

THE AWARENESS ON EMERGENCY MANAGEMENT OF TOOTH AVULSION INJURY AMONG PRIMARY SCHOOL TEACHERS

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ABSTRACT

Teachers are most likely to be among the first to see a child immediately if dental injury happens at school. Hence, their intervention greatly influences the prognosis of an avulsed tooth. This study assessed the level of knowledge and attitude on the management of tooth avulsion injury among primary school teachers. This cross-sectional study was done using a pretested questionnaire involving 100 teachers of two primary schools in Kuantan. 81 out of 100 teachers understood that an avulsed permanent tooth should be saved. 45% of the respondents thought that they were able to distinguish between deciduous and permanent teeth. Only 24% of respondents were able to answer correctly on immediate action to be taken when they encountered tooth avulsion injury. 81% of respondents knew that an avulsed tooth has to be held by its crown. However, only 18% chose to replant the tooth back into its socket, and 76% agreed that replantation must be done immediately. Regarding the storage medium for the avulsed tooth, 38% chose to place it in ice, followed by tissue paper (32%). Previous experience of witnessing tooth avulsion injury, knowing the importance of emergency management and female gender were found to improve the teachers' knowledge on emergency protocols ($p < 0.05$). Overall, the level of awareness on emergency management of tooth avulsion injury among primary school teachers was found to be unsatisfactory (81%). Thus, the teachers should be given more exposure and training on the emergency management of tooth avulsion injury at school. The teachers play a key role in preventing detrimental impact to the children's dentition and psychosocial development due to the loss of permanent tooth.

Key words: tooth avulsion, school teachers, awareness

INTRODUCTION

Tooth avulsion is defined as complete displacement of the tooth from socket (Welbury et al., 2005). It is considered as one of the most detrimental traumatic dental injuries among school-aged children (Natarajan et al., 2013) and commonly involves the permanent upper anterior teeth (Bastone et al., 2000). The permanent anterior teeth are not only crucial for aesthetics but are also necessary for speech, mastication, health of the periodontium, psychological and mental health of children. Events like falls, contact sports (due to not wearing properly fitted mouth guard), collisions and direct trauma are among the reasons such injury occurs.

School is a place where children between the ages of 7-12 years old spend most of their time apart from their own house, and it is a common place where tooth avulsion injury usually occurs. In this range of age, the children are extremely active and involved in various physical activities at schools. Consequently, the teachers will be among the first person to attend any traumatic incidents that occurred within the school facility. The immediate action taken by them may greatly affect the prognosis of the injured tooth. The teachers' awareness regarding the emergency management of tooth avulsion injury will help to reduce the time interval between avulsion and replantation and ensuring the success of treatment.

The prognosis of an avulsed tooth can be determined by several factors; the extra-oral drying time, the storage medium of the avulsed tooth and also least damage to the root (Prathyusha et al., 2015). Positive prognosis can be obtained only when all of these factors intertwined together. Short extra-oral drying time is important for avulsed teeth to preserve their vitality after replantation. As mentioned by Abidi et al. (2010), the speed with which the avulsed tooth is replanted into the alveolar socket will result in an enhanced outcome. Therefore, it should be replanted within the first 15-20 minutes and drying of viable periodontal ligament (PDL) cells must be avoided (Manjeet et al., 2014; Basir et al., 2013). Appropriate storage medium is crucial to store the avulsed tooth when immediate replantation is not possible until the patient is brought to the nearest dental clinic. The storage mediums in order of preference are Hank's balanced salt solution (HBSS), milk, saliva, vestibule of the mouth or container with the patient's spit, normal saline or water (Mehrabkhani et al., 2015; Prathyusha et al., 2015; Manjeet et al., 2014). Water is the least preferred medium because it could cause hypotonicity which will result in the rapid lyses of the cells. This will also increase the inflammation during replantation. HBSS is the most effective storage media and much more specialized to store an avulsed tooth. This solution has superior ability to maintain vitality of the PDL cells, however it is not easily accessible. Wet storage media ensures the viability of the PDL attachment so that the cells will not undergo dehydration. It is necessary to keep these cells hydrated so that these cells remain vital and reattach to bone during replantation. The usage of milk is favourable, easily accessible and free from bacteria. In a study done by Touré et al. (2011) involving primary school teachers, it was found that 57.3% teachers chose wet media to store the avulsed tooth while another 42.7% opted to keep it in a

dry storage media, followed with milk (21.9%). Meanwhile, Nikam et al. (2014) stated that most of the teachers chose to wrap the avulsed tooth in a soft cloth or tissue paper. The avulsed tooth also must be handled properly to ensure minimal damage to its root. It should be held cautiously at the crown part (white part) and the root should be left untouched (Abidi et al., 2010). If the root is touched, it may cause disruption to the remaining PDL cells that are attached on it. Hence, it will compromise the vitality of the cells. Before replanting the avulsed tooth, it needs to be rinsed gently and briefly for 10 seconds with tap water without brushing it.

Natarajan et al. (2013) found that rinsing with tap water was the most common option (60.3%) to clean a soiled tooth, followed by normal saline (21.4%). It was also reported that 9.2% of the teachers thought they could scrub the tooth with a toothbrush whereas 5.3% of them said they would replace the tooth into its socket without doing anything. The knowledge to differentiate between primary and permanent dentitions is necessary to ensure that the teachers can make a correct judgment whether or not to replant the avulsed tooth. A primary tooth should not be replanted as it might impair the development of the permanent successor. Pithon et al. (2014) reported that about 28.0% of teachers were unable to differentiate between a permanent and primary anterior tooth in a 9 year-old-child. It is best to bring the child and the avulsed tooth to the dentist or to a nearby hospital immediately for proper treatment to save the tooth (Mori et al., 2007). Delaying the treatment will result in high chance of tooth loss.

In Malaysia, not many studies have been conducted to ascertain the knowledge of primary school teachers on the management of dental injuries. Therefore, the objectives of this study were to investigate the knowledge and attitude of teachers from selected primary schools in Kuantan on the emergency management of dental trauma and to determine the associating factors. The outcome of this study could be used to develop and refine the primary school teachers' curriculum on first aid training related to tooth avulsion injury.

MATERIALS AND METHODS

This cross-sectional survey was conducted using convenience sampling involving 100 teachers of two selected primary schools, namely Sekolah Rendah Kebangsaan Tunku Azizah and Sekolah Rendah Kebangsaan Fakeh Abdul Samad in Kuantan, Pahang. The ethical clearance was obtained from the Kulliyah of Dentistry Research Committee and Ethics Review Committee of International Islamic University Malaysia (IREC 626). Permissions to conduct the study at the selected schools were obtained from Pahang State Education Department and the schools' authority. Only full-time teachers were selected to receive the consent form and the self-administered questionnaire. Teachers who were on training and on leave were excluded, as well as incomplete questionnaires. A pilot testing of the self-design questionnaire was conducted (n=15). Face validity was assessed using expert opinions. The Cronbach's alpha value obtained was 0.55. Subsequently, data collection was conducted from 20th August 2016 to 31st August 2016. The questionnaire was designated to include dependent and independent variables. The dependent variable was awareness which includes knowledge and attitude on emergency management of tooth avulsion injury, while the independent variables were age, gender, race, level of education, career time-span, first aid training, dental injury management training, previous experience of tooth avulsion injury and knowing the importance of tooth avulsion injury. The questionnaire was divided into two parts; the socio-demographic background and problem based questions. A total of 9 questions for the problem-based section were included, in which the level of knowledge and attitude of respondents were assessed and classified into three groups, which are poor (0-3), fair (4-6) and good (7-9). The relationship between the teachers' level of awareness and its associating factors were analysed using Chi-square test. The level of statistical significance was set at $p < 0.05$.

RESULTS

A total of 140 questionnaires were distributed to the respondents, with 112 questionnaires returned, giving a response rate of 80%. However, only 100 completed questionnaires were accepted for analysis. The socio-demographic and characteristics data of the respondents is shown in **Table 1**. Majority of the respondents were female (74%). Teachers in the age range of 31 to 40 years old represent 47% of respondents and 58% of respondents had teaching experience of 7 to 19 years. It was found that 42% of respondents had received first aid training with 34% of them had experienced managing dental injury, while majority of the respondents (64%) had never witnessed a tooth avulsion injury.

Table 1: Socio-demographic and characteristics of respondents (n= 100)

CHARACTERISTICS	n	%
GENDER		
Male	26	26
Female	74	74
AGE		
< 30 years	3	3
31 to 40 years	47	47
41 to 50 years	32	32
>50 years	18	18
RACE		
Malay	96	96

Chinese	1	1
Indian	3	3
Others	0	0
LEVEL OF EDUCATION		
Bachelor of Education	40	40
Diploma of Education	14	14
Educational certificate	9	9
KPLI	32	32
KPLD	5	5
TEACHING EXPERIENCE		
<6 years	5	5
7 to 19 years	58	58
>19 years	37	37
FIRST AID TRAINING		
Yes	42	42
No	58	58
DENTAL INJURY MANAGEMENT		
Yes	34	34
No	8	8
IMPORTANCE OF EMERGENCY MANAGEMENT		
Yes	26	26
No	74	74
WITNESSED TOOTH AVULSION		
Yes	36	36
No	64	64

The distribution of responses to the questions is shown in Table 2. Table 3 shows the score for each question, respectively. This study found that only 45% of the respondents were able to correctly identify the tooth whether it was a milk tooth or a permanent tooth. 78% of the respondents correctly answered permanent tooth as the type of tooth to be saved. Meanwhile, only 24% of the respondents opted to calm the child down, compress the bleeding and find the avulsed tooth as their first action immediately after tooth avulsion injury has occurred. 81% had chosen correctly to handle the tooth by its crown instead of by the root. 71% of them responded that they would clean the tooth with water compared to cleaning it with a cloth or tissue paper or leaving the tooth as it is. Meanwhile, only 18% of the teachers opted to replant the tooth, while majority chose not to. It was also found only 21% of the respondents had chosen correctly the appropriate storage medium for the avulsed tooth which are normal saline, HBSS, saliva and milk. Majority of the teachers (94%) knew about the suitable time for the treatment of avulsed tooth, which is within 30 minutes and 64% of the respondents chose to go to the nearest dental clinic to seek proper treatment for the children.

Table 2: Knowledge and attitude on emergency management of tooth avulsion injury

Items	n	%
Tooth identification		
Yes	45	45
No	55	55
Type of tooth to be saved		
Milk tooth	0	0
Permanent tooth	81	81
Both	19	19
First action immediately after tooth avulsion injury		
Calm the child down, stop bleeding by compressing the gum	73	73
Calm the child down, stop bleeding by compressing and look for the tooth	24	24
Do nothing	3	3
Tooth handling		
By the crown	81	81

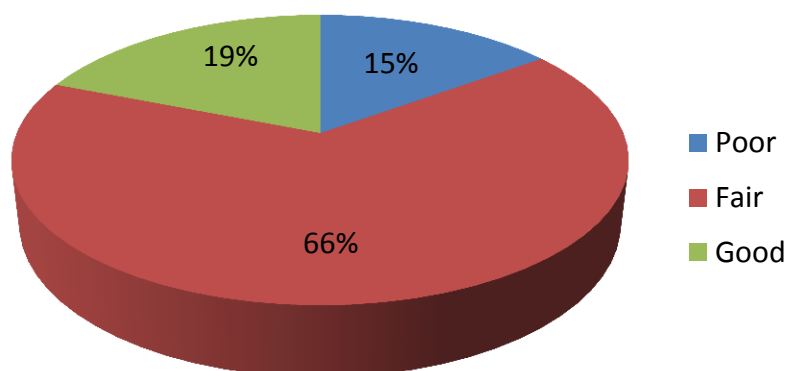
By the root	19	19
Cleaning of the tooth		
Clean with water	71	71
Clean with cloth or tissue paper	21	21
Leave as it is	8	8
Tooth replantation		
Yes	18	18
No	82	82
Storage medium		
Ice	38	38
Tissue paper	32	32
Normal saline	6	6
HBSS	8	8
Saliva	6	6
Milk	1	1
Water	5	5
Others	4	4
Time		
Immediately	76	76
Within 30 minutes	18	18
Within a few hours	5	5
Next day	1	1
First place of contact		
Nearest dental clinic	64	64
Hospital	12	12
Child's home	24	24
Others	0	0
Do nothing	0	0

Table 3: Scores for each question in the knowledge and attitude section

Items	Correct %	Incorrect %
Tooth identification	45	55
Type of tooth to be saved	81	19
Immediate action following tooth avulsion injury	24	76
Tooth handling	81	19
Method to clean the tooth	71	29
Tooth replantation	18	82
Storage medium	21	79
Time	94	6
First place of contact	64	36

Figure 1 shows the respondents' level of knowledge and attitude, which were classified into three groups of poor, fair and good. It was found that 66% of the respondents had fair level of knowledge and attitude towards management of tooth avulsion injury. Comparatively, 19% of the respondents had good level of knowledge and attitude, while 15% had poor level of knowledge and attitude.

Figure 1: Knowledge and attitude level of respondents



The correlation between the level of knowledge and attitude of respondents and the associating factors was evaluated. Table 4 shows that there was a positive correlation between the gender of respondents with their level of knowledge and attitude ($p=0.041$). A large percentage of female teachers were classified into fair level of knowledge and attitude (70.3%) and good level of knowledge and attitude (21.6%). In comparison, 53.8% of the smaller proportion male teachers were classified into fair level of knowledge and attitude, and 11.5% for good level of knowledge and attitude.

Table 4: Correlation between gender and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
GENDER			
Male (n=26)	9 (34.6)	14 (53.8)	3 (11.5)
Female (n=74)	6 (8.1)	52 (70.3)	16 (21.6)
		"p"= 0.041	

Table 5 demonstrated no significant correlation between the age of the respondents and the level of knowledge and attitude ($p=0.528$). 74.5% of the respondents in the age range of 31 to 40 years old had a fair level of knowledge. Meanwhile, 10.6% of respondents had a good level of knowledge.

Table 5: Correlation between age and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
AGE			
< 30 years	0 (0.0)	2 (66.7)	1 (33.3)
31 to 40 years	7 (14.9)	35 (74.5)	5 (10.6)
41 to 50 years	5 (15.6)	18 (56.2)	9 (28.1)
>50 years	3 (16.7)	11 (61.1)	4 (22.2)
		"p"= 0.528	

Majority of the respondents were Malay as shown in Table 6. Thus, the correlation between race and the level of knowledge and attitude was not significant ($p=0.441$). Majority of the Malay respondents were classified into fair level of knowledge (66.7%), 17.7% for good level of knowledge, while 15.6% had a poor level of knowledge.

Table 6: Correlation between race and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
RACE			
Malay	15 (15.6)	64 (66.7)	17 (17.7)
Chinese	0 (0.0)	1 (33.3)	2 (66.7)
Indian	0 (0.0)	1 (100.0)	0 (0.0)
Others	0 (0.0)	0 (0.0)	0 (0.0)
		"p"= 0.441	

In this study, there was no correlation between the level of education and the level of knowledge and attitude ($p=0.08$), as shown in Table 7. The highest percentage of respondents with good level of knowledge consists of those who graduated with qualifications in Bachelor of Education (32.5%).

Table 7: Correlation between the level of education with the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
LEVEL OF EDUCATION			
Bachelor of Education	6 (15.0)	21 (52.5)	13 (32.5)
Diploma of Education	3 (21.4)	9 (64.3)	2 (14.3)
Educational certificate	1 (11.1)	7 (77.8)	1 (11.1)
KPLI	2 (6.2)	28 (87.5)	2 (6.2)
KPLD	3 (60.0)	1 (20.0)	1 (20.0)
		"p"= 0.08	

Table 8 shows no correlation between teaching experience and the level of knowledge and attitude ($p=0.992$). Most of the respondents with teaching experience of 7 to 19 years were classified as having fair level of knowledge and attitude (67.2%). Only 19% of the respondents had good level of knowledge and attitude.

Table 8: Correlation between teaching experience and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
TEACHING EXPERIENCE			
<6 years	1 (20.0)	3 (60.0)	1 (20.0)
7 to 19 years	8 (13.8)	39 (67.2)	11 (19.0)
>19 years	6 (16.2)	24 (64.9)	7 (18.9)
		"p"= 0.992	

Despite the respondents having received prior first aid training, the outcome of this study with regards to the level of knowledge and attitude was not satisfactory. Pearson Chi Square test revealed no significant correlation between receiving first aid training and the level of knowledge and attitude ($p=0.412$), as shown in Table 9. Respondents who had received first aid training and had good level of knowledge were only 21.4%.

Table 9: Correlation between first aid training and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
FIRST AID TRAINING			
Yes	4 (9.5)	29 (69.0)	9 (21.4)
No	11 (19.0)	37 (63.8)	10 (17.2)
		"p"= 0.412	

Respondents who had undergone training for dental injury management did not give a positive outcome pertaining to their level of knowledge and attitude ($p=0.379$), as shown in Table 10. A low percentage of respondents (37.5%) had good level of knowledge, although they were trained in dental injury management.

Table 10: Correlation between dental injury management training and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
DENTAL INJURY MANAGEMENT			
Yes	0 (0.0)	5 (62.5)	3 (37.5)
No	4 (11.8)	24 (70.6)	6 (17.6)
		"p"= 0.379	

Table 11 shows that the respondents' awareness on the importance of emergency management had significant correlation with their level of knowledge and attitude ($p=0.048$). Those who realised about the importance of emergency management consisted of 34.6% respondents with good level of knowledge. Meanwhile, those who were not aware about the importance of dental injury management consisted of only 13.5% respondents with good level of knowledge.

Table 11: Correlation between the awareness on the importance of emergency management and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
IMPORTANCE OF EMERGENCY MANAGEMENT			
Yes	2 (7.7)	15 (57.7)	9 (34.6)
No	13 (17.6)	51 (68.9)	10 (13.5)
		"p"= 0.048	

Table 12 shows that 25% of respondents had good level of knowledge due to past experience of witnessing tooth avulsion injury. Positive correlation can be seen between having experienced witnessing tooth avulsion injury and the level of knowledge and attitude ($p=0.034$).

Table 12: Correlation between experience of witnessing tooth avulsion injury and the level of knowledge and attitude

CHARACTERISTICS	POOR n (%)	FAIR n (%)	GOOD n (%)
WITNESSED TOOTH AVULSION			
Yes	1 (2.8)	26 (72.2)	9 (25.0)
No	14 (21.9)	40 (62.5)	10 (15.6)
		"p"= 0.034	

DISCUSSION

It is of utmost importance that primary school teachers who are always in the vicinity of school children to have adequate knowledge in managing tooth avulsion injury and consequently play a role in improving the prognosis of avulsed permanent tooth. In this study, the teachers' awareness was classified into three groups of poor, and good. This enables the teachers' level of knowledge and attitude to be assessed in depth and provides better understanding with regards to the teachers' ability in dealing with this type of injury. The fair and poor levels of knowledge were considered unsatisfactory, as the teachers' knowledge was below the standard and inadequate to ensure a successful prognosis of the avulsed tooth. Hence, in this study, 81% of teachers had insufficient knowledge on correct tooth identification between milk and permanent tooth, immediate action to be taken following the injury, tooth replantation and storage media for the avulsed tooth. A study by Pithon et al. (2014) found that almost half of the respondents (48.2%) had unsatisfactory knowledge regarding dental trauma and its emergency management. Similar

findings was reported by Young et al. (2012), wherein the primary and secondary school teachers in Hong Kong did not have satisfactory level of knowledge regarding tooth avulsion injury. Natarajan et al. (2013) also reported the lack of knowledge regarding this traumatic dental injury among physical education teachers in Chennai. Meanwhile, Taranath et al. (2017) had conducted a study to compare the knowledge and attitude of the teachers in East Madurai before and after training exposure with regards to emergency management of avulsed teeth. It was found that the knowledge level of majority of the respondents (70.8%) was in the very good category after the training, which was initially nil. Similarly, the attitude level also significantly rose (41.2%), which was initially 0.9%. This highlighted the importance of imparting the knowledge on managing the tooth avulsion injury to the teachers with hopes that the avulsed permanent tooth could be saved and retained for life.

In this study, factors like gender, teaching experience, having undergone first aid training course as well as training in dental injury management, knowing the importance of emergency management and having witnessed tooth avulsion injury were taken into consideration. It has been shown that female teachers had better knowledge regarding tooth avulsion injury compared to male teachers; 21.6% of female teachers and 11.5% of male teachers had good level of knowledge. A similar result reported by Pithon et al. (2014). It was found that the female teachers in their study had greater knowledge pertaining to dental trauma and emergency procedures compared to male teachers with statistically significant difference. The possible reason could be due to the fact that majority of them were mothers. Therefore, they displayed more mothering emotion and caring towards the children's safety as part of their duty as teachers. According to Vogt (2002) in a study on explorations into primary school teachers' professional identity and ethic of care, caring within teaching can be implicit in a range of ways. It includes caring as commitment, caring as physical care, caring as relatedness, caring as parenting and caring as mothering. Caring as mothering is remarkably associated with traditional Western notions of femininities whereas caring as commitment is non-gender-specific. Caring as relatedness can be linked with the concept of ethic of care. It is translated as responsibility for and relatedness to their pupils has been conceptualised as a moral perspective more often held by women.

Teachers with teaching experience of 7 to 19 years had greater knowledge with regards to the management of tooth avulsion injury (19%). The long career time span might give them more experiences and insight in handling emergencies. Mehrabkhani et al. (2015) concluded in their study that, teachers who were older than 50 years old, presumably with a long period of teaching experience, had better knowledge and skills to cope with the situation.

Approximately 42% of the primary school teachers in this study had undergone first aid training. However, the percentage of teachers with good level of knowledge and having undergone first aid training was relatively small (21.4%). There was not much difference compared to the teachers with good level of knowledge and have not undergone first aid training (17%). Meanwhile, it was found that 34 of 42 teachers (81%) had received training on management of traumatic dental injuries. Despite that, only 7.1% of the teachers were classified as having good level of knowledge on management of tooth avulsion. This result corroborated with the result of the study by Olatosi et al. (2013) in which almost 30.3% of teachers in the study had received first aid training and 30.9% of them reported that their training included management of traumatic dental injuries. Nevertheless, it was surprising to find the result of their study reflected that majority of the teachers (84%) had unsatisfactory knowledge regarding the emergency management of avulsed teeth.

This present study found that a large percentage of teachers (74%) did not know the importance of tooth avulsion emergency management. Although cases of tooth avulsion were quite common in schools, their management was never given its due importance as stated by Abidi et al. (2010). Teachers who claimed that they knew the importance of emergency management had a good level of knowledge, which was higher (34.6%) than those who did not know the importance of emergency management (13.5%). This result was statistically significant ($p < 0.05$), confirming that knowing the importance of emergency management may promote a better prognosis and outcome of an avulsed tooth. Moreover, this study also found that 36% of the primary school teachers had previous experience of witnessing tooth avulsion injury and this was quite similar with the result obtained by Olatosi et al. (2013). This percentage was higher than the result of previous study by Basir et al. (2010) in which it was reported that 15.2% of the teachers had experienced witnessing tooth avulsion injury. Past experience of witnessing tooth avulsion allowed the teachers to equipped themselves with information on proper management of the injury and thus, contributing to good knowledge level (25%). The result showed that there was a statistical significant difference in the knowledge levels among the teachers who had previously experienced dental trauma to those who have had no previous experience.

It is of utmost importance that the teachers are able to distinguish a deciduous tooth to a permanent tooth. Deciduous tooth should not be replanted back into the socket as it may jeopardize the viability of permanent tooth (Prathyusha et al., 2015). In the present study, approximately 55% of teachers were unable to identify the tooth whether it was a deciduous or a permanent tooth. Pithon et al. (2014) also reported that nearly 28% of teachers in their study were unable to distinguish a permanent to a primary (deciduous) anterior tooth. In a study by Krishnan et al. (2016), 69% of the teachers knew that avulsed deciduous teeth should not be replanted into its socket.

In this study, 73% of the respondents' first action after tooth avulsion injury was to only calm the child down and compress the bleeding without searching for the tooth. Prathyusha et al. (2015) reported that almost 52% of the participants chose not to pick up the avulsed tooth after the incident occurred. This may be due to the lack of knowledge among teachers, with a thinking that an avulsed tooth could not be saved by replantation.

Majority of the teachers (81%) in this study opted to handle the avulsed tooth by its crown instead of the root. The avulsed tooth should be held carefully at the crown part (white part) and the root should be left untouched. Periodontal ligament cells that are attached on the root are delicate and fragile, therefore if the root was touched, it may cause disruption to the remaining PDL cells, thus, compromising their vitality (Abidi et al., 2010).

Before replanting the soiled tooth, it needs to be cleaned first for approximately 10 seconds. It is a prerequisite for the tooth to be cleaned with water before its reimplantation into the socket so as to preserve the cells of the periodontal ligament viable for healing and revascularization (Prathyusha et al., 2015). The most common answers chosen by the teachers pertaining to the cleaning method of the avulsed tooth were by using water (71%). The result obtained was almost similar with the study by Natarajan et al. (2013), where rinsing with tap water was the most common option among their respondents (60%).

Extraoral drying time is one of the most important factors in determining good prognosis of the avulsed tooth. Replantation of the avulsed tooth ensured the extraoral drying time is put to a halt. Consequently, the prognosis of the tooth will be enhanced. However, in this study, almost 82% of the teachers opted not to replant the tooth. The same results were seen in the study by Natarajan et al. (2013), in which 61.1% of teachers also chose not to replant. Krishnan et al. (2016) reported that about 60% of respondents would not put back the tooth into its socket as they thought it was hazardous to do so. This may be due to the lack of adequate knowledge and confidence, concern of frightening the child, inflicting pain or even causing further mutilation to the tooth. Replantation must be executed immediately to allow periodontal ligament repair and maintenance. Hence, teachers should attempt to replant the tooth within the first 15-20 minutes of injury and drying of viable periodontal ligament cells should be avoided. In this study, among teachers who opted to replant the avulsed tooth, 76% of them chose to replant it immediately and 18% chose to do it within 30 minutes. Manjeet et al. (2014) mentioned that time is one of the crucial factors for avulsed tooth to preserve their vitality after replantation. Teachers should be made aware that the avulsed tooth requires immediate attention in order to have a positive outcome. A study conducted by Basir et al. (2013) reported that teeth replanted after 18 minutes had lower root resorption than the ones after 2 hours.

The results of this study found that the teachers' knowledge on transport media was poor. Most teachers opted for dry storage that will seriously affect the survival of the replanted tooth. 38% and 32% of teachers preferred ice and tissue paper as the storage medium for avulsed tooth, respectively. Similar finding was reported by Touré et al. (2011), in which 42.7% of the respondents opted to keep it in a dry storage media. Nikam et al. (2014) also reported that majority of the teachers chose to wrap the avulsed tooth in a soft cloth or tissue paper. Meanwhile, milk was chosen as the least preferred (1%) transport medium in this study. Abidi et al. (2010) also reported that only 3.1% of their respondents preferred to store the tooth in milk. Milk has a favourable osmolarity and composition for maintaining the viability of periodontal ligament cells, thus its usage as temporary storage media of avulsed teeth before replantation is recommended. In addition to being readily available, it preserves cell viability for up to 3 hours (Taranath et al., 2017). Aside from milk, normal saline (6%) and HBSS solution (8%) were also few of the least preferred storage medium chose by the teachers as they were not easily available at school.

Tooth avulsion injury among school children could cause confusions and panic among teachers, and their decision to seek definite treatment for the children who sustained such injury is crucial. The results of this study found that majority of the respondents (64%) would bring the child to the nearby dental clinic. This revealed that most of the teachers were well aware on the role of dentists as the appropriate healthcare providers with expertise in managing teeth injuries. However, in contrast, Young et al. (2012) reported that only 32.8% of their respondents stated that they preferred to go to the dentists directly while most of them thought that going to the hospital were a better option. Aside from that, this study also found that 24% of the teachers thought that it was better to call the parents first, resulting in delayed treatment and consequently affects the prognosis of the avulsed tooth.

CONCLUSION

The level of awareness on emergency management of tooth avulsion injury among two primary school teachers in Kuantan was found to be unsatisfactory. The teachers' attitude towards tooth avulsion injury correlated with their knowledge on the matter. Thus, it is recommended to incorporate a module on emergency management of tooth avulsion in the primary school teachers' first aid training programme to improve their knowledge. However, an assessment on the teachers' knowledge and attitude before and after the training programme must be implemented to ensure the efficacy of the programme. The role played by the primary school teachers is the key in preventing detrimental impact to the children's dentition and psychosocial development due to the loss of permanent tooth as the result of traumatic dental injury.

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