

EMERGENCY MANAGEMENT OF DENTAL INJURY; PREPAREDNESS AMONG SCHOOL TEACHERS IN BHUBANESWAR, INDIA

Ramesh Nagarajappa¹, Debasruti Naik¹

¹Department of Public Health Dentistry, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar, Odisha, India

ABSTRACT

Background. School is the place, identified with a noticeable risk of Traumatic Dental Injuries (TDI) in children which have functional, esthetic and psychological effects.

Objectives. To assess the preparedness of concerning traumatic dental injuries and their management among school teachers and also to empower the clinician to frame a set of instructions for school teachers to handle the emergencies effectively at the site of the incident.

Material and Methods. A cross-sectional study was conducted among 330 school teachers enrolled in government and private schools of 24 randomly selected schools in Bhubaneswar city. A self-administered questionnaire was distributed to collect information on participants demographic characteristics, knowledge, attitude and practice about emergency management of Traumatic Dental Injury. Chi-square test with level of significance set at 5% was used for statistical analysis.

Results. Statistically significant ($p < 0.05$) correct responses were provided by 66.7% males and 35.6% females and 100% younger age teachers. Larger population perceived that their level of knowledge was not satisfactory as they responded for inadequate and don't know options which was significant in relation to gender and age ($p < 0.05$) but not with respect to the type of school ($p > 0.05$). All the respondents expressed the need for a training program.

Conclusions. This study highlights the instantaneous need for tailor made dental health educational and preventive programs for school teachers in order to effectively manage the Traumatic Dental Injuries.

Key words: *knowledge, management, school teachers, Traumatic Dental Injury*

INTRODUCTION

Childhood is a social construction; whose boundaries shift with time and place and this has implications for vulnerability to injury. Epidemiological studies have shown that prevalence of Traumatic Dental Injury (TDI) ranges between 11% to 30% and 4% to 58% in primary and permanent dentition respectively [13, 28]. Luxation injuries are the most common TDIs in primary dentition, whereas crown fractures are more commonly reported for permanent teeth. This variability may have various causes, including the type of study, trauma classification, strategy, study size and population, geographical area, and contrasts in cultural behavior [13].

Most dental injuries result from simple falls, accidents, sports activities, or childish pranks, which were not intended to cause harm [3, 13, 28]. Children with TDIs can experience emotional stress, teasing,

and distress, influencing their self-image both at the time of mishap, as well as later during treatment [1, 21]. Moreover, there is a relationship between dental issues and scholastic accomplishment and learning in children [22].

Dental trauma is one of the most important oral health problems in children and is considered a dental public health problem because: (a) incidence of TDI is high world-wide; (b) trauma to oro-facial structures can cause severe damage to teeth, supporting structures, and craniofacial structures; (c) oro facial injuries can occur at a young age, and treatment may continue for rest of the patient's life.

Children spend large span of time in school where accident from falls is very common and is the main etiological factor of TDI at school [3, 28]. School teachers are the first ones contacted by the child after accident. Hence, they are expected to have proper knowledge and awareness, which will help them

Corresponding author: Debasruti Naik, (ORCID ID: 0000-0003-2476-3451), Department of Public Health Dentistry, Institute of Dental Sciences, Siksha 'O' Anusandhan (Deemed to be University), Bhubaneswar - 751003, Odisha, India, Mobile: +919439238604, e-mail: smilewithdebsruti@gmail.com

to carry out expedite procedures in time. Further, proper diagnosis, treatment planning and follow-up assures a favourable outcome. Therefore, the present investigation was set out with the following objectives: (1) to assess the knowledge, attitude and practice towards the emergency management of dental trauma among school teachers of Bhubaneswar (India) and (2) to enable the clinician to formulate a set of instructions which can be given to school teachers, such that the emergencies can be handled effectively.

MATERIAL AND METHODS

Study design and ethical approval

This cross-sectional descriptive survey was steered from July to August 2018 among 330 primary and secondary school teachers of Bhubaneswar, India. School teachers who were permanent residents of Bhubaneswar city, aged over 18 years and were logically and physically proficient of responding to questionnaire in English language were included in the study. Teachers who did not give their consent to participate and those do not present on the day of survey were excluded.

The survey procedure was approved by Institutional Ethical Committee (Ref No/DMR/IMS.SH/SOA/180074). Prior to initiation of primary investigation, certified list of all schools (Government and Private) of Bhubaneswar city was attained from District Education Office (DEO), Bhubaneswar. An official authorization was attained from corresponding Heads of designated schools. Filling out the questionnaire itself was considered consent by participating teachers.

Compilation of study subjects

School teachers were enrolled by a two-stage stratified random sampling technique. In the primary stage, Bhubaneswar city was alienated into four geographical areas, and six schools (two Government and four private) from each area were randomly chosen. Of the total number of Government (163) and private schools (319), eight Government and 16 private schools were randomly picked. In the subsequent stage, qualified school teachers were stratified by age and gender and randomly selected in proportion to the aggregate number of teachers accessible in each school which accomplished for a sample of 330.

Pre-testing survey

A self-administered structured questionnaire was developed in English and pretested on a group of 15 school teachers. Face validity specifies whether the

instrument seems to be evaluating the anticipated qualities. When face validity was assessed, it was detected that 96% of participants found the questionnaire to be easy. Assessment of content validity reproduces a decision whether the instrument samples all the relevant or significant domains. Mean content validity ratio was intended as 0.89 based on the thoughts stated by a panel of four academicians. Test of reliability encompassed two components: Question-question reliability, which was calculated by percentage of agreement (88%) and internal reliability for the responses to questions, which was evaluated using Cronbach's alpha coefficient (0.86).

Questionnaire

Ultimate questionnaire comprised of 36 questions under subsequent sections:

Section I: incorporated five questions to gather information related to teacher's demographic characteristics.

Section II: integrated 13 multiple choice questions to assess the knowledge in emergency management of TDI.

Section III: comprised of 12 questions, which aimed to assess the attitude of teachers toward the emergency management of TDI. Responses were recorded on a five-point Likert scale as "strongly agree", "agree", "neither agree nor disagree", "disagree" and "strongly disagree".

Section IV: contained six multiple choice questions aimed to investigate the practice of teachers regarding emergency management of TDI.

Data collection

The nature and purpose of study were enlightened to the teachers. Its voluntary nature was accentuated, and confidentiality was guaranteed. Questionnaire was distributed to school teachers by a single investigator, offered adequate time to fill it and collected on the spot after completion. During this process the investigator was available to teachers for any clarifications with the questionnaire, simultaneously assured that the respondents answered sincerely without any access to other sources and also established that every question was answered.

Statistical analysis

The data collected was subjected for statistical analysis using SPSS version 21.0 (SPSS Inc., Chicago, Illinois, USA). For the purpose of analysis, proportion of KAP scores was used to assess the level of knowledge, attitude and practice among the participants. Correct responses of <40%, 40-60%,

60-80% and >80% were categorized as having poor, average, good and very good KAP scores respectively. Descriptive statistics were used to summarize the data. *Chi-square test* (χ^2) was used to assess the relationship between categorical variables. For all tests, confidence interval and 'p-value' were fixed at 95% and <0.05 correspondingly.

RESULTS

A total of 330 school teachers, 60 (18.2%) males and 270 (81.8%) females consented and participated in the study. More than half, 175 (53%) the study population were in the age group of 30 to 39 years and the mean age was 34 ± 2.3 years. A proportion of 81.8% and 18.2% represented the private and government schools respectively (Table 1).

Table 1. Demographic characteristics of study participants (n=330)

Characteristics	n (%)
Gender:	
Male	60 (18.2)
Female	270 (81.8)
Age Group (years):	
20 -29	39 (11.8)
30-39	175 (53.0)
40-49	78 (23.6)
>50	38 (11.5)
Type of school:	
Private	270 (81.8)
Government	60 (18.2)

Regarding knowledge on avulsion of tooth (Table 2), 66.7% males and 35.6% females and 100% younger age teachers provided the correct response which was statistically significant ($p < 0.05$). Contradictory responses were obtained for necessity of saving permanent tooth (66.7% v/s 35.6%), right method of

carrying the affected tooth to dentist (66.7% v/s 14.8%). On the basis of school type, government teachers (60%) gave higher correct responses but the difference was not statistically significant ($p > 0.05$). For all other knowledge-based questions, majority of males have given correct response which was statistically significant ($p < 0.05$). Responses on the basis of age has shown that a greater number of right answers were provided by younger age population. Government school teachers demonstrated better knowledge than their counterparts which was statistically significant ($p < 0.05$). Larger population perceived that their level of knowledge was not satisfactory as they responded for inadequate and don't know options which was significant in relation to gender and age ($p < 0.05$) but not with respect to type of school ($p > 0.05$).

Male school teachers showed a significantly improved attitude than females ($p < 0.05$). More of negative attitude was observed in elderly age group subjects compared with other groups. Responses categorized with reference to school type was almost alike in both private and government teachers which was statistically not significant ($p > 0.05$) (Table 3). A statistically significant ($p < 0.05$) observation was found across all groups wherein they felt the emergency management and their timely intervention towards dental injuries was essential. Every participant expressed the need for receiving more information on proper management of traumatic dental injuries.

Practices followed by study population differed significantly between groups for all characteristics (Table 4). Additional healthier practices were reported in males than females for appropriate management of avulsed tooth. Across all age groups again a greater number of younger teachers were found to practice better methods which was statistically significant ($p < 0.05$). Similar findings were observed which did not differ much in both private and government school teachers.

Table 2. Responses to knowledge-based questions according to gender, age and type of school

Questions	Gender		Age (years)				Type of school		χ^2 P
	Male n=60 (%)	Female n=270 (%)	20-29 n=39 (%)	30-39 n=175 (%)	40-49 n=78 (%)	>50 n=38 (%)	Private n=270 (%)	Government n=60 (%)	
			χ^2 P						χ^2 P
<i>What is avulsion of a tooth?</i>									
Correct response	40 (66.7)	96 (35.6)	39 (100)	39 (22.3)	58 (74.4)	0 (0)	100 (37)	36 (60)	143.52
Incorrect response	20 (33.3)	174 (64.4)	0 (0)	136 (77.7)	20 (25.6)	38 (100)	170 (63)	24 (40)	0.002
<i>Do you have any prior knowledge about the management of avulsed tooth?</i>									
Yes	20 (33.3)	19 (7)	20 (51.3)	19 (10.9)	0 (0)	0 (0)	35 (13)	4 (6.7)	73.98
No	40 (66.7)	251 (93)	19 (48.7)	156 (89.1)	78 (100)	38 (100)	235 (87)	56 (93.3)	0.001
<i>What is your source of information on avulsion?</i>									
Internet source	40 (66.7)	82 (30.4)	34 (87.1)	69 (39.4)	15 (19.2)	4 (10.5)	102 (37.8)	20 (33.3)	
Health talks on television or radio	5 (8.3)	33 (12.2)	2 (5.1)	20 (11.4)	8 (10.3)	8 (21)	28 (10.4)	10 (16.7)	
Magazines/Newspapers	13 (21.7)	140 (51.9)	3 (7.7)	86 (49.1)	49 (62.8)	15 (39.5)	126 (46.7)	27 (45)	308.69
Others (specify)	2 (3.3)	15 (5.5)	0	0	6 (7.7)	11 (28.9)	14 (5.2)	3 (5)	0.001
<i>Do you think it is necessary to save avulsed permanent tooth?</i>									
Yes	40 (66.7)	96 (35.6)	39 (100)	59 (33.7)	38 (48.7)	0 (0)	119 (44)	17 (28.3)	88.15
No	20 (33.3)	174 (64.4)	0 (0)	116 (66.3)	40 (51.3)	38 (100)	151 (56)	43 (71.7)	0.001
<i>If you were at a site where the child knocked out his permanent front tooth, would you advise the parents to look for the avulsed tooth?</i>									
Yes	60 (100)	270 (100)	39 (100)	175 (100)	78 (100)	38 (100)	270 (100)	60 (100)	-
No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
<i>What would you do if the tooth was in child's mouth, however, out of place?</i>									
Correct response	0 (0)	39 (14.4)	0 (0)	19 (10.9)	20 (25.6)	0 (0)	33 (12.2)	6 (10)	24.78
Incorrect response	60 (100)	231 (85.6)	39 (100)	156 (89.1)	58 (74.4)	38 (100)	237 (87.8)	54 (90)	0.001
<i>If you did not put the knocked-out tooth back into its socket, would you advise the parents to take the tooth to the dentist?</i>									
Yes	60 (100)	250 (92.6)	39 (100)	155 (88.6)	78 (100)	38 (100)	256 (94.8)	54 (90)	18.86
No	0 (0)	20 (7.4)	0 (0)	20 (11.4)	0 (0)	0 (0)	14 (5.2)	6 (10)	0.001

<i>If you decide to put the knocked-out tooth back into its socket, but it has fallen onto the ground and is covered with dirt, what would you do?</i>	Correct response	0 (0)	98 (36.3)	111.85	19 (48.7)	39 (22.3)	40 (51.3)	0 (0)	60.85	81 (30)	17 (28.3)	0.097
	Incorrect response	60 (100)	172 (63.7)	0.001	20 (51.3)	136 (77.7)	38 (48.7)	38 (100)	0.001	189 (70)	43 (71.7)	0.953
<i>If you decide to visit the dentist how would you carry the tooth to him?</i>	Correct response	40 (66.7)	40 (14.8)	78.57	20 (51.3)	60 (34.3)	0 (0)	0 (0)	189.326	66 (24.4)	14 (23.3)	3.512
	Incorrect response	20 (33.3)	230 (85.2)	0.001	19 (48.7)	115 (65.7)	78 (100)	38 (100)	0.001	204 (75.6)	46 (76.7)	0.476
<i>How to hold an avulsed tooth?</i>	Correct response	0 (0)	115 (42.6)	39.23	19 (48.7)	19 (10.9)	58 (74.4)	19 (50)	105.14	88 (32.6)	27 (45)	3.329
	Incorrect response	60 (100)	155 (57.4)	0.001	20 (51.3)	156 (89.1)	20 (25.6)	19 (50)	0.002	182 (67.4)	33 (55)	0.068
<i>Is extra oral time for putting the knocked-out tooth back into its socket important?</i>	Yes	20 (33.3)	77 (28.5)		0 (0)	97 (55.4)	0 (0)	0 (0)		77 (28.5)	20 (33.3)	
	No	0 (0)	0 (0)	0.548	0 (0)	0 (0)	0 (0)	0 (0)	121.68	0 (0)	0 (0)	0.548
	Don't know	40 (66.7)	193 (71.5)	0.46	39 (100)	78 (44.6)	78 (100)	38 (100)	0.001	193 (71.5)	40 (66.7)	0.459
<i>When should the tooth be put back, if it had been knocked out of the mouth?</i>	Correct response	0 (0)	19 (7)	50.14	0 (0)	19 (10.9)	0 (0)	0 (0)	238.04	15 (5.6)	4 (6.7)	14.835
	Incorrect response	60 (100)	251 (93)	0.002	39 (100)	156 (89.1)	78 (100)	38 (100)	0.003	255 (94.4)	56 (93.3)	0.005
<i>What do you think is your level of information about traumatic dental injuries?</i>	Adequate	0 (0)	0 (0)		0 (0)	0 (0)	0 (0)	0 (0)		0 (0)	0 (0)	
	Inadequate	40 (66.7)	231 (85.6)	11.93	39 (100)	116 (67.4)	78 (100)	38 (100)	63.63	221 (81.9)	50 (83.3)	0.073
	Don't know	20 (33.3)	39 (14.4)	0.001	0 (0)	59 (22.7)	0 (0)	0 (0)	0.001	49 (18.1)	10 (16.7)	0.786

Table 3. Responses to attitude-based questions according to gender, age and type of school

Questions	Gender		Age (years)					Type of school		χ^2 P
	Male n=60 (%)	Female n=270 (%)	χ^2 P	20-29 n=39 (%)	30-39 n=175 (%)	40-49 n=78 (%)	>50 n=38 (%)	Private n=270 (%)	Government n=60 (%)	
<i>A teacher is not responsible for posttraumatic dental injuries</i>										
Correct	0 (0)	40 (14.8)	15.96	0 (0)	20 (11.4)	20 (25.6)	0 (0)	32 (11.9)	8 (13.3)	94.85
Incorrect	60 (100)	230 (85.1)	0.001	39 (100)	155 (88.6)	58 (74.4)	38 (100)	238 (88.1)	52 (86.7)	0.001
<i>Time consciousness for emergency management of dental trauma can play a vital role in improving tooth prognosis</i>										
Correct	60 (100)	270 (100)	-	39 (100)	175 (100)	78 (100)	38 (100)	270 (100)	60 (100)	-
Incorrect	0 (0)	0 (0)	-	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	-
<i>A tooth after avulsion will be lost definitely, so there is no need for treatment</i>										
Correct	40 (66.7)	250 (92.6)	40.05	39 (100)	135 (77.1)	78 (100)	38 (100)	237 (87.8)	53 (88.3)	10.83
Incorrect	20 (33.3)	20 (7.4)	0.001	0 (0)	40 (22.9)	0 (0)	0 (0)	33 (12.2)	7 (11.7)	0.004
<i>Dental trauma emergency management must become one of the educational priorities for teachers</i>										
Correct	60 (100)	213 (78.9)	16.30	39 (100)	156 (89.1)	78 (100)	0 (0)	236 (87.4)	37 (61.7)	24.18
Incorrect	0 (0)	57 (21.1)	0.001	0 (0)	19 (10.9)	0 (0)	38 (100)	34 (12.6)	23 (38.3)	0.001
<i>Dental trauma emergency is not an emergency situation</i>										
Correct	40 (66.7)	58 (21.5)	11.39	39 (100)	116 (66.3)	78 (100)	19 (50)	203 (75.2)	49 (81.7)	2.33
Incorrect	20 (33.3)	212 (78.5)	0.003	0 (0)	59 (33.7)	0 (0)	19 (50)	67 (24.8)	11 (18.3)	0.312
<i>Teacher intervention in school dental injuries may play a key role in traumatized tooth</i>										
Correct	60 (100)	251 (93)	15.31	39 (100)	175 (100)	59 (75.6)	38 (100)	251 (93)	60 (100)	4.50
Incorrect	0 (0)	19 (7)	0.001	0 (0)	0 (0)	19 (24.4)	0 (0)	19 (7)	0 (0)	0.105
<i>Emergency management of dental trauma requires special education and therefore there is no need for teacher intervention</i>										
Correct	60 (100)	156 (57.8)	38.70	39 (100)	80 (45.7)	78 (100)	19 (50)	172 (63.7)	44 (73.3)	2.768
Incorrect	0 (0)	114 (42.2)	0.001	0 (0)	95 (54.3)	0 (0)	19 (50)	98 (36.3)	16 (26.7)	0.251

<i>Wearing a mouth guard should be compulsory in all contact sports</i>	60 (100) 0 (0)	270 (100) 0 (0)	15.31 0.001	39 (100) 0 (0)	175 (100) 0 (0)	78 (100) 0 (0)	38 (100) 0 (0)	21.23 0.001	270 (100) 0 (0)	60 (100) 0 (0)	1.61 0.204
<i>Due to legal considerations, it is advisable that a teacher refrains from intervening in such scenarios</i>	20 (33.3) 40 (66.7)	192 (71.1) 78 (28.9)	35.16 0.001	19 (48.7) 20 (51.3)	97 (55.4) 78 (44.6)	58 (74.4) 20 (25.6)	38 (100) 0 (0)	137.75 0.002	169 (62.6) 101 (37.4)	43 (71.7) 17 (28.3)	10.68 0.005
<i>Having some short pertinent educational experiences, educators can provide better assistance in traumatic dental injuries</i>	60 (100) 0 (0)	270 (100) 0 (0)	4.73 0.030	39 (100) 0 (0)	175 (100) 0 (0)	78 (100) 0 (0)	38 (100) 0 (0)	18.86 0.003	270 (100) 0 (0)	60 (100) 0 (0)	1.99 0.157
<i>Learning about traumatic dental injuries is</i>	60 (100) 0 (0)	251 (93) 19 (7)	7.30 0.026	39 (100) 0 (0)	175 (100) 0 (0)	59 (75.6) 19 (24.4)	38 (100) 0 (0)	93.67 0.001	251 (93) 19 (7)	60 (100) 0 (0)	4.963 0.084
<i>Would you like to receive more information in order to properly manage traumatic dental injuries?</i>	60 (100) 0 (0)	270 (100) 0 (0)	-	39 (100) 0 (0)	175 (100) 0 (0)	78 (100) 0 (0)	38 (100) 0 (0)	-	270 (100) 0 (0)	60 (100) 0 (0)	-

Table 4. Evaluation of practices according to gender, age and type of school

Questions	Gender		χ^2 P	Age (years)				χ^2 P	Type of school		χ^2 P
	Male n=60 (%)	Female n=270 (%)		20-29 (%) n=39	30-39 (%) n=175	40-49 (%) n=78	>50 (%) n=38		Private n=270 (%)	Government n=60 (%)	
<i>Have you ever come across a patient with avulsed tooth (knocked out)?</i>	Yes	20 (33.3)	39 (14.4)	20 (51.3)	39 (22.3)	0 (0)	0 (0)	49 (18.1)	10 (16.7)	0.073 0.07	
	No	40 (66.7)	231 (85.6)	19 (48.7)	136 (77.7)	78 (100)	38 (100)	221 (81.9)	50 (83.3)		
<i>Would you refer the child or instruct the parents to visit the dentist after avulsion?</i>	Yes	60 (100)	270 (100)	39 (100)	175 (100)	78 (100)	38 (100)	270 (100)	60 (100)	-	
	No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)		
<i>If yes, when will you advise the parents to go the dentist?</i>	Correct response	40 (66.7)	231 (85.6)	20 (51.3)	155 (88.6)	58 (74.4)	38 (100)	220 (81.5)	51 (85)	0.414 0.52	
	Incorrect response	20 (33.3)	39 (14.4)	19 (48.7)	20 (11.4)	20 (25.6)	0 (0)	50 (18.5)	9 (15)		
<i>A boy comes to you with a knocked out permanent anterior tooth in his hand after the accident. What will you do with the tooth?</i>	Correct response	40 (66.7)	115 (42.6)	39 (100)	58 (33.1)	58 (74.4)	38 (100)	140 (51.9)	15 (25)	15.946 0.002	
	Incorrect response	20 (33.3)	155 (57.4)	0 (0)	117 (66.9)	20 (25.6)	0 (0)	130 (48.1)	45 (75)		
<i>If you decided to save the tooth, what will you do with it?</i>	Correct response	20 (33.3)	38 (14.1)	20 (51.3)	19 (10.9)	0 (0)	19 (50)	35 (13)	23 (38.3)	21.881 0.001	
	Incorrect response	40 (66.7)	232 (85.9)	19 (48.7)	156 (89.1)	78 (100)	19 (50)	235 (87)	37 (61.7)		
<i>Would you care if the tooth that has been knocked out was a primary tooth?</i>	Yes	20 (33.3)	154 (57)	19 (48.7)	77 (44)	59 (75.6)	19 (50)	135 (50)	39 (65)	4.431 0.035	
	No	40 (66.7)	116 (43)	20 (51.3)	98 (56)	19 (24.4)	19 (50)	135 (50)	21 (35)		

DISCUSSION

Dental trauma is injury to mouth, including teeth, lips, gums, tongue, and jawbones. Traumatic dental injuries (TDIs) may include knocked-out teeth (dental avulsion), cracked or craze (fractured), displaced teeth (dental luxation, lateral displacement, or extrusion), pushed up into the jawbone (dental intrusion), or loosened teeth (subluxation or dental concussion). TDIs leading to avulsion can be defined as complete displacement of tooth out of socket [8]. Among all types of TDIs, avulsion is the most complicated. Avulsion of permanent teeth is seen in 0.53% of all dental injuries. Several studies have demonstrated that this injury is one of the most thoughtful dental injuries and the prognosis is very much dependent on the actions taken at the place of accident and promptly after the avulsion and hence, we decided to assess the knowledge of management of avulsion among school teachers.

The major source of information reported was internet which is readily accessible to everyone through the development of technology. Similar findings of internet for young people and television for elderly people were observed by *Al-Sane* et al. [7]. Recently, *Al-Musawi* et al. [5] established the provision of information on emergency management of TDI through the use of smartphones.

The current study revealed insufficient proportion of knowledge about avulsion of tooth which can be comparable to previous similar studies. Around half the teachers think that it is necessary to save the avulsed tooth which is in accordance with the similar study conducted by *Mohandas and Chandan* [19] at Bangalore (49.6%). This shows the positive attitude of teachers in Bhubaneswar towards the necessity of saving avulsed tooth.

The transport media also play an important role. The most popular choice of storage medium during transportation was antiseptic solution 72.6%. Storing the tooth in an antiseptic solution is not recommended because it will compromise the periodontal ligament cells and thus adversely affect the prognosis of replanted tooth. Many teachers were not aware that dry storage during transportation would seriously prejudice survival of the replanted tooth; the prognosis being dependent on avoidance of injury to periodontal membrane during the time the tooth is out of its socket [29]. The perfect storage medium should be proficient of preserving cell vitality, adherence, and clonogenic capacity and must be readily accessible at the site of accident or easily reachable [9]. Milk has a favourable osmolarity and composition for maintaining the viability of periodontal ligament cells and has been recommended for temporary storage of avulsed teeth before replantation. In addition to being readily available, it preserves cell viability for up to 3

hours [27]. In the present study most of the teachers were unaware of the right method in transporting the affected tooth to dentist which is almost similar to the study conducted by *Shamarao* et al., [24]. Contrary to this, studies conducted by *Singh* et al., [26]; *Mohandas and Chandan* [19]; *Ahluwalia* et al., [2]; *Alluqmani and Omar* [4]; *Chandukutty* et al. [11] and *Taranath* et al. [27] found that a good number of school teachers, i.e. 87%, 49.6%, 47.4%, 45.3%, 40%, and 35.7%, respectively, were aware of correct storage medium.

It was surprising to notice that school teachers of Bhubaneswar were not aware of the importance of extra oral time in managing a dental injury. This was evident from their response regarding the urgency of seeking professional help, where a vast majority were not in favor of seeking immediate professional help. Opposing results were obtained from studies conducted by *Chandukutty* et al. [11], *Taranath* et al., [27], *Al-Obaida* [6] and *Kaul* et al. [15] as 45.9%, 33.6%, 50% and 78.3% respectively.

In our study, it was noteworthy to witness that majority of the participants (mostly male teachers) were having better knowledge which reflected in their positive attitude and practice as compared to the female counterparts regarding the need for treatment of loss of avulsed tooth. Contrary results were obtained in other studies conducted by *de Lima Ludgero* et al. [12] at Brazil (60.4%) and *Hashim* [14] at the UAE (44.1%). This can be owed to caring nature and closeness of females to children.

Responses based on age has shown that a greater number of right answers were provided by younger age population and were also found to practice better methods. This might be because the younger age group is more connected with various sources of information like technology and mass media. Similarly, though statistically not significant the government school teachers demonstrated better awareness which again may be related to improved knowledge in them.

Larger population perceived that their level of knowledge was not satisfactory as they responded for inadequate and don't know options which was similar to other studies [10, 18]. This indicates the need of organizing educational promotive and preventive programs on dental trauma. Statistically significant ($p < 0.05$) observation was found across all groups wherein they felt the emergency management and their timely intervention towards dental injuries was essential.

When teachers were asked if they would like to receive more information to manage such cases, everyone (100%) answered 'yes' and almost similar responses were obtained in studies conducted by *Mohandas and Chandan* (96.5%) [19], *Olatossio* et al. (93.4%) [20], *Chan* (81.9%) [10] and *Uppal* et al., (76.4%) [30].

In our study, less than half the teachers have come across the cases of avulsed tooth. Such situations were responded to be managed by referring to nearby dentists and majority were aware of the immediate actions to be taken without wasting time which is analogous with the study conducted in Saudi [6]. In contrast majority of the teachers would call the parent and ask them to take the child to a dentist, while one-third were not able to decide on what to do under such circumstances [23]. It was appreciable to observe that at least half the subjects would care even if the avulsed tooth was a primary tooth. Early loss of a primary tooth may affect the physiological sequence of permanent teeth and may be an etiological factor for malocclusion.

Reports show that more than half of all children suffer traumatic dental injuries in school [16, 25] and this highlights the importance of experienced/trained school staff, who are often required to respond initially to traumatic event. Instantaneous response to dental injury can reduce the level of children's and their parents' apprehension with respect to succeeding dental treatment [17]. Therefore, teachers who work with children must be aware of the importance of emergency treatment and of how to proceed in cases of tooth avulsion. Educational programs and dental camps can prove to be beneficial in this regard.

LIMITATIONS

As participants' responses were self-reported it may be considered as a limitation and caution must be exercised with generalization of these findings. It's also advisable to include teachers from all the schools in Bhubaneswar and consider many more variables.

CONCLUSION

This study has demonstrated the lack of knowledge among school teachers regarding correct handling, transportation, and storage of an avulsed tooth and stressed the immediate need for dental health education to be stepped up among school teachers. By increasing knowledge on how avulsed teeth are to be dealt with at the site of the accident, the risk of permanent tooth loss is minimized. The prognosis of an avulsed tooth is good if it is replanted under ideal circumstances, and the tooth can often be retained for life.

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