Original Article

AWARENESS ABOUT THE MANAGEMENT OF AVULSED TOOTH AMONG DENTAL STUDENTS

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Abstract

AIM: To assess the level of awareness and also to create awareness about the management of avulsed tooth among dental students.
BACKGROUND: The complete displacement of a tooth from its socket due to accidental or non accidental injuries that may cause loss of healthy teeth is termed as the tooth avulsion. Success of tooth replantation depends on extra-alveolar dry time, storage media, type of retention, time of endodontic treatment, type of drug prescribed, oral hygiene status of the victim as well as the general health.Preventing the dehydration of the avulsed tooth and also minimizing the root manipulation are very important for preserving the periodontal ligament cells.
MATERIALS AND METHOD: A questionnaire was prepared,comprising 13 questions with the sample size of 100 dental students.The results were analyzed using SPSS version 23 and the method of representing each output variable was a bar graph.Chi square test was done to check the association, and a *p-value* of 0.05 was said to be statistically significant.
RESULTS AND DISCUSSION: 44% chose less than 60 minutes as the ideal time for replantation of an avulsed tooth. 33% of IVth year students reported 4 weeks as the splinting period for an avulsed tooth with a dry time of more than 60 minutes. 30% of IVth year students reported semi rigid as the type of splint used in the replantation of an avulsed tooth. 32% of IVth year students reported extra alveolar dry time as the most critical factor in the outcome of the replanted tooth. Association between the study year and the awareness on the splinting period of an avulsed tooth with a dry time of 60 mins(p=0.00), replantation of primary tooth(p=0.028), type of used in replantation of tooth(p=0.00), and the critical factor in the outcome of replanted tooth(p=0.00) showed a statistically significant difference.
CONCLUSION: The present study reveals the knowledge and awareness among the dental students on the management of avulsed tooth.The results of this survey show that the majority were the IVth year students who were aware about the tooth avulsion, its replantation and treatment than the Ist year, IInd year, IIIrd year and Vth year students

Keywords: Avulsion, Replantation, Storage media, Tooth vitality, Novel analysis.
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INTRODUCTION:

The complete displacement of a tooth from its socket due to accidental or non accidental injuries that may cause loss of healthy teeth is termed as the tooth avulsion. Tooth Replantation has to be performed in case of avulsion of a tooth. Epidemiology reveals that the prevalence of tooth avulsion is 3 times greater in boys when compared to girls, most probably due to their active participation in games and sports of more aggressive nature(Iyer, Panigrahi and Sharma, 2017).Tooth avulsion most commonly seen in the permanent dentition for 8 to 12 year-old children, and the teeth that are most commonly involved are maxillary central incisors and lateral incisors. According to Andreasen *et al*., it is the loosely formed periodontal ligament that surrounds the erupting teeth that can exhibit short and incompletely formed roots and also the elasticity of the alveolar bone that favors the avulsion of the tooth(Flores *et al.*, 2007). Success of tooth replantation depends on extra-alveolar dry time, storage media, type of retention, time of endodontic treatment, type of drug prescribed, oral hygiene status of the victim as well as the general health. In short, time, handling, and storage medium of the tooth are the fundamental factors in tooth replantation. Preventing the dehydration of the avulsed tooth and also minimizing the root manipulation are very important for preserving the periodontal ligament cells(Zhang and Gong, 2011). A replanted tooth with a viable periodontium has a greater

regeneration potential . Tooth avulsion is very common in school, sports, and leisure environments. Epidemiological studies reported that the lack of training for the educators, sports professionals, and even health care professionals on the management of dental trauma has led to the loss of tooth and partial edentulousness. Emergency management of an avulsed tooth is very fundamental and a correct protocol has to be followed(Petrovic *et al.*, 2010). Knowledge of parents regarding important steps to be taken immediately after dental avulsion is vital in order to achieve a more successful prognosis of the treatment. Dental practitioners should always be prepared to give appropriate advice to the public about the first aid to be given for an avulsed tooth. In addition to promoting public awareness by mass media campaigns, the healthcare professionals, parents and teachers should receive information on how to proceed during such unexpected injuries(Manfrin *et al.*, 2007; Petrovic *et al.*, 2010).Our team has extensive knowledge and research experience that has translate into high quality publications (Krishnan, Pandian and Kumar S, 2015; Felicita, 2017; Gothai *et al.*, 2018; Iswarya Jaisankar *et al.*, 2020; Rajakumari *et al.*, 2020; Wu *et al.*, 2020; Ponnanna *et al.*, 2021; Shanmugam *et al.*, 2021; Tahmasebi *et al.*, 2021; Veeraraghavan *et al.*, 2021). If a tooth is avulsed, make sure it is a permanent tooth as the primary tooth should never be replanted. The patient has to be kept calm following a trauma following which the tooth has to be picked by the crown and not the root. If the tooth is dirty, the tooth is supposed to be washed for about 10 seconds under cold running water and repositioned. We should try to encourage the patient/parent to replant the tooth. In order to preserve the vitality of the tooth and the periodontium the victim has to bite a handkerchief to hold it in position, If this is not possible, the avulsed tooth should be placed in a suitable storage medium like milk or saline(Tzigkounakis *et al.*, 2008). The tooth can also be transported by keeping it in the mouth in between the molars and the cheek. Storage of the avulsed tooth in water has to be avoided. Few studies show that the majority of the population, as well as the dental professionals involved in the management of dentoalveolar injuries, have a minimal knowledge concerning this subject(Dinesh *et al.*, 2013; Krishnan and Lakshmi, 2013; Muthukrishnan and Warnakulasuriya, 2018; Sekar *et al.*, 2019; Gomathi *et al.*, 2020) (Sathivel *et al.*, 2008; Panda *et al.*, 2014; Govindaraju, Neelakantan and Gutmann, 2017; Johnson *et al.*, 2020; Saraswathi *et al.*, 2020). Hence, the study was conducted to know the level of awareness and also to create awareness about the management of avulsed tooth among dental students.

MATERIALS AND METHOD:

A questionnaire consisting of 13 questions were framed based on knowledge and awareness about the management of avulsed tooth online using google forms. These questions were carefully studied and corresponding answers were marked by 100 dental students. The responses from 100 dental students were received and results were analysed using SPSS software and represented as pie charts and bar graphs. The results were obtained and statistically analyzed through SPSS software, Chi square test was done to check the association, and a *p-value* of 0.05 was said to be statistically significant.

RESULTS:

Out of 100 participants, the mean age of the participants who took the survey was 21.47 $\pm$ 1.54 years(Table 1). The demographic details of the participants are tabulated in Table 1.

91% of the participants were aware that tooth avulsion is the dislodgement of an intact tooth out of its socket, due to any trauma. 63% of the participants were aware that an avulsed tooth cannot be replanted in all cases. 44% of the respondents were aware that the ideal time for replantation of an avulsed tooth is less than 60 minutes(Figure 1). 59% of the population were aware that the best medium to preserve an avulsed tooth is the patient's saliva itself(Figure 2). 68% of the respondents were aware that extra alveolar dry time was the most critical factor in the outcome of the replanted tooth. 71% of the population were aware that a semi rigid splint is used in the replantation of an avulsed tooth(Figure 3). 80% of the participants chose 2 weeks as the splinting period for an avulsed tooth with a dry time of more than 60 minutes and 92% of the participants were aware that an avulsed primary tooth need not be replanted.

Fourth year students were better aware about the splinting period(Figure 4), replantation of primary tooth(Figure 5), type of splint used(Figure 6) and the most critical factor in the outcome of a replanted tooth(Figure 7).

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Table 1: Table represents the total number of participants, percentage distribution of gender, study year and the mean value of the age of the participants.

Total	N= 100	
	Males	52% (n= 52)

Gender	Females	48% (n= 48)
Age	Mean ± Standard deviation	21.47 ± 1.54 years
Study year	Ist year	10% (n= 10)
	IInd year	21% (n= 21)
	IIIrd year	19% (n= 19)
	IVth year	33% (n= 33)
	Vth year	17% (n= 17)

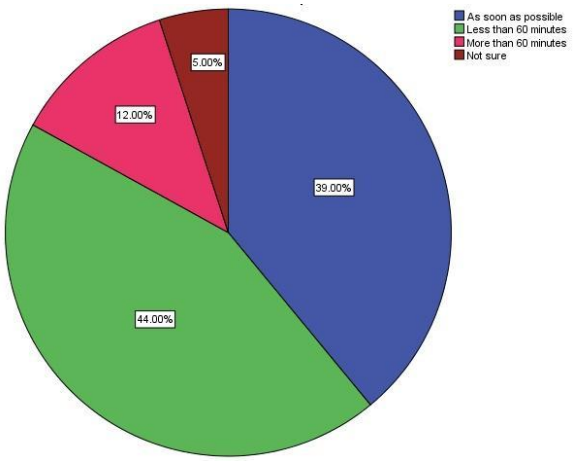

Figure 1:Pie chart showing percentage distribution of knowledge of the participants on the ideal time for replantation of an avulsed tooth.Wherein, the pink colour more than 60 minutes(12%), the green colour represents less 60 minutes(44%), the blue colour represents as soon as possible (39%), and the brown colour represents not sure (5%).

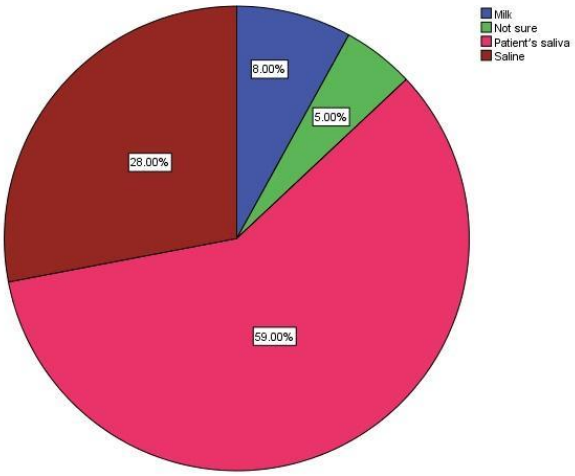

Figure 2: Pie chart showing percentage distribution of knowledge of the participants of the best medium to preserve the tooth before getting professional care.Wherein, the pink colour represents patient's saliva(59%), the brown colour

represents saline(28%), the blue colour represents milk(8%), and the green colour represents that the respondents are not sure (5%).

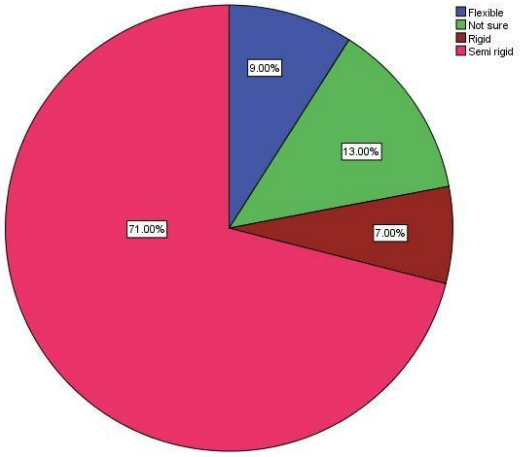

Figure 3: Pie chart showing percentage distribution of knowledge of type of splint used in replantation of tooth.Wherein, the pink colour represents semi rigid (71%), the blue colour represents flexible (9%), the brown colour represents rigid (7%), and the green colour represents that the respondents are not sure (13%).

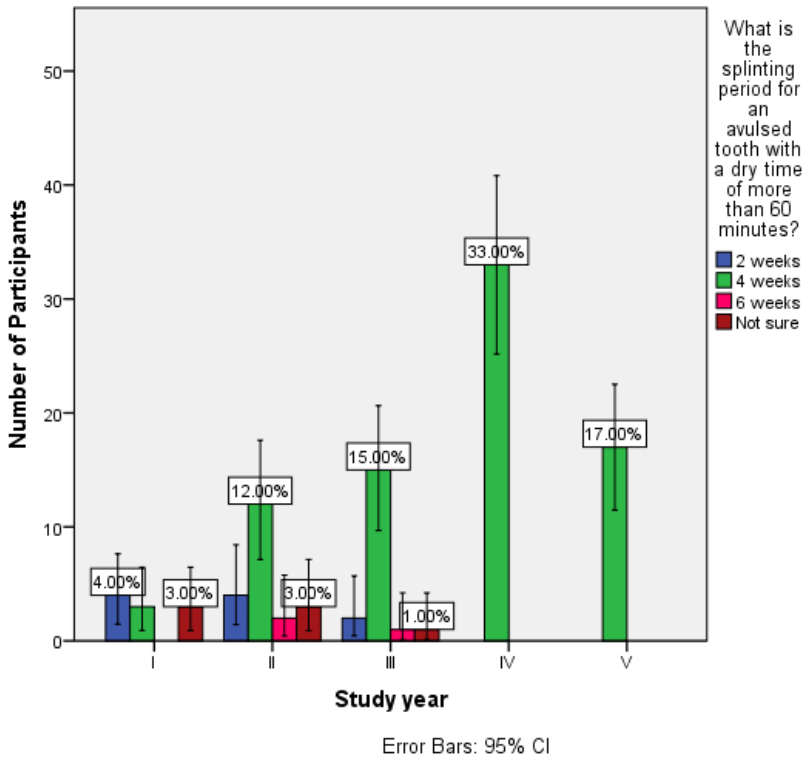

Figure 4: Bar graph showing association between study year and the knowledge of the splinting period for an avulsed tooth with a dry time of more than 60 minutes. X-axis represents the study year and the Y-axis represents the number of participants. 33% of IVth year students reported 4 weeks, 17% of Vth year students reported 4 weeks. Blue denotes 2 weeks, green denotes 4 weeks, pink denotes 6 weeks and brown denotes not sure. Chi square test was done and association was found to be statistically significant. Pearson's chi square value: 40.558, df: 12, p value: 0.000 ($p<0.05$) hence statistically significant, providing IVth year students have better awareness than Vth year students.

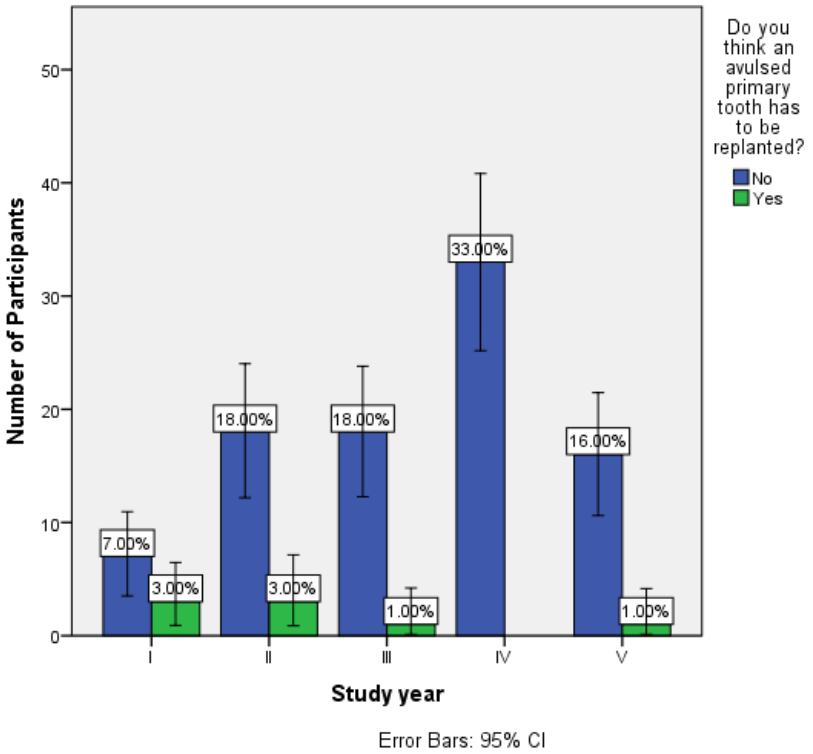

Figure 5: Bar graph showing association between the study year and the knowledge that avulsed primary tooth can be replanted. X-axis represents the study year and the Y-axis represents the number of participants. 33% of IVth year students reported No and 16% of Vth year students reported No. Blue denotes No, and green denotes yes. Chi square test was done and association was found to be statistically significant. Pearson's chi square value: 10.780, df: 4, p value: 0.028 ($p<0.05$) hence statistically significant, providing IVth year students have better awareness than Vth year students.

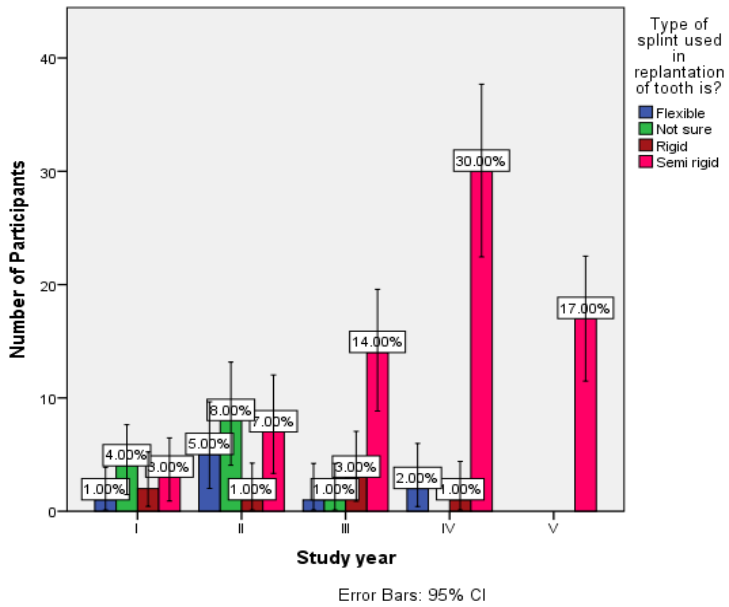

Figure 6: Bar graph showing association between the study year and type of splint used in replantation of tooth. X-axis represents the study year and the Y-axis represents the number of participants. 30% of IVth year students reported semi rigid and 17% of Vth year students reported semi rigid. Blue denotes flexible, green denotes that the respondents

are not sure, pink denotes semi rigid, and brown denotes rigid. Chi square test was done and association was found to be statistically significant. Pearson's chi square value:47.460, df: 12, p value: 0.000 ($p<0.05$) hence statistically significant, providing IVth year students have better awareness than Vth year students.

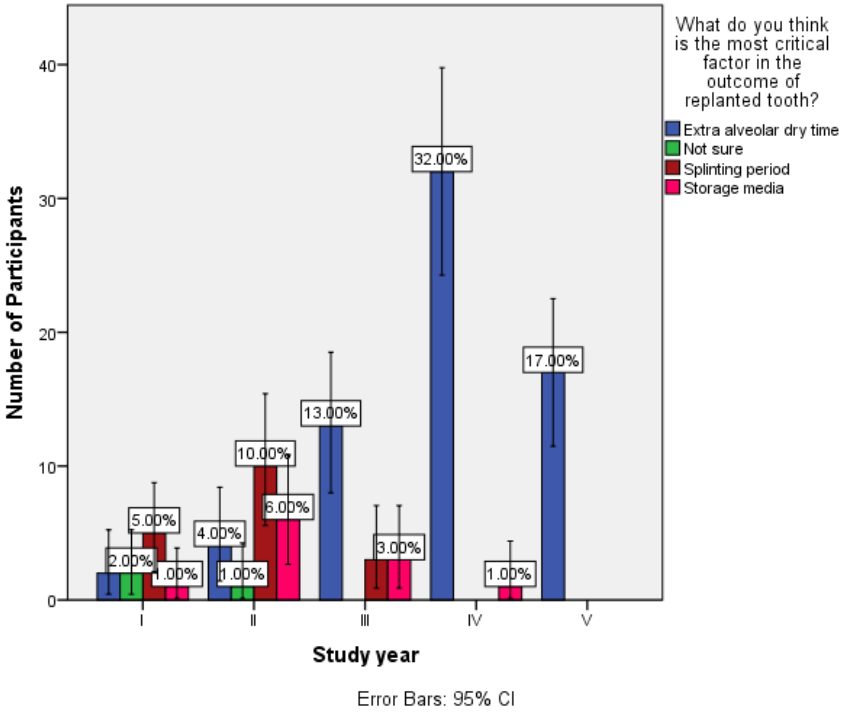

Figure 7: Bar graph showing association between the study year and the knowledge that the most critical factor in the outcome of replanted tooth. X-axis represents the study year and the Y-axis represents the number of participants. 32% of IVth year students reported extra alveolar dry time , and 17% of Vth year students reported extra alveolar dry time. Blue denotes extra alveolar dry time, green denotes that the respondents are not sure, brown denotes splinting period, and pink denotes storage media. Chi square test was done and association was found to be statistically significant. Pearson's chi square value: 64.393, df: 12, p value: 0.000 ($p<0.05$) hence statistically significant, providing IVth year students have better awareness than Vth year students.

DISCUSSION:

The prognosis of an avulsed tooth is dependent on the quick management of the tooth after it gets displaced from its socket. The tooth has to be replanted into its socket after it is cleaned with saline in order to preserve the periodontal ligament cells that are viable for healing and revascularization(Nikam *et al.*, 2014). The very important storage media for the preservation of an avulsed tooth milk, sterile saline, and saliva. These storage media promote pulpal healing and periodontal healing. Among these storage media, milk and saliva are easy to obtain(Murali *et al.*, 2014**).** In the present study 59% of the respondents chose saliva, 28% chose saline, and only 8% chose milk as the best medium to preserve the tooth before getting professional care. Replantation time is a very important factor for the prognosis of an avulsed tooth(Ram and Cohenca, 2004). The integrity of the periodontal cells and the vitality of the tooth are the main factors to replant a tooth which depends on the extra alveolar dry time of the avulsed tooth. In the present study, 68% chose extra alveolar dry time, 11% chose storage media, 18% chose splinting period as the most important critical factor in the outcome of replanted tooth. The success of a reimplanted tooth directly depends on the minimal extra alveolar dry time, adequate storage of the avulsed tooth, and the transport media along with minimal damage to the root surface and periodontal ligament (Andreasen and Hjorting-Hansen, 1966; Pohl, Filippi and Kirschner, 2005). Andreasen JO et al., reported that 90% of teeth replanted within 30 minutes of their avulsion did not undergo any root resorption and the prognosis was also found to be good(Andreasen *et al.*, 1995). In the present study, 44% chose less than 60 minutes, 39% chose as soon as possible, and 12% chose more than 60 minutes as the ideal time for replantation of an avulsed tooth. Leaving the splint in place for about 7-10 days without any bony fractures or even longer if necessary is considered mandatory after the reimplantation of the tooth(Mustafa, 2017). Three different types of splint are used in the management of tooth avulsion and are classified as: rigid, semi- rigid, and flexible. The authors highly

recommend the use of semi-rigid splint in case of dental avulsion with no bone fracture(Veras *et al.*, 2017). In the present study, 71% chose semi rigid splint, 9% chose flexible splint, and 7% chose rigid splint for splinting of replanted tooth and regarding the splinting period for an avulsed tooth with a dry time of more than 60 minutes, 80% chose 4 weeks, 10% chose 2 weeks and 3% chose 6 weeks. If a tooth is avulsed, the dental practitioner has to make sure it is a permanent tooth, since the primary tooth should not be replanted(Alaslami *et al.*, 2018). In the present study, 92% chose no and 8% chose yes, when asked if the avulsed primary tooth can be replanted.

CONCLUSION:

The present study reveals the knowledge and awareness among the dental students on the management of avulsed tooth.The results of this survey show that the majority were the IVth year students who were aware about the tooth avulsion, its replantation and treatment than the Ist year, IInd year,IIIrd year and Vth year students . It also shows the need for providing more general and correct information to the population about this treatment modality by conducting and implementing various public awareness campaigns and counselling centres.

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AUTHOR CONTRIBUTION:

P.Titus Lalith Antony carried out the literature search, data collection, data analysis and manuscript writing. Dr.Kavalipurapu Venkata Teja conceived the study, participated in its design and coordinated and provided guidance to draft the manuscript. All the authors have equally contributed in developing the manuscript.

CONFLICT OF INTEREST: The author declares that there were no conflicts of interest.

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