

Original Article

Evaluation of teachers' knowledge about dental injuries in primary schoolchildren in the city of Isfahan

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ABSTRACT

Background: Dental trauma is a common problem in children, which mostly occurs at school. Traumatic dental injuries often cause unpleasant experiences for children, and immediate and appropriate measures are needed. Its prognosis depends on immediate posttraumatic measures, and schoolteachers can play a key role in the treatment of children. The current study aimed to investigate teachers' knowledge about dental injuries in primary school children in the city of Isfahan.

Materials and Methods: Following a cross-sectional design, the current study was conducted on 248 elementary school teachers who were selected using the simple two-stage random cluster. Then the teachers' knowledge was measured based on a four-choice questionnaire consisted of two parts. According to this questionnaire, teachers were divided into five categories based on their knowledge score which was consist of strongly high knowledge, high knowledge, average knowledge, low awareness, and strongly low knowledge. Data were analyzed using the Spearman correlation coefficient and independent t-test. Statistical significance was considered when $P < 0.05$.

Results: The total knowledge score of teachers was 45.9%. About 61% of the teachers had a history of exposure to dental injuries. Furthermore, 49.6% of them believed milk was the best environment to keep the avulsed teeth. There was no significant association between teachers' knowledge and education level, history of previous trauma, or participation in a training course, but there was a direct association between teachers' knowledge and their work experience ($P < 0.05$). Female teachers' knowledge score was significantly higher than their male counterparts ($P < 0.001$).

Conclusion: Participants had a moderate level of knowledge about the management of dental traumas. Hence, it is suggested to develop educational programs to increase teachers' awareness about this issue.

Key Words: Knowledge, school teachers, tooth avulsion, tooth injuries

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INTRODUCTION

Dental trauma is a serious and common problem.^[1] Nowadays, that the severity and prevalence of dental caries have declined due to caries prevention methods,^[2,3] traumatic injuries are the second leading

cause of dental injury in children and adolescents.^[4] The prevalence of dental trauma is reported as 60%, of which more than 16% of cases are reported at schools, and 19% are due to falls in other environments.^[5,6] It is reported that 88.5% of maxillary teeth and 87.5%

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of central teeth will suffer trauma.^[6] Dental trauma most frequently occurs in children aged 8–11 years.^[7,8] “Falling” is the most common cause of injury^[9,10], and the most dental damage is a crown fracture, followed by luxation injuries, and avulsion. Also, 76.26% of injuries occur in permanent teeth.^[7] The frequency and causes of dental trauma among Iranian school children are similar to other countries.^[11]

Consequences of traumas depend on three factors: (a) the severity of damage; (b) quality and the time of primary care; and (c) follow-up care.^[12] The important principle in the treatment of dental trauma is prevention and proper care.^[9]

The most serious dental injury is avulsion, and the best prognosis is when the tooth is immediately returned to the socket or the child is immediately referred to the dentist while the tooth is kept in an appropriate environment.^[13]

Previous studies have emphasized the lack of proper handling in traumatized teeth due to unawareness.^[14,15] Since posttraumatic complications may include tooth discoloration, ankylosis, root resorption, and tooth loss,^[16] increasing awareness about dental injuries and how to manage them is important.

Most dental traumas occur at school and many studies state that teachers, as the first ones encountered with, do not have enough knowledge about the complications;^[17-30] So current study was an attempt to investigate the knowledge of primary school teachers of Isfahan concerning the management of dental injuries of primary school children in 2017 to develop interventions to increase awareness and reduce complications of dental traumas.

MATERIALS AND METHODS

This study was approved by research and ethics committee of Isfahan university of medical sciences code: (396395). Following a cross-sectional descriptive-analytical design, the current study was conducted on 248 teachers working in public elementary schools in the city of Isfahan. The inclusion criteria were being a primary school teacher and informed consent to participate in the present study. Participants were selected using a two-stage random cluster sampling so that the schools were initially clustered and then teachers were randomly selected. After explaining the objectives of the study and obtaining informed consent from teachers, they

were asked to fill the questionnaire. Participants were ensured about the confidentiality of their information. After collecting the questionnaires, each teacher was given an educational pamphlet for increasing their awareness.

Data were collected using the questionnaire designed by Mirhadi *et al.*^[31] in Shiraz, after translation it to Farsi, the participants' native language for their convenience, and confirming its validity and reliability (a Cronbach alpha of 0.877 and ICC of 0.716).^[32]

The four-choice questionnaire consisted of two parts. The 6 questions in the first part asked demographic information of the teachers' age, gender, education level, work experience, participation in educational courses, and history of encountering a child with trauma. The second part consisted of 19 items on teachers' knowledge about dental injuries. It also contained nine items on avulsed teeth. There were two items about crown and enamel fractures, two items about teachers' information about soft tissue injuries, and 6 items on general information about permanent and deciduous teeth. A score of 1 point would be considered for each correct answer and 0 for each false answer. The mean score of knowledge ranged from zero to 19.

The mean score of total knowledge of teachers, the mean score of teachers' awareness in how to deal with an avulsed tooth, and the mean score of teachers' knowledge about general information on teeth were calculated in percentage. A score of 80–100 indicated a strongly high knowledge, 60–79 high knowledge, 40–59 average knowledge, 20–39 low awareness, and zero to 19 strongly low knowledge.

Data analysis was performed using the following tests:

1. Independent *t*-test to compare the mean score of knowledge between male and female teachers, having a history of dealing with trauma, and participating in a course on trauma management
2. Pearson correlation coefficient to investigate the correlation between age and work experience with knowledge score
3. Spearman correlation coefficient to investigate the correlation between education level and knowledge score.

One of the limitations of this study was the lack of cooperation of teachers in filling out the questionnaire, which was somehow addressed by explaining the objectives of the present study and the necessity of

familiarizing teachers with how to manage dental traumas.

RESULTS

Table 1 shows a summary of the demographic characteristics of participating teachers.

In the present study, 86 (34.7%) male and 162 (65.3%) female teachers participated, of which 10 (4%) had high-school diploma, 205 (82.6%) associate bachelor or bachelors degree, and 33 (13.4%) masters or higher. Most teachers had a master's or bachelor's degree. Furthermore, 61.7% of the teachers had a history of dealing with dental injuries and 10.9% of them had participated in a course on how to deal with dental injuries. Information about the participating teachers' awareness in dealing with dental traumas appears in Table 2. The highest and lowest scores of the teachers' knowledge were related to how to deal with children's soft tissue injuries and how to deal with teeth with crown fractures, respectively.

Independent *t*-tests showed that the mean score of the female teachers' knowledge of permanent and deciduous teeth was high and significantly higher than that of men. The mean score of the female teachers' knowledge was very low about crown fracture management, moderate for avulsion, and high for soft tissue injuries in children, which was significantly higher than that of the male teachers ($P < 0.001$) [Table 3].

Also, the independent *t*-test showed that the mean score of the teachers' total knowledge, regardless of participating in a relevant training course, was not significantly different from treatment and emergency measures in dental traumas and its domains ($P > 0.05$) [Table 4].

According to Table 5, the independent *t*-test about the total score of the teachers' knowledge of treatment and necessary emergency measures, dental trauma, and its different areas showed no significant difference between teachers with a history of exposure to dental trauma, and those with no similar experience ($P > 0.05$).

According to the Pearson correlation coefficient, teachers' age and work experience were directly related to their overall knowledge of treatment and emergency measures of dental traumas, general information about permanent and deciduous teeth, and knowledge of how to deal with avulsed teeth ($P < 0.05$). However,

Table 1: Descriptive statistics of the teachers' age and work experience

Variable	Mean	SD	Minimum	Maximum
Age (years)	38.1	8.7	21	59
Work experience (years)	16.2	9.3	1	32

SD: Standard deviation

Table 2: Descriptive statistics of the teachers' knowledge about treatment, necessary emergency measures for dental traumas, and general information about permanent and deciduous teeth in percent

Variable	Mean	SD	Minimum	Maximum
Treatment and emergency measures for dental traumas	45.9	17.9	5	84
General information on permanent and deciduous teeth	48.7	20.8	0	100
How to deal with a crown fracture	17.5	12.5	0	100
How to deal with a tooth that has avulsed	49.01	23.8	0	100
How to deal with children's soft tissue injuries	52.2	36.6	0	100

SD: Standard deviation

Table 3: Mean and standard deviation of teachers' knowledge score about different cases in treatment and emergency measures during dental traumas by gender

Cases	Male		Female		<i>P</i>
	Mean	SD	Mean	SD	
Treatment and emergency measures for dental traumas	35.9	15.6	51.4	16.6	<0.001
General information about permanent and deciduous teeth	41.3	22.1	52.7	19.1	<0.001
How to deal with crown fracture	11.04	8.2	21.1	14.6	0.002
How to deal with a tooth that has avulsed	37.9	22.7	55.1	22.1	<0.001
How to deal with children's soft tissue injuries	36.04	33.1	61.2	35.3	<0.001

SD: Standard deviation

this association was insignificant for the score of knowledge about how to deal with crown fractures and the score of awareness about how to deal with soft tissue injuries in children ($P > 0.05$). Spearman's correlation coefficient also showed that the level of the teachers' education had no significant association with the total score of their knowledge and its dimensions ($P > 0.05$) [Table 6].

The frequency distribution of correct answers is provided in Table 7. The highest frequency of correct answers related to "Which teeth are most affected

Table 4: Mean and standard deviation of teachers' knowledge about treatment and necessary emergency measures for dental trauma and its dimensions, separated by participating in a training course

Variable	Participated		Nonparticipated		P
	Mean	SD	Mean	SD	
Treatment and emergency measures for dental traumas	44.4	18.7	46.2	17.8	0.62
General information about permanent and deciduous teeth	45.7	21.9	49.2	20.6	0.40
How to deal with crown fracture	20.4	15	17.4	11.7	0.56
How to deal with a tooth that avulsed	47.7	27.4	49.2	23.4	0.76
How to deal with children's soft tissue injuries	50	36.7	52.7	36.7	0.71

SD: Standard deviation

Table 5: Mean and standard deviation of teachers' knowledge about treatment and necessary emergency measures for dental trauma and its domains based on the history of dental injuries

Variable	Yes		No		P
	Mean	SD	Mean	SD	
Total score of knowledge about treatment and necessary emergency measures for dental traumas	46.2	17.9	45.9	17.9	0.93
Knowledge score about the amount of general information about permanent and deciduous teeth	48.5	20.4	49.6	21.1	0.67
Score of awareness of how to deal with a crown fracture	16.7	25.6	19.2	25.6	0.45
Score of awareness of how to deal with a tooth that avulsed	50.03	24.1	47.9	23.3	0.49
Score of awareness of how to deal with soft tissue injuries in children	51.6	36.9	53.3	36.4	0.73

SD: Standard deviation

by craniofacial trauma" (76.2%), followed by "If a student refers to you with an avulsed tooth, where is the first place of referral?" (75.8%). The lowest frequency related to "Common complaints of people after enamel fracture of the tooth (4.4%).

DISCUSSION

Due to the increased incidence of dental traumas, it is obvious that more children will suffer from dental traumas and avulsion.^[33,34] According to reports, about half of dental traumas occur in schools,^[11,35,36] therefore, those working in schools should know how to control such incidents. It is not possible to predict the occurrence of dental traumas, but their negative effects can be reduced.^[8,36]

Concerning avulsed teeth, if a rapid replacement is not possible, the tooth should be kept in an appropriate environment until referral to a dentist.^[37]

Clinical management of dental traumas is a complicated matter that requires appropriate and timely intervention. Some studies have reported inappropriate management of dental injuries by general dentists in most cases.^[38-41] Hu has reported that endodontists have more information about managing dental injuries than general dentists, which implies that referring to a specialist (pediatricians and endos) is associated with a better prognosis.^[41]

Several studies have reported that the level of the teachers' knowledge about managing dental traumatic emergencies in schools is not sufficient.^[42-47] Similarly, in Iran, Blakytyn *et al.*,^[48] Al-Jundi *et al.*,^[49] Raof *et al.*,^[22] and Fallahinejad and Haghghatdoost^[24] showed that teachers had little or no relevant information. A systematic review in 2020 showed that the level of teachers' awareness in different parts of the world was unclear yet. It also reported that the studies did not have a good design in terms of the applied questionnaires. Similarly, in the present study, the level of knowledge and confidence of the teachers in the face of dental injuries was low.^[50] According to the findings of the present study, the overall information of the teachers concerning managing dental injuries was moderate, which is similar to the study by Singh *et al.*^[51]

In the present study, 89.1% of the teachers did not have a history of participating in a first aid course, which is consistent with studies performed by Kamali *et al.*^[19] and Raof *et al.*^[22] The findings are also in line with some studies conducted in countries other than Iran. For instance, reports indicate that 61% of teachers in the United States,^[52] 60% in Cardiff,^[48] 63% in Singapore,^[53] and 95.1% in China^[54] did not have prior training. Chokshi *et al.* have reported that 7% of elementary school teachers working in public schools and 27% of those working in private schools did not have information about managing traumas.^[55] Therefore, it can be concluded that in most countries, instructing teachers about dental trauma has been ignored and requires appropriate policy-making.

In the present study, 61.7% of the teachers had a history of dealing with dental traumas, similar to studies conducted in China by Keerthika Natarajan and Gurunathan has reported that 51.3% of physical education teachers had a history of exposure to

Table 6: Correlation coefficients between teachers' total knowledge score about treatment and necessary emergency measures for dental traumas concerning age, work experience, and education level

Awareness score	Age		Work experience		Education level	
	R	P	R	P	R	P
Regarding treatment and emergency measures necessary for dental traumas	0.272	<0.001	0.229	<0.001	0.022	0.74
Regarding the general information about permanent and deciduous teeth	0.144	0.02	0.132	0.04	0.026	0.69
Knowing how to deal with a crown fracture	0.119	0.06	0.112	0.08	0.032	0.62
Awareness about dealing with an avulsed tooth	0.282	<0.001	0.226	<0.001	0.028	0.67
Knowledge about dealing with soft tissue injuries in children	0.109	0.09	0.102	0.11	-0.066	0.30

avulsion.^[56] Chandukutty *et al.*^[18] also argues that nearly 50% of teachers in India have a history of dealing with dental trauma. Similar findings are reported by Feldens *et al.*,^[57] Baginska *et al.*,^[58] and Nikam *et al.*^[32] Accordingly, it can be argued that most trauma cases occur in schools, and more than half of teachers develop a history of dealing with dental traumas, because of the high physical activity of children.

In the present study, 96% of the teachers had a university degree, similar to a study conducted in Tehran by Mesgarzadeh *et al.*, in which most teachers had a university degree.^[23] According to the findings of the present study, education, unlike work experience, had no significant association with the teachers' information. Similar results have been reported by Fallahinejad and Haghghatdoost,^[24] Vahhabi and Khoshsar,^[59] and Sae-Lim and Lim.^[53] However, in the study by Mesgarzadeh *et al.*^[23] and Moieni *et al.*,^[28] the education and work experience of teachers had a direct association with their information. Therefore, it can be argued that the higher the work experience of teachers, or more experience, the higher will be their awareness. Nevertheless, we cannot reach a definitive conclusion regarding education because based on

Table 7: Frequency distribution of correct answers

Item	n (%)
What is the total number of deciduous teeth?	104 (41.9)
Typically, what teeth break the first?	32 (12.9)
At what age does the first permanent tooth grow?	159 (64.1)
What is your suggestion to an 8-year-old student whose cheek is injured while playing with a dusty object (you know that the student has received the last dose of tetanus vaccination)?	94 (37.9)
Which teeth are most affected by blows to the head and face?	189 (76.2)
Usually, in what age range, children's teeth are more affected by head and facial trauma?	74 (29.8)
What is the common complaint after breaking the enamel?	11 (4.4)
If the front teeth of the upper jaw of a primary school child are damaged, what is the first priority?	76 (30.6)
In your opinion, which teeth are most likely to avulse from their socket after trauma?	135 (54.4)
For a 10-year-old child, what is the best action if an anterior permanent tooth is avulsed from its socket?	83 (33.5)
If you decided to return the tooth in its socket and the tooth has contacted soil, what do you do before placing the tooth in its socket?	156 (62.9)
If you did not decide to place an avulsed tooth in its socket, in what environment would you prefer to keep the tooth?	123 (49.6)
What do you preferably do if a child with damaged teeth or gum injury refers to you?	165 (66.5)
During school hours, a 12-year-old girl with a blow to the mouth, bleeding from the gums, and the absence of an anterior tooth refers to you, what will you do?	83 (33.5)
For children with damaged teeth, what is the most important thing to inform the doctor?	100 (40.3)
Which option is correct for a 9-year-old student? a) This person does not have any permanent molar teeth b) Both deciduous and permanent teeth can be seen in this person's mouth c) We expect all of this person's permanent teeth to have grown d) I don't know	166 (66.9)
If a student refers you with avulsed teeth due to falling, where will the patient's first referral be?	188 (75.8)
In your opinion, if an avulsed tooth is kept in a salt serum solution, when is the best time to put the tooth in its socket?	76 (30.6)
In your opinion, what is the most important factor in the success of implanting the teeth that are avulsed?	150 (60.5)

the type and field of study, teachers (i.e., math, experimental sciences, and human sciences) may not have received similar information about this issue. Furthermore, considering that 96% of the teachers had a university degree in the present study, this difference is not unexpected.

According to the findings of the present study, having participated in a first aid training course for dental trauma management had no significant effect on the teachers' knowledge. Raouf *et al.* in 2014, also,

reported no significant difference between the level of knowledge of teachers who participated in a training course and those who did not.^[60] Nevertheless, Attarzadeh *et al.*^[17] and Sae-Lim and Lim,^[53] found a direct association between teacher's information and history of participating in a first aid program is found. It can be attributed to the small number of participants with a history of passing such courses. Overall, according to the findings, it can be concluded that an effort to increase awareness about dental emergencies in the future is essential and should teach up-to-date information.

In the present study, the history of exposure to dental injuries was found to be ineffective on the total score of the teachers' knowledge about treatment and necessary emergency measures. Moieni *et al.*^[28] reported no significant association between the knowledge of physical education teachers and their history of exposure to dental trauma. While according to the Fux-Noy *et al.*,^[61] the history of exposure to dental traumas was associated with increased knowledge of teachers, which can be attributed to their lack of access to appropriate information sources to raise their awareness in this field, regardless of teachers' exposure to trauma cases. In the present study, the overall information of female teachers was higher than that of male teachers. Similarly, a study conducted in Brazil^[62] and studies by Feldens *et al.*^[57] in the city of Canoas in 2010, showed that female teachers had more information.

In the present study, 33.5% of the teachers would place avulsed teeth in its socket in dental trauma cases. Keerthika Natarajan and Gurunathan showed that 38.9% of teachers would re-implant an avulsed tooth.^[56] Mesgarzadeh *et al.*^[23] reported that 50.6% of teachers believed that permanent teeth should be re-implanted, but they had little information about how to perform the process. Few teachers would implant the tooth, probably because they think that a fractured or avulsed tooth will be replaced by another tooth, which is a worrying mindset. Furthermore, some teachers refuse to do so because they do not have sufficient knowledge or fear of further harm to children. It seems that teachers' information about dental insertion is very limited, due to a lack of education in this regard.

Also, 62.9% of the teachers knew how to correctly wash a tooth before its implantation. Chan *et al.*^[54] and Namdev *et al.*^[63] reported that teachers

had good information in this regard, too. However, Chandukutty *et al.* and Mesgarzadeh *et al.* reported that 36.6%^[18] and 38.9%^[23] of teachers had a moderate level of awareness, respectively. In the study by AL-Asfour *et al.*, the level of awareness was very low,^[64] because teachers did not know about PDL cells and the fact that not contaminating teeth with germs is more important.

If it is not possible to place the tooth immediately, it should be kept in an appropriate environment until referral to a dentist. Milk, physiologic serum, cell culture, and saliva are useful for increasing the survival of PDL cells. The milk increases the viability of the cells up to 3 h^[33] However, some of these substances may not be available. The accessibility and osmolarity of milk are much higher than saliva.^[65]

Also, keeping teeth in the saliva of buccal mucosa may make PDL infectious. Besides, the risk of tooth swallowing in children is high.^[66] In the present study, 49.6% of the participants mentioned milk as the appropriate maintenance material. Similar results are reported by Chokshi *et al.*^[55] McIntyre *et al.* reported that 32% of teachers performed tooth retention in HBSS, 34% in milk, and 29% directly implanted the tooth.^[52] Similar results are reported in Blakytyn *et al.*,^[48] Vergotine and Govoni.^[25] In this regard, a rate of 13%^[22] is reported in Kerman, 15%^[53] in Singapore, 10%^[23] in Iran, and 9%^[54] in Hong Kong. Furthermore, in southern European cities, the level of information is reported to be low.^[27] It seems that the knowledge of most people in this regard is low, but in some developed countries, the level of teachers' information in this regard is high. In the present study, too, teachers had relatively good information about the issue.

The low level of awareness can be attributed to the fact that teachers do not know that maintaining PDL cells is more important than preventing microbial infection. The duration of the tooth felled out from the mouth and the substance, in which the tooth is kept during this period are the most important factors that improve avulsed tooth prognosis by maintaining PDL cells^[67,68] Only 30.6% of the teachers believed that the avulsed tooth should be replaced quickly in the first 20 min and others mentioned that bleeding should be controlled first. Moieni *et al.*,^[28] and Vahhabi and Khoshshar^[59] reported that 20.5 and 15.2% were aware that in 30 min the necessary measures should be taken for dental placement,

respectively. Mesgarzadeh *et al.*,^[23] Chan *et al.*,^[54] and Al-Jundi *et al.*,^[49] also, reported that teachers had little information. Raouf *et al.*^[22] reported only 13% said that they would replace the tooth immediately, but most teachers would try to prevent bleeding. Most people think that bleeding is a dangerous factor. Similar results are also reported by Chandukutty *et al.* and Mohandas and Chandan.^[18,22,26] However, according to another study conducted in Iran, one in five people knew that the tooth should be inserted as quickly as possible and that the time of tooth extraction should be limited as much as possible.^[23] It seems that the length of bleeding control causes delayed tooth placement. In Chandukutty's *et al.*^[18] study, most teachers believed that teeth should be inserted as soon as possible.

In the present study, 36% of the teachers did not know that a 9-year-old children have permanent teeth. Raouf's *et al.* study in Kerman reported that 61% of teachers did not know that the anterior teeth of 9-year-old children are permanent.^[22] It seems that there is a low level of information in this regard, which may lead to neglecting the management of dental injuries by teachers, which eventually results in declined dental prognosis and children's quality of life.^[22] A study conducted in Hong Kong reported that more than 70 respondents were aware of this issue in compare with our study.^[54]

Unfortunately, in our study, only 33.5% of the teachers said that they would send the avulsed tooth to the dentist. Raouf *et al.* also reported that only 34.1% of teachers saved the teeth.^[22] Similar results are reported by Al-Jundi *et al.*,^[49] and Vergotine and Govoni^[25] indicating that very few teachers know that the dentist can use avulsed teeth. These studies show that teachers do not know the importance of finding an avulsed tooth or a broken piece of tooth.

In the present study, 76.3% of the teachers correctly believed that most dental events occur in the maxilla, as 90.1% of teachers in Chandukutty *et al.*^[18] did. In fact, due to overjet, protrusion of teeth, and low lip lining, maxilla teeth are at increased risk of avulsion.

In the present study, teachers had very little information about crown fractures. Chandukutty *et al.*^[18] reported that only 23.4% of teachers knew correctly about the management of fractured teeth. Mesgarzadeh *et al.*^[23] noted that 52.4% of teachers working in the city of Tehran gave correct answers to items related to tooth fractures. Therefore, teachers working in Tehran seem

to have more information than those working in Isfahan about managing crown fractures, which can be attributed to their higher exposure to such cases. Overall, teachers' information about crown fractures was relatively low and they did not have information about emergency measures, perhaps because they do not think that a broken piece of tooth can be re-attached. It is very important to inform the public that the broken piece of a tooth can be re-attached.^[27]

Despite extensive efforts to reduce the incidence of tetanus, it remains a major public health problem in developing countries.^[69] It is recommended that if the avulsed tooth has contacted soil and it is not clear whether the child has been vaccinated for tetanus, the patient should receive the vaccine.^[13] In the present study, only 37.9% of the teachers gave a correct answer to the item related to the tetanus vaccine. Similarly, studies performed by Raouf *et al.*^[22] and Caglar *et al.*^[27] reported that 40 and 30% of teachers had appropriate information about the tetanus vaccine, respectively, and none of them knew the importance of the tetanus vaccine in dental traumas. It seems that teacher training is essential in this regard.

In the present study, concerning the general knowledge of teachers about the management of dental traumas, 1.2% had a very high level of information, 23.8% high, 39.9% moderate, 27% low, and 8.1% very little information. In a study on physical education teachers, Moieni *et al.* reported that 30.3% of teachers had good knowledge, 51.6% moderate knowledge, and the rest had poor knowledge.^[28] Ebrahimi and Mohaajeri^[70] reported similar results; that is, most teachers had moderate to low knowledge. However, Wahhabi reported that 87.5% of public health teachers had good knowledge and 12.5% had moderate, and none of them had poor knowledge.^[59] This contradiction goes back to the fact that in the present study, public health teachers mostly participated in continuing education programs, but unfortunately, other teachers did not receive appropriate training. In the Al-Asfour *et al.* study, teachers' awareness increased significantly after instruction.^[64]

One of the limitations of our study included using close-ended questions, which restricts the answers, was one of the limitations of our study. Furthermore, we used a cross-sectional design, and samples were selected from several schools in one city, not from the whole country. Hence, the findings cannot be generalized to all teachers. Nevertheless, this

cross-sectional study which was conducted in some schools and limited to one city, its findings showed that teachers' awareness about managing dental injuries was inadequate. Hence, education programs can improve the prognosis of such injuries in school children, who are at increased risk of facial trauma.

CONCLUSION

As the highest frequency of tooth injuries is in school-aged children and teachers' performance can have beneficial results on children's quality of life and health, and most of the teachers who participated in the present study did not have a good level of knowledge and practice about emergency management and treatment of dental traumas, we suggest performing similar studies in other cities of the country to provide information for developing programs intended to increase teachers' awareness about such interventions. The Ministry of health can provide useful inputs for such programs. Furthermore, pamphlets or appropriate educational videos to raise teachers' awareness can be useful. Moreover, further community-oriented research intended to identify the main causes of the low level of knowledge of teachers about dental trauma management is necessary.

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Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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