Knowledge and Practice of Health Workers to Tooth Avulsion in a Teaching Hospital in Lagos, Nigeria.

***Modupe Oluwafunmilayo ASHIWAJU, **Omotayo Adebola OREMOSU, *Omolola Olubunmi ORENUGA, ***Ezi Abigail AKAJI**

*[*Department of Child Dental Health, College of Medicine, University of Lagos*
***Department of Restorative Dentistry, Faculty of Dental Sciences. College of Medicine, University of Lagos*
****Department of Preventive Dentistry. Faculty of Dentistry. University of Nigeria, Enugu,]*

Correspondence
Dr M O Ashiwaju
Department of Child Dental Health,
Faculty of Dental Sciences.
College of Medicine University of Lagos.
Email: funmash@yahoo.co.uk

ABSTRACT

Objective: The health care workers (HCW) may be the first contact of a tooth avulsion case. This study aimed to assess their knowledge and practice of emergency management of tooth avulsion.

Methods: The cross-sectional study was carried out among health care workers in a teaching hospital, using a self-administered questionnaires containing closed and open-ended questions, on their knowledge and practice of management of tooth avulsion. Data collected was analyzed using EPI info version 7 statistical software.

Results: A total of 362 questionnaires were administered with a response rate of 90.4%. The health care workers were 331 between the ages of 18years to 64years. There were 200(60.4%) females and 131(39.6%) males (ratio 3:2). Less than half (41.7%) of the respondents rated their knowledge on avulsion as fair.

About half of the respondents 156(47.1%) reported that primary tooth should be replaced into the socket. The knowledge of how to hold avulsed tooth among 217(65.6%) of the respondents was incorrect. More than half 185(55.9%) answered that avulsed teeth, will be stored in a dry medium. Less than half, 146(44.1%) knew the appropriate storage media to be used. Only a third 122(36.9%) were confident in their knowledge to replant an avulsed tooth.

About a third 114(34.4%) of HCW had encountered an avulsion case, most were dentists and nurses. More than a quarter 92(27.7%) referred the avulsion while (16.1%) did nothing to the avulsed tooth.

Conclusion: There is a need to increase the knowledge and practice of HCW, so that immediate replantation can be practiced thereby improving the prognosis for replanted teeth.

Key words: Avulsion, Health care workers, Replant

Modupe O. Ashiwaju
https://orcid.org/0000-0001-6767-2344
Omotayo A. Oremosu
https://orcid.org/0000-0003-0551-8020
Omolola O. Orenuga
https://orcid.org/0000-0001-6363-4949
Ezi A. Akaji
https://orcid.org/ 0000-0003-4977-4472

Received: 2-April-2021
Revision: 13-April-2021
Accepted: 19-April-2021

Citation: Ashiwaju MO, Oremosu OA Orenuga OO, Akaji EA. Knowledge and practice of health workers to tooth avulsion in a teaching hospital in Lagos, Nigeria. Nig J Dent Res 2021; 6(2):160-168.
https://dx.doi.org/10.4314/njdr.v6i2.7

INTRODUCTION

The loss of a tooth can be physically and emotionally trying as the resulting space may be the cause of psychological, social and functional challenges.[1] The teeth are not only important for aesthetics but are also essential for phonetics, mastication, health of

supporting tissues, physiological and mental health.[2] A prime goal of dental management therefore is the retention of teeth in a natural and aesthetic state and as a functional unit of the dental apparatus.

Trauma within the home is more likely to involve young children while older children are more often involved in trauma outside the home especially during sporting activities. The places with the highest frequency where trauma occurs are the home, school and the street. About 33% of these injuries occur at home and 25% at school.[3] Tooth avulsion is a resultant effect of dental trauma. It is common among children and adolescents, and usually considered a dental emergency. In dental traumatic injuries, a directed force overcomes the bond between the periodontal ligament and the alveolar bone, leading to periodontal and pulp damage and subsequent pulp necrosis, periapical inflammation and root resorption.[4] Andreasen et al.[5] suggested that the loosely structured periodontal ligament surrounding the erupting teeth and the elasticity of the alveolar bone favours avulsion.

Avulsion is reportedly the most common type of dental injury in children below 15years of age seeking treatment in emergency rooms.[6] The central incisors are the most commonly avulsed teeth.[7] This loss can cause embarrassment to the child and the parents.[8] The highest percentage of success in the management of avulsion is achieved by immediate replantation of the avulsed tooth into its socket.[9]

Avulsion of a permanent tooth is an emergency and basic knowledge of the right action to take is very important. Appropriate storage media and proper handling of the tooth is of great importance in successful management of the avulsed tooth. Prompt recognition, swift, appropriate and often simple-actions can improve the prognosis of most dental injuries.[10] This is not usually practicable because of reasons such as lack or inadequate knowledge of what to do, delay after accident, time lapse during transportation to health facility, and the choice of health facility. The viability of the periodontal ligament (the attachment apparatus) of the tooth is very critical for the successful healing of the replanted avulsed tooth.[11] It is important to pick up the tooth and hold it by the crown. If it is dirty, clean it under cold tap water for 10 seconds. The method of cleaning and handling, duration of extra alveolar time and the storage or transport medium used to preserve teeth are important in the prognosis. Efforts should be made to replant the tooth within the first 15-20 minutes which will require the attention of personnel with knowledge of treatment protocol.[12] The attendant personnel play a significant and crucial role in the determination of the prognosis of an avulsed tooth. When an avulsed tooth cannot be replanted immediately, it is important to store the tooth in an appropriate temporary storage media. This helps to preserve and protect the periodontal ligament.[13] The recommended storage media includes, Eagle's medium, Hanks Balanced Salt Solution (HBSS), Via span, coconut water while the most readily available is tooth placed in saliva, in the buccal mucosa or a low-cost option of milk.[14,15]

A number of studies have been carried out on the knowledge of management of tooth avulsion among parents,[16] teachers,[17] and children.[18,19] It was reported that such an emergency may be referred to doctors, nurses, pharmacists and other health care workers. It is expected that this group of healthcare professional have adequate knowledge in the management of avulsion in children.

The World Health Organization (WHO) defines health care workers to be all people engaged in actions whose primary intent is to enhance health. But reports have shown that knowledge of emergency management of avulsion is poor among doctors,[20] nurses, oral health care professionals,[21] dental therapists,[22] school teacher[23] and other health professionals.[24] It is imperative to find out the knowledge and practice of health workers to emergency management of tooth avulsion in this environment. This is in order to maintain and improve service delivery and outcome to patients who experience tooth avulsion. The present study assessed the knowledge and practice of health workers regarding tooth preservation as an emergency management of tooth avulsion.

MATERIALS AND METHODS

This cross-sectional study was conducted at the Lagos University Teaching Hospital (LUTH), Lagos, Nigeria among health care professionals: dentists, medical doctors, nurses, dental technologists, dental nurses, dental therapists, pharmacists, medical laboratory scientists and physiotherapists. A pilot study was carried out on the different health professionals for clarity of the questionnaire and all

ambiguities adjusted accordingly. Data from the pilot study were excluded from the final analysis.

A verbal informed consent was obtained from all eligible subjects prior to the conduct of the study.

A self-administered questionnaire consisting of closed and open-ended questions was given to the health care workers. The questionnaire was designed to assess the level of knowledge and practice of health workers on tooth preservation as an emergency management of tooth avulsion. The information collated included socio demographic data, knowledge and practice of tooth avulsion.

In order to assess the knowledge of health workers, for each question asked, scores were allocated for each response. A score of 1(one) was allocated to each of 10 (ten) knowledge testing questions. A total score was then calculated for each individual. The maximum score obtainable per individual was ten. A score of 10 was graded as excellent; 7-9 was graded as good knowledge, 4-6 as fair and 0-3 as poor knowledge.

The analysis of data collected was done using EPI info version 7 statistical software. Frequency distributions and tabulations were used for categorical variables. Associations and differences in response to questions (between the categories of health workers) were considered significant when the p value was equal to or less than 0.05 using the chi square test.

RESULTS

A total of 331 health workers were part of the study. There were 200(60.4%) females and 131(39.6%) males, giving a 3:2 ratio. The age range was 18years to 64years and the majority of health workers had practiced for between 1-5 years (42.3%). The majority of health workers were in the 21-30years age group (37.2%) while the least number were in the group aged below 20 years (1.8%). A third of the HCW were doctors and nurses respectively while other HCW are reported in Table 1.

A total of 362 questionnaires were administered 331 were properly filled and returned giving a 90.4% response rate. In the open-ended question on definition of tooth avulsion, 268(81.0%) defined correctly, while 63(19.0) gave incorrect definition. Among the health workers, only 26% reported being well informed about the management of avulsion. The health workers reported the source of information on avulsion to be by formal education in 42%, reading 19%, from colleagues 18% and 21% had no information about avulsion.

Less than half (41.7%) of the health workers rated their knowledge on avulsion as fair. The dentists displayed the highest degree of knowledge with 27(67.5%) showing good knowledge while 25% showed excellent knowledge. This was the only group that had no record of poor knowledge. The pharmacists displayed poor knowledge (52%). Table 2.

About half of the health workers 156(47.1%) reported that primary tooth should be replanted into the socket. The health workers gave incorrect answers when asked on their knowledge of how to hold an avulsed tooth 217(65.6%) while over half, 185(55.9%) gave incorrect answer on storage in a dry medium. Almost all the health workers, 318(96.1%) answered correctly, questions on the dental clinic as the appropriate health facility for management of tooth avulsion. They also answered correctly that assistance should be sought immediately 253(76.4%) after avulsion. Other answers are presented in Table 3. Less than half, 146 (44.1%) of the health workers knew the appropriate storage media used in storing avulsed teeth.

About one-third, 122 (36.9%) of the health workers were willing to replant an avulsed tooth because they had confidence in their knowledge and also being the right thing to do. While about two-thirds, 209(63.1%) were unwilling to replant because they lacked knowledge (Table 4).

About two-thirds, 209(63.1%) of the health workers were unwilling to replant avulsed permanent teeth (Table 5). About a third 114(34.4%) of the HCW had encountered an avulsion case, dentists and nurses had more encounters than other health workers. While the physiotherapists and pharmacists had the lowest encounter with tooth avulsion cases.

When asked about the action taken on presentation of the encountered avulsion, more than a quarter either referred the patient 92 (27.7%) or cleaned the tooth 90(27.1%), while 53(16.1%) replanted the tooth or did nothing, only 43(12.9%) administered drugs (Figure 1).

Amongst the avulsion cases encountered, less than half (44.7%) were encountered in the hospital, while 27.2% and 15.8% were encountered at home and at a practice respectively

Table 1: Socio-demographic distribution of the study population (N= 331)

Variable	Frequency (n)	Percent (%)
Age group (years)		
Below 21	6	1.8
21-30	123	37.2
31-40	95	28.7
41-50	71	21.5
Above 50	36	10.9
Total	331	100
Gender		
Male	131	39.6
Female	200	60.4
Total	331	100
Profession		
Dental Therapist/Tech/Nurses	26	7.9
Doctors	100	30.2
Dentists	40	12.1
Laboratory Scientists	19	5.7
Nurses	110	33.2
Pharmacists	25	7.6
Physiotherapists	11	3.3
Total	331	100

Table 2: Health workers' self-assessment on knowledge of avulsion and management

Profession	Poor n (%)	Fair n (%)	Good n (%)	Excellent n (%)	Total n (%)
Dental nurses/ Ther/Tech/	2(7.7)	9(34.6)	13(50.0)	2(7.7)	26(100)
Doctors	14(14.0)	52(52.0)	28(28.0)	6(6.0)	100(100)
Dentists	-	3(7.5)	27(67.5)	10(25.0)	40(100)
Laboratory Scientists	4(21.0)	14(73.7)	1(5.3)	-	19(100)
Nurses	18(16.4)	47(42.7)	41(37.3)	4(3.6)	110(100)
Pharmacists	13(52.0)	7(28.0)	5(20.0)	-	25(100)
Physiotherapists	2(18.2)	6(54.5)	3(27.3)	-	11(100)
Total	53(16.0)	138(41.7)	118(35.6)	22(6.7)	331(100)

Dental nurses/ Ther/Tech/ =Dental Nurses/ Therapists/ Technologists

Table 3: Distribution of health workers answers to knowledge on avulsed teeth.

No.	Question	Correct **n** (%)	**I**ncorrect **n** (%)	Total **n** (%)
1	What is avulsion?	268(81.0)	63(19.0)	331(100)
2	Should primary tooth be replaced	175(52.9)	156(47.1)	331(100)
3	Should permanent tooth be replaced	221(66.8)	110(33.2)	331(100)
4	How soon should one seek professional assistance	253(76.4)	78(23.6)	331(100)
5	To which health facility should avulsion patient go	318(96.1)	13(3.9)	331(100)
6	How do you hold an avulsed tooth	114(34.4)	217(65.6)	331(100)
7	How do you clean an avulsed tooth	222(67.1)	109(32.9)	331(100)
8	How would you store an avulsed tooth	146(44.1)	185(55.9)	331(100)
9	Which media is appropriate	274(82.7)	57(17.3)	331(100)
10	When is the best time to put back an avulsed tooth	134(40.5)	197(59.5)	331(100)

Table 4: Distribution of reasons for willingness/unwillingness to replant

Variable	Frequency (n)	Percent (%)
Willingness		
Confidence in knowledge	47	38.5
Right thing to do	75	61.5
Total	122	100
Unwillingness		
Lack of adequate knowledge	184	88.0
Fear of litigation	17	8.1
Can't be bothered	8	3.8
Total	209	100

Table 5: Distribution of satisfaction with knowledge of first aid management of tooth avulsion.

Profession	Satisfied n (%)	Not satisfied n (%)	Total n (%)	X^2	P-value
Dental Nurses/ Ther/Tech	8(30.8)	18(69.2)	26(100)	90.41	0.0000
Doctors	7(7.0)	93(93.0)	100(100)		
Dentists	26(65.0)	14(35.0)	40(100)		
Laboratory Scientists	3(15.8)	16(84.2)	19(100)		
Nurses	9(8.2)	101(91.8)	110(100)		
Pharmacists	-	25(100)	25(100)		
Physiotherapists	1(9.0)	10(91)	11(100)		
Total	54(16.3)	277(83.7)	331(100)		

Dental nurses/ Ther/Tech/=Dental Nurses/ Therapists/ Technologists

Table 6: Distribution of encountering an avulsion case

Profession	Encountered n (%)	Not encountered n (%)	Total n (%)	X^2	P-value
Dental Nurses/ Ther/Tech	16(61.5)	10(38.5)	26(100)	45.99	0.0000
Doctors	14(14.0)	86(86.0)	100(100)		
Dentists	23(57.5)	17(42.5)	40(100)		
Lab Scientists	7(36.8)	12(63.2)	19(100)		
Nurses	48(43.6)	62(56.4)	110(100)		
Pharmacists	5(20.0)	20(80.0)	25(100)		
Physiotherapists	1(9.1)	10(90.8)	11(100)		
Total	114(34.4)	217(65.6)	331(100)		

Dental nurses/ Ther/Tech/=Dental Nurses/ Therapists/ Technologists

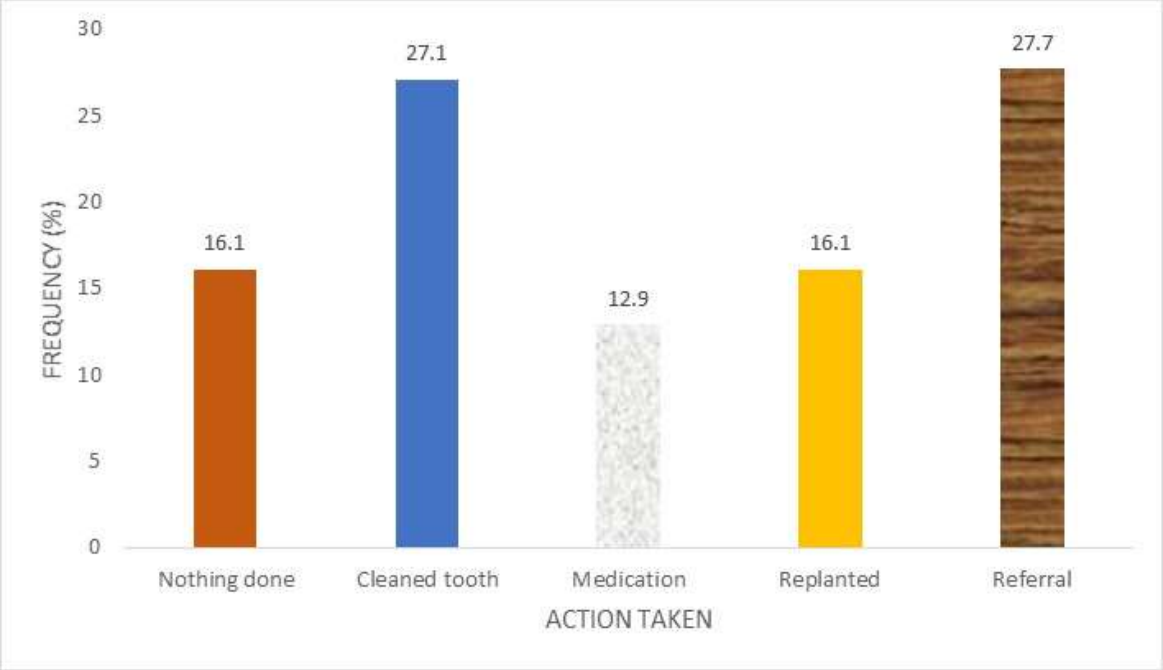

Figure 1: Emergency response to avulsion by respondents

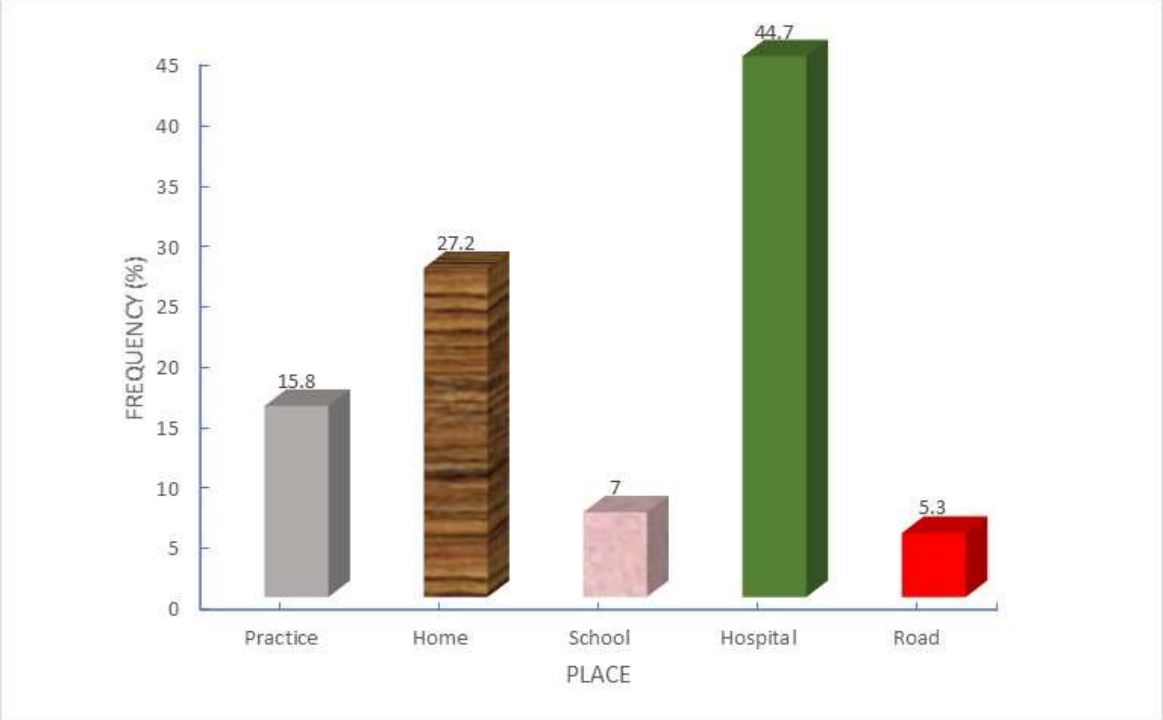

Figure 2. Distribution of place where avulsion was encountered

DISCUSSION

Tooth avulsion is common in children and adolescents below the age of 15years. It is considered as one of the commonest emergencies in dental trauma and the best treatment of the avulsed tooth/teeth is immediate replantation. The long-term prognosis and survival of the replanted permanent teeth depend on the extra oral time,

whereby a shorter time before replantation is desirable, the type of storage media it was transported in and the physical damage to the root surface. Decisive and prompt action depends on the knowledge of attending person present at the time of avulsion. Studies on knowledge have been carried out on parents,[16] teachers,[17] and on doctors and nurses.[25]

Health care workers help to disseminate information and when well informed, are in a position to impact positively on first aid. There are no known studies on health workers, who may be the first to attend to a child with avulsion in a low resource country like Nigeria. The present study assessed the knowledge and practice of the health workers' who need to have correct and appropriate knowledge in order to improve prognosis of avulsed teeth.

Improved knowledge of health care workers enable first aid treatment before definitive treatment by the dentist can be carried out, this has a positive impact on prognosis. Majority (81%) of health workers in the present study answered correctly to definition of avulsion. However, did not consider themselves well informed on the management of tooth avulsion. A study reported that health workers had low information on management of tooth avulsion.[25] Information is knowledge; this is important in the management of avulsion. While another study corroborated that lack of knowledge on first aid treatment can prevent immediate replantation.[26]

Important factors that favour and improve prognosis of an avulsed teeth are the actions taken at the site of injury and immediate replantation. Time is an important factor for the preservation of tooth vitality (viability of periodontal ligaments),[27] as prognosis of survival of avulsed tooth depends on a shorter extra oral dry time.[26] In this study, more than half of the respondents (59.5%) did not know the best time to replant an avulsed tooth. Another study[25] also reported low number of respondents (17.1%) that know time of replantation, while a higher number of participants (82.9%) did not know the best time. The difference in the findings of the study and our study may be because there were dentist and dental health care workers in our study. The extra oral dry time depends directly on the knowledge of the individuals present at the trauma site especially if they know the correct action to take. The child may be quickly taken to the closest health worker, who must know that shorter extra oral time is important.

Holding an avulsed tooth properly prevents disruption of the periodontal ligaments as it determines survival of the tooth. In this study, only 34.4% knew how to hold the avulsed tooth by the crown. This is of concern as holding the tooth by the root may compromise the viability of the periodontal membrane. The report from the present study differs from that by Loh et al.[22] on dental therapists. A high knowledge of replantation of permanent teeth (100%), the time to replant (85.1%), tooth handling (97.6%) and transportation (97.6%) was reported among the dental therapists. Another study[31] on medical doctors indicated only 50% of the participants knew how to hold an avulsed tooth. This poor knowledge of handling avulsed teeth could be due to the general low-level awareness of dentistry in low resource countries like Nigeria.[24]

The knowledge of just rinsing the avulsed tooth was good (67%). This is important as; rinsing prevents replanting debris into the tooth socket. The recommendation is that avulsed teeth should be rinsed in cold running water.[12]

Some health care workers (47%) reported that primary tooth should be replanted. There is need to correct this knowledge as replanted primary teeth, have the tendency to jeopardize integrity of the developing tooth germ of the permanent succesor.[26]

The major reason for being unwilling to replant avulsed tooth is lack of knowledge. This reason is usually why medical personnel do not replant.[20, 24,25] Only 36.9% of health workers were willing to replant an avulsed tooth. Another study[25] reported 47.5% willingness among doctors and nurses. This low number in our study underscores the need to improve knowledge of health care workers. There is need to increase the knowledge of health care professionals, teachers and others that may be present in the event of an avulsion injury. This can be done through mass media educational campaign and other forms of enlightenment.

Once immediate replantation is not possible, proper transportation using the right media is important. The knowledge of the right media was manifested in 45.1% of the health care workers. Most of the health workers (82.7%) gave correct answer on appropriate media of transporting the avulsed tooth, this included Hanks Balanced salt solution, milk, and saliva. This finding may be because dentists were included in this study. The finding of better knowledge is contrary to a study in Singapore[28] that revealed 15% of the study population knew the ideal storing solution for an avulsed tooth. This study revealed a good knowledge of storage media but poor knowledge of handling. The knowledge of appropriate storage media must be complemented by the proper handling of the tooth itself. Natural

products like saliva, milk, egg white and coconut water may be easier to come by. The appropriate storage media to use that will permit periodontal and pulpal healing are milk and saliva.[23,27]

The health workers who had encountered avulsion cases were (34.4%). With half of them being dentist, then nurses. This is similar to the report of Lin et al.[24] which was carried out in Israel. They reported that 41.2% cases of dental injuries were first seen by emergency medical technicians, it further stated that 25% were seen first by physicians. Interestingly in this study, more doctors (86%) had not encountered an avulsion case while other health workers like pharmacist and physiotherapist also had not encountered avulsion injuries.

In a study on the knowledge of physicians on emergency management of tooth avulsion, it was reported that only 4% of physicians would provide an appropriate initial treatment that is followed by treatment by dentist that could lead to better prognosis of the avulsed tooth.[29]

Most avulsion cases were encountered in the hospital. This is not surprising as referral to the clinic is also practiced by more of the health workers. The need for all health practitioners to be able to practice replantation is also emphasized here as the time interval between time of avulsion and getting to the hospital, also affects the long-term prognosis of the tooth. The next place avulsion is encountered is at home. This indicates that health care workers are perceived to have knowledge about avulsion hence cases are taken to them in the community.

Most health workers that encounter avulsion cases as a first point of call are almost often not the ones to give definitive treatment. It is therefore imperative that health workers should have some degree of knowledge on what to do in such cases.

CONCLUSION

The knowledge of health workers in the LUTH about emergency management of tooth avulsion were generally above average. However, knowledge on how to hold the tooth, the tooth storage media and the best time to replant were below average.

RECOMMENDATION

There is a need to increase the knowledge and practice of HCW, so that immediate replantation can be practiced thereby improving the prognosis.

Source of Support
Nil.

Conflict of Interest
None declared

REFERENCES

1. Rochas MJ, Cardoso M. Traumatized permanent teeth in Brazillian children assisted at the federal university of Santa Catarina, Brazil. Dent Traumatol 2001; 17: 245-249.
2. Gotfredsen K, Wall. What dentition assures oral function. Clin Oral Implant Res. 2008; 19(3): 326-3328
3. Azami-Aghdash S, Ebadifard Azar F, Pournaghi Azar F, Rezapour A, Moradi-Joo M, Moosavi A, Ghertasi Oskouei S. Prevalence, etiology, and types of dental trauma in children and adolescents: systematic review and meta-analysis. Med J Islam Repub Iran 2015; 29(4):234
4. Trope M. Clinical management of avulsed tooth: present strategies and future directions. Dent Traumatol 2002; 18(1):1-11
5. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 4. Factors related to periodontal ligament healing. Endod Dent Traumatol 1995; 11:76-89
6. Bhat M, Li SH. Consumer related tooth injuries treated in hospital emergency rooms:US, 1979-1987.Community Dent Oral Epidemiol 1990; 18:133-138.
7. Lee.JY, Vann WV, Sigurdsson A. Management of avulsed permanent incisors: A decision analysis based on changing concepts. Pediatric Dentistry 2001; 23: 3;14
8. Abeer M, Salwa A, Hegazy A. Knowledge of emergency management of avulsed teeth among sample of Egyptian parents. J Adv Res.2011;2: 157-162.
9. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F, et al Guidelines for the management of traumatic dental injuries. I. avulsion of permanent teeth. Dent Traumatol. 2007; 23(2):130-136.
10. Andreason JO, Andreason FM, Skeie A, Hjørting-Hansen E, Schwartz O. Effect of treatment delay upon pulp and periodontal healing of traumatic dental injuries- a review article. Dent Traumatol 2002: 18: 116-128.

11. Martin Trope. Clinical management of the avulsed tooth: present strategies and future directions. Dental Traumatol 2002; 18: 1-11.
12. Andersson L, Andreasen JO, Day P, Heithersay G, Trope M, Diangelis AJ, *et al.* International association of dental traumatology guidelines for the management of traumatic dental injuries: 2. Avulsion of permanent teeth. Dent Traumatol 2012; 28: 88-96.
13. Lee JY, Vann WF, Sigurdsson A. Management of avulsed permanent incisors: decision analysis based on changing concepts. Pediatr Dent 2001; 23 (4); 357-360
14. Adnan S, Lone MM, Khan FR, Hussain SM, Nagi SE. Which is the Most Recommended Medium for the Storage and Transport of Avulsed Teeth? A Systematic Review. Dental Traumat 2018; 34(2): 59-70.
15. Udoye CI, Jafarzadeh H, Abbott PV. Transport Media for Avulsed Teeth: A Review. Aust Endod J 2012; 38(3): 129-136.
16. Sanu OO, Utomi IL. Parental Awareness of Emergency Management of Avulsion of Permanent Teeth of Children in Lagos, Nigeria. Niger Postgrad Med J 2005; 12(2): 115-120.
17. 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(4):30-52. Eigbobo JO, Etim SS. An Assessment of Emergency Care Following Tooth Avulsion among a selected population of Nigerian school children. Inter Ped Dent Open Acc J 2020; 3(5):265-270.
18. Adekoya – Sofowora C, Oziegbe E, Ugboko V, Akinbade *A.* Knowledge of first aid measures of avulsion and replantation of teeth in Nigerian *school children*. The Int. J. Dent. Sci. 2008 7 (1): 1-7
19. Holan G, Shmueli Y. Knowledge of physicians in hospital emergency rooms in Israel on their role in cases of avulsion of permanent incisors. Int J Paediatr Dent 2003;13(1):13-19
20. Cohenca N, Forrest JL, Rotstein I. Knowledge of oral health professionals of treatment of avulsed teeth. Dent Traumatol 2006; 22(6): 296-301.
21. Loh T, Sae-lim V, Yian TB, Liang S. Dental therapists' experience in the immediate management of traumatized teeth. Dent Traumatol 2006; 22(2): 66-70
22. Al-Jundi SH, Al-Waeili H, Khairalah K. Knowledge of Jordanian school children health teachers with regards to emergency management of dental trauma. Dent Traumatol 2005; 15: 183-187.
23. Lin S, Levin L, Emodi O, Fuss Z, Peled M. Physician and emergency medical technicians' knowledge and experience regarding dental trauma. Dent Traumatol 2006: 22(3) 124-126.
24. Enabulele JE, Enabulele O, Nwashilli NJ. knowledge of hospital emergency unit staff about the first-aid management of traumatic tooth avulsion in a tertiary hospital in Nigeria. EC Dent Sci 2016: 5(3):1082-1089.
25. Nene KS, Bendgude V. Prognosis of replanted avulsed permanent incisors: A systematic review. Int J Pedod Rehabil 2018; 3:87-98.
26. Poi WR, Sonoda CK, Martins CM, Melo ME, Pellizzer EP et al. Storage media for avulsed teeth: a literature review. Braz Dent J 2013; 24(5):437-445.
27. Holan G, Shmueli Y. Knowledge of physicians in hospital emergency rooms in Israel on their role in cases of avulsion of permanent incisors. Int J Paediatr Dent 2003; 13(1):13-19.