

Evaluation of educational needs assessment and management of dental traumas in primary school teachers, in Iran and worldwide: A systematic review

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Abstract

Background: Every year, many primary school children suffer from dental trauma. The long-term success of treatment depends on immediate emergency care and initial professional management after the injury occurs. Therefore, primary school teachers can play an important role in the management of traumatic dental injuries (TDIs). As no systematic review has been conducted on this subject in Iran, the present study aimed to investigate the educational needs assessment and management of dental trauma in primary school teachers in Iran and in other countries.

Methods: In this systematic review, four main electronic databases, PubMed, Web of Science, Scopus, and Google Scholar, were examined with keywords derived from MESH and by designing a detailed search strategy. The studies were then transferred to EndNote software version 20 and screened based on preferred reporting items for systematic reviews and according to the study input criteria. Then, the selected studies were reviewed to extract the data based on the objectives of the study.

Results: Eventually 19 studies were included in the final review phase out of the 774 studies obtained during the systematic search. Five of these studies were specific to Iran. The present study showed that the knowledge of primary school teachers about managing dental traumas is insufficient, and it is necessary to train them on appropriate trauma management to improve their ability and performance.

Conclusion: There are gaps in the management of dental traumas that confirm the need for effective education and intervention to improve the knowledge, performance, attitude, and ability of teachers.

Keywords: Educational needs assessment, Dental trauma, Primary school

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Introduction

According to the World Health Organization (WHO), 16% to 40% of children aged 6 to 12 years suffer from dental trauma.¹ The main cause of traumatic dental injuries (TDIs) at this age is the accidents while playing with peers; due to having a lot of physical activities, despite not having an ideal musculomotor coordination.² School is the most prone place for trauma to children's teeth.

The long-term success of treatment depends on immediate emergency care and initial professional management after the injury occurs. Thus, elementary school teachers can play an important role in the management of TDIs, because they are often close to children when an accident occurs and students immediately seek for their help.¹ In this situation, the role of teachers' knowledge and awareness of how to manage dental traumas is highlighted.²

The severity of dental trauma can vary from minor blows to extensive damage to the jaw and face, which includes damage to periodontal structures and displacement or evulsion of teeth. Types of dental trauma, in order of prevalence, include crown fractures, luxation, and complete detachment of the tooth from the socket (evulsion). Maxillary central incisors are the most affected teeth by trauma in this age group.³ Pain, discomfort, insomnia, and absenteeism are common problems for many children following dental trauma.⁴ The International Association of Dental Traumatology (IADT) and the American Academy of Pediatric Dentistry acknowledge that one of the important factors to determine and improve dental prognosis in almost all cases, is the level of individuals', including primary school teachers, knowledge of how to provide emergency care and appropriate and immediate management (as directed



by the IADT).⁵

Parents and school teachers dealing with children should be familiar with dental emergency assistance. Many studies around the world indicate that school teachers are unaware of emergency management of dental trauma.⁶

Although tooth decay and periodontal disease are the most important problems threatening oral health, recently trauma to the teeth and jaws has also been a major problem in oral health.⁷

Since no systematic review has been conducted on this subject in Iran, the present study aims to investigate the level of knowledge and management of dental traumas, and also the need for training courses in primary school teachers in Iran and other countries in the world through a systematic review.

Methods

Based on Cochrane guidelines for systematic reviews,⁸ in the first stage, the research question must be carefully designed. At this stage, the scope of the research is determined. A thorough research question is important for doing the right resource search, extracting results, and analyzing them. The present research question based on PICO is as follows:

P=Population: All available studies without time and space restrictions related to the knowledge and performance of primary school teachers regarding dental traumas.

I=Intervention: The level of Iranian teachers' knowledge and management regarding dental trauma.

C=Control: The level of teachers' knowledge about dealing with dental trauma and its management in primary school students in other countries.

O=Outcome: Awareness and management of dental traumas, and finally educational needs assessment in primary school teachers in Iran compared to other countries.

In the second stage, a systematic search of studies related to the research topic, including bibliographic sources, is carried out in PubMed, Scopus, Web of Science and Google Scholar, non-electronic information sources through manual search, and gray sources through websites such as NTIS and PsycEXTRA.

No time, language and space limitation were imposed to increase the sensitivity of the search. The following keywords related to the research question were taken from the MeSH section of the PubMed database: Traumatic dental injuries, Dental trauma, Dental injury, Tooth injuries, Tooth trauma, Traumatized teeth, Dentoalveolar trauma, Oral trauma, Elementary school, Primary school, Teacher, Educator, Coach.

To increase the search sensitivity in the search strategy for each word, synonyms were also included in the search. Blind search was performed by combining the keywords

related to the independent variable with the OR operator after they were searched independently. A similar search was performed for keywords related to the dependent variable, and finally the results were combined with the AND statement. The resulting articles were transferred to EndNote software version 20 for further review. After removing duplicate articles, unrelated articles were removed by the screening method in the three stages of deletion based on title, abstract, and full text. After performing the qualitative evaluation stage, articles with appropriate quality were checked to extract the required data.

Results

The total number of articles obtained through the electronic database search was 773 studies, including manual search and gray literature review, and one article was added in the supplementary search. A total of 774 studies were transferred to EndNote software version 20. After deleting duplicate data, 550 articles remained for further review. Then, the titles and summaries of these articles were carefully and deeply examined in terms of merit and inclusion criteria. Finally, 19 studies remained for full text reviewed. The research path is summarized in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) chart below (Figure 1).

Due to the importance of the management of dental traumas, its effect on dental prognosis, and the level of educators' knowledge, the need for training courses, and also the most common methods used by educators in trauma injuries are summarized in the following tables (Tables 1 and 2).

Discussion

In many studies, dental trauma has been mentioned as one of the public health concerns.²³ In addition to disorders in dental functions and the psychological and social consequences for children, they cause economic and aesthetic issues for families as well.²⁴

Berger and colleagues' study showed that there is an immediate decrease in the quality of life of the injured child their parents following disorders in a child's emotional and social wellbeing, which persists even up to one year after the initial trauma. However, proper initial management can minimize negative psychosocial consequences such as pain, tooth loss, prolonged treatment, and high treatment costs.²⁵

Dental trauma in children should be treated immediately and carefully, and the sooner the treatment is given, the better the prognosis. The American Society of Pediatric Dentists recognizes that the prognosis of dental trauma will improve if the general public becomes aware of the basic knowledge and immediate needs for the treatment of dental trauma.³ For this reason, educating people who are more likely to be exposed to dental trauma on how

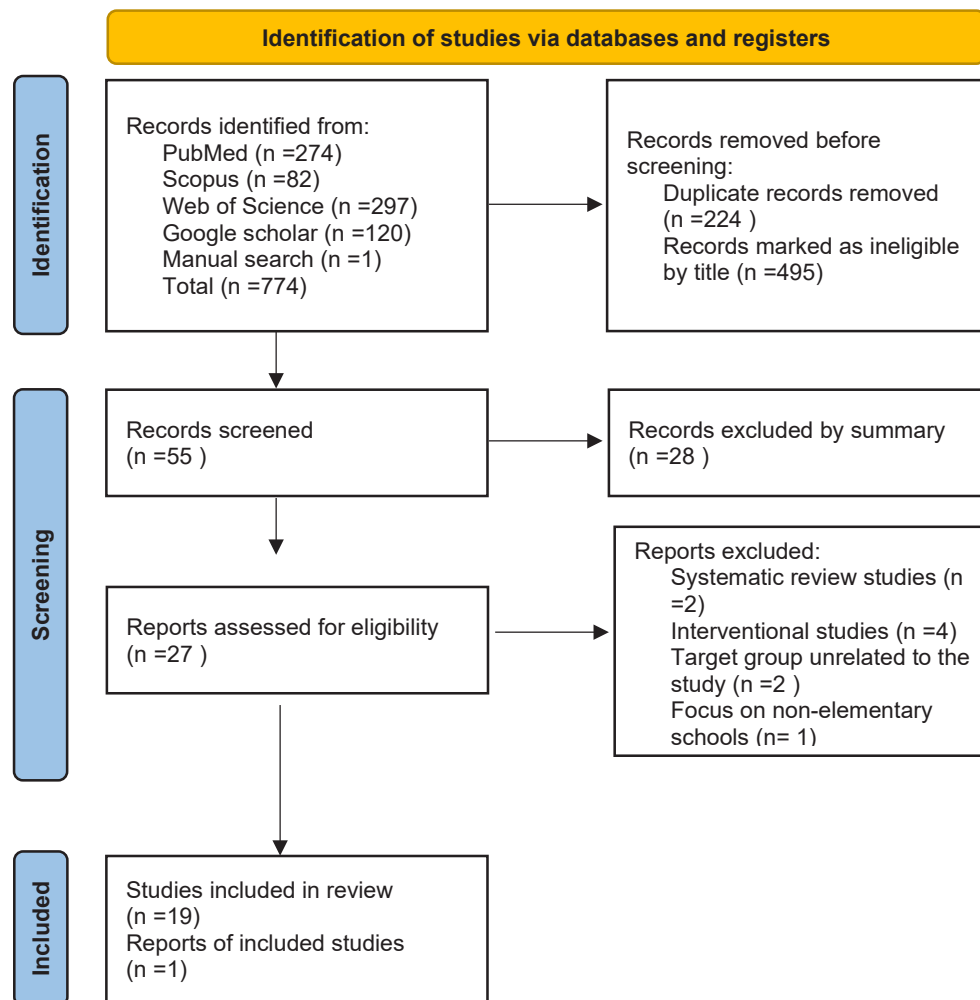


Figure 1. The process of study retrieval, selection, and inclusion adopted in the present systematic review

to manage emergency dental injuries is very important.⁹

Due to the great importance of dental trauma as a public health problem and because preventive interventions are always much more cost-effective than treatment, the present study included a systematic review of 19 studies that assessed teachers' knowledge of handling dental trauma.

The results of this systematic review indicate that in all four studies conducted in different parts of Iran, the level of knowledge of the participants was low and unsatisfactory and the highest performance of participants in managing dental trauma emergencies was to refer the child to a dentist.

The results of Raof and colleagues' study showed that while about half of the teachers had witnessed dental trauma, more than half of them had not received any training in this area. It is worth considering that the knowledge of physical education teachers about dealing with dental trauma was not different from other teachers.²³ According to the results of this study, although extra-oral time and storage medium are two of the most important

factors in preserving periodontal ligament (PDL) cells and very important determinants in the prognosis of a tooth replantation, teachers' knowledge in this field was low and only 13% of participants knew they had to replant the teeth immediately. In this study, more than 94% of the subjects were dissatisfied with their knowledge about dental trauma and eager to receive more education and information.²³

The results of 15 studies that assessed teachers' knowledge about dental trauma emergency management in different parts of the world indicate lack of an acceptable level of knowledge; Only one case, Yang and colleagues' study⁹ in China, found relatively adequate knowledge and skills in the field; in seven of the studies, the participants' level of knowledge was reported to be very low and inadequate. These results are in line with Trabelsi and colleagues'²⁶ systematic review of 15 studies. A recent study shows that most sports teachers lacked adequate knowledge of the initial management of dental trauma, and the first concern of most teachers was to control bleeding rather than replantation of

Table 1. Summarizing knowledge and educational and management needs in the field of dental traumas in primary school teachers around the world

First Author, year	Country	Sample size	Knowledge level	Emergency management method (The most)	Need of training
Yang, 2021 ⁹	China	973	Partly mastered	Inform the parents	Need to strengthen training courses
Salarić, 2021 ¹⁰	Croatia	312	Serious lack of knowledge	Using dry tissue, as a transport medium for an avulsed tooth	Need for continuous education
Kurnaz, 2021 ¹¹	Turkey	1634	Inadequate knowledge (not satisfactory)	Replace the permanent tooth	Almost all had never received dental trauma (DT) training
Tzimpoulas, 2020 ¹²	Greece	276	Knowledge was limited	Would not take any immediate action and would refer the child to a dentist	Requires reliable information
Khan, 2020 ¹³	Australia	267	Inadequate level of knowledge	Inform the parents and then seek help	Suitable transport technique awareness
Daupare, 2020 ¹	Lithuania	106	Little knowledge	Stop the bleeding and wrap the tooth in a handkerchief or paper to transport to the dentist	Need to be informed about replantation and proper storage media
Altamimi, 2019 ¹⁴	Saudi Arabia	378	Lack of knowledge	Stop the bleeding by compressing a cloth over the injury	Finding the proper and most preferable type of education method
Malakh, 2018 ⁶	Israel	120	Insufficient knowledge of management	Bleeding control and referral to pediatric dentist	Need of general knowledge of TDI and storage materials
Awad, 2017 ¹⁵	United Arab Emirates	292	Lack of awareness about the importance of their role	Contact parents and advise them to send child to the dentist immediately	Need the education of proper manipulation and handling of teeth to maintain vitality
Nirwan, 2016 ¹⁶	South Jaipur	280	Substantial lack of knowledge	Locate the avulsed tooth and referral to dentist	Need of educational programs to manage TDI
Pithon, 2014 ¹⁷	Brazil	141	Fair (Approximately half the teachers had unsatisfactory knowledge)	Look for the tooth and wash it with tap water	Need to improve teachers' ability to deal with injured patients
Touré, 2011 ¹⁸	Morocco	501	Lack of knowledge	Call the child's parents and store the tooth in a wet medium	Information and training program in first-aid procedures regarding tooth avulsion
Prasanna, 2011 ¹⁹	Davangere	300	Poor knowledge	Seek an emergency service nearby	Improve awareness of avulsed tooth management
McIntyre, 2008 ²⁰	US, North Carolina	175	Not well-versed	Save the avulsed tooth (in milk) and then seek dental care	Education and management are needed

Table 2. Summarizing knowledge and educational and management needs in the field of dental traumas in primary school teachers in Iran

First Author, year	Country	City	Sample size	Knowledge level	Emergency management method (The most)	Need of training
Attarzadeh, 2017 ²¹	Iran	Yazd	281	Poor knowledge	Referral to the dentist	Education of dental emergency management
Mehrabkhani, 2015 ²²	Iran	Mashhad	163	Moderate level of knowledge	Contact a dentist and refer a child to them immediately after dental trauma	Adding dental trauma (DT) management courses in the teacher training curriculum and keeping them updated
Raooof, 2012 ²³	Iran	Kerman	400	Considerably low knowledge	Contact the child's parents to get them to a dentist	Educational campaigns are needed to improve the level of knowledge on immediate management of TDI
Mesgarzadeh, 2009 ²⁴	Iran	Northwestern urban area	160	substantial lack of knowledge	Refer the child to a clinician in case of any trauma	Educational campaigns to improve their knowledge and awareness

teeth. Despite the fact that most teachers were aware of the urgency of professional treatment following dental injuries, very few of them considered themselves able to perform immediate dental replantation and appropriate emergency procedures in this area, and about one third of teachers did not even know that avulsed teeth should be found and maintained for further treatment.⁴

The results of Anand and colleagues' study also showed that half of the teachers thought that the avulsed tooth could not be replanted or the broken tooth could not be reattached.²⁷

Teachers' education has a significant effect on teachers' knowledge in how to manage and handle dental trauma in children.¹ All studies reviewed in this systematic review

– whether conducted in Iran or elsewhere in the world – emphasize the need for training courses for teachers to improve their knowledge and performance in the dealing with dental trauma.

The results of a study by Al-Asfour et al showed that a 30-minute lecture that allows teachers to discuss the issue can be an effective and efficient way to increase teachers' knowledge of the initial management of dental trauma.²⁸ Other similar studies have suggested informative lectures, seminars, educational campaigns, and posters as appropriate methods for educating and raising teachers' knowledge.²⁹

Conclusion

It seems that the knowledge of primary school teachers is not enough to manage dental traumas. Considering that they feel the need for being educated, performing interventions based on education (lectures, practical courses, posters, etc) can improve their knowledge, ability, and confidence to deal with injuries caused by dental trauma. Creating a small guidebook about TDI management with some examples can be helpful. There are gaps in the management of dental traumas, which confirms the need for effective intervention to improve performance. It is also suggested that more studies be conducted in Iran to investigate the level of parents' awareness of dental trauma management.

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Competing Interests

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References

1. Daupare S, Narbutaite J. Primary school teachers' knowledge and attitude regarding traumatic dental injuries. *J Indian Soc Pedod Prev Dent.* 2020;38(3):216-21. doi: [10.4103/jisppd.jisppd_170_18](https://doi.org/10.4103/jisppd.jisppd_170_18).
2. Al-Obaida M. Knowledge and management of traumatic dental injuries in a group of Saudi primary schools teachers. *Dent Traumatol.* 2010;26(4):338-41. doi: [10.1111/j.1600-9657.2010.00894.x](https://doi.org/10.1111/j.1600-9657.2010.00894.x).
3. Srilatha Y, Shekar BR, Krupa NC. Effectiveness of school-based dental health education on knowledge and practices related to emergency management of dental trauma and tooth avulsion: an educational intervention study. *Int J Acad Med.* 2021;7(1):39-61. doi: [10.4103/ijam.ijam_56_19](https://doi.org/10.4103/ijam.ijam_56_19).
4. Lima J, Caldarelli PG, Rocha JS, Fagundes Tomazinho FS, Fariniuk LF, Baratto-Filho F, et al. Educational approaches for assessing knowledge about and actions of educators in response to dental avulsion. *J Indian Soc Pedod Prev Dent.* 2021;39(2):138-46. doi: [10.4103/jisppd.jisppd_186_20](https://doi.org/10.4103/jisppd.jisppd_186_20).
5. Marcano-Caldera M, Mejía-Cardona JL, Parra Sanchez JH, Méndez de la Espriella C, Covo Morales E, Sierra Varón G, et al. Knowledge about emergency dental trauma management among school teachers in Colombia: a baseline study to develop an education strategy. *Dent Traumatol.* 2018;34(3):164-74. doi: [10.1111/edt.12393](https://doi.org/10.1111/edt.12393).
6. Malakh G. Primary School Staff's Knowledge and Attitude Regarding Traumatic Dental Injuries in Qalansuwa, Israel [thesis]. Kaunas: Lithuanian University of Health Sciences; 2018.
7. Al-Sehaibany FS, Almubarak DZ, Alajlan RA, Aldosari MA, Alqahtani ND, Almaflehi NS, et al. Elementary school staff knowledge about management of traumatic dental injuries. *Clin Cosmet Investig Dent.* 2018;10:189-94. doi: [10.2147/ccide.s172105](https://doi.org/10.2147/ccide.s172105).
8. Cumpston M, Li T, Page MJ, Chandler J, Welch VA, Higgins JP, et al. Updated guidance for trusted systematic reviews: a new edition of the Cochrane Handbook for Systematic Reviews of Interventions. *Cochrane Database Syst Rev.* 2019;10:ED000142. doi: [10.1002/14651858.ed000142](https://doi.org/10.1002/14651858.ed000142).
9. Yang L, Ran X, Li Y. [Primary school teachers' knowledge regarding tooth trauma in Putuo district, Shanghai area]. *Shanghai Kou Qiang Yi Xue.* 2021;30(4):435-8. [Chinese].
10. Salarić I, Tikvica Medojević D, Baždarić K, Kern J, Miličević A, Đanić P, et al. Primary school teachers' knowledge on tooth avulsion. *Acta Stomatol Croat.* 2021;55(1):28-36. doi: [10.15644/asc55/1/4](https://doi.org/10.15644/asc55/1/4).
11. Kurnaz S, Bayraktar C. School teachers' knowledge and attitudes about the emergency management of traumatic dental injuries in Turkey. *Community Dent Health.* 2021;38(3):215-9. doi: [10.1922/CDH_00375Kurnaz05](https://doi.org/10.1922/CDH_00375Kurnaz05).
12. Tzimpoulas N, Markou M, Zioutis V, Tzanetakos GN. A questionnaire-based survey for the evaluation of the knowledge level of primary school teachers on first-aid management of traumatic dental injuries in Athens, Greece. *Dent Traumatol.* 2020;36(1):41-50. doi: [10.1111/edt.12503](https://doi.org/10.1111/edt.12503).
13. Khan A, Goyal A, Somaiya V, Rathesh A, Sathiyamoorthy J, Larkin K, et al. Knowledge of Australian primary education providers towards dental avulsion injuries: a cross-sectional study. *Aust Dent J.* 2020;65(1):46-52. doi: [10.1111/adj.12732](https://doi.org/10.1111/adj.12732).
14. Altamimi YS, Siddiqui AA, At-Tamimi S, Al-Ateeq NF, Al-Zuayzi AA, Alsayegh MA, et al. Knowledge of primary school teachers regarding dental trauma management in Hail region, Saudi Arabia. *Pesqui Bras Odontopediatria Clin Integr.* 2020;19(1):e4757. doi: [10.4034/pboci.2019.191.114](https://doi.org/10.4034/pboci.2019.191.114).
15. Awad MA, AlHammadi E, Malalla M, Maklai Z, Tariq A, Al-Ali B, et al. Assessment of elementary school teachers' level of knowledge and attitude regarding traumatic dental injuries in the United Arab Emirates. *Int J Dent.* 2017;2017:1025324. doi: [10.1155/2017/1025324](https://doi.org/10.1155/2017/1025324).
16. Nirwan M, Syed AA, Chaturvedi S, Goenka P, Sharma S. Awareness in primary school teachers regarding traumatic dental injuries in children and their emergency management: a survey in South Jaipur. *Int J Clin Pediatr Dent.* 2016;9(1):62-6. doi: [10.5005/jp-journals-10005-1335](https://doi.org/10.5005/jp-journals-10005-1335).

17. Pithon MM, dos Santos RL, Magalhães PH, da Silva Coqueiro R. Brazilian primary school teachers' knowledge about immediate management of dental trauma. *Dental Press J Orthod*. 2014;19(5):110-5. doi: [10.1590/2176-9451.19.5.110-115.oar](https://doi.org/10.1590/2176-9451.19.5.110-115.oar).
18. Touré B, Benoist FL, Faye B, Kane A, Kaadioui S. Primary school teachers' knowledge regarding emergency management of avulsed permanent incisors. *J Dent (Tehran)*. 2011;8(3):117-22.
19. Prasanna S, Giriraju A, Narayan NL. Knowledge and attitude of primary school teachers toward tooth avulsion and dental first aid in Davangere city: a cross-sectional survey. *Int J Clin Pediatr Dent*. 2011;4(3):203-6. doi: [10.5005/jp-journals-10005-1110](https://doi.org/10.5005/jp-journals-10005-1110).
20. McIntyre JD, Lee JY, Trope M, Vann WF Jr. Elementary school staff knowledge about dental injuries. *Dent Traumatol*. 2008;24(3):289-98. doi: [10.1111/j.1600-9657.2007.00542.x](https://doi.org/10.1111/j.1600-9657.2007.00542.x).
21. Attarzadeh H, Kebriaei F, Sadri L, Foroughi E, Taghian M. Knowledge and attitudes of elementary schoolteachers on dental trauma and its management in Yazd, Iran. *J Dent (Shiraz)*. 2017;18(3):212-8.
22. Mehrabkhani M, Ajami B, Parisay I, Bolboli A, Akbarian G. Knowledge of emergency management of traumatized teeth among schoolteachers in Mashhad, Iran. *J Dent Res Dent Clin Dent Prospects*. 2015;9(2):121-5. doi: [10.15171/joddd.2015.024](https://doi.org/10.15171/joddd.2015.024).
23. Raoof M, Zaherara F, Shokouhinejad N, Mohammadalizadeh S. Elementary school staff knowledge and attitude with regard to first-aid management of dental trauma in Iran: a basic premise for developing future intervention. *Dent Traumatol*. 2012;28(6):441-7. doi: [10.1111/j.1600-9657.2011.01085.x](https://doi.org/10.1111/j.1600-9657.2011.01085.x).
24. Mesgarzadeh AH, Shahamfar M, Hefzollesan A. Evaluating knowledge and attitudes of elementary school teachers on emergency management of traumatic dental injuries: a study in an Iranian urban area. *Oral Health Prev Dent*. 2009;7(3):297-308.
25. Berger TD, Kenny DJ, Casas MJ, Barrett EJ, Lawrence HP. Effects of severe dentoalveolar trauma on the quality-of-life of children and parents. *Dent Traumatol*. 2009;25(5):462-9. doi: [10.1111/j.1600-9657.2009.00809.x](https://doi.org/10.1111/j.1600-9657.2009.00809.x).
26. Trabelsi K, Shephard RJ, Zlitni S, Boukhris O, Ammar A, Khacharem A, et al. Dental trauma first-aid knowledge and attitudes of physical education teachers: a systematic review and meta-analysis of the literature with meta-regressions. *Educ Sci*. 2019;9(4):251. doi: [10.3390/educsci9040251](https://doi.org/10.3390/educsci9040251).
27. Anand A, Mukherjee CG, Shukla JN, Sharma S. Knowledge and awareness regarding traumatic dental injuries in school children among physical education teachers in Patna: a cross-sectional study. *Int J Sci Study*. 2016;4(1):51-4.
28. Al-Asfour A, Andersson L, Al-Jame Q. School teachers' knowledge of tooth avulsion and dental first aid before and after receiving information about avulsed teeth and replantation. *Dent Traumatol*. 2008;24(1):43-9. doi: [10.1111/j.1600-9657.2006.00476.x](https://doi.org/10.1111/j.1600-9657.2006.00476.x).
29. Al Sari S, Kowash M, Hussein I, Al-Halabi M. An educational initiative for Dubai school nurses and physical education teachers on the management of traumatic dental injuries. *J Sch Nurs*. 2019;35(5):359-66. doi: [10.1177/1059840518780306](https://doi.org/10.1177/1059840518780306).

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