



RELATIONSHIP BETWEEN GENDER, TEACHING EXPERIENCE, SUBJECT TAUGHT, AND TEACHER'S ATTITUDE AND KNOWLEDGE TOWARD DENTAL TRAUMA IN CHILDREN

ABSTRACT

Objectives: The purpose of this study was to analyze the relationship between gender, teaching experience, and subject taught by the primary school teacher and the attitude as well as knowledge of the teacher about dental trauma in the Indonesian population.

Materials and Methods: Ninety teachers from 14 public elementary schools in Central Jakarta were randomly chosen to fill in a questionnaire. The data were analyzed using the Kendall rank correlation.

Results: A significant relationship (weak negative linear correlation) between teaching experience and teacher's attitude ($p < 0.05$) was observed. No significant correlation between attitude and knowledge and the other variables were noted.

Conclusions: A significant relationship between teaching experience and the teacher's attitude toward dental trauma in children was observed. In general, the attitude toward dental trauma in children was positive whereas, knowledge about dental trauma was insufficient among the teachers.

Keywords: Attitude, knowledge, teacher, dental, trauma.

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Received : 25.03.2020

Accepted : 08.05.2020

INTRODUCTION

Trauma to the permanent teeth occurs most commonly found in children at school.¹⁻³ Children usually spend a minimum 6 h per day at school; one out of fourteen students experience a dental injury in school every year.^{3,4} The clinical manifestations may be vary from simple enamel fracture to a complex dental avulsion.¹ Treatment strategies such as prompt treatment and proper first aid management are vital to increasing the prognosis of the traumatized tooth.³ Delayed replatantion and improper management can dramatically decrease the prognosis of an avulsed tooth leading to tooth loss.¹ The teacher is the guardian of the child at school and is responsible for the dental trauma cases that occur in the school environment.^{2,3,5} However, there is a lack of knowledge about first aid dental trauma management among primary school teachers.^{2,6-8}

Attitude is the tendency of a reaction or response to an object, situation, and people. Knowledge is a result of knowing and it is gained after the individual senses a particular object. Knowledge is an important domain because it is the basis of the behavioral performance. Several internal and external factors, such as the physiological aspect, occupation, and personal experience determine the attitude and knowledge of an individual. Physiological attributes (such as gender); the working environment (such as the subject taught by the teacher), and the teaching experience can, directly and indirectly, contribute to the teacher's attitude and knowledge directly and indirectly.⁹ Significant correlations between teachers' knowledge towards dental trauma and gender, teaching experience, and the subject taught have been reported previously.^{4,10}

Questionnaire-based studies evaluating the attitude and knowledge toward dental trauma have been reported in many countries.^{6,11-14} The results of the questionnaires can be used as education guidelines based on the population studied.¹⁵ Currently, teachers' attitude and knowledge toward dental trauma in children has been evaluated in the Middle East, India, Iran, Brazil, and other countries.^{4,16-18} However, there is no specific questionnaire to assess the teacher's

attitude and knowledge about dental trauma in children in Indonesia.

The purpose of this study was to analyze the relationship between gender, teaching experience, subject taught by the primary school teacher and the teacher's attitude and knowledge toward dental trauma in the Indonesian population.

MATERIALS AND METHODS

Ethical approval

This cross-sectional study was approved by the Research Ethics Committee at the Faculty of Dentistry, University of Indonesia (21/Ethical Approval/FKGUI/III/2019), Indonesia.

Subjects

The inclusion criteria were public primary school teachers in Central Jakarta who had not filled any questionnaire regarding dental trauma in children previously and were prepared to participate in this study. The exclusion criteria were homeschooling teachers, special education teachers, and teachers who move or transfer schools in one year.

Questionnaire

A self-administered questionnaire consisting of various sections on demographic data, attitude, and knowledge regarding first aid for dental trauma in children was used in this study. The questionnaire was modified from previous studies based on discussions in the expert panel and translated to the Indonesian language.^{1,2,19} The section on demographic data consisted of questions on the type of school, the gender, age, education, teaching experience, position, first aid training experience, and dental trauma self-first aid training experience of the teacher, other sources of information about dental trauma, and whether the teacher had witnessed or experienced dental trauma with information about where it had occurred. There were 10 Likert scale questions regarding dental trauma in children in the attitude section with the score ranging from 1 for the wrong answer to 4 for the right answer. The total range of the score was 10 to 40. The scores for attitude were classified as follows: poor (10-19), fair (20-30), and good (31-40). The knowledge section consisted of nine questions on dental trauma; a score of 0 was given for an incorrect answer and 2 for a correct answer. In cases where

there was more than 1 correct answer, a score of 0 was given for an incorrect answer, 1 for a correct answer, and 2 if they got more than one answer correct. The total range of the scores was 0–18. The scores for the knowledge section were classified as follows: poor (0–6), fair (7–13), and good (14–18).

Sample Size Calculation

The minimum sample needed from the correlation formula with $z\alpha=5\%$ (type I error of 5%), $z\beta=20\%$ (type II error of power 80%), $r=0.3$ (value of minimum correlation) was 85. Based on consecutive random sampling, a total of 90 primary school teachers participated in this study from April to May 2019.

Statistical analysis

SPSS (Statistical Package for Social Studies) version 23.0 (IBM Corporation, Chicago, IL, USA) was used for data entry, descriptive statistics, and data analysis.

The filled questionnaires were statistically analyzed using Cronbach's alpha to measure the internal consistency.

Kendall's correlation test was used to analyze the correlation between gender, teaching experience, and school subject to teacher's attitude and knowledge toward dental trauma in children. A p -value <0.05 was considered significant.

RESULTS

Ninety primary school teachers met the inclusive criteria and participated in this study. The questionnaire was found to be reliable with a Cronbach's alpha value of 0.766 in the attitude section and 0.715 in the knowledge section.

Among the teachers, 37 (41.1%) were males and 53 (58.9%) were females; 20 teachers (22.2%) had below 5 years of experience and 70 had over 5 years of experience (77.8%). Furthermore, there were 77 non-sport teachers (85.6%) and 13 sports teachers (14.4%); 36 teachers (40%) were below 35 years of age, 24 (26.7%) were between 36–45 years old, and 30 (33.3%) were above 45 years of age. Nine teachers (10%) had diploma degrees, 79 (87.8%)

had bachelor degrees, and 2 (2.2%) had master degrees. Among the 90 teachers, 26 (28.9%) had attended a first aid course, and only 3 (3.3%) had attended a first aid course for dental trauma.

One teacher (1.1%) demonstrated a poor attitude, 37 (41.1%) showed a moderate attitude, and 52 teachers (57.8%) presented with a positive attitude toward dental trauma in children. The median score in the attitude section was 31.5 with a minimum score of 19 and a maximum score of 40. With regard to knowledge about dental trauma, 55 teachers (61.1%) demonstrated poor knowledge, 34 (37.8%) had fair knowledge, and 1 teacher (1.1%) showed good knowledge. The median score was 6 out of 18, which was classified as poor. The minimum score in the knowledge section was 1 and the maximum score was 17.

Approximately 59 teachers (65.6%) remarked that teachers are responsible for the provision of emergency care to children who experience dental trauma at school and 81 (90%) agreed that dental avulsion needs prompt treatment. Regarding the effect of time on long term prognosis, 70 teachers (77.8%) believed time has an important role and 71 teachers (78.9%) agreed that dental trauma is an emergency situation. About 85 teachers (94.4%) remarked that the teacher must inform the parents about the incidence of dental trauma in the school. Furthermore, 72 teachers (80%) encouraged the use of a mouthguard in all contact sports and 74 teachers (82.2%) agreed that dental trauma emergency management must be an educational priority for teachers. Seventy-five teachers (83.3%) believed that they could provide better assistance in traumatic dental scenarios if they were provided with some short pertinent educational experiences. Fifty-four teachers (60%) agreed that emergency management of dental trauma is thoroughly professional and requires special education and training, whereas 59 teachers (65.5%) believed that teacher intervention in dental injuries that occur in the school may play a key role in the survival of the tooth.

Among the 90 teachers, only 33 (36.7%) knew that the damaged tooth was permanent.

Most teachers (86.7%) would investigate as to whether the child had received a tetanus vaccine. Only 5 teachers (5.6%) knew how to store the tooth immediately after the trauma, whereas 35 teachers (38.9%) were aware of the best time to place the avulsed tooth back in the mouth.

The result of the Kendall correlation test between gender and attitude is shown in Table 1, and that between gender and knowledge in Table 2. No significant correlation between gender and both attitude and knowledge toward dental trauma ($p < 0.05$) was observed.

Table 1. Correlation between gender and attitude toward Trauma

Variable	Attitude			Total	p	r
	Poor	Fair	Good			
Males	0 (0%)	13 (35.1%)	24 (64.9%)	37 (100%)	0.235	-0.125
Females	1 (1.9%)	24 (45.3%)	28 (52.8%)	53 (100%)		

Kendall Correlation Test, significant = $p < 0.05$

Table 2. Correlation between gender and knowledge about dental trauma

Variable	Knowledge			Total	p	r
	Poor	Fair	Good			
Males	21 (56.8%)	15 (40.5%)	1 (2.7%)	37 (100%)	0.427	-0.084
Females	34 (64.2%)	19 (35.8%)	0 (0%)	53 (100%)		

Kendall Correlation Test, significant = $p < 0.05$

The results of Kendall's correlation tests between teaching experience and attitude and knowledge are shown in Tables 3 and 4, respectively. There was a significant correlation between teaching experience and attitude toward dental trauma ($p <$

0.05) with a weak linear negative correlation. No significant correlation between teaching experience and knowledge toward dental trauma ($p < 0.05$) was observed, although the correlation was weakly positive.

Table 3. Correlation between teaching experience and attitude towards dental trauma

Variable	Attitude			Total	p	r
	Poor	Fair	Good			
< 5 years	0 (0%)	4 (20%)	16 (80%)	20 (100%)	0.022*	-0.241
≥5 years	1 (1.4%)	33 (47.1%)	36 (51.5%)	70 (100%)		

Kendall Correlation Test, *significant = $p < 0.05$

Table 4. Correlation between teaching experience and knowledge about dental trauma

Variable	Knowledge			Total	p	r
	Poor	Fair	Good			
< 5 years	14 (70%)	6 (30%)	0 (0%)	20 (100%)	0.342	0.1
≥5 years	41 (58.6%)	28 (40%)	1 (1.4%)	70 (100%)		

Kendall correlation test, *significance = $p < 0.05$

The results of the Kendall correlation test between school subject and attitude toward trauma was $p = 0.129$ with $r = 0.160$. (Table 5)

Table 5. Correlation between subject taught and attitude toward dental trauma

Variable	Attitude			Total	p	r
	Poor	Fair	Good			
Non-sport	1 (1.3%)	34 (44.2%)	42 (54.5%)	77 (100%)	0.129	0.160
Sport	0 (0%)	3 (23.1%)	10 (76.9%)	13 (100%)		

Kendall Correlation Test, significant = $p < 0.05$

While the result between school subject and attitude toward trauma was $p = 0.503$ with $r = -0.071$. (Table 6) There was no significant correlation statistically ($p < 0.05$) between school

subject neither to attitude nor knowledge toward trauma with positive weak linear correlation to attitude and negative weak linear correlation to knowledge.

Table 6. Correlation between subject taught and knowledge of dental trauma

Variable	Knowledge			Total	p	r
	Poor	Fair	Good			
Non-sport	46 (59.7%)	30 (39%)	1 (1.3%)	77 (100%)	0.503	-0.071
Sport	9 (69.2%)	4 (30.8%)	0 (0%)	13 (100%)		

Kendall Correlation Test, significant = $p < 0.05$

DISCUSSION

This cross-sectional study was conducted by consecutive random sampling in 14 out of 195 public elementary schools in Central Jakarta. There were 90 primary school teachers participated in this study. The questionnaire was translated into the Indonesian version^{1,20,21}; the adaptation process of a questionnaire includes the translation phase, synthesis phase, review phase by the expertise, and a confirmation from the original author. In the present study, data were collected using a modified questionnaire based on previous studies and an expert panel discussion. The questionnaire copyright was confirmed by the original author through email. In some cases, a modification may be needed during the translation phase because of some words that are not compatible with other languages.²² A neutral option or a safe answer such as “Neither agree nor disagree” used in a previous study can be deleted to avoid a biased result in the research.²¹ In the present study, the Cronbach alpha was applied to obtain internal consistency in the questionnaire, which was tested on 30 teachers in the pilot study.²² The results showed a value of 0.766 in the attitude section and 0.715 in the knowledge section that indicates acceptable reliability.

The gender proportion was higher in females based on the demographic data. From all of the participants, the proportion of teachers with below 5 years teaching experienced was relatively lower than teachers with over 5 years teaching experienced. Based on the public primary school curriculum in 2013 from Ministry of Education and Culture of Indonesia, there were class teacher, religion teacher, art and culture teacher, and sport teacher. The class teacher covers mathematic, natural science, social science, Indonesian language, and civics. Therefore, the number of sports teachers was dramatically lower than non-sport teacher as in this study respectively.

Good knowledge and attitude results in good oral behavior.²³ The median attitude score of the school teachers with regard to dental trauma in children was 31.5 of 40, which was considered as positive in this study. This result was consistent to the teachers' attitude toward dental trauma in children in Singapore and Iran.^{1,15}

The median score of teachers' attitudes in the current study was 31.5 of 40, which was considered as good. The teacher is responsible for providing first aid dental trauma management to the child in the school.^{2,3,5} Approximately 94.4% of the teachers agreed to actively contact the

parents when a child encountered dental trauma.^{2,6} Most teachers (78.9%) were aware that dental trauma is an emergency situation, 90% of them were prepared to treat an avulsed tooth, and 77.8% acknowledged that time had an important role in increasing the prognosis of the avulsed tooth. Delayed replantation and improper treatment might dramatically decrease the long term prognosis, especially in the case of a dental avulsion.¹

A significant correlation between the duration of teaching experience and the teacher's attitude toward dental trauma in children at school was noted in the study. The result of positive attitude was seen more in the younger age group consistent to findings in the United Arab Emirates.¹⁰ On the other hand, no significant correlations were observed between teachers' attitude and both gender as well as the subject taught as reported in Iran.^{1,17}

The median score in the knowledge section was 6 out of 18 and was classified as poor in this study. The minimum score was 1 and the maximum score was 17. Bayram *et al.*²⁴ reported a lack of knowledge in public and private primary school teachers regarding dental trauma in school. The majority of the teachers (63.3%) in this study demonstrated a lack of knowledge as to whether the involved tooth was a permanent or a deciduous tooth. This proportion was relatively higher than that reported in Iran and the United Arab Emirates.^{1,10} Knowledge regarding the order of tooth eruption is inadequate among primary school teachers and could lead to a decrease in the prognosis of the avulsed tooth.^{10,25} Only 35 teachers (38.9%) answered correctly about the best time to reimplant an avulsed tooth. This was lower than that reported in a study conducted in Saudi Arabia, wherein 52.2% of the participants answered that the best time to replace an avulsed tooth was as soon as possible.⁴ In general, there was a lack of knowledge among primary school teachers toward dental trauma in school.

Alsadhan *et al.*⁴ reported there is no significant correlation between gender and knowledge was noted as in this study. However, Pithon *et al.*²⁶ found female teachers had better

knowledge about dental trauma in children due to the intimate and intensive contact with kids during outdoor activities and their role as a mother.

No significant correlation between teaching experience and the teacher's knowledge about dental trauma in children was observed in this study (Table 4). This not in accordance with Alsadhan *et al.* where a group of teachers with 21–30 years of experience demonstrated better knowledge than those with less than 20 years of experience. Teachers with higher amounts of teaching experience may be more exposed to cases of dental trauma in the school.⁴ However, some Al Jundi *et al.*⁷ and Pithon *et al.*²⁶ have reported no correlation between teaching experience and primary school teacher's knowledge of dental trauma in children. Neither the length of the teaching experience nor the attendance of a dental trauma training course was associated with the knowledge of the teacher in a previous study.¹⁸

A sports teacher has an important role in providing first aid treatment because a child spends 40% of their active time in school and is generally involved in sports and games. The prevalence of trauma in school is about 60% and is mainly caused by sports-related accidents.^{2,5,19,36} No significant correlation between the subject taught and the teacher's knowledge was noted (Table 6). This is in accordance with Raof *et al.*¹, Kaul *et al.*¹⁶, and Pithon *et al.*²⁶ although a sports teacher is expected to have better knowledge than a non-sports teacher.

Only 3 (3.3%) out of 90 teachers in this study had been trained for first-aid management of dental trauma. This result clearly seen since the Ministry of Health in Indonesia only includes first aid management of toothache due to caries in the school dental care curriculum. Similar results have been reported in the United States of America, Saudi Arabia, Europe, and United Arab Emirates^{2,4,19,27}, and may be due to the lack of education about dental trauma. The conventional first aid management training was inadequate to fulfill the teacher's knowledge.¹⁰ On the other hand, the teachers' awareness about including first aid management in the teaching curriculum was

quite high (82.2%) in this study. Therefore, further training regarding the management of dental trauma in children should be provided to the teachers.

A larger sample might be needed to represent the whole population in the future. Only three variables were tested in this study. However, this is the first study to use a questionnaire as a tool to assess the teachers' attitude and knowledge toward dental trauma in Indonesia.

CONCLUSIONS

There was a significant relationship between teachers' attitude toward dental trauma in children and teaching experience; on the other hand, no significant relationships with the other variables were observed. In general, the teachers demonstrated a positive attitude toward dental trauma in children, whereas knowledge about dental was insufficient in this study population. First aid management for dental trauma in children should be included in the UKGS. Moreover, the results of this research could be used as a reference for future guidelines based on the Indonesian population.

ACKNOWLEDGMENTS

The publication of this manuscript supported by the University of Indonesia. The research was fully funded by HIBAH PITTA UI. The funding agency had no role in the study design, collection of data, data analysis, interpretation of the data, writing of the report, or the decision to submit the report for publication.

CONFLICTS OF INTEREST STATEMENT

The authors declare no conflict of interest in this research.

REFERENCES

1. Raof 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;28:441–447.
2. McIntyre JD, Lee JY, Trope M, Jr WFV. Elementary school staff knowledge about dental injuries. *Dent Traumatol* 2008;24:289–298.
3. Choi D, Badner VM, Yeroshalmi F, Margulis KS, Dougherty NJ, Kreiner-litt G. Dental Trauma Management by New York City School Nurses. *J Dent Child* 2012;79:74–78.
4. Alsadhan SA, Alsayari NF, Abuabat MF. Teachers' knowledge concerning dental trauma and its management in primary schools in Riyadh, Saudi Arabia. *Int Dent J* 2018;68:306–313.
5. Thakur S, Singhal P, Chauhan D, Jayam C. Knowledge, Attitude and Practice (KAP) of Teachers Regarding Dental Traumatic Injuries among School Children of Shimla City. *Int J Recent Sci* 2018;7:11236–11241.
6. Soubra BN, Nassif N. Impact of audiovisual method in educating children facing dental avulsion. *Dent Traumatol* 2014;30:216–221.
7. Al-jundi S, Al-Waeili H, Khairalah K. Knowledge and attitude of Jordanian school health teachers with regards to emergency management of dental trauma. *Dent Res Jounal* 2005;21:183–187.
8. Kapdan A, Buldur B, Kapdan A, Ünal M. Knowledge of First-Aid Measures of Avulsion and Replantation of Teeth in Schoolchildren with Sports Education. *Cumhur Dent J* 2011;14:191–203.
9. Baartman LKJ, De Bruijn E. Integrating Knowledge, Skills and Attitudes: Conceptualising Learning Processes towards Vocational Competence. *Educ Res Rev* 2011;6:125–134.
10. 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;2:1–7.
11. Al-obaida M. Knowledge and management of traumatic dental injuries in a group of Saudi primary schools teachers. *Dent Traumatol* 2010;26:338–341.
12. Hashim R. Investigation of mothers' knowledge of dental trauma management in United Arab Emirates. *Eur Arch Paediatr Dent* 2011;13:83–87.
13. Talluri D, Bommireddy VS, Rao V. Management of Dental Injuries by South Indian Medical Professionals - A Hospital Based Questionnaire Design Study. *Int J Appl Dent Sci* 2014;79:18–21.
14. Buldur B, Kapdan A. Factors Associated with Knowledge and Attitude of Management of Traumatic Dental Injuries: A cross-sectional Study among Turkish Dentists. *Pesqui Bras Odontopediatria Clin Integr* 2018;18:1–9.
15. Sae-Lim V, Lim L. Dental Trauma Management

Awareness of Singapore Pre-school Teachers. *Dent Traumatol* 2001;17:71–76.

16. Kaul R, Jain P, Saha N, Goswami S, Mukhopadhyay S, Saha S, et al. Evaluation of Knowledge, Awareness, and Attitude toward Emergency Dental Trauma Management among the School Teachers of Kolkata. *Indian J Dent Res* 2017;28:595–603.

17. Attarzadeh H, Kebriaei F, Sadri L, Foroughi E, Taghian M. Knowledge and Attitudes of Elementary School Teachers on Dental Trauma and Its Management in Yazd, Iran. *J Dent (Shiraz, Iran)* 2017;18:212–218.

18. Azeredo L, Antunes A, Pretti RT, Lima LF, Esteves V. Traumatic Dental Injury in Primary Teeth: Knowledge and Management in Brazilian Preschool Teachers. *J Dent Oral Hyg* 2015;7:9–15.

19. Caglar E, Ferreira L, Kargul B. Dental trauma management knowledge among a group of teachers in two south European cities. *Dent Traumatol* 2005;21:258–262.

20. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the Process of Cross-Cultural Adaptation of Self-Report Measures. *Spine (Phila Pa 1976)* 2000;25:3186–3191.

21. Meadows KA. So you want to do 5 : Questionnaire

design. *Br J Community Nurs* 2003;8:562–570.

22. Widenfelt BM Van, Treffers PDA, Beurs E De, Siebelink BM, Koudijs E. Translation and Cross-Cultural Adaptation of Assessment Instruments Used in Psychological Research With Children and Families. *Clin Child Fam Psychol Rev* 2005;8:135–147.

23. Ivana I, Indiarti IS, Budiardjo SB. The Relationship between Mother's Oral Health Behavior and The Child's First Permanent Molar Caries Rate. *J Int Dent Med Res* 2018;11:1022–1027.

24. Bayram M, Koruyucu M, Seymen F. Assessment of Knowledge among Public and Private Elementary School & Teachers in Dental Trauma Management. *Dent 3000 J* 2017;5:1–7.

25. Zamon EL, Kenny DJ. Replantation of Avulsed Primary Incisors : A Risk – Benefit Assessment. *J Can Dent Assoc (Tor)* 2001;67:22–25.

26. Pithon MM, Lacerda R, Henrique P, Magalhães B, Coqueiro S. Brazilian Primary School Teachers' Knowledge about Immediate Management of Dental Trauma. *Dental Press J Orthod* 2014;19:110–115.

27. Hashim R. Dental Trauma Management Awareness among Primary School Teachers in the Emirate of Ajman , United Arab Emirates. *Eur J Paediatr Dent* 2011;12:99–102.