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Knowledge level of children with Down Syndrome's parents before and after reading electronic book "Tooth Injuries in Children with Down Syndrome"

Nível de conhecimento dos pais de crianças com Síndrome de Down antes e depois da leitura do livro eletrônico "Traumatismos Dentários em Crianças com Síndrome de Down"

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ABSTRACT

Objective: To analyse the knowledge level before and after reading electronic book "Tooth Injuries in Children with Down Syndrome" through children with Down syndrome's Parents. **Material and Methods:** This study was conducted at three special need school type C (designed to the mentally disabled children) in Jakarta and POTADS Foundation, with 37 eligible parents. Book and questionnaire used were developed and modified from the guidelines of tooth injuries on typical children, with special consideration of children with Down syndrome. Validity and reliability were tested through discussion with experts, dentists, and children with Down syndrome's parents. Knowledge was measured twice, before and after reading electronic book for 10 minutes each step using same questionnaire. The total scores were categorized as follows: good (12-15), fair (9-11), and poor (0-8). Difference knowledge scores were statistically tested. **Results:** Mean of total score before and after reading were 6.62 (poor); 10.51 (fair), respectively. Difference score was statistically significant (p=0,001) using paired T-test. **Conclusion:** The electronic book "Tooth Injuries in Children with Down Syndrome" was developed and modified by authors and needs to be evaluated by measuring the knowledge level of parents of children with Down syndrome. The measurement conducted showed that there is a difference in the level of knowledge of parents before and after reading the electronic book "Tooth Injuries in Children with Down Syndrome."

KEYWORDS

Books; Down Syndrome; Parents; Tooth Injuries.

RESUMO

Objetivo: Analisar o nível de conhecimento dos pais de crianças com Síndrome de Down antes e depois de lerem o livro eletrônico "Traumatismos Dentários em Crianças com Síndrome de Down". **Material e Métodos:** Este estudo foi conduzido em três escolas de necessidades especiais tipo C (destinadas a crianças com deficiência mental) em Jacarta e na Fundação POTADS, com 37 pais elegíveis. O livro e o questionário utilizados foram desenvolvidos e modificados a partir das diretrizes sobre lesões dentárias em crianças típicas, com consideração especial para crianças com Síndrome de Down. A validade e a confiabilidade foram testadas por meio de discussões com especialistas, dentistas e pais de crianças com Síndrome de Down. O conhecimento foi medido duas vezes, antes e depois da leitura do livro eletrônico por 10 minutos em cada etapa, utilizando o mesmo questionário. As pontuações totais foram categorizadas da seguinte forma: bom (12-15), razoável (9-11) e ruim (0-8). A diferença nas pontuações de conhecimento foi testada estatisticamente. **Resultados:** A média da pontuação total antes e depois da leitura foi de 6,62 (ruim) e 10,51 (razoável), respectivamente. A diferença na pontuação foi estatisticamente significativa (p=0,001) usando o teste T pareado. **Conclusão:** O livro eletrônico "Traumatismos Dentários em Crianças com Síndrome de Down" foi desenvolvido e modificado pelos autores e

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precisa ser avaliado medindo o nível de conhecimento dos pais de crianças com Síndrome de Down. A medição realizada mostrou que há uma diferença no nível de conhecimento dos pais antes e depois de lerem o livro eletrônico "Traumatismos Dentários em Crianças com Síndrome de Down".

PALAVRAS-CHAVE

Livros; Síndrome de Down; Pais; Traumatismos dentários.

INTRODUCTION

Tooth injuries refers to injuries caused by impact to the teeth and/or hard and soft tissues inside and surrounding oral cavity [1]. Usually, trauma occurs suddenly, indirectly, and unexpectedly, often requiring immediate and accurate emergency treatment to improve the success rate [1,2]. The oral cavity is one of the most commonly affected by physical injuries in children, accounting for approximately 18% of injuries, right after skin and soft tissues. Worldwide, studies show that the prevalence of dental trauma to deciduous (baby) teeth is around 21%, and to permanent teeth is around 15% [3]. Research conducted on Jakarta children aged 8-12 years found that 11.4% experienced trauma to permanent teeth [4].

Several causes ot tooth injuries are from sports, falling, vehicle accidents, physical collisions, violence, lack of protective devices, and behavioral issues [5]. Certain populations are at a higher risk of tooth injuries, especially the one who develop behavioral issues, such as children with special health care needs (CSHCN) [6]. One of this group is Down syndrome or trisomy 21, which is the most common chromosomal abnormality, with a prevalence of 1:600-2000 live births worldwide [7]. In Indonesia, Down syndrome ranks first among congenital disabilities and have shown an increasing trend based on data from the Basic Health Research (Riskesdas) on children aged 24-59 months in 2010, 2013, and 2018, with prevalence rates of 0.12%, 0.13%, and 0.21%, respectively [8].

The prevalence of tooth injuries in all types of CSHCN ranges from 8.7% to 23.1% in various countries [9–11]. However, tooth injuries prevalence among CSHCN, including Down syndrome, have not been researched and reported in Indonesia. The prevalence of tooth injuries in individuals with Down syndrome compared to typical children is 24.73%; 4.95% [12]. This higher risk can be attributed to medical and dental conditions, as well as factors such as intellectual and behavioural disorders, physical limitations, coordination, and mobility impairments [3,10]. Those limitations or impairments lead individuals with Down syndrome to depend on assistance from others to carry out daily activities, including emergency dental care after trauma [13].

Various consequences that can result from tooth injuries including crown discoloration, pulp necrosis, inflammatory or replacement resorption, and rooth obliteration. Another sequels can also affect replacement teeth, leading to changes in enamel opacity, enamel growth defects, crown or root dilaceration, and ectopic eruption [14,15]. Reviewing the high prevalence of the sequelae necessitates appropriate and timely prompt treatment to reduce the occurence [15]. In addition, education and strategies for preventing tooth injuries are crucial for parents, caregivers, teachers, and sports coaches [2,13].

Tooth injuries in CSHCN, including Down syndrome, has not received adequate dental care. The proportion of children receiving post-tooth injuries care is only 23.1% in Saudi Arabia, 50% in Brazil, and 27.7% in Jordan [10,11,16]. One of the most frequently mentioned causes is the low attitudes, awareness, and dental health literacy of parents or caregivers [2,10,11].

Various media and platforms have been developed as means of preventive education and emergency management of tooth injuries [2]. The widespread use of smartphones in this era of industry 4.0 can be utilized for educational purposes [17]. Research in Indonesia shows that 55.4% of mothers prefer internet as a source of information for parenting over other sources (seminars, family, or neighbours) [18]. Emergency education media are recommended to utilize computerized technology to reach a wider population, be easily accessible and readable, especially when accidents occur at home or in school environments [19].

In Indonesia, studies on first aid education for tooth injuries among various groups such as parents

and elementary school teachers have proven effective in improving knowledge through interventions such as animated videos and educational posters [20,21]. However, health education programs focused on parents of children with Down syndrome (CDS) are still limited in Indonesia. Education regarding dental and oral health to Down Syndrome Parents and Children Association (POTADS) has been conducted through animated videos, webinars, and online personal consultations as community service. However, this education does not yet include topics on preventing tooth injuries and its emergency management. Therefore, research is needed to assess the improvement in knowledge of parents with Down syndrome regarding tooth injuries.

In this study, we created and developed an educational electronic book titled "Tooth Injuries in Children with Down Syndrome" which includes risk factors, emergency management, and prevention strategies. These topics have not been previously addressed. The aim of this study was to evaluate the effectiveness of this new electronic book by examining the differences in knowledge levels of parents of CDS before and after reading it.

MATERIAL AND METHODS

Subjects

This experimental research was started and ended in November 2022 at the Centre for Down Syndrome Parents and Children Association (POTADS) and three special needs schools type C (designed to the mentally disabled children) in Jakarta. The research participants were parents of CDS who lived in Jakarta. The subjects were selected using purposive sampling, considering inclusion and exclusion criteria.

Inclusion criteria for respondents were as follows: having a smart mobile device for communication and internet access to fill out questionnaires and access electronic books. Respondents who had received education related to dental and oral trauma in children, individuals with special needs who had difficulties in receiving visual information, and those with an educational or occupational background in dentistry were excluded from the study.

Sample size calculation

The minimum sample needed in this study to ensure the intervention effect was detected, based on previous study [22], and calculated using correlation formula. The result from this formula with $z\alpha=5\%$ (type I error of 5%), $z\beta=5\%$ (type II error of power 95%), $S=2.1$, and $\bar{x1}-\bar{x2}=1.4$ was 32 individuals.

Electronic book

The authors created and developed the electronic book "Tooth Injuries in Children with Down Syndrome" and the questionnaire for parents. These materials were prepared based on the guidelines for tooth injuries in typical children, which were then modified to consider the limitation ability of CDS. This new electronic book needs to be evaluated first before being made available to the public. The content validity was validated through discussions with experts and 10 dentists, and face validity was conducted with 10 parents of children with Down syndrome (outside the research subjects). These parents for validity test did not participated in the final sample.

After the validation process, the electronic book consists of 9 pages with coloured illustrations. The topics about tooth injuries in CDS includes prevalence, risk factors, emergency management, and prevention (Figure 1).

Questionnaire

A self-administered questionnaire consisting of several sections about demographic data, experience, and knowledge regarding tooth injuries in CDS was used in this study. The knowledge section related to the book's content was modified from several previous studies [20,23,24], and based on discussions with expert panels. After evaluation and improvements were made, the questionnaire's reliability was tested using the Kuder Richardson-20 (KR-20) on a minimum of 30 parents of CDS (outside the research subjects). Questionnaire consisted of 15 multiple choices questions with a scoring system of 0 for incorrect answers and 1 for correct answers. The total range of score was 0-15. The categories for total scores are defined as follows: good (12-15), fair (9-11), and poor (0-8).

Education method

During the initial knowledge assessment, respondents were asked to fill out the questionnaire via Google Form, with a maximum duration of

Figure 1 - Cover electronic book "Tooth Injuries in Children with Down Syndrome".

10 minutes for completion. Subsequently, the respondents were allowed to carefully read the electronic book "Tooth Injuries in Children with Down Syndrome" for 10 minutes. After that, the measurement was repeated using the same questionnaire and duration.

Statistical analysis

Statistical Package for Social Studies (SPSS) version 22.0 (IBM Corporation, Chicago, IL, USA) was used for data entry, coding, descriptive statistics, and analyse data. The normality data of filled questionnaire were statistically analysed using Shapiro-Wilk. Paired parametric numerical comparative test of two groups (Paired T-test) was used to analyse the difference of knowledge total score of respondents before and after reading electronic book "Tooth Injuries in Children with Down Syndrome". A p-value <0.05 was used and considered significant.

RESULTS

The reliability testing of the questionnaire using KR-20 yielded a value of 0.72, which can be interpreted as both the electronic book and the knowledge questionnaire being valid and reliable. Out of the 43 samples of parents of CDS present during the measurement, 37 parents met the criteria and agreed to participate as respondents. The distribution of respondent characteristics in this study was predominantly female (86.5%), aged between 46-65 years (73%), with a basic to intermediate education level (59.5%), and unemployed or housewife (78.3%) (Table I).

Table I - Demographic details of respondents

Variables	Frequencies (N)	Percentage (%)
Sex		
Male	5	13.5
Female	32	86.5
Age Group (years)		
Adult (26-45)	10	27.0
Elderly (46-65)	27	73.0
Education Level		
Basic-Intermediate (Primary, Secondary Education)	22	59.5
Advanced (Bachelor, Master, Doctorate Education)	15	40.5
Working Status		
Employed	8	21.6
Unemployed	29	78.3

The results of the normality test for the data using Shapiro-Wilk on parental knowledge before and after reading the electronic book consecutively were 0.067 and 0.116 ($p>0.05$), indicating a normal distribution. The mean knowledge scores of parents before and after reading the electronic book were 6.62 (poor) and 10.51 (fair), respectively (Figure 2).The total difference in knowledge scores was tested using the Paired T-test, and the obtained p-value was 0.001 (Table II). Thus, it can be concluded that there is a statistically significant difference ($p<0.05$) between the knowledge scores of parents of CDS before and after reading the electronic book "Tooth Injuries in Children with Down Syndrome."

DISCUSSION

The background for selecting this topic is based on several recent studies regarding Down syndrome and its relationship with tooth injuries [7,10,12]. According to a meta-analysis study, three studies showed that the prevalence of tooth injuries in the Down syndrome group was significantly higher compared to the control group, with percentages of 24.73%:4.95%, 88.7%:3.2%, and 8.7%:4.1% [12]. The odd ratios for tooth injuries in Down syndrome and control group ranged from 6.18 to 69.95. It also mentioned that further research should focus on the development of prevention efforts aimed to avoid factors related to tooth injuries and Down syndrome, as well as reducing the impact of tooth injuries [12].

The parents of CDS were chosen as respondents is considered due to the limitations and dependence of CDS on other helps in daily living. Parents are the closest individuals, facilitators, and caregivers who hold the main authority and responsibility for making decisions related to the behaviour and healthcare of their children [25]. The proportion of children who experience tooth injuries and receive dental care afterward remains low, ranging from 23.1% to 27.7% [10,11,16]. The most common reasons disclosed for this are the low knowledge, awareness, and attitude of parents towards dental trauma management [2,10,11]. Through direct education to parents, it is hoped that knowledge and awareness regarding the management and prevention of dental trauma in CDS can be improved.

The research was taken place at POTADS and several special needs schools type C at Jakarta was mainly refers to previous dental and oral health education in CDS research on conducted in several similar places [26]. By taking samples from various locations, a diverse background of parents was expected to obtain. There are no restrictions on the sociodemographic background of the respondents because it is expected that this electronic book can be understood by all parents of CDS. In this study, the differences in parental sociodemographic characteristics concerning knowledge improvement were tested and

Table II - Comparison of total knowledge scores before and after reading electronic book

Total Knowledge Score	n	Mean (SD)	Knowledge Level	p Value
Before	37	6.62 (0.34)	Poor	*0.001
After	37	10.51 (0.48)	Fair	

*Parametric Paired T-test, sig. level $p \leq 0.05$.

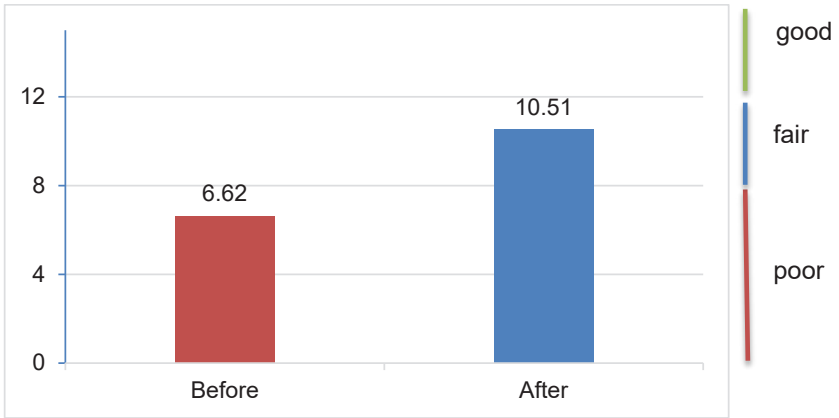

Figure 2 - The difference of total score of samples before and after reading electronic book.

showed no significant differences in education level, employment status, and age. This is in line with previous research that age, employment status (whether working or staying at home), and education are not significantly related to knowledge, attitudes, and concern about their children's dental health [27]. Knowledge improvement can be achieved not only through formal education but also through non-formal education and other sources of information such as television, social media, and others [28].

We choose visual educational media through books in this study is considered based on previous studies that have shown an improvement in knowledge about oral health and dental trauma in parents or teachers through visual educational media such as posters, online videos, and leaflets [20,23]. According to experts, visual perception is the dominant sense in conveying knowledge to the brain (75-87%), followed by hearing (13%), and other senses (12%) [29]. The advantage of visual media is that education can be presented in a more concrete, engaging, meaningful, and effective manner. The use of images and illustrations can help visualize educational concepts more realistically and concretely [30].

There are some drawbacks of printed visual media, such as the materials being easily torn or lost, printing costs depending on quality and quantity, and limited information availability in certain locations [2,20]. To address these limitations, education in this research is developed in digital, one of which is an electronic book. Teaching and education about emergency are better utilized through technology, computerized, and internet connectivity to broaden the target audience, reduce printing costs, facilitate regular topic updates, and provide access from various places and times [19].

The content of this electronic book on emergency management of tooth injuries refers to the guidelines for dental trauma by International Association of Dental Traumatology (IADT), International Association of Paediatric Dentistry (IAPD), and health departments of several countries for typical children [31-34]. Modifications are made based on discussions with experts to specifically formulate for CDS. Material on the prevention of tooth injuries is organized both generally and specifically. General prevention follows the guidelines for injury prevention in paediatric dentistry, such as the use of safety equipment and trauma prevention tools (helmets, mouthguards), creating a safe home environment, and using a car seat [33,34]. Specific prevention material for CDS is developed based on their specific risk factors for trauma, including improving motor coordination and balance through physical therapy, using specialized footwear, hearing and visual aids, and regular visits to a paediatric dentist, especially for those with malocclusion, mouth-breathing habits, and incompetent lips [35-37]. Proper use of car seat, according to the child's weight and specifically designed for CDS, is essential to protect them from head, neck, and spinal injuries due to their reduced muscle tone and neck instability [38].

The questionnaire was adapted from several previous studies related to tooth injuries in children [20,23,24]. Then, modifications were made to make the questions more specific in measuring knowledge about tooth injuries in CDS, and it covered all the topics from the electronic book that had been prepared. Content validity is highly recommended when developing a new instrument involving literature review and evaluation by experts. Meanwhile, face validity focuses on whether the measurement instrument is relevant, logical, not ambiguous, and clear or easy to understand [39]. In this study, content validity was conducted for both the electronic book and the knowledge questionnaire, where the researchers and experts discussed the content, text, and illustrations of the electronic book, as well as the 15 knowledge questions along with their answer choices. Face validity was assessed by 10 dentists and 10 parents of CDS (other than research respondents).

The reliability of the questionnaire measurement tool can be assessed based on the aspect of internal consistency. Consistency or internal reliability evaluates to what extent responses to each question have the same concept characteristics or correlate with each other. The reliability of the questionnaire with binary answer types in this study was tested using the KR-20 test [40]. This test was conducted on 30 parents of CDS (excluding the research respondents from Jakarta) who had not received any educational intervention previously, and the KR-20 correlation result was 0.72. Based on the reliability index category, the KR-20 result in this study has good reliability criteria. Through

this series of validity and reliability tests, it can be concluded that the electronic book media and the research questionnaire are valid and reliable.

Effective Speed Reading (ESR) is a combination of the average reading speed and the accuracy of understanding the content. Calculating the reading speed for various educational levels with a minimum comprehension rate of 70%, the ESR values are as follows: elementary school level - 140 words per minute (wpm), junior high school - 140-175 wpm, senior high school - 175-245 wpm, and college - 245-280 wpm [41]. In this study, the electronic book consists of a total of 1290 words. The reading duration was determined considering the ESR for the lowest educational level, which is elementary school with 140 wpm and a duration of 9.2 minutes, and the longest reading duration during the validation of the electronic book by parents, which was 10 minutes. Therefore, the researcher decided that the duration for reading the electronic book and filling out the questionnaire would be 10 minutes each.

From those 15 knowledge questions in the questionnaire, it was found that all question had a varied increase in the percentage of correct answers, ranging from 5.41% to 70.27% (Table III). The three questions with the highest increase in the distribution of correct answers were question numbers 4, 5, and 7. Question number 4, which addressed the risk factors for tooth injuries in CDS, had an increase of 45.95% in the score of correct answers. Question number 5, which covered emergency management of avulsed teeth, had the highest increase in correct answers, reaching 70.27%. Question number 7, concerning emergency management of fractured teeth, showed an increase of 67.57% in the percentage of correct answers. These findings are in line with previous research that showed an increase in knowledge related to avulsed tooth management in parents who received interventions such as posters, pamphlets, brochures, and the "ToothSOS" mobile application by IADT [23,42].

Emergency management for avulsed and fractured teeth are essential topics for parents

Table III - Distribution percentage of knowledge scores before and after reading electronic book

No	Questions		Right Answer (%)	Delta
1.	What is dental and oral trauma in children?	Before	16.22	43.24
		After	59.46	
2.	Which of the following are classified as dental trauma in CDS?	Before	18.92	21.62
		After	40.54	
3.	How is the prevalence of dental and oral trauma in CDS and children without Down syndrome?	Before	64.86	10.81
		After	75.68	
4.	Which one of the following can increase the risk of CDS to dental and oral trauma?	Before	21.62	45.95
		After	67.57	
5.	What first aid treatment should be taken if tooth falls out and falls in a dirty area?	Before	21.62	70.27
		After	91.89	
6.	What is the correct way to handle a dislodged tooth to ensure the good prognosis?	Before	48.65	32.42
		After	81.08	
7.	What is the first aid treatment should be taken for broken tooth due to an impact?	Before	8.11	67.57
		After	75.68	
8	What is the first aid treatment should be taken for bleeding lip in children?	Before	64.86	16.22
		After	81.08	
9	When is the appropriate time to seek medical treatment when dental and oral trauma happens in CDS?	Before	89.19	5.41
		After	94.59	
10	Where should parents seek appropriate dental help when dental and oral trauma occurs in CDS?	Before	54.05	8.11
		After	62.16	
11	When should follow-up post-treatment dental trauma be scheduled?	Before	78.38	5.41
		After	83.78	
12	What tool can be used to prevent dental trauma in children during physical activities?	Before	56,76	24.32
		After	81.08	
13	Which one is NOT a prevention way of dental and oral trauma in children?	Before	45.95	8.11
		After	54.05	
14	Which one is NOT a way to improve motor coordination and balance in CDS?	Before	51.35	8.11
		After	59.46	
15	What is the way to create a safe condition inside the car for CDS weighing 12 kg?	Before	13.51	37.84
		After	51.35	

of CDS to be understood due to the success prognosis of dental trauma treatment largely depends on the accuracy of the emergency management performed by those closest to the child. Inadequate management can lead to early tooth loss, reduced prognosis, increased complications, and psychological problems in growing children [23]. From the above analysis, it can be concluded that the electronic book "Tooth Injuries in Children with Down Syndrome" is able to fulfill its value as an information and education tool for parents regarding dental and oral trauma in CDS, especially on the crucial topics.

The results of the Paired T-test analysis with a p-value of 0.001 indicate that there is a statistically significant difference in parents' knowledge levels before and after reading the electronic book "Tooth Injuries in Children with Down Syndrome." This is consistent with other studies that have shown an increase in parents' knowledge in various countries after receiving dental trauma education through printed media, seminars, digital tools, mobile applications, or multimodal approaches [22,23,42]. The average knowledge level of the research respondents before the intervention was 6.62, which was considered inadequate. This is consistent with the findings of other studies, which revealed that parents' knowledge about avulsion and replantation of teeth before education was inadequate [23,43].

The results of this research indicate that the educational media of the electronic book can increase parents' knowledge about tooth injuries in CDS. Therefore, it can be considered in developing easily accessible educational media about dental and oral trauma that are evidence-based for parents CDS in the future. Additionally, the inadequate knowledge of parents of CDS about dental and oral trauma emphasizes the importance of education for this group, considered its high prevalence in this population.

As this research focused on the development of new electronic educational media, such as an electronic book, the sample included only the parents of CDS. However, studies targeting other populations closely related to CDS, such as special school teachers, and caregivers are also needed. The design used in this study was before and after treatment measurement. Sometimes, it is necessary to measure the retention of new knowledge. This can be assessed by implementing several measurements, for example 5 days, 7 days, or 10 days after reading. High prevalence of tooth injuries is also found in other special needs populations, such as those with cerebral palsy, attention defisit hyperactivity disorder (ADHD), and autism spectrum disorder (ASD). Educational intervention about tooth injuries may also be developed for these populations.

CONCLUSION

There is a difference in the level of knowledge of parents of CDS before and after reading the electronic book "Tooth Injuries in Children with Down Syndrome," it can be concluded that the electronic book is an effective educational media in improving the knowledge of parents about dental and oral trauma in CDS. The increase in knowledge observed after reading the book demonstrates its effectiveness in providing valuable and relevant information to parents, which can positively impact the way they handle dental and oral trauma in their children. The electronic book has proven to be a useful tool in enhancing knowledge of parents to make better decisions for the tooth injuries and oral trauma of their CDS.

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Author's Contributions

IS: Methodology, Software, Formal Analysis, Investigation, Resources, Data Curation, and Writing – Original Draft Preparation. EF: Conceptualization, Methodology, Validation, and Writing – Review & Editing, Supervision. HS: Conceptualization, Validation, and Writing – Review & Editing, Visualization.

Conflict of Interest

The authors declare no conflicts of interest.

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Regulatory Statement

This study protocol was reviewed and approved by Research Ethics Committee at the Faculty of Dentistry, University of Indonesia, approval number 116/Ethical Approval/FKGUI/XI/2022.

REFERENCES

1. Lam R. Epidemiology and outcomes of traumatic dental injuries: a review of the literature. Aust Dent J. 2016;61(Suppl 1):4-20. http://doi.org/10.1111/adj.12395. PMid:26923445.
2. Nowosielska M, Bagińska J, Kobus A, Kierklo A. How to educate the public about dental trauma: a scoping review. Int J Environ Res Public Health. 2022;19(4):2479. http://doi.org/10.3390/ijerph19042479. PMid:35206665.
3. Slayton RL, Palmer EA. Introduction: epidemiology of traumatic dental injuries. In: Slayton RL, Palmer EA. Traumatic dental injuries in children: a clinical guide to management and prevention. USA: Springer; 2020. p. 1-12. http://doi.org/10.1007/978-3-030-25793-4_1.
4. Septahapsari AI, Sutadi H, Fauziah E. Distribusi Frekuensi Trauma Gigi Permanen Anterior Pada Anak Usia 8-12 Tahun (Kajian di Sekolah Dasar Negeri Kecamatan Johar Baru, Jakarta Pusat). Jakarta: Universitas Indonesia Library; 2014.
5. Reisen A, Parpaiola AR, Oliveira AMG, Zanin L, Flório FM. Diagnostic reliability of a simplified epidemiologic tool to detect high-risk overjet for dental trauma. Braz Dent Sci. 2015;18(4):68-75. http://doi.org/10.14295/bds.2015.v18i4.1167.
6. Levin L, Zadik Y. Education on and prevention of dental trauma: it's time to act! Dent Traumatol. 2012;28(1):49-54. http://doi.org/10.1111/j.1600-9657.2011.01060.x. PMid:21895972.
7. AlSarheed M. A comparative study of oral health amongst trisomy 21 children living in Riyadh, Saudi Arabia: Part 1 caries, malocclusion, trauma. Saudi Dent J. 2015;27(4):220-3. http://doi.org/10.1016/j.sdentj.2015.03.003. PMid:26644758.
8. Kementerian KRI. Infodatin Riskesdas: Antara Harapan dan Fakta Down Syndrome [Internet]. InfoDATIN; 2019 [cited 2023 Sep 23]. 10 p. Available from: https://lib.fkm.ui.ac.id/detail?id=132530&lokasi=lokal
9. Ferreira MCD, Guare RO, Prokopowitsch I, Santos MTBR. Prevalence of dental trauma in individuals with special needs. Dent Traumatol. 2011;27(2):113-6. http://doi.org/10.1111/j.1600-9657.2010.00961.x. PMid:21199337.
10. Al-Batayneh OB, Owais AI, Al-Saydali MO, Waldman HB. Traumatic Dental Injuries in children with special health care needs. Dent Traumatol. 2017;33(4):269-75. http://doi.org/10.1111/edt.12334. PMid:28276628.
11. Basha S, Mohamed RN, Al-Thomali Y, Ashour AA, Al Zahrani FS, Almutair NE. Traumatic dental injuries in special health care needs children and association with obesity. Ann Saudi Med. 2021;41(1):51-8. http://doi.org/10.5144/0256-4947.2021.51. PMid:33550911.
12. Alzahrani, Ali HA. Down Syndrome and its Association with Traumatic Dental Injuries: a systematic review and meta-analysis. J Res Med Dent Sci. 2022;10(1):531-9.
13. American Academy of Pediatric Dentistry. Management of Dental Patients with Special Health Care Needs. The Reference Manual of Pediatric Dentistry. Chicago, Ill: AAPD; 2023. p. 337-44.
14. Kominami PAA, Costa VPP, Rezende LVML, Garcia FCP, Almeida JCF, Takeshita EM. Traumatic dental injuries in the primary dentition and sequelae in the permanent dentition: a 7-year retrospective study. Braz Dent Sci. 2022;25(3):e3313. http://doi.org/10.4322/bds.2022.e3313.
15. Fontenele M, Macedo M, Rebouças P, Silva PGB, Sousa DL, Sousa RBRA, et al. Sequelae in primary teeth after traumatic injury. Braz Dent Sci. 2017;20(2):70-5. http://doi.org/10.14295/bds.2017.v20i2.1350.
16. dos Santos MTBR, Souza CBC. Traumatic dental injuries in individuals with cerebral palsy. Dent Traumatol. 2009;25(3):290-4. http://doi.org/10.1111/j.1600-9657.2009.00765.x. PMid:19583577.
17. Banowati E, Juhadi, Sanjoto TB. The utilization of smartphone communication technology the as digital literacy learning school instruments in 4.0 Era. J Phys Conf Ser. 2019;1387(1):012111. http://doi.org/10.1088/1742-6596/1387/1/012111.
18. Setyastuti Y, Suminar JR, Hadisiwi P, Zubair F. Millennial moms: social media as the preferred source of information about parenting in Indonesia. Libr Philos Pract. 2019:1-16.
19. De Moura VA, Fernanda K, Santana S. Educational technologies for teaching first aid to parents and educators: an integrative review. Cienc Cuid Saude. 2021;20:e56987. https://doi.org/10.4025/ciencuidsaude.v20i0.56987.
20. Enikawati M, Fauziah E, Budiardjo SB. Effect of first aid management of dental avulsion posters on primary school teachers' knowledge. Pesqui Bras Odontopediatria Clin Integr. 2020;20:e0061. http://doi.org/10.1590/pboci.2020.159.
21. Katthika VK, Fauziah E, Budiardjo SB. Animated video for increasing primary school teachers' knowledge regarding first aid management of dental avulsion. Braz Dent Sci. 2020;23(4):1-7. http://doi.org/10.14295/bds.2020.v23i4.2108.
22. Razeghi S, Mohebbi SZ, Mahmoudi M, Ahmadian M, Kharazifard MJ. Effect of two educational interventions regarding the management of traumatic dental injuries on mothers of 8-year-old children. Front Dent. 2020;17:33. http://doi.org/10.18502/fid.v17i33.5197. PMid:36042805.
23. Al-Asfour A, Andersson L. The effect of a leaflet given to parents for first aid measures after tooth avulsion. Dent Traumatol. 2008;24(5):515-21. http://doi.org/10.1111/j.1600-9657.2008.00651.x. PMid:18821954.
24. Tian J, Lim JJJ, Moh FKC, Siddiqi A, Zachar J, Zafar S. Parental and training coaches' knowledge and attitude towards dental trauma management of children. Aust Dent J. 2022;67(Suppl 1):S31-40. http://doi.org/10.1111/adj.12913. PMid:35510930.
25. Lisboa SO, Assunção CM, Junkes MC, Yokoyama MF, Couto ACF, Fraiz FC, et al. Do parents' oral health literacy levels influence their response to interventions to improve their knowledge of traumatic dental injuries? Pesqui Bras Odontopediatria Clin Integr. 2020;20:e5498. http://doi.org/10.1590/pboci.2020.134.
26. Putri AR. Perbedaan Perubahan Pengetahuan Kesehatan Gigi dan Mulut melalui Edukasi dengan Busy Book dan Verbal Konvensional pada Anak Penyandang Sindroma Down. Jawa Barat: Universitas Indonesia; 2019.
27. Williams NJ, Whittle JG, Gatrell AC. The relationship between socio-demographic characteristics and dental health knowledge and attitudes of parents with young children. Br Dent J. 2002;193(11):651-4, discussion 642. http://doi.org/10.1038/sj.bdj.4801652. PMid:12607623.
28. Manurung P, Karimaliana K, Ansi RY, Harahap DA, Ginting D, Subagiharti H. The involvement of non-formal education in students' learning needs during the covid-19 epidemic. Int J Educ Vocat Stud. 2021;3(4):287. http://doi.org/10.29103/ijevs.v3i4.5901.
29. Notoadmodjo S. Metodologi penelitian kesehatan. Jakarta: Rineka Cipta; 2012.
30. Hanifa PA. Perbedaan pengetahuan orang tua dalam pemeliharaan kesehatan gigi dan mulut anak sebelum dan setelah pemberian media visual secara daring. Jawa Barat: Universitas Indonesia; 2021.

31. International Association of Dental Traumatology. How to prevent dental trauma in primary teeth? [Internet]. 2023 [cited 2023 Sep 23]. Available from: https://iadt-dentaltrauma.org/prevention-and-emergency-care/

32. Emergency Medical Services Authority. California Health and Human Services Agency. Emergency first aid guidelines for California schools. USA: 2013. 77 p.

33. Cagetti MG, Marcoli PA, Berengo M, Cascone P, Cordone L, Defabianis P, et al. Italian guidelines for the prevention and management of dental trauma in children. Ital J Pediatr. 2019;45(1):157. http://doi.org/10.1186/s13052-019-0734-7. PMid:31801589.

34. Tepper MB, McLauren J. Oral health for families with special health care needs. more smiling faces project. South California: Oral Health Division S.C. Department of Health and Environmental Control; 2021.

35. Malak R, Kostiukow A, Krawczyk-Wasielewska A, Mojs E, Samborski W. Delays in motor development in children with down syndrome. Med Sci Monit. 2015;21:1904-10. http://doi.org/10.12659/MSM.893377. PMid:26132100.

36. American Academy of Pediatrics. Health care information for families of children and adolescents with Down Syndrome. Pediatrics. 2022;149(5):e2022057010. http://doi.org/10.1542/peds.2022-057010.

37. American Academy of Orthopaedic Surgeon. Down Syndrome: Musculoskeletal Effects [Internet]. 2019 [cited 2023 Sep 23]. Available from: https://orthoinfo.aaos.org/en/diseases--conditions/down-syndrome-musculoskeletal-effects

38. National Center for the Safe Transportation of Children with Special Healthcare Needs. Car safety for children with Down Syndrome. Indianapolis: National Center for the Safe Transportation of Children with Special Healthcare Needs; 2014.

39. Taherdoost H. Validity and reliability of the research instrument; how to test the validation of a questionnaire/survey in a research. Int J Acad Res Manag. 2016;5(3):26-36. http://doi.org/10.2139/ssrn.3205040.

40. de Souza AC, Alexandre NMC, Guirardello EB. Psychometric properties in instruments evaluation of reliability and validity. Epidemiol Serv Saude. 2017;26(3):649-59. http://doi.org/10.5123/S1679-49742017000300022. PMid:28977189.

41. Mulyati Y. Kecepatan Efektif Membaca : Apa, Mengapa, dan Bagaimana? West Java: Universitas Pendidik Indones; 2003.

42. Duruk G, Gümüşboğa ZŞ. Effectiveness of the ToothSOS App as a training tool for the emergency management of traumatic dental injuries among non-dentists. Dent Traumatol. 2022;38(3):229-37. http://doi.org/10.1111/edt.12742. PMid:35276026.

43. Hashim R. Investigation of mothers' knowledge of dental trauma management in united arab emirates. Eur Arch Paediatr Dent. 2012;13(2):83-6. http://doi.org/10.1007/BF03262849. PMid:22449807.

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