Preclinical Dentistry Students' Knowledge and Attitude Towards Traumatic Dental Injuries (TDI) in Children

Pengetahuan Dan Sikap Mahasiswa Preklinik Kedokteran Gigi Terhadap *Traumatic Dental Injuries* (TDI) pada Anak-Anak

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Received: 12 Sept 2024; Revised: 13 Oct 2024; Accepted: 7 Nov 2024; Published: 28 Nov 2024

ABSTRACT
Traumatic Dental Injuries (TDI) are medical emergencies that require immediate treatment. The accuracy of first aid during the golden time plays a role in the treatment outcome of TDI. This study aimed to investigate the knowledge and attitudes of Preclinical students regarding TDI in pediatric patients. This study administered an online questionnaire that had completed validity and reliability testing to all preclinical students (N=258). With a 95% confidence level ($p<0.05$), a chi-square test was conducted on the data using SPSS software. First-year students had the lowest knowledge and attitudes toward TDI (68% and 54%, respectively). The degree of knowledge between preclinical students regarding the primary causes of TDI (61.1%), the need for immediate first aid in cases of avulsion (85.5%), an appropriate technique to hold avulsed teeth (91.5%), the selection of transport media (72.2%), storage medium (58.5%), and the urgency of receiving first aid for tooth fractures (60.3%) was significantly different. Regarding attitudes, there were significant differences in first aid actions, reimplantation, and attitudes toward selecting storage media, which were 60.7%, 62.8%, and 55.1%, respectively. The level of knowledge and attitudes of respondents towards TDI were low. Evaluation of learning methods, training implementation, and curriculum evaluation is needed.
Keywords: Traumatic Dental Injuries, Knowledge, Attitude, Dental Students

ABSTRAK
Traumatic Dental Injuries (TDI) merupakan kondisi gawat darurat yang membutuhkan perawatan segera. Keberhasilan perawatan TDI salah satunya adalah ketepatan pertologan pertama saat golden periode. Tujuan penelitian ini adalah untuk menggali pengetahuan dan sikap mahasiswa Preklinik Kedokteran Gigi terhadap TDI pada anak. Seluruh mahasiswa preklinik berjumlah 258 diikutsertakan dalam penelitian ini untuk mengisi kuesioner secara online yang sebelumnya telah dilakukan uji validitas dan reliabilitas. Data dianalisis menggunakan software SPSS untuk dilakukan uji chi-square dengan tingkat kepercayaan 95% ($p< 0,05$). Persentase paling rendah terkait pengetahuan dan sikap terhadap TDI terdapat pada mahasiswa tingkat pertama, masing-masing 68% dan 54%. Terdapat perbedaan signifikan tingkat pengetahuan antar mahasiwa preklinik terkait penyebab utama TDI (61.1%), urgensi mencari pertolongan pertama kasus avulsi (85.5%), cara memegang gigi avulsi (91.5%), pemilihan media transport (72.2%), media penyimpanan (58.5%), dan urgensi mencari pertolongan pertama fraktur gigi (60.3%). Sementara terkait sikap, perbedaan signifikan terdapat pada tindakan untuk mencari pertolongan pertama, reimplantasi, dan sikap memilih media penyimpanan, masing-masing 60.7%, 62.8%, dan 55.1%. Tingkat pengetahuan dan sikap responden terhadap TDI rendah. Perlu dilakukan evaluasi metode pembelajaran, pelaksanaan pelatihan dan evaluasi kurikulum.
Kata Kunci: *Traumatic Dental Injuries*, Pengetahuan, Sikap, Mahasiswa Kedokteran Gigi

INTRODUCTION

The term "Traumatic Dental Injuries" (TDI) refers to the impact of injury to the teeth and/or other hard and soft tissues in and around the mouth and oral cavity.[1] Trauma to the face, teeth, and jaw areas can result in tooth mobility/ displacement tooth fractures, dentoalveolar fractures, teeth displaced out of their sockets, wounds or lacerations of soft tissues around the mouth, and several other complications.[2] Dental trauma usually occurs suddenly, indirectly, unexpectedly, unintentionally, and frequently requires emergency action.[1] In children and young adults, traumatic dental injuries (TDI) are common. Since a child's motor abilities and bone density are still developing at this age and they are beginning to explore their surroundings, any trauma to the teeth or facial area could lead the teeth to fall out of their sockets.[3]

A face injury may occur anywhere, at any time, with particular emphasis on the jaw and teeth. It generally occurs at play areas, schools, or even commercial malls.[4] Five percent of all trauma cases are associated with TDI.[5] Worldwide data show that the prevalence of TDI in primary teeth is 22.7%, whereas it is 15.2% in permanent teeth.[6] It is impossible to predict when TDI might occur, and it is challenging to estimate the injury's prognosis. The type and circumstances of the trauma can affect the success rate. The amount of time that passes between the trauma and well-administered first aid, however, is one of the critical factors that can impact the effectiveness of dental trauma therapy.[1,7,8]

Treatment outcomes will suffer if initial aid is delayed when TDI occurs. Delaying first aid when TDI occurs will affect the success of treatment. This is related to the minimal knowledge of the community to immediately seek dental care when TDI occurs. Approximately 1% of patients possess this awareness.[9] Since TDI instances occur frequently in daily life, it is important for the public, particularly dentistry students, to be aware of what may be done as first aid in situations of TDI in order to ensure long-term treatment effectiveness. Numerous researches have indicated that dentistry students' perspectives regarding TDI cases are inconsistent and lack information.[10,11]

Since dental students are future health professionals, they ought to know more about traumatic dental injuries (TDI) in children and how to treat them than the general public does. However, as of right now, no epidemiological data exists on the level of knowledge dental students in Indonesia, particularly those at the Faculty of Dentistry at Syiah Kuala University in Aceh Province, have about TDI in children and how to treat them. Therefore, preliminary research is required to gather this data. The data from this study can be utilized to assess the dentistry faculty's curriculum, particularly regarding knowledge and management of pediatric traumatic dental injuries. This study aims to investigate the knowledge and attitudes of Preclinical students regarding TDI in pediatric patients.

RESEARCH METHODS

This was a quantitative, cross-sectional, and descriptive study. An online questionnaire served as the research tool. This survey was conducted at the end of the 2023/2024 academic year by inviting all dental clinic students from the Faculty of Dentistry Universitas Syiah Kuala to participate. Students were considered to have granted their agreement to take part in the study if they were willing to respond to the questionnaires.

The questionnaire used in this study was developed based on a validated questionnaire used in the literature,[10] modifications were made to the survey instrument before its use in the main survey. The questionnaire completed the face validity stage and is considered valid and reliable based on the test results. It comprises four sections: (1) sociodemographic characteristics; (2) dental trauma training and experience; (3) knowledge of dental trauma in children; and (4) attitudes towards dental trauma cases. Responses to Parts 3 and 4 were recorded as true or false. Respondents were divided into groups of preclinical students from years 1 to 4 for further analysis. Ethics approval was obtained through the Research Ethics Committee of the Faculty of Dentistry, Syiah Kuala University (reference no. 515/KE/FKG/2024). The data were analyzed using the chi-square test with the SPSS Statistical Package for Social Sciences software version 25 (IBM Corp.).

RESULTS

The study involved 234 preclinical students 90.7% at FKG USK who were categorized as 61 first-year students, 64 second-year students, 69 third-year students, and 40 fourth year students. According to sociodemographic data, there are 83.3% female respondents and 16.7% male respondents in terms of gender distribution. Distribution data linked to training and experience with TDI shows that 29.9% of respondents claimed that they had received training related to Dental Trauma, whereas 70.1% of them had never received training. Of those surveyed, 12.4% acknowledged having suffered dental trauma, and 87.6% reported having no prior experience with TDI (Table 1).

Table 1. Sociodemographic characteristics, experience of attending training and with TDI

Respondent Data		**Quantity**	**%**
Respondent Group	First Year	61	26.1%
	Second Year	64	27.4%
	Third Year	69	29.5%
	Fourth Year	40	17%
Total		234	100%
Gender	Male	39	16.7%
	Female	195	83.3%
Total		234	100%
TDI Training	Yes	70	29.9%
	No	164	70.1%
Total		234	100%
TDI Experience	Yes	29	12.4%
	No	205	87.6%
Total		234	100%

Table 2. Quantity and percentage of preclinical respondents who answered each question item correctly regarding knowledge of TDI cases.

Code	**Knowledge level questions**	**Respondent Group**				**Total**	***p***
		1st Year	**2nd Year**	**3rd Year**	**4th Year**		
P1	What do you think is the main cause of TDI?	27 (44.3%)	50 (78.1%)	38 (55.1%)	28 (70%)	143 (61.1%)	0.00
P2	Do you think TDI is an emergency?	59 (96.7%)	63 (98.4%)	68 (98.6%)	39 (97.5%)	229 (97.9%)	0.88
P3	Do you think tooth avulsion requires immediate care?	60 (98.4%)	64 (100%)	69 (100%)	40 (100%)	233 (99.6%)	0.41
P4	How urgent do you think it is to seek professional help if a permanent tooth has been knocked out?	43 (70.5%)	58 (90.6%)	60 (87%)	39 (97.5%)	200 (85.5%)	0.00
P5	If you find an avulsed tooth, how would you handle the tooth?	50 (82.0%)	59 (92.2%)	66 (95.7%)	39 (97.5%)	214 (91.5%)	0.01
P6	If liquid is used to transport the tooth, how would you transport it to the dentist?	28 (45.9%)	53 (82.8%)	54 (78.3%)	34 (85%)	169 (72.2%)	0.00
P7	Do you think a tooth fracture requires immediate care?	54 (88.5%)	61 (95.3%)	63 (91.3%)	37 (92.5%)	215 (91.9%)	0.57
P8	What do you think is the most appropriate storage medium for a fractured tooth?	24 (39.3%)	44 (68.8%)	45 (65.2%)	24 (60%)	137 (58.5%)	0.04
P9	When do you think it is time to seek help if a tooth fracture occurs?	29 (47.5%)	36 (56.3%)	50 (72.5%)	26 (65%)	141 (60.3%)	0.02
	Average	68%	84.7%	83%	85%	-	-

Grey boxes indicate significant differences between variables (Chi-square test, $p \leq 0.05$)

Table 3. Quantity and percentage of preclinical respondents who answered each question item correctly regarding attitude of TDI cases

Code	Attitude related questions	Respondent Group				Total	*P*
		1st Year	2nd Year	3rd Year	4th Year		
S1	Case (permanent tooth avulsion). Do you think that the affected front tooth likely to be a primary or permanent tooth?	49 (80.3%)	52 (81.3%)	62 (89.9%)	38 (95%)	201 (85.9%)	0.09
S2	Which of the following would you do?	44 (72.1%)	42 (65.6%)	35 (50.7%)	21 (52.5%)	142 (60.7%)	0.04
S3	Would you replant (put back) the tooth into the socket from which it avulsed?	23 (37.7%)	43 (67.2%)	52 (75.4%)	29 (72.5%)	146 (62.8%)	0.00
S4	If you decide to replant the tooth into its socket, but it has fallen onto the ground and is covered in dirt, what would you do?	39 (63.9%)	48 (75%)	52 (75.4%)	29 (72.5%)	168 (71.8%)	0.45
S5	If you did not replant the tooth, how would you transport it to the dentist?	10 (16.4%)	20 (31.3%)	64 (92.8%)	35 (87.5%)	129 (55.1%)	0.00
Average		54%	64%	76.8%	76%	-	-

Grey boxes indicate significant differences between variables (Chi-square test, $p \leq 0.05$)

Table 2 shows the level of respondents' knowledge about TDI cases. First-year students have the lowest level of knowledge about TDI cases, which is 68%, followed by third-year students at 83% and continued by second-year students with a percentage of 84.7%. Meanwhile, fourth-year students have the highest level of knowledge, which is 85%. Significant differences between preclinical students regarding knowledge about TDI cases are found in the question items on the degree of knowledge regarding the primary causes of TDI (61.1%), the crucial role of seeking first aid in the event of an avulsed tooth case (85.5%), the handling of avulsed tooth cases (91.5%), the selection of transport media (72.2%), storage media (58.5%), and the seeking first aid (60.3%).

Table 3 shows the percentage of respondents' attitudes towards TDI management. First-year students showed the lowest percentage of attitudes towards TDI, which was 54%. The second-year student group had a percentage of 64%, followed by the fourth-year student group with a percentage of 76%, while the third-year students showed the highest percentage, which was 76.8%. There were significant differences between test groups regarding attitudes in TDI case management, namely in the question items on attitudes towards seeking first aid, performing reimplantation, and selecting storage media, with percentages of 60.7%, 62.8%, and 55.1%, respectively.

DISCUSSION

All preclinical students of Syiah Kuala University's (FKG USK) Faculty of Dentistry participated in this study, which was carried out at the end of the 2023–2024 academic year. Students that enroll in the undergraduate dentistry program from the first to the fourth year are known as preclinical students. The material for Traumatic Dental Injuries (TDI) is acquired by students throughout their preclinical education in growth and development science at the start of semester 4 or midway through their second year of study.

The MARA University of Technology's Faculty of Dentistry in Sungai Buloh, Malaysia, similarly adopts the same system.[10]

According to research data, 12.4% of respondents had encountered TDI of various kinds throughout their lives, and less than half of respondents (30%) have undergone TDI training. One can acquire TDI training from a number of sources, including seminars, online courses, and formal training.[12] According to Momeni et al,[13] a person's attitude toward managing TDI cases is influenced by their personal experience with the disorder, which in turn influences the case care prognosis. Significant differences were found in the research data pertaining to USK FKG students' overall awareness of TDI instances. The study's results are consistent with research conducted by Mahmood et al. Only question items related to TDI emergency status, urgency of avulsion cases, and tooth fractures showed insignificant differences. This is estimated because a majority of respondents answered correctly with a percentage range of 91.9%-99.6%, indicating that there was no significant difference for these questions.[10]

The study conducted by Gautam et al,[11] revealed that preclinical students had less understanding about TDI cases than clinical students. As expected, the fourth-year student group has the highest percentage of TDI knowledge (85%) according to the study's findings. This is because, in contrast to the second and third-year student groups, this group has been exposed to more in-depth theories and case examples during lecture periods. The second-year student group has the highest proportion, 84.7%, and ranks second. This is estimated since the TDI course was delivered at the completion of the fourth semester, when the study was done. It is estimated that the third-year student group has a lower percentage than the second-year students because, despite having acquired the TDI theory by the end of the second year of lectures, this test group did not receive the oral surgery theory, which also includes a TDI subtopic pertaining to the treatment of tooth avulsion cases. Based on the curriculum, this oral surgery course is offered at the start of the fourth year of lectures. According to the study's findings, fourth-year students had the highest percentage, followed by second-year students, third-year students, and first-year students, who had the lowest percentage.

As demonstrated by this study, which found that first-year students had the lowest proportion of knowledge about TDI cases among preclinical students, the range of percentages of knowledge was 68% to 85%. The results of this study is consisted with those carried out in Sudan by Azmi et al,[14] and another study by Fujita et al,[15] on dentistry students at Khusyu University, Japan. A literature search indicated that a lack of knowledge, training, and clinical experience in the management of TDI cases was probably the reason for preclinical students' low level knowledge regarding dental trauma cases, even though they had been exposed to this material during preclinical education.[10,11,14,15]

Students' attitudes toward TDI as a proportion are similar to their degree of knowledge. First-year students had the lowest percentage because, in comparison to other test groups, they were new learners who had not been exposed to sufficient dentistry theory. The third-year student group had the greatest proportion (76.8%), which was 0.8% higher than the fourth-year students' (76%). Theoretically, fourth-year students with better knowledge percentages should also have higher attitudes than third-year students, which makes this surprising. This probably affects the overall percentage because of the variation in the number of respondents from each test group. A study by Alzoubi et al,[16] found that one of the reasons dental students have low knowledge and attitude of TDI is that preclinical education basically delivers the material or education related to dental trauma, but there is very limited evaluation of the teaching methodology. Therefore, the main goal of undergraduate education should be to provide students sufficient current insight to enable them to correctly diagnose TDI, give appropriate advice, perform emergency care, know when to refer, and prevent unnecessary care that can have a negative impact on the final outcome of treatment.[16] In order to enhance students' understanding, Al-Shamiri[17] suggest expanding the range of teaching strategies, including problem-based learning, and reinforcing the curriculum's emphasis on dental trauma subjects.

Our results showed that there were significant differences between preclinical students attitudes towards TDI case management, particularly with relation to handling avulsed permanent teeth and transporting avulsed teeth to the dentist's office. In line with knowledge, the attitudes of preclinical students towards TDI in this study were also quite low. In line with research by Ivkosic et al,[18] which reported that overall students showed inappropriate attitudes in TDI management. In order to enhance treatment outcomes, the study's findings highlight the significance of continuing education for professionals in all fields who may encounter dental injury situations.[19–24]

The assessment question about transporting avulsed teeth into the dentist's practice had the lowest number of respondents who answered correctly (55.1%). With only 16.4% of responders in their first year of preclinical training correctly answering. Meanwhile, third-year preclinical students achieved the highest percentage, at 92.8%. This is based on the fact that third-year preclinical students had just finished studying TDI content the semester before the study was carried out, therefore they had excellent knowledge and attitudes regarding TDI management. There was a notable discrepancy observed in first-year preclinical students; only ten individuals properly answered the question. This was attributed to a lack of understanding and the absence of TDI management training. According to research by Uthman et al,[22] most of the participants had never gone to a workshop, symposium, or conference on TDI management, which made it difficult for them to comprehend and deal with traumatic dental injuries. The researchers suggest that in order to improve the existing state of affairs, it is imperative that the causes of this problem be evaluated and solutions developed.[17,18,25]

CONCLUSION

The results of the study showed that the level of knowledge and attitude of preclinical students of FKG USK towards TDI cases was quite low. It is necessary to evaluate learning methods, implementation of dental trauma training and evaluation of the curriculum related to TDI.

ACKNOWLEDGEMENT

This research was funded by Universitas Syiah Kuala by letter of agreement for the assignment of expert assistant research for 2024 number 530/UN11.2.1/PG.01.03/ SPK/PTNBH/2024 dated 3 May 2024.

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