 week of injury though with the tooth improperly stored. Wrapping in papers and handkerchiefs are some of the improper methods of storing avulsed tooth.^[10]

The best treatment for an avulsed tooth is immediate re-implantation.^[11,12] However, where there is delayed

re-implantation, a storage media is needed to preserve the periodontal ligament of the tooth for the better prognosis.^[13,14] Hank's Balance Salt Solution, Viaspan, Eagle's media, and milk are some of the common transport or storage media used, however, milk is the most convenient and available medium.^[11] The prognosis also depends on the duration of time between tooth avulsion and re-implantation into the tooth socket (extraoral time), the transport medium used, proper handling of the tooth, and stage of root development.^[15]

A previous study conducted among Nigerian school children showed that only 5.2% will take the avulsed tooth to a dentist, while more than 50% will consult a medical doctor in case

Address for correspondence: Dr. Nneka Kate Onyejaka,
Department of Child Dental Health, University of Nigeria, Ituku
Ozalla, Enugu, Nigeria.
E-mail: nnekaonyejaka@yahoo.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Amobi EO, Onyejaka NK, Onwuka CI, Okoye LO. Primary school teachers' knowledge of immediate management of permanent tooth avulsion. Niger J Med 2020;29:390-5.

Submitted: 08-Apr-2020 **Revised:** 15-Jun-2020

Accepted: 15-Jul-2020 **Published:** 18-Sep-2020

Access this article online

Quick Response Code:



Website:
www.njmonline.org

DOI:
10.4103/NJM.NJM_22_20

of tooth avulsion.^[16] Another study found that many teachers will transport the teeth to the dental clinic in a handkerchief, which is inappropriate.^[12]

The awareness of the immediate management of avulsed tooth by non-dental professionals such as teachers, caregivers, and sports directors will increase the prognosis of avulsed teeth, since children spend 40% of their awake time with their teachers.^[12]

In Brazil and Kuwait, dental education of primary school teachers on the management of tooth avulsion improved the outcome of an avulsed tooth.^[2,17] There is, however, a dearth of information on primary school teachers' knowledge of the need for immediate management of avulsed tooth in Enugu, South-Eastern Nigeria. This study assessed primary teachers' knowledge of management of tooth avulsion. It also assessed the relationship between sex, age, qualification, year of service, type of school, and having a good knowledge of immediate management of an avulsed tooth among primary school teachers.

METHODS

Study location

The study was conducted in Enugu metropolis of Enugu State, Nigeria. Enugu is located in South-Eastern Nigeria and is one of the 36 states of the country. Enugu metropolis is made up of three Local Government Areas (LGAs). These are Enugu East, Enugu North, and Enugu South. The inhabitants are mainly farmers, civil servants, and traders.

Study population

The study population were primary school teachers in Enugu metropolis. The total number of teachers in both private and public primary schools in the State as at 2009/10 session was 13,261, whereas the total number of teachers in the metropolis was 3682.^[18]

Study design

This was a cross-sectional study with age, sex, qualification, year of service, and type of school as the independent variables and knowledge of immediate management of avulsed teeth as the dependent variable.

The conceptual framework is based on the fact that primary school teachers have a very high chance of seeing children with avulsed teeth. Most avulsions in permanent dentition occur between 7 and 12 years which is primary school age.^[5,8] Teachers' level of education and duration of service are proximal factors to having a good knowledge of the immediate management of avulsed teeth. This is because a higher level of education tends to improve knowledge of oral health^[19] and those with long duration of service have higher inclination to attend seminars^[20] and workshops on first aid and other fields. Distal factors considered included age, sex, and type of school.

Inclusion criteria

All the primary school teachers who gave consent to participate in the study were included.

Exclusion criteria

All primary school teachers who were not psychologically disposed to participate in the study.

Sample size determination

The sample size was calculated using the sample size formula $pxq/(SE)^2$ by Akpala^[21] where P is prevalence, q is $(100 - p)$ and SE is standard error tolerated. Based on 50.0% prevalence of primary school teachers' adequate knowledge on immediate management of avulsed teeth, sampling error of 5%, the minimum sample size calculated was 100. To accommodate for 10% nonresponders, the sample size came to 110 teachers.

Sample selection

Teachers were selected from primary schools in the three LGAs that make up Enugu metropolis. There were 2615 teachers in public schools and 1067 in private primary schools in the metropolis.^[18] The number of teachers in Enugu East LGA was 1526 (871 in public schools and 655 in private schools). In Enugu North LGA, there were 952 teachers (927 in public primary schools and 25 in private primary schools) while Enugu South LGA had 1,204 teachers (817 teachers in public primary schools and 387 teachers in private primary schools). The total population of teachers in Enugu metropolis at the time of data collection was 3682. The sample was proportionally distributed among the LGAs and between the private and public schools, using a multistage sampling method.

Stage 1: Representation of the study sample per LGA using stratified sampling technique: The sample size was distributed among the 3 LGAs in Enugu metropolis. A total of 15 schools from the metropolis were selected to participate in the study; five from each of the LGAs (Enugu East, Enugu North, Enugu South) and eight teachers selected from each school.

Stage 2: Proportionate representation of the sample between private and public primary schools in the various LGAs: The ratio of public primary teachers to private primary teachers in Enugu East was 1:0.75, Enugu North: 1:0.03, Enugu South: 1:0.47.

For school selection, Enugu East: 3 public primary schools to 2 private primary schools; Enugu North: 4 public primary schools to 1 private primary school; Enugu South: 3 public primary schools to 2 private primary schools.

Stage 3: Selection of teachers in the schools by random sampling: Teachers were seen in staff rooms, and they picked from a ballot box containing papers written "yes" or "no". This was a blind selection and those who picked "yes" participated in the study.

Study tool

A self-administered semi-structured questionnaire was developed for the study, see Appendix 1. The first part consisted of questions on age, sex, type of school, qualification of teachers, and duration of service. The qualification was classified into West African Examination Council/National Examination Council/General Certificate Education

certificates, National Certificate of education, Bachelor degree and Postgraduate degree.

The second part consisted of questions that elicited information on having heard about tooth avulsion, knowledge of the immediate management of an avulsed tooth, and knowledge of any type of tooth storage media were also elicited. Finally, information on the availability of a tooth storage medium in the school and attendance at any course/seminar on first aid of an avulsed tooth was elicited.

Study procedure

Ethical approval was obtained from the Research and Ethics Committee of University of Nigeria Teaching Hospital, Enugu. Written informed consent was obtained from the teachers. The teachers were met in the staffrooms and given questionnaires to fill and the completed ones collected immediately. Afterward, the teachers were educated on immediate management of avulsed tooth.

Pilot study

The questionnaires were evaluated using five teachers not included in the study. This was done two weeks before the study to validate the questionnaire and also assess the teachers' understanding of the questions.

Data handling

Data were kept confidential by numbering the participants' questionnaire instead of using names. Furthermore, the laptop computers used for the study were password protected.

Good knowledge of immediate management of avulsed teeth was taken as a positive response for both immediate re-implantation and putting the tooth in a transport medium while poor knowledge was taken as a wrong response to the above questions.

Data analysis

The data collected from the study were keyed into a personal laptop computer and analyzed using the Statistical Package of Social Science (SPSS) version 18 (IBM, Chicago, IL, U.S.A). Exploratory analysis was conducted to ensure data consistency. The results were expressed using frequency tables, percentages, and bar charts. Descriptive analysis was conducted using a wide variety of measures of location (mean) and dispersion (deviation). Bivariate analysis was conducted to test the association between the teachers' age, sex, qualification, type of school, year of service, and having a good knowledge of immediate management of avulsed tooth. The Chi-square was used to assess the association between variables. All factors were considered significant at $P < 0.05$.

RESULTS

One hundred and thirty-five primary school teachers participated in the study. The age of the study participants ranged from 20 to 58 years. More teachers in public schools 73 (54.1%), more females 123 (91.1%) and many of those with bachelor degree 69 (51.1%) participated in the study.

The teachers' years of service ranged from 1 year to 35 years. Only 25 (18.5%) of the teachers had good knowledge about the immediate management of avulsed teeth. No school had a tooth storage medium in their first aid box [Table 1].

Table 2 showed a significant association between sex ($P < 0.001$) and having good knowledge of the immediate management of tooth avulsion.

There was no significant association between age ($P = 0.42$), school type ($P = 0.27$) qualification ($P = 0.09$), year of service ($P = 0.42$), and having adequate knowledge about the management of tooth avulsion.

Figure 1 showed that many teachers (51.1%) do not know what to do in a case of tooth avulsion, while 14.1% will put it in a transport medium and transport it to the dentist. Only 4.4% will re-implant the tooth immediately.

DISCUSSION

In this study, few teachers (18.5%) had good knowledge of immediate management of avulsed tooth similar to the findings from prior studies in which few teachers had good knowledge of immediate management of avulsed tooth.^[12,22,23] Less than five percent of the teachers knew that immediate management of a avulsed tooth is re-implantation while more than half

Table 1: Sociodemographic profile of study participants (n=135)

Variables	Frequency, n (%)
Sex	
Male	12 (8.9)
Female	123 (91.1)
Age (years)	
21-30	26 (19.3)
31-40	40 (29.6)
41-50	51 (37.8)
51-60	18 (13.3)
School type	
Public	73 (54.1)
Private	62 (45.9)
Qualifications	
WAEC/NECO	8 (5.9)
NCE	55 (40.7)
Degree and above	72 (53.3)
Duration of service (years)	
10 and below	58 (43.0)
11-20	29 (21.5)
21-30	39 (28.9)
31-40	9 (6.9)
Seminar on first aid	
Yes	18 (13.3)
No	117 (86.7)
Storage medium in school	
Yes	0 (0.0)
No	135 (100.0)

Table 2: Association between variables and having good knowledge of management of avulsed tooth

Variables	Good knowledge of management of avulsed tooth			P
	Yes, n (%)	No, n (%)	Total, n (%)	
Sex				
Male	2 (8.0)	10 (9.1)	12 (8.9)	<0.001* [†]
Female	23 (92.0)	100 (90.9)	123 (91.1)	
Age (years)				
21-30	2 (5.3)	24 (24.7)	26 (19.3)	0.42
31-40	11 (28.9)	29 (29.9)	40 (29.6)	
41-50	18 (47.4)	33 (34.0)	51 (37.8)	
51-60	7 (18.4)	11 (11.3)	18 (13.3)	
School type				
Public	16 (64.0)	57 (51.8)	73 (54.1)	0.27
Private	9 (36.0)	53 (48.2)	62 (45.9)	
Qualifications				
WAEC/NECO/GCE	2 (8.0)	6 (5.5)	8 (5.9)	0.09
NCE	15 (60.0)	40 (36.4)	55 (40.7)	
Degree and above	8 (32.0)	61 (55.5)	69 (51.1)	
Higher degree	0 (0.0)	3 (2.7)	3 (2.2)	
Duration of service(years)				
10 and below	7 (28.0)	51 (46.4)	58 (43.0)	0.42
11-20	7 (28.0)	22 (20.0)	29 (21.5)	
21-30	9 (36.0)	30 (27.3)	39 (28.9)	
31-40	2 (8.0)	7 (6.4)	9 (6.7)	
Total	25 (100.0)	110 (100.0)	135 (100.0)	

[†]Nonparametric test was carried out

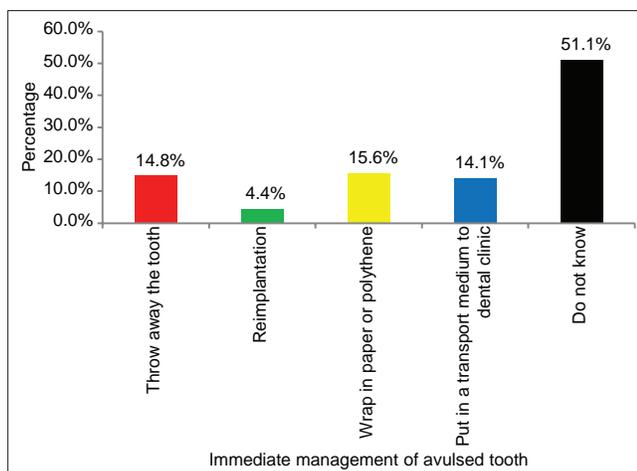


Figure 1: Distribution of teachers with knowledge of immediate management of avulsed teeth

of them did not know what to do in cases of tooth avulsion. This is similar to a prior study in Nigeria by Olatosi *et al.*,^[12] where about 42% of the respondents were not aware that an avulsed tooth can be re-implanted. In fact, more than half of the respondents in another study would not re-implant the tooth because they felt it was dangerous to do so.^[24] Low awareness of dental care may also be a contributing factor.^[25] This finding implies that avulsed teeth in the study environment will not be re-implanted immediately, resulting in poor prognosis and eventual tooth loss.

More females than males had significantly adequate knowledge of immediate management of an avulsed tooth. This may be because of the natural inclination of females to take care of children and being more concerned about children's wellness when compared to males.

Transportation of avulsed tooth in an appropriate medium to the dental clinic for re-implantation by a dentist is an alternative management for an avulsed tooth that was not immediately re-implanted. In such situation, the prognosis depends on the duration of stay of teeth in these media and the type of media used.^[15] Hank's balanced salt solution is an excellent transportation medium^[11] among other media such as milk, saliva, and coconut water,^[11,26] but few teachers in this study would transport the tooth in an appropriate transport medium. Many will transport it dry by wrapping it in paper and polythene bags. This is not surprising as most of the teachers were not dentally aware, coupled with the fact that no school had any form of tooth transport medium in their first aid box. Transporting the tooth in a dry medium will result in the death of the periodontal cells, failure of periodontal ligament to reattach to the alveolar socket, and eventual loss of the tooth.

In this study, few teachers have had seminars on first aid management of some health conditions, and tooth avulsion was not inclusive. This is contrary to the finding in South-West Nigeria where some teachers have had seminars on traumatic dental injuries.^[12] This is a pointer to the need to incorporate immediate management of avulsed tooth in first aid seminars

of teachers in the study area. In fact, a prior study in Brazil^[2] showed an increase in teachers' knowledge of immediate management of tooth avulsion after oral health education.

The limitations of this study were that the data were skewed with more females than males, and only teachers who were in school on the day of the study participated.

CONCLUSION

Few primary school teachers had good knowledge of immediate management of avulsed tooth indicating the need to increase educational campaigns among primary school teachers in the study area, especially on the steps to take for immediate management of avulsed teeth.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Glendor U. Epidemiology of traumatic dental injuries-a 12 year review of the literature. *Dent Traumatol* 2008;24:603-11.
2. Frujeri Mde L, Costa ED Jr. Effect of a single dental health education on the management of permanent avulsed teeth by different groups of professionals. *Dent Traumatol* 2009;25:262-71.
3. Sardana D, Goyal A, Gauba K. Delayed replantation of avulsed tooth with 15-hours extra-oral time: 3-year follow-up. *Singapore Dent J* 2014;35:71-6.
4. Oyedele TA, Jegede AT, Folayan MO. Prevalence and family structures related factors associated with crown trauma in school children resident in suburban Nigeria. *BMC Oral Health* 2016;16:116.
5. Patel MC, Sujan SG. The prevalence of traumatic dental injuries to permanent anterior teeth and its relation with predisposing risk factors among 8-13 years school children of Vadodara city: An epidemiological study. *J Indian Soc Pedod Prev Dent* 2012;30:151-7.
6. Gutmann JL, Gutmann MS. Cause, incidence, and prevention of trauma to teeth. *Dent Clin North Am* 1995;39:1-3.
7. Enabulele JE, Oginni AO, Sede MA, Oginni FO. Pattern of traumatized anterior teeth among adult Nigerians and complications from late presentation. *BMC Res Notes* 2016;9:70.
8. Dua R, Sharma S. Prevalence, causes, and correlates of traumatic dental injuries among seven-to-twelve-year-old school children in Dera Bassi. *Contemp Clin Dent* 2012;3:38-41.
9. Ajayi DM, Abiodun-Solanke IM, Sulaiman AO, Ekhalufoh EF. A retrospective study of traumatic injuries to teeth at a Nigerian tertiary hospital. *Niger J Clin Pract* 2012;15:320-5.
10. Oji C, Okoye LO. Re-implantation of an avulsed maxillary permanent central incisor in an eight year old girl- case report. *Ebonyi Med J* 2010;9:130-3.
11. Udoye CI, Jafarzadeh H, Abbott PV. Transport media for avulsed teeth: A review. *Aust Endod J* 2012;38:129-36.
12. Olatosi OO, Iwuala SO, Isiekwe GI, Oredugba FA, Adenaike AS, Oluwo AO. Knowledge and attitude of some Nigerian school teachers on the emergency management of avulsed permanent incisor. *J West Afr Coll Surg* 2013;3:30-52.
13. Marino TG, West LA, Liewehr FR, Mailhot JM, Buxton TB, Runner RR, *et al.* Determination of periodontal ligament cell viability in long shelf-life milk. *J Endod* 2000;26:699-702.
14. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F, *et al.* Guidelines for the management of traumatic dental injuries. II. Avulsion of permanent teeth. *Dent Traumatol* 2007;23:130-6.
15. Petrovic B, Marković D, Peric T, Blagojevic D. Factors related to treatment and outcomes of avulsed teeth. *Dent Traumatol* 2010;26:52-9.
16. Adekoya-Sofowora C, Oziegbe E, Ugboko V, Akinbade. Knowledge of first aid measures of avulsion and replantation of teeth in Nigerian school children. *Int J Dent Sci* 2008;7:1-7.
17. Al-Asfour A, Andersson L, Al-Jame Q. School teachers' knowledge of tooth avulsion and dental first aid before and after receiving information about avulsed teeth and re-implantation. *Dent Traumatol* 2008;24:43-9.
18. Ministry of Education. Enugu State School Census Report 2009-2010.
19. Gomes AP, da Silva EG, Gonçalves SH, Huhtala MF, Martinho FC, Gonçalves SE, *et al.* Relationship between patient's education level and knowledge on oral health preventive measures. *Int Dent Med J Adv Res* 2015;1:1-7.
20. Mahmoudi F, Ozkan Y. Exploring experienced and novice teachers' perceptions about professional development activities. *Procedia Soc Behav Sci* 2015;199:57-64.
21. Akpala CO. Epidemiologic Research. A Practical Approach for the Medical and Nursing Sciences, Enugu. University of Nigeria; 1994. p. 64-5.
22. Al-Zaidi AA, Al-Asmari AA. Knowledge of teachers and parents about emergency management of dental trauma in Qassim province, Saudi Arabia. *Int J Contemp Med Res* 2017;4:2131-8.
23. Etim SS, Eighobo JO. Traumatic dental injuries: An assessment of knowledge of emergency care among a group of school teachers in port Harcourt, Nigeria. *Nig Q J Hosp Med* 2017;27:890-7.
24. Chan AW, Wong TK, Cheung GS. Lay knowledge of physical education teachers about the emergency management of dental trauma in Hong Kong. *Dent Traumatol* 2001;17:77-85.
25. Sofola OO. Implication of low oral health awareness in Nigeria. *Niger Med J* 2010;51:131-3.
26. Poi W R, Sonoda CK, Martins CM, Melo ME, Pellizzer EP, Mendonça MR, *et al.* Storage media for avulsed teeth: A literature review. *Braz Dent J* 2013;24:437-45.

Appendix Legend

Appendix I: Questionnaire

Dear respondent,

Please, take time out to fill this questionnaire as honestly as you can. You do not have to put your name. Your responses would help us in planning oral health programme.

Thank you.

%%

1. Age as at last birthday.....

2. Sex.....

3. Qualification.....

(WAEC/NECO/GCE

NCE

Bachelor Degree

Postgraduate degree<.....

4. Duration of year of service.....

Section B

Please, tick the your answers

5. Have you ever heard about avulsion of permanent tooth/teeth ? Yes.....No.....

6. Have you ever seen a child with avulsed permanent tooth/teeth ? Yes...No....

7. The ideal immediate treatment for an avulsed tooth include.....

- A Throwing the tooth away
- B. Placing it back into the socket and taking the child to the dental clinic
- C. Wrapping it in a polythene bag and bringing it with the child to the dental clinic
- D. Wrapping it in a paper and bringing it with the child to the dental clinic
- E. Putting it in save-a-tooth-pack and bringing it with the child to the dental clinic.
- F. Others[specify}....

8. Do you have any tooth storage medium in your school first aid box ? Yes...No...

9. If yes, Specify.....

10. Have you had any course/seminar on first aid ? Yes . No...

11. If yes, who organized it ?

- A. Ministry of Education
- B. Nigeria Union of Teachers
- c. Non Governmental Organizations
- D. Your school authority
- E. Others {specify).....

12. Were you taught the management of tooth avulsion? Yes.... No...