

ORIGINAL RESEARCH

Knowledge and Attitude of Elementary School Teachers on Emergency Management of Traumatic Dental Injuries in Darbhanga, Bihar

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ABSTRACT

Introduction: Majority of traumatic dental injuries (TDIs) occur at school. Teachers are first responders in such situation. There is an utmost need to increase the knowledge of teachers on recommended protocol for emergency management of TDI. The purpose of this study was to assess knowledge and attitude of elementary school teachers on emergency management of TDI.

Materials and Methods: A cross-sectional study was performed among 148 elementary school teachers in Darbhanga urban and rural block of Darbhanga district, Bihar (India) in 2017. A pre-tested 20 item questionnaire was used to evaluate the school staff knowledge about management of dental trauma. Each questionnaire composed of three sections: First section comprised of questions related to the personal and professional profile of the participant, second section included questions based on training of the respondents on dental trauma management, assessment of their knowledge, and source of their knowledge, and the third section of the questionnaire consisted questions about management of dental trauma.

Results: Overall 160 teachers were contacted, of which 148 participated in the study and responded to interview questionnaire (response rate - 92.5%). Only 14.9% of respondents have participated in first aid training courses. Merely, 2% of the respondents agreed to be undergone through dental trauma management training course. When question about the management of displaced tooth asked, only 10.8% of respondents gave correct answer. When question about avulsion was asked, 35.1% of respondents told that they would tell the child

to bite on a tissue paper to control bleeding. Furthermore, 93.2% of the school staffs were highly interested in attending the traumatized teeth management training courses.

Conclusion: School teachers were found to have a low level of knowledge regarding management of TDIs. Therefore, the school teachers require further training on appropriate emergency management protocols with respect to dental trauma.

Keywords: Attitude, Elementary, Knowledge, School teachers, Traumatic dental injuries.

How to cite this article: Kumar S, Agrawal R, Kumari K, Kumar A, Dutta SD, Prasad R. Knowledge and Attitude of Elementary School Teachers on Emergency Management of Traumatic Dental Injuries in Darbhanga, Bihar. *Int J Prev Clin Dent Res* 2018;5(1):S49-55.

Source of support: Nil

Conflicts of interest: None

INTRODUCTION

Dental trauma is a painful incident that can impair orofacial function, adversely affecting growth, occlusion, and esthetics. At the same time, it has a significant impact, on an emotional and psychological plane, ultimately affecting the quality of life of young children and their parents.^[1,2] A severe dental trauma, unlike a chronic condition, causes immediate and unexpected pain. Apart from the obvious economic cost, it can initiate a series of socioeconomic consequences, affecting the quality of life, and probably lead to the absence from school or work, sleep disturbances, and changes in the daily schedule.^[2,3] Furthermore, affected children may experience stress from unhelpful behavior by their peers and inability to participate in school activities such as sports and music.^[2,3]

According to epidemiologic studies, 50% of children experience dental trauma,^[4-6] and about 35% of children and adults had trauma to permanent teeth.^[7-9] Statistical data also indicate that 4.9%–37% of individuals suffer from traumatic dental injuries (TDIs) during childhood or adolescence in different countries.^[7,10,11] The prevalence of TDIs to primary teeth in the 0–6 years' segment varies from 11% to 30%.^[12] Avulsion accounts for approximately 0.5%–16% traumatic injuries in the permanent dentition and 7%–13% in the primary

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dentition.^[13] 48% dental injuries involve maxillary teeth. Over 16% was in the school environment and 19% of the injury due to fall.^[14]

Previous studies indicate that the majority of TDIs occur at school.^[15,16] School is one of the locations with the greatest prevalence of the occurrence of dental trauma in child and adolescents. Falls and collisions, followed by sports activities such as cycling and soccer, are the most common etiological factors. Such accidents often take place during or after school hours; teachers are the first responders in that situation.^[17]

Knowledge of lay people such as child's parents and school teachers is very important since the prognosis of traumatized teeth depends on prompt and appropriate treatment. Immediate care is very important for the avulsed permanent tooth as the prognosis stays high as long as the reimplantation takes place within 30 min after avulsion.^[18] Teachers have limited knowledge regarding the recommended course of action in such situations. Keeping in mind the need for it, a scientific study is designed to assess the knowledge level of teachers regarding traumatic dental injury and its management.

MATERIALS AND METHODS

This cross-sectional study was performed among elementary school teachers in Darbhanga urban and rural block, Darbhanga district, Bihar in 2017. Convenient sampling was used and a total of 160 teachers were contacted, of which 148 participated in the study and responded to interview questionnaire. A study conducted between March and June 2017. The study was approved by the Institutional Review Board of college, and a prior permission was also obtained from the schools where the teachers were working.

A pre-tested 20 item questionnaire was used to evaluate the school staff knowledge about management of dental trauma. Each questionnaire composed of three sections: The first section comprised of questions related to the personal and professional profile of the participant, the second section included questions based on training of the respondents on dental trauma management, assessment of their knowledge, and source of their knowledge, and the third section of the questionnaire consisted of questions about management of our dental trauma; management of upper front tooth is loosed or displaced, immediate management of knocked out tooth, identification of deciduous and permanent tooth, question about reimplantation of deciduous and permanent teeth, appropriate transportation media, limit of dry time, or transportation time for an avulsed tooth. Interview was taken by one of the investigators and response of study participants is recorded

in questionnaire. All the participants signed a consent form and their confidentiality was maintained throughout the survey. Results were presented as number and percentage of respondents for each question and were analyzed using IBM Statistical Package for the Social Sciences software Version 16 (SPSS 16.0). Data were analyzed by Chi-square, and $P < 0.05$ was considered to be statistically significant.

RESULTS

Of 160, 148 completed questionnaires were collected (92.5% - response rate), and details of the statistics of the respondents' background information are tabulated in Table 1.

About 57.4% of the respondents were males and 42.6% were females; most respondents belonged to the age group of 20–30 years (45.3%). 5–10 years' teaching experience was exhibited by 39.1% of respondents, and the levels of education in 43.9% of participants were intermediate [Table 1].

Part II Attitude Survey Responses are Presented in Table 2

Only 14.9% of respondents have participated in first aid training courses. Merely, 2% of the respondents agreed to be undergone through dental trauma management training course. Around 46% of the participants estimated their level of knowledge as moderate. Furthermore, 93.2% of the school staffs were highly interested in attending

Table 1: Responses to part I: Personal and occupational profile of respondents

Details of variable	Number of respondents (%)
Sex	
Male	85 (57.4)
Female	63 (42.6)
Age (years)	
<20	5 (3.4)
20–30	67 (45.3)
31–40	39 (26.3)
More than 40	37 (25)
Teaching experience (years)	
<5	29 (19.6)
5–10	58 (39.1)
11–20	35 (23.6)
More than 20	26 (17.6)
Responsibility in school	
Principal	29 (19.6)
Other Teachers	119 (80.4)
Level of education	
Matric	11 (7.4)
Intermediate	65 (43.9)
Graduate	49 (33.1)
Post graduate	23 (15.5)

Table 2: Responses to part II: Training background and attitude questionnaire

Question	Response	Number of respondents (%)
Have you received first aid training	Yes	22 (14.9)
	No	126 (85.1)
Have you participated in training courses on dental traumas so far?	Yes	3 (2.0)
	No	145 (94)
How do you assess your own knowledge concerning management of dentaltraumas?	None	35 (23.6)
	Low	40 (27)
	Moderate	68 (45.9)
	High	5 (3.4)
How interested are you in attending "management of dental trauma" courses?	Not interested	10 (6.8)
	Interested	138 (93.2)
What was your main source of knowledge in regard to dental traumas?	Training courses	3 (2.0)
	Dentists	18 (12.2)
	Friends	27 (18.2)
	Articles and books	55 (37.1)
	None	45 (30.4)

the traumatized teeth management training courses. The main source of participant dental trauma knowledge was from articles and books (37.1%) [Table 2].

Responses to the Part III of the Questionnaire in Table 3

When question about luxation (a 7-year-old child fell and his/her upper front tooth is loosed or displaced. Immediate Emergency action you would take is?) is asked, 55.4% of respondents were not knowing what to do and correct answer was given by only 10.8% of respondents. When question about avulsion (what is the immediate management of knocked out tooth?) was asked, 35.1% of respondents told that they would tell the child to bite on a tissue paper to control bleeding. When asked regarding unconscious for a couple of minutes after falling down, 71.6% of respondents correctly stated that they will send the child to the hospital immediately [Table 3].

Regarding reimplantation of tooth that is fallen on the floor, 29.7% told that they would rinse the tooth under tap water and 14.2% answered that they will put the tooth straight back into the socket without any pretreatment. When question regarding tooth avulsion (If tooth falls off from mouth whether you can put back the tooth into its original position in mouth or not?) is asked, 64.1% respondents answered knocked out tooth cannot be put back in to its original position in patient's mouth. About 74.3% of respondents stated that they are not able to differentiate between permanent and milk teeth. Antiseptic solution and milk were chosen as an ideal transport media by 31% and 14.9% of teachers, respectively. Regarding the time limit to seek dentists help urgently, 54.7% answered it correctly (within 30 min) [Table 3].

Chi-square test indicated a non-significant difference in the number of correct responses regarding luxation (displaced tooth) with relation to the level of education, teaching experience, age, and position in school (P -values: 0.668, 0.738, 0.985, and 0.83, respectively). A non-significant difference in the number of correct responses regarding avulsion (knocked out tooth) with relation to the level of education, teaching experience, age, and position in school (P -values: 0.748, 0.885, 0.783, and 0.678, respectively) was also obtained. Distribution of correct responses to various questions on dental trauma among school teachers is given in Table 4.

DISCUSSION

It is observed that only 14.9% teachers had first aid training. This indicates that whatever knowledge they are having is mostly due to their perception and is not scientifically based. Comparable results, in which few teachers had first aid training, were reported by studies done by Antunes *et al.* (23.9%),^[19] Kaul *et al.* (29.7%),^[20] and Megalamanegowdru *et al.* (29%).^[21] The situation became worse as the first aid training is not an integral part of the school teachers training.^[21] This is in contrast with a study conducted by Young *et al.*,^[22] Fux-Noy *et al.*,^[23] and Bayrak *et al.*^[24] where 50%, 76.8%, and 50% of the elementary school teachers had first aid training. The frequency of attending dental trauma management training courses was very low (2%) among the school teachers, and similar results were reported by Megalamanegowdru *et al.* (5.3%),^[21] Fux-Noy *et al.*^[23] (3.7%), and Bayrak *et al.*^[24] (4.4%). Most of them (45.9%) rated their dental trauma knowledge as moderate, but actually the knowledge was not up to the mark. The reason for unsatisfactory knowledge could be not trained in dental trauma management

Table 3: Responses to part III: Questionnaire consisted questions about management of dental trauma

Question	Response	Number of respondents (%)
A 7-year-old child fell and his/her upper front tooth is loosed or displaced. Immediate emergency action you would take is	Do not touch; let it remains in its new position	38 (25.7)
	Try to put back in original position	16 (10.8)
	Ask patient to carefully clench one's teeth if possible	12 (8.1)
	Do not know	82 (55.4)
What is the immediate management of knocked out tooth?	You would look for the tooth and wash it with any liquid	18 (12.2)
	You would ask the child to bite on a tissue paper to control bleeding	52 (35.1)
	You would ask the child to hold the tooth carefully in his mouth and take him immediately to the nearest dentist	37 (25)
	You would look for the tooth and put it back into the socket*	19 (12.8)
	Do not know	22 (14.9)
If tooth falls off from mouth whether you can put back the tooth into its original position in mouth or not?	Yes	22 (14.9)
	No	95 (64.1)
	Do not know	31 (21)
Should knocked out milk teeth be put back in to its original position?	Yes	8 (5.4)
	No	105 (71)
	Do not know	35 (23.6)
Should knocked out permanent teeth be put back in to its original position?	Yes	18 (12.2)
	No	93 (63)
	Do not know	37 (25)
Can you differentiate between milk and permanent teeth?	Yes	38 (25.7)
	No	110 (74.3)
How urgently do you think it is to seek a dentist help, if a permanent tooth has been knocked out?	Within 30 min	81 (54.7)
	More than 30 min	31 (21)
	24 h after trauma	10 (6.7)
	Do not know	26 (17.56)
If you decide to reimplant the tooth back in its original place, but it had fallen on the floor, what would you do?	You would scrub the tooth gently with a toothbrush	41 (27.7)
	You would rinse the tooth under tap water	44 (29.7)
	You would put the tooth straight back into the socket without any pretreatment	21 (14.2)
	Do not know	42 (28.4)
If you do not reimplant (put back tooth in its original position) the tooth, how would you transport it to the dentist?	Tap water	36 (24.3)
	Milk	22 (14.9)
	Child's mouth	17 (11.5)
	Paper tissue	27 (18.2)
	Antiseptic solution	46 (31)
A 10-year-old child became unconscious for couple of minutes after falling down. A part of his/her teeth is fractured. What would be your first procedure?	Refer the child instantly to hospital	106 (71.6)
	Let the child rest and refer to dentist in proper time	24 (16.2)
	No idea	18 (12.2)

courses. Majority (93.2%) were interested to attend educational courses in this field which was similar to the results of previous studies.^[20,23-25]

The correct knowledge regarding reimplantation is permanent teeth which should be reimplanted and deciduous teeth which should not be reimplanted. Therefore, to carry out the most appropriate emergency management, it is essential to distinguish between the two types. However, in the present study, only 25.7% were confident that they could distinguish between the two dentitions which are comparatively low to similar studies carried out by Megalamanegowdru *et al.* (59%)^[21] and Young *et al.* (71%)^[22] Among all, 71% were

right regarding milk teeth reimplantation, but the correct response may be due to their false perception that teeth whether it is primary or permanent both cannot be put back in its socket.^[24] Dental trauma management programs would definitely have an impact on the teachers as revealed in literature.^[26,27]

Only 10.8% of school teachers correctly answered the question regarding emergency management of loosed or displaced teeth, whereas 55.4% were unaware of its management method. Ideally, an avulsed tooth should be immediately replanted in its socket to avoid further damage to the periodontal membrane.^[24] Ideally, this is the treatment of choice with the best long-term

Table 4: Distribution of correct responses among respondents

Question	Correct Responses
A 7-year-old child fell and his/her upper front tooth is loosed or displaced. Immediate Emergency action you would take is:	16 (10.8)
What is the immediate management of knocked out tooth?	56 (37.5)
If tooth falls off from mouth whether you can put back the tooth into its original position in mouth or not?	22 (14.9)
Should knocked out milk teeth be put back in to its original position?	105 (71)
Should knocked out permanent teeth be put back in to its original position?	18 (12.2)
How urgently do you think it is to seek a dentist help, if a permanent tooth has been knocked out?	81 (54.7)
Within 30 min 81 (54.7)	
More than 30 min 31 (21)	
If you decide to reimplant the tooth back in its original place, but it had fallen on the floor, what would you do?	44 (29.7)
If you do not reimplant (put back tooth in its original position) the tooth, how would you transport it to the dentist?	39 (26.4)
A 10-year-old child became unconscious for couple of minutes after falling down. A part of his/her teeth is fractured. What would be your first procedure?	106 (71.6)

prognosis and sending the child to the dentist with the avulsed tooth carefully in his mouth or in liquid is the second best option.^[23] Only 12.8% of respondents in the present study said that they would immediately replace the tooth in its socket, and 25% said that they would look for the tooth, place it in the child's mouth or a liquid, and send him/her to a dentist. These rates are similar to studies done in Turkey.^[24] Rouhani *et al.*^[25] also reported almost same results. Sae-Lim and Lim^[28] and Fux-Noy *et al.*^[23] found better results, where collectively 71% and 61% of teachers gave correct answers. A common perception that bleeding can be life-threatening and dangerous, about 35.1% respondents were more concerned in controlling bleeding because in their perception bleeding is more dangerous and life threatening. The results are in agreement with the studies conducted by Bayrak *et al.*^[24] and Holan *et al.*^[26] The results clearly represent lack of knowledge among school teachers when it comes to manage tooth avulsion.

The knowledge of teachers regarding management of a dirty avulsed tooth was also found inadequate as only 29.7% of respondents gave correct answer. It was discouraging to find that 27.7% of the school teachers preferred cleaning the dirty avulsed tooth with toothbrush. Comparatively, better results were reported by Kaul *et al.*^[20] and Megalamanegowdru *et al.*^[21] where 68.3% and 59.5% of respondents gave correct answers.

The storage media for an avulsed tooth should have low bacterial content, physiological osmolarity, a neutral pH, and essential nutrients. Milk is a medium traditionally indicated for storage of avulsed teeth.^[29] About 31% of them responded about using any antiseptic solution as the storage and transport medium. The intention of using antiseptic solution may be to kill the microorganism on the root surface; however, they do not realize that the viable cells of the tooth would also be damaged simultaneously. Alarming, only 14.9% of respondents

preferred milk and 11.5% choose child's mouth (saliva) as storage media. Similar results were found in the studies conducted by Kaul *et al.*^[20] and de Lima Ludgero *et al.*^[30] in which only 3.72% and 5% of school teachers, respectively, were aware of correct storage medium. Contrary to this, a study conducted by Blakytyn *et al.*^[31] reported that 45.6% number of school teachers were aware of milk as correct storage medium.

Maximum limit of dry time or transportation time for an avulsed tooth should not exceed 20–30 min as drying causes loss of normal physiological metabolism and morphology of periodontal ligament cells. Furthermore, this is not the case with primary teeth, where reimplantation is not recommended.^[23] In this study, 54.7% of teachers gave a correct answer regarding seeking immediate professional help which is within 30 min. A similar result was reported by studies conducted by Singh *et al.*^[17] (41.8%) and Fux-Noy *et al.*^[23] (65.2%). However, the contradictory result was obtained in a study done by Ahmed *et al.*^[32] in which only 27% of teachers answered that the tooth should be replanted within 30 min.

Recommendations

1. Development of planned teacher training programs or teachers' training courses for school teachers, especially physical education teachers to impart relevant knowledge regarding first aid and emergency management of dental trauma throughout the country. To take training in such courses should be made mandatory by government.
2. Regular updating of knowledge regarding emergency dental trauma management by virtue of Continuing Dental Education programs.
3. Dental camps should be held for school children every year including delivery of educational lectures. Implementing such awareness lectures highlighting

emergency management of dental traumatic injuries occurring in children for teachers and parents on a regular basis would help in reinforcing their knowledge.

4. Developing interactive sessions between dentists and school teachers, especially during school functions such as annual programs, parent-teacher meetings, and sports competitions, so that they can get some knowledge by professionals like dentists in rendering the best action for the management of TDIs.

CONCLUSION

School teachers were found to have a low level of knowledge regarding management of TDIs. Therefore, the school teachers require further training on appropriate emergency management protocols with respect to dental trauma. One of the most important methods to change the situation of lack of knowledge is general first-aid training, but it should include emergency management of TDIs. Moreover, educational programs/training including lectures or courses should be conducted during formal and continuing education to improve teachers' knowledge and attitudes related to the emergency management of dental trauma in children. Others methods can be used to improve knowledge of school teachers such as educational brochures, leaflets, posters, lectures, courses, seminars, and dentist's availability in school.

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