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Original Research Article

Assessment of knowledge and decision-making regarding dental trauma among primary school teachers in south Bangalore- a cross-sectional survey

Rejita Nongmeikapam[1], Manish Kumar[2]*, Rajkumari Surbala Devi[3], Mamatha Murthy[4], Sushma S. G.[5], Dhimi Nongmeikapam[1]

[1]Dental World (Multispeciality Dental Clinic), Singjamei Wangma Kshetri Leikai Mongkhang Lambi, Imphal, Manipur, India
[2]Primary Health Center, Roh, Nawada, Bihar, India
[3]Department of Public Health Dentistry, Dental College, RIMS, Imphal, Manipur, India
[4]Omkaar Dental Speciality Clinic, Sriganda Naga, Hegganahalli, Bangalore, Karnataka, India
[5]Department of Public Health Dentistry, Rajarajeswari Dental College and Hospital, Bangalore, Karnataka, India

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***Correspondence:**
Dr. Manish Kumar,
E-mail: manishrr87@gmail.com

ABSTRACT

Background: Injury to primary and permanent dentitions is one of the most common dental problems seen in school going children. Teachers play an important role in prevention of dental trauma and immediate management of the injured tooth. Hence, the aimed of the study was to evaluate primary school teachers' knowledge and decision making regarding dental trauma in South Bangalore, Karnataka.
Methods: A cross-sectional survey was conducted among 400 primary school teachers in South Bangalore, using self-administered pretested questionnaire consisting 16 close-ended questions.
Results: Among 400 primary school teachers, 212 participants could identify the damaged front teeth likely to be permanent teeth. Almost half of the participants would seek the dentists help immediately and only 74 respondents would not mind the delay of 30 minutes. Most of the respondents would clean the dirty tooth in tap water and only 16 respondents would use milk for transporting the avulsed tooth. A great majority of the respondents were satisfied with the knowledge on the management of dental trauma but most of them expressed desire for further knowledge.
Conclusions: The research clearly revealed that majority of school teachers had very less knowledge related to handling of traumatic dental injuries. First aid training program with dental content and acquisition of dental injury management should be included in the curriculum of teachers training program.

Keywords: Dental trauma, Decision-making, Knowledge, Primary school teachers

INTRODUCTION

Dental injuries are common in childhood. It has been shown that when a child reaches school age, accidents in the school environment in the form of falls are very common and are the main cause of traumatic tooth injuries Carter et al, 1972; O'Neil et al, 1989).[1,2] Dental injuries may cause intrusion, extrusion, avulsion, luxation and subluxation of the tooth.[3] Post-traumatic complications may occur, including crown discoloration, cervical root fracture, ankylosis, and root resorption and tooth loss[4]. Among the different types of dental trauma, avulsion results in the greatest functional and esthetic impairment due to its worse prognosis.[5] The most common locations where a traumatic dental injury occurs are mostly in the school. School teachers often have the

first opportunity to attend to a child with dental injuries, since children spend considerable duration of their active day time at school. Teachers who deal with children must be familiarized with dental emergency maneuvers.[6,7] Epidemiological data show that about 50% of children have their primary or permanent dentition affected by traumatic injuries throughout the school period.[8] Several studies have shown lack of teacher's knowledge regarding emergency management of dental trauma.[9-11]

Thus, the aim of the study was to assess knowledge and decision making regarding dental trauma among primary school teachers attending government and private schools in South Bangalore, Karnataka.

Objectives of the study

To assess the knowledge and attitude regarding dental trauma among primary school teachers in south Bangalore. To compare between government and private school teachers regarding the same.

METHODS

A descriptive cross-sectional study was conducted to assess the knowledge and decision-making regarding dental trauma among primary school teachers in south Bangalore. Before the commencement of the study, an ethical clearance was obtained from the institutional review, scientific and ethical committee of Rajarajeswari Dental College and Hospital, Bangalore. Study was carried out for a period of 10 months from September 2020 to August 2021. A total of 400 subjects was included in the study. The questionnaire was designed and modified from questionnaires used in earlier studies. The questionnaire containing three parts, part I consist of personal data, part II consists of knowledge questions regarding dental trauma and Part III consists of attitude questions regarding dental trauma (Annexure). A brief introduction was given to the concerned authorities in the respective schools and a prior permission was obtained for conducting the study. Data was collected from primary school teachers of both government and private schools in South Bangalore. Multistage cluster random sampling technique was employed in this study. The participants were asked to tick the most appropriate answer from the given list and the filled questionnaire were collected on the same day. After the questionnaire was completed, the participants were briefly educated about the management of dental trauma and asked if they had any queries, which were subsequently answered. Data collected were analyzed and then presented in the form of tables.

Statistical analysis

Statistical Package for Social Sciences (SPSS) for Windows Version 22.0 Released 2013. Armonk, NY: IBM Corp., was used to perform statistical analyses.

Descriptive analysis of all the explanatory and outcome parameters were done using mean and standard deviation for quantitative variables, frequency and proportions for categorical variables.

Chi square test was used to compare the responses for knowledge and attitude-based questions between government and private school teachers.

Similarly, the responses from the study participants were compared based on their age, gender, educational qualification, teaching experience for knowledge and attitude based questions using the same test. The level of significance was set at $p<0.05$.

RESULTS

Of the 400 participants, a total (n=212) 53.0% participants said that the damaged upper front tooth is permanent, of them 54.5% (n=109) and 51.5% (n=103) participants were private and government school teachers respectively (Table 1)

Table 1: Comparison of the distribution of participant's responses for the knowledge based questions between government private schools.

Q. no.	Category	Government		Private		Total		χ^2 value	P value
		N	%	N	%	N	%		
Q1	Permanent	103	51.5	109	54.5	212	53.0	0.361	0.84
	Milk tooth	64	32.0	60	30.0	124	31.0		
	Not sure	33	16.5	31	15.5	64	16.0		
Q2	Yes	90	45.0	54	27.0	144	36.0	14.063	<0.001*
	No	110	55.0	146	73.0	256	64.0		
Q3	Immediately	149	74.5	98	49.0	247	61.8	35.743	<0.001*
	Within 30 mins	30	15.0	44	22.0	74	18.5		
	Within few hours	12	6.0	15	7.5	27	6.8		
	Before next day	9	4.5	43	21.5	52	13.0		
Q4	Yes	126	63.0	131	65.5	257	64.3	0.272	0.60
	No	74	37.0	69	34.5	143	35.8		

Continued.

Q. no.	Category	Government		Private		Total		χ^2 value	P value
		N	%	N	%	N	%		
Q5	General hospital	67	33.5	76	38.0	143	35.8	0.882	0.35
	Dental hospital	133	66.5	124	62.0	257	64.3		
Q6	Put back tooth into socket	10	5.0	13	6.5	23	5.8	25.880	<0.001*
	Take broken tooth to dentist	134	67.0	84	42.0	218	54.5		
	Not concerned about broken tooth	32	16.0	62	31.0	94	23.5		
	Do not know	24	12.0	41	20.5	65	16.3		
Q7	From the crown	83	41.5	84	42.0	167	41.8	3.140	0.21
	From the root	52	26.0	65	32.5	117	29.3		
	Anywhere	65	32.5	51	25.5	116	29.0		
Q8	Ice	69	34.5	84	42.0	153	38.3	11.477	0.04*
	Milk	12	6.0	4	2.0	16	4.0		
	Child's mouth	3	1.5	8	4.0	11	2.8		
	Paper tissue	66	33.0	60	30.0	126	31.5		
	Plastic wrap	13	6.5	19	9.5	32	8.0		
	Others	37	18.5	25	12.5	62	15.5		
Q9	Yes	71	35.5	76	38.0	147	36.8	0.269	0.60
	No	129	64.5	124	62.0	253	63.2		
Q10	Scrub the tooth gently with tooth brush	20	10.0	6	3.0	26	6.5	10.241	0.04*
	Rinse the tooth under tap water	79	39.5	97	48.5	176	44.0		
	Put the tooth straight back into socket	3	1.5	5	2.5	8	2.0		
	Others	26	13.0	22	11.0	48	12.0		
	Do not know	72	36.0	70	35.0	142	35.5		
Q11	Yes	162	81.0	175	87.5	337	84.3	3.184	0.07
	No	38	19.0	25	12.5	63	15.8		

*Statistically significant

Table 2: Comparison of the distribution of participant's responses for the attitude based questions between government and private schools.

Variables	Category	Government		Private		Total		χ^2 value	P value
		N	%	N	%	N	%		
Q12	Yes	46	23.0	57	28.5	103	25.8	1.582	0.21
	No	154	77.0	143	71.5	297	74.3		
Q13	Teacher's training program	13	28.3	14	26.4	27	27.3	4.078	0.13
	First aid course	16	34.8	10	18.9	26	26.3		
	School dental programme	17	37.0	29	54.7	46	46.5		
Q14	Yes	192	96.0	179	89.5	371	92.8	9.350	0.009*
	No	5	2.5	5	2.5	10	2.5		
	Don't know	3	1.5	16	8.0	19	4.8		
Q15	Yes	157	78.5	129	64.5	286	71.5	10.508	0.005*
	No	36	18.0	54	27.0	90	22.5		
	Don't know	7	3.5	17	8.5	24	6.0		
Q16	Yes	189	94.5	150	75.0	339	84.8	32.464	<0.001*
	No	10	5.0	27	13.5	37	9.3		
	Don't know	1	0.5	23	11.5	24	6.0		

*Statistically Significant

Majority of the participants, 64.0% (n=256) would not search for the lost tooth after the injury, of them 55.0% (n=110) and 73.0% (n=146) participants were government and private school teachers respectively (Table 1).

In this study, 61.8% (n=247) participants said that they would immediately seek professional help if a permanent tooth has been knocked out, 74.5% (n=149) participants were government school teachers and 49.0% (n=98) participants were private school teachers respectively (Table 1).

54.5% (n=218) participants answered that they would take the broken pieces to dentist if the knocked out tooth was broken, 67.0% (n=134) and 42.0% (n=84)

participants were government and private school teachers respectively (Table 1).

When asked about the transport media to take the tooth, 38.3% (n=153) participants would choose ice as a transport media. Of them, 42.0% were private school teachers and 34.5% government school teachers. 4.0% (n=16) participants would choose milk as a transport media, 6.0% (n=12) and 2.0% (n=4) were government and private school teachers respectively (Table 1).

44.0% (n=176) participants have answered that they would rinse the tooth under tap water, 39.5% (n=79) and 48.5% (n= 97) participants were government and private school teachers respectively. Majority of private school teachers had more knowledge than government school teachers (Table 1).

On being asked about, is it important to have an educational program regarding management of dental trauma, 92.8% (n=371) participants responded "yes", 96.0% (n=192) and 89.5% (n=179) were government and private school teachers respectively (Table 2).

Majority of the participants 71.5% were satisfied with their knowledge on the management of dental trauma, 78.5% (n=157) and 64.5% (n=129) participants were government and private school teachers respectively (Table 2).

Most of the participants 84.8% (n=339) would like to attend an educational program on management of dental trauma. 94.5% (n=189) and 75.0% (n=150) government and private school teachers respectively would like to attend an educational program on management of dental trauma (Table 2).

DISCUSSION

With regard to the type of school, the public school children had 2.4 times moretraumatic dental injuries than private school children.[12] In a Brazilian study, the public schools had the largest number of dental trauma with 392 cases (66.8%), whereas the private schools had 195 cases (33.2%), the huge difference is may be due to the better facilities and more desirable environment at the private schools as compared with the government schools.[13]

Crown fractures are common in permanent dentition with prevalence rates ranging from 26% to 76%.[14] Chan et al published very similar results, where 71% of their participants answered that the maxillary central incisor was a permanent tooth and 47% knew how to proceed correctly after the incident.[15] The study conducted in Iran, results showed lower rates for correct answer 61% and 34.1% for the same questions.[16] But in my study only 53.0% participants told that the damaged upper front tooth is permanent tooth which is much lower than the other countries. In this survey, school teachers have shown lack of knowledge regarding management of dental trauma. This could be due to less exposure or campaigning regarding dental trauma management in developing countries.[17]

Only 61.8% said that they would seek professional advice immediately if a permanent tooth has been knocked out, of them 74.5% and 49% from the government and private school teachers respectively. But in a study done by Raphael and Gregory and Hamilton et al shows that 92% and 38.6% respondents indicated 'very urgent', if a permanent tooth has been avulsed.[18,19]

In the present study, only 4% of teachers chose milk as best storage media, 6% from government school teachers while 2% from private school teachers. The composition and osmolality of milk are more compatible for survival of cells over the root and easy access to milk in the moment of accident makes it the best short-term storage/transport media.[20] 38.3% chose that they would carry on ice as storage media. In Singapore, only 15% knew the ideal storage media and in China only 9% chose milk as the best media for transporting avulsed tooth.[15,21] Storage in water/ice should be the last option because of its hypotonicity, as it leads to tissue necrosis. Storing in inside the mouth may lead to infection of the periodontal membrane and the risk of swallowing in children.[22]

In this research, only 2.8% of the participants recognized that an avulsed tooth should be intraorally transported, while in the study of Lim et al, 13.2% of the participants answered that the best transport medium for an avulsed tooth is saliva.[23] Andreasen and Andreasen clarified that when saliva is used as a storage medium, the extra alveolar period must be limited to a maximum of 2 hours due to the slightly hypotonic nature of the medium.[24]

In the present study, 36.8% participants were felt comfortable in replanting the avulsed tooth back into the socket. A study done by Chan et al, only 5.4% of the physical education teachers were able to perform an immediate replantation.[16] This may be explained by the lack of capability, knowledge and awareness regarding management of dental trauma. Replantation is contraindicated in the deciduous dentition, because it may damage the future permanent tooth. Therefore, it is a must that the teachers should have a basic knowledge of type of dentition.[25]

74.3% of teachers said that they haven't received any training regarding emergency management of dental trauma. This finding is higher than the study done in Kingdom of Saudi Arabia which was 72% of teachers.[26] In a similar study in England, 67% of the teachers had been specifically trained in managing traumatic dental injury and 91% had been trained in first aid but in this study the percentage of teachers trained in first aid was very low (26.3%).[27]

In this study, 84.8% participants would like to attend an educational program on management of dental trauma.

These results showed the lack of awareness among teachers to the importance of immediate and optimum treatment of dental injuries. 94.5% government school teachers whereas 75.0% private school teachers mentioned that they would like to attend further educational program on management of dental trauma.

The limitation of this study is small sample size. This study indicated that government school teachers showed keen interest to learn and get educate regarding dental trauma management.

CONCLUSION

The study clearly shows that there is a lack of proper knowledge on management of traumatic dental injury among the primary school teachers. Educational programs regarding dental trauma management and giving awareness about basic oral health can be a part of school dental program and this program can also be included as a part of teachers training program/teachers' continuing education program or first aid program for the school teachers.

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ANNEXURE

Questionnaires (Kindly answer the following questions with relevant information. Some questions may have one or multiple answers).

Part I (personal data)	
Name	
Age (years)	a) 20-29 b) 30-39c) 40-49 d) >50
Sex	a) Male b) Female
School type	a) Government b) Private
Education	a) Diploma b) University Higher education
Teaching experience	a) <3 years b) 3-6 years c) >6 years

Part II

During a game an 8-year-old boy got hit on his mouth, his mouth is bleeding and an upper front tooth is found to be missing/ fractured

1. Are the damaged front teeth likely to be?
a) Permanent b) Milk Tooth c) Not sure
2. After control of bleeding will you search for the lost tooth?
a) Yes b) No
3. How urgent do you think it is to seek professional help if a permanent tooth has been knocked out?
a) Immediately b) Within 30 min
c) Within a few hours d) before the next day
4. If the child does not have any pain, would you still go for a professional advice
a) Yes b) No
5. Where will you take the child? (First place of contact)
a) General hospital b) Dental hospital
6. What would you do if the "knocked out" tooth was broken?
a) Still put back the tooth into the socket b) Take the broken tooth to the dentist
c) Would not be concerned about the broken piece d) do not know
7. How would you hold the tooth?
a) From the Crown b) From the root
c) Anywhere (crown or root)
8. What media would you choose to take the tooth?
a) Ice b) Milk
c) Child's mouth d) Paper tissue (handkerchief)
e) Plastic wrap f) others, please state (antiseptic/alcohol)
9. Would you replant (put back) the tooth into the socket?
a) Yes b) No
10. If you decide to replant a tooth back into its socket but it has fallen onto the ground and is covered with dirt, what would you do?
a) Scrub the tooth gently with a toothbrush b) Rinse the tooth under tap water
c) Put the tooth straight back into the socket without doing other things d) others (antiseptic/alcohol) e) Do not know
11. Is the follow-up of child by the dentist important?
a) Yes b) No.

Part III

12. Have you received any training on management of dental trauma?
a) Yes b) No
13. If yes, the source of information.
a) Teachers training program b) First-aid course
c) School Dental program d) others
14. Do you think it is important to have an educational program regarding management of dental trauma?
a) Yes b) No c) Do not know
15. Are you satisfied with your knowledge on the management of dental trauma?

a) Yes b) No
c) Do not know
16. Would you like to attend an educational program on management of dental trauma?
a) Yes
b) No
c) Do not know