






Awareness and Preferred Mode of Getting Information on First Aid Management of Avulsed Permanent Teeth: Survey of Nigerian Mothers

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ABSTRACT

Objective: To determine the awareness and sources of information on first aid management of avulsed permanent teeth in a group of South-western Nigerian mothers. **Material and Methods:** An 18-item interviewer-administered questionnaire was used to survey 385 mothers attending the antenatal and immunization clinics on their perception towards dental avulsion, its management, sources, and preferred mode of receiving information on first aid. The effect of all significant factors was inferred at $p < 0.05$. **Results:** Mothers who had previous information on the first aid management of dental avulsion had significantly higher knowledge ($p = 0.000$). Majority (80.8%) of the mothers did not know that an avulsed permanent tooth could be replanted, though mothers whose children had not experienced dental trauma had significantly higher knowledge ($p = 0.003$). The knowledge of first aid management of avulsed permanent tooth was low, regardless of age, education and employment status of the respondents. **Conclusion:** There was low knowledge among mothers regarding the first aid measures in the management of avulsed permanent teeth. Their main preference for receiving information was through social media and television. There is a need to increase oral health educational campaigns targeted towards mothers.

Keywords: Tooth Injuries; Tooth Avulsion; Tooth Fractures; First Aid.

Introduction

Dental avulsion is the most serious form of traumatic dental injury and it is defined as the complete removal of a tooth out of its socket after the periodontal ligament is severed with or without fracture of the alveolar bone [1]. Avulsions constitute 0.5-16% of all traumatic dental injuries to permanent anterior teeth [2,3], while the teeth most commonly avulsed in the primary and permanent dentitions are the maxillary incisors [4]. These anterior teeth are important for aesthetics, mastication, speech, integrity of supporting tissues, and psychological and mental well-being of children [5,6]. Tooth avulsion is three times more frequent in boys than girls because of their active participation in sports, and it occurs most commonly from ages 7 to 9 years, when the permanent incisors are erupting [7]. Tooth avulsion can create significant psychosocial and economic problems for the child and the parents.

The loss of the permanent anterior teeth can be very distressing to both child and parents, and this can cause poor facial esthetics and may result in a child exhibiting low self-esteem [7,8]. However, an avulsed permanent tooth tends to heal and be retained for life if properly replanted, even though the prognosis of healing depends on appropriate emergency management immediately after the avulsion occurs [9,10]. Furthermore, since most dental injuries occur in the home environment, mothers who play a major role in the child's upbringing have a higher likelihood to handle an avulsed tooth than other persons. Therefore, it is pertinent to assess maternal knowledge on the important steps to take immediately dental avulsion occurs and design appropriate educational interventions to ensure successful outcomes of treatment [11,12].

Studies that have been conducted show a lack of knowledge among mothers and caregivers on the emergency management of traumatic dental injuries. In a study among teachers in Brazil, 91.2% reported having no knowledge about the management of dental trauma, even though 16.6% of them had seen acute dental trauma cases. Regarding actions to take when acute injuries occur in permanent teeth, the teachers showed a significant error rate. The knowledge and actions of the Brazilian schoolteachers in relation to care of acute injuries in permanent teeth were inconsistent and based on unfounded concepts, beliefs and intuition, and lack of training [13]. In another study done in the United Arab Emirates, the level of knowledge about dental avulsion among mothers was inadequate, necessitating educational campaigns to improve the emergency management of dental injuries [14]. Similarly, in a Kuwaiti study, no difference was found in paternal and maternal knowledge about dental avulsion, and despite a high level of knowledge about the management of simple body injuries, knowledge about first aid management for dental injuries due to trauma was inadequate [10]. Furthermore, a study done in Lagos, Nigeria, to assess parental awareness of emergency management of avulsion of permanent teeth of children showed that a majority of the parents had little or no knowledge of what to do regarding emergency management of dental trauma [15].

Studies have been conducted among school teachers in Nigeria and also among parents to assess awareness of emergency management of dental trauma [15-17], but there is a paucity of data with regards to awareness of mothers and their preferred mode of receiving training on the first aid management of avulsion. Therefore, the purpose of this study was to determine the awareness and preferred mode of getting information on first aid management of avulsed permanent teeth in a group of South-Western Nigerian mothers.

Material and Methods

Ethics

Ethical approval for the study was obtained from the Health Research Ethics Committee of the Lagos University Teaching Hospital, Lagos, Nigeria, on the 9th of October 2019 (Protocol Number:

ADM/DCST/HREC/APP/3240). Adequate consideration was given to protect the study participants' identity, and the confidentiality of the information given was guaranteed.

Study Design and Population

This was a cross-sectional descriptive study. The study was carried out at the Lagos University Teaching Hospital (LUTH), a teaching hospital located in Idi-Araba, Surulere, Lagos, Nigeria. Patients with diverse ethnicities, languages, cultures, and religions from Lagos and its environs are usually referred to LUTH. The study included mothers attending the antenatal clinic and those who brought their children to the LUTH immunization clinics.

Sampling Method

The sample included all mothers who were enrolled at the antenatal clinic and those who had their babies enrolled at the immunisation clinic at the Lagos University Teaching Hospital, Idi-Araba, Lagos, during the period of study. A simple random sampling technique using the balloting method was used for enlisting the study subjects using the attendance register for each clinic day as the sampling frame.

Sample Size Determination

The sample size was determined using a formula for a descriptive cross-sectional study. Sample size = $Z^2 pq/e^2$, where $Z = 1.96$, $p =$ with 16.7% prevalence of traumatic dental injuries in Lagos [18], $q = 1 - p$, with margin of error (e) set at 5%. The minimum calculated sample size was 213.

Inclusion and Exclusion Criteria

Those included were mothers attending the antenatal clinic and immunization clinic who had at least one child above the age of 6 years. The subjects were included in the study after explaining the study's nature to them and obtaining their informed consent. Mothers who were unwilling to give their informed consent and those who were unable to communicate were excluded from the study.

Data Collection

An 18-item structured, interviewer-administered questionnaire was used for data collection. This questionnaire was adapted from a previously validated questionnaire [16], which consisted of three main parts. The first part included the study participants' personal information (age, educational level, qualification, tribe and employment status). The second part explored the knowledge of the participants on the first aid management of an avulsed permanent tooth while the third part assessed the participants' source of information and willingness to receive more information and their preferred medium for receiving information on first aid management of avulsed teeth.

The right responses were assigned a score of 1, while wrong responses were given a score of 0. The respondents were categorized as having either 'good' or 'poor' knowledge on the first aid management of avulsed permanent teeth and dental trauma based on their responses to the 8 knowledge questions. Obtaining a score < 4 was classified as 'poor', and score ≥ 4 as 'good' knowledge.

Data Analysis

The data was analyzed using IBM SPSS software version 23.0 (IBM Corporation, Armonk, NY, USA). Frequency tables were made for all variables, and central tendency and dispersion measures were computed for numerical variables. Descriptive statistics, including means, standard deviations, and percentages, were used to present the socio-demographic variables and knowledge of the study population. The chi-square test was used to determine the level of association between variables. Differences and associations were considered statistically significant, where the associated p-values were equal to or less than 0.05.

Results

A total of 385 mothers participated in the study with a mean age of 33.6 ± 6.4 years. The majority of the mothers (64.2%) had tertiary education and 39.2% had full-time employment. About a third of the mothers stated that their children had experienced dental trauma. Fractured anterior tooth was the most common type of traumatic dental injury (53%), followed by avulsion (16%) and jaw fracture (3%).

Table 1 shows the participants' knowledge on the first aid management of an avulsed permanent tooth. When asked about the immediate response to dental trauma in a child, more than half (65.4%) of the mothers reported that they will take the child to the dentist, while 26.5% of them stated that they will manage child and self-administer medication. A high proportion (80.8%) of the mothers did not know that an avulsed permanent tooth could be replanted. A greater proportion (64.7%) of the mothers stated they will not keep an avulsed permanent tooth if found. Of the 136 mothers who stated that they will keep it, 75.7% opted to take the avulsed permanent tooth along with the child to the dentist.

On the transport media for an avulsed permanent tooth, most mothers (74.3%) reported they will use paper/gauze/plastic bag while 11.0% chose milk as the preferred transport medium. Most of the mothers (65.7%) answered correctly that professional dental care should be sought immediately or within an hour of having experienced an avulsed tooth. Two hundred and two (60.3%) of the mothers agreed that tetanus toxoid is important in the first aid management of dental trauma. After scoring the respondents on their first aid knowledge of the management of an avulsed permanent tooth, less than half (46.8%) of the mothers had good knowledge of the first aid management of an avulsed permanent tooth.

Table 1. Mothers' knowledge on first aid management of an avulsed permanent tooth.

Variables	N	%
Immediate Response/Care in Case of Trauma to the Teeth		
Take Child to the Dentist	252	65.4
Give Self-Medication and Put Child to Rest	102	26.5
No Need for Treatment	13	3.4
Others	18	4.7
Are You Aware That an Avulsed Tooth can be Replanted/Put Back in Place?		
Yes	74	19.2
No	311	80.8
Will You Keep an Avulsed Tooth if Found?		
Yes	136	35.3
No	249	64.7
An Avulsed Tooth Should be Taken to the Dentist Along with the Child		
Yes	103	75.7
No	30	22.1
I Don't Know	3	2.2
How Should the Avulsed Tooth be Kept When Going to the Dentist		
Paper/Tissue/Gauze/Plastic Bag	101	74.3
Milk	15	11.0
Water	15	11.0

Saline	4	3.0
Others	1	0.7
How Soon do You Think it is Appropriate to Seek Professional Help for an Avulsed Tooth?		
Immediately/Within an Hour	253	65.7
Within a Few Hours	35	9.1
At Least Before the Next Day	9	2.3
When There is Pain	48	12.5
I Don't Know	40	10.4
Administration of Tetanus Toxoid is Important in Management of Dental Trauma		
Yes	232	60.3
No	35	9.1
I Don't Know	118	30.6
It is Important to Seek Professional Dental Care as Regard Dental Trauma		
Yes	333	86.5
No	52	13.5
Summary of Knowledge of Participants		
Good Knowledge	180	46.8
Poor Knowledge	205	53.2

In Table 2, the respondents' source and preferred mode of receiving information/training on first aid management of dental avulsion is shown. Three hundred and four (79%) of the mothers had not received any form of information with regards to first aid management of dental avulsion. Of those 81 (21%) that had received information on first aid management of dental avulsion, 9.9% got their information from the dental clinic/hospital followed by television (4.9%) and from family/friends (4.4%). Almost all the mothers (96.4%) were willing to receive more information on first aid management of dental avulsion. When asked about their preferred medium of receiving information, most of the mothers (49%), chose social media platforms, followed by television/radio (43.9%).

Table 2. Mothers' source of and preferred mode of receiving information/training on first aid management of dental trauma.

Variables	N	%
Ever Received Information on First Aid Management of Dental Trauma in Children		
Yes	81	21.0
No	304	79.0
Source of Information		
Television or Radio Show	19	4.9
Social Media	10	2.6
Books, Magazines and Newspapers	7	1.8
Dental Clinic/Hospital	38	9.9
Friends/Family	17	4.4
School/Seminar	2	0.5
Knowledge of First Aid Management of Dental Trauma is Sufficient		
Yes	91	23.6
No	294	76.4
Willingness to Receive More Information on First Aid Management of Dental Trauma		
Yes	371	96.4
No	14	3.6
Preferred Means of Receiving Information on First Aid Management of Dental Trauma		
Television/ Radio Show	169	43.9
Social Media	189	49.1
Books, Magazines, Newspaper	46	11.9
Clinic/Hospital	35	9.1
Workshop/ Community Talk	7	1.8

Those whose children had not experienced dental trauma had significantly higher knowledge than those whose children had experienced dental trauma ($p=0.003$) and those from the Hausa tribe had significantly poorer knowledge than those of other tribes ($p=0.000$) (Table 3).

Table 3. Association between mothers' knowledge of first aid management of avulsed tooth and socio-demographics characteristics.

Socio-Demographics Characteristics	Frequency		Knowledge		p-value
	N	%	Good N (%)	Poor N (%)	
Age (Years)					
20 – 29	97	25.2	37 (38.1)	60 (61.9)	0.225
30 – 39	219	56.9	107 (48.9)	112 (51.1)	
40 – 49	62	16.1	33 (53.2)	29 (46.8)	
≥ 50	7	1.8	3 (42.9)	4 (57.1)	
Mean Age = 33.6 ± 6.4 years					
Educational Level					
Primary	22	5.7	7 (31.8)	15 (68.2)	0.108
Secondary	98	25.5	37 (37.8)	61 (62.2)	
Tertiary	247	64.2	126 (51.0)	121 (49.0)	
No Formal Education	18	4.6	10 (55.6)	8 (44.4)	
Employment Status					
Working (Full-Time)	151	39.2	70 (46.4)	81 (53.6)	0.236
Working (Part Time)	110	28.6	59 (53.6)	51 (46.4)	
Student	18	4.7	9 (50.0)	9 (50.0)	
Not Working	106	27.5	42 (39.6)	64 (60.4)	
Tribe					
Igbo	150	39.0	68 (45.3)	82 (54.7)	0.0002
Hausa	11	2.9	0 (0.0)	11 (100.0)	
Yoruba	195	50.6	90 (46.2)	105 (53.8)	
Others	29	7.5	22 (75.9)	7 (24.1)	
Ever Encountered any Case of Dental Trauma in a Child					
Yes	127	33.0	47 (26.1)	80 (39.0)	0.003
No	258	67.0	133 (73.9)	125 (61.0)	
Previous Information on First Aid Management of Dental Trauma					
Yes	81	21.0	56 (69.1)	25 (30.9)	0.000
No	304	79.0	124 (40.8)	180 (59.2)	

Those mothers who had previous information on the first aid management of dental trauma had significantly higher knowledge than those who had not ($p=0.000$).

Discussion

Our study assessed mothers' knowledge on first aid management of avulsed permanent teeth and their preferred mode of receiving information on emergency management of dental trauma. The loss of the permanent anterior teeth can be very distressing to both child and parents, while poor aesthetics resulting from the loss can cause a child to exhibit low self-esteem [7,8]. Even though most of the mothers from the present study had tertiary education, the highest proportion of respondents had poor knowledge on the immediate management of an avulsed tooth. This resulted from lack of awareness because most (79%) of the mothers had never received any information or training on first aid management of dental trauma. This was similar to other studies [7,12,15,19,20] where they reported poor awareness regarding first aid management of dental trauma, indicating that literacy may not automatically translate into health literacy.

One significant finding in this study is the method through which information is disseminated to mothers/caregivers. When the mothers were asked about their source of information on dental emergencies

most of them reported that they had received their information from the dental clinic/hospital. Similarly, when the mothers were asked about their preferred mode of receiving information most chose social media, which is different from the hospital setting. This was in agreement with a similar study, conducted in Saudi Arabia [21]. Most often, mothers/caregivers get information on prevention and first aid management of dental trauma at the dental clinic after the incidence has occurred. Patients seek professional help often times for curative rather than preventive purposes [22]. This knowledge should make researchers and clinicians seek for innovative and patient-friendly ways to get evidence-based information out in a timely and effective manner and to those who need it the most, beyond the dental clinic settings. It is important to consider patients' preferred mode of receiving information because this could help when planning health education for mothers and their children. In this era of the widespread use of various social media platforms, social media has become a trusted source of information to many people, and it may be worthwhile to use it as one of the channels of dental public health enlightenment.

From our study, only 19% of mothers knew that an avulsed tooth could be replanted. This finding was higher than that reported by Murali et al. [20] (7%), but lower than that reported by Oliveira et al. [23] (39%), Loo et al. [7] (43.3%), Raphael and Gregory [24] (66.6%), and Hegde et al. [25] (66.5%). Ignorance about the management of an avulsed tooth could lead to the tooth being thrown away or abandoned at the site of accident. Similarly, only 35% of the mothers stated they will keep an avulsed tooth, of which the higher proportion opted to transfer it in the wrong storage media (paper or gauze). This corroborates the findings by similar studies [7,12,19,20] where they reported poor knowledge about transport media choice. Dry storage of the tooth in media such as plastic bags, paper, handkerchiefs will allow irreversible desiccation of the periodontal ligament, resulting in the loss of the replanted tooth over time [9,26]. Mothers whose children had not experienced dental trauma had significantly higher knowledge than those whose children had experienced dental trauma. This may be an indication that maternal knowledge about dental trauma was translated into preventive practices but we cannot make causal inferences because of the descriptive nature of our study.

Emergency management of an avulsed permanent tooth involves keeping the patient calm; if the tooth is found, it should be picked by the crown, rinsed under running water, and replanted in the socket. When this is not possible, the tooth should be placed in a storage medium and brought to the clinic with the patient for replantation. Maintaining an avulsed tooth in a suitable wet storage medium, which can preserve the tooth's vitality, is key to a successful replantation [27]. The ideal storage medium should be capable of preserving cell vitality, adherence and clonogenic capacity [28] and should be readily available at the site of the accident or easily accessible. A recent literature review showed that several types of wet storage media have been evaluated in laboratory studies and clinical reports: these include bovine milk, saliva, egg white, coconut water, green tea, and tissue culture solutions such as Hank's Balance Salt Solution. They concluded that apart from solutions designed specifically for storage and culture purposes, regular pasteurized whole milk was the most frequently recommended medium with the best prognosis due to its ready availability, easy access, physically compatible pH, and the presence of nutrients and growth factors [28].

A good number of the mothers (65%) agreed that professional care should be sought immediately a permanent tooth is avulsed. Previous authors concluded that under any circumstance, best results will be achieved if the tooth remains out the socket for less than 20 minutes [29]. In contrast, other authors have shown that appropriate replantation of an avulsed permanent tooth within 30 minutes has a 90% chance of

success [30]. Only a negligible chance (5%) of long-term retention of an avulsed tooth exists if replantation occurs after two hours [30].






It is worth noting that most mothers (71%) from the present study had not received information on first aid management of dental trauma. This finding, though still portraying inadequate knowledge, shows that there has been a marginal improvement in information dissemination when compared to a similar study conducted in Nigeria over a decade ago, which reported that (91%) of the parents had never received information [15]. This present study also revealed that those mothers who had received previous information on first aid management of dental trauma had significantly higher knowledge than those who had not. There is still a need for more educational campaigns directed towards the first aid management of dental trauma as most of the campaigns are targeted towards prevention of caries and other oral diseases.

Within the limit of our study, the knowledge of first aid management of avulsed permanent teeth was low, regardless of age, education and employment status. Mothers with previous information on management of dental trauma had significantly higher knowledge. Evidence from a systematic review shows that children and adolescents whose traumatic dental injuries (TDI) have no associated complications have similar quality of life with children without injuries [31]. Research has also shown that instituting measures that promote healthy practices lead to a lower prevalence of TDI [32]. Hence, there is a need for continuous oral health campaign targeted towards prevention and emergency management of dental trauma using the appropriate and preferred means. Future randomized population-based interventional studies to improve maternal knowledge on first aid management of dental trauma are recommended.

Conclusion

Maternal knowledge about the first aid management of avulsed permanent teeth in Nigeria was low, regardless of age, educational level, and working status. The mothers' preference for receiving information/training was through social media and television. There is a need to increase oral health educational campaigns targeted towards mothers, utilising their preferred mode of receiving the information.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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