

Dental Pain Among Children and Adolescents

Darmawan Setijanto¹, Aulia Ramadhani¹, Keyona Laila Olivia², Nada Fajrina², Muhammad Canino Cahya Caesarandi², Cornelia Melinda Adi Santoso³

¹Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga

²Undergraduate Student of Dental Medicine, Faculty of Dental Medicine Universitas Airlangga

³Department of Preventive Medicine, Faculty of Public Health, University of Debrecen

Corresponding author: Darmawan Setijanto,

Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Jl. Prof. Dr. Moestopo No. 47, phone numbers: (+6231) 5030255, 5020256, facsimile numbers : (+6231) 5020256, email: setijantodarmawan20@gmail.com

ABSTRACT

Dental pain is one of the major public health problems among children and adolescents. It is mostly caused by dental caries and has negative impacts on children's and adolescents' quality of life (e.g., difficulty in sleeping, eating, school absenteeism) and their families (e.g., work loss, waking up at night). Several determinants have been found to be associated with dental pain, including socio-economic factors at the individual and city levels. There have been some instruments developed to assess dental pain among children.

Keywords: dental pain, children, adolescents.

Correspondence:

Darmawan Setijanto

Department of Dental Public Health, Faculty of Dental Medicine, Universitas Airlangga, Jl. Prof. Dr. Moestopo No. 47, phone numbers: (+6231) 5030255, 5020256, facsimile numbers : (+6231) 5020256, email: setijantodarmawan20@gmail.com

INTRODUCTION

One of the main goals of Global Goals for Oral Health 2020 is to reduce the impact of oral and craniofacial diseases [1]. Oral diseases, such as caries, usually lead to toothache, which negatively influences quality of life [2][3]. Besides the objective clinical measurement of oral health, dental pain has also been recommended as a practical assessment of treatment needs [4]. Pain is a subjective experience that is usually measured by self-report [5]. Dental pain is common among children, with the prevalence estimated to range from 5% to 33% in different countries [6]. There have been many literatures concerning oral diseases, but article reviewing dental pain is still few. This article aimed to review some important aspects of dental pain, including determinants, impacts, and assessment tools that may be used on children and adolescents [1].

Definition

Orofacial pain refers to pain within the trigeminal system, related to pathological conditions of somatic and neurological structures. Acute pain is one of the prevalent type of oral pain, lasting for short time, such as dental pulpitis, pericoronitis, periapical periodontitis, dentin sensitivity, dry socket, trauma or infection occurred on orofacial tissues. Odontogenic pain comes from teeth or adjacent structures [2].

Toothache is most often caused by dental caries that affected 60-90% of school children globally. Dental caries and chemical or thermal insult following dental treatment can cause inflammation of the pulp (pulpitis), which may be classified into reversible and irreversible [2]. Pulpitis reversible usually causes the tooth to be sensitive to cold and sweet taste, short and sharp pain [7,8]. If infection or irritation continues, it will become irreversible [9,10]. Enhanced pulpal vascularity leads to intra-pulpal pressure, resulting in ischemia, sensitivity, continuous pain in response to heat [3]. After pulp necrosis, the infection continues to apical, surrounding bone, periodontal membrane. This will lead to a dental abscess, characterized by spontaneous aching that lasts for hours or days and pain when biting the tooth [2].

Prevalence of dental pain

Most of the studies assessed children's dental pain from their parents. Dental pain affected between 5% and 33% of children in different countries [4]. Lifetime prevalence was higher in older children and those from lower socio-economic status [6]. In developed countries, the lifetime prevalence was between 11.8% and 47.5% [11][12]. This prevalence was only 7.6% in England for dental pain suffered in the previous month [11]. In contrast, the occurrence of dental pain in the previous two months was around 25% among children in Sri Lanka [13]. It was also estimated that 51.5% of school children in Brazil suffered from dental pain in the previous month [14]. The prevalence in Tanzanian school students was 36.4% and 24.4% in an urban and rural areas, respectively [15].

Social determinants of dental pain

Determinants of dental pain in children include sex, caries, PUFA/pufa index (to measure the clinical impacts of caries on primary and permanent dentition), and ulceration [14]. Other study demonstrated that sociodemographic (e.g., ethnic, income, household size) and oral health status of individual play important roles [16]. It was argued that children with larger family size had less attention from parents, less assistance in maintaining proper oral health behaviour, leading to dental pain [17]. Socio-economic factors in the city level, such as lower human development index (HDI) and higher percentage of population with incomplete primary education, were also found to report more dental pain [16]. Those with poor health-related behaviours, psychosocial characteristics, public school attenders, residents of cities with high level of caries prevalence at age 12, tended to have more dental pain [18-20]. A sense of coherence was found to be a protective factor for dental pain [21].

Impacts of dental pain

Dental pain has been consistently demonstrated to have negative impacts on children's daily performances, including difficulty in sleeping, eating, brushing teeth, concentrating in

the class, doing homework, playing, avoiding recreation activities, and school absenteeism [3,14,22]. [14][3] Dental pain experienced by children also negatively affected their families, such as disruption in physical activities (e.g., performing household activities), social activities (e.g., visiting friends and relatives), psychological activities (e.g., waking up at night, emotional stability, family relationship), and economic impacts (e.g., work loss, effect on family budget due to expenditure on pain relief). These impacts were more observed on families with lower than higher socio-economic status [23].

Acute Pediatric Dental Pain Management

The American Academy of Pediatric Dentistry (AAPD) recommends health care professionals to conduct detailed pain assessment and document the pain symptoms in the patient's record [24]. One of the tool to measure the severity of the pain is by using the Visual Analogue Scale of Faces [25]. Healthcare professionals should also consider non-pharmacologic and pharmacologic strategies to lessen the pain. Non-pharmacologic strategies include keeping the calm environment, deep breathing, distraction, play therapy, employing the tell-show-do technique, while pharmacologic therapies include administration of anesthesia, analgesic medications, or sedation regimens [24][26][27].

Assessment Tools for Dental Pain

Preschool children and children with learning disability

The Dental Discomfort Questionnaire (DDQ) is an instrument used for recognizing behaviours of preschool children that indicate dental pain [5, 6]. The underlying concept behind its development was that toothache usually led to difficulty in sleeping, eating, negative behaviour, and the fact that children at this age were usually unable to verbalize pain, as their understanding of pain depended on their development of cognitive abilities [7]. The first version consisted of 12 items concerning pain-related behaviour that had to be completed by parents. The final version had 8 items with good psychometric properties. It was first validated in the Netherland and later in Brazil [28][29]. There is also a DDQ version developed for children with a learning disabilities [30].

School children

The child dental pain questionnaire (child-DPQ) was a tool used for measuring self-reported dental pain and its impact on children. This questionnaire consisted of three different parts, which are prevalence, severity, and consequences of dental pain on life quality. Each part has two items, corresponding to six questions in total. The final score will be either 0 or between 6 and 15. Lower score refers to better oral health status. This questionnaire has been validated in children aged 8-9 years old in Brazil. It was suggested to have the benefits of being short, easy to interpret, and be integrated into clinical settings [31-38].

REFERENCES

1. Hobdell, M., Clarkson, J., Petersen, P. E., & Johnson, N. (2003). Global goals for oral health 2020. *International dental journal*, 53(5), 285-288.
2. Renton, T. (2011). Dental (odontogenic) pain. *Reviews in pain*, 5(1), 2-7. <https://doi.org/10.1177%2F204946371100500102>
3. Moura-Leite, F. R., Ramos-Jorge, J., Ramos-Jorge, M. L., de Paiva, S. M., Vale, M. P., & Pordeus, I. A. (2011). Impact of dental pain on daily living of five-year-old Brazilian preschool children: prevalence and associated factors. *European Archives of Paediatric Dentistry*, 12(6), 293-297. <https://doi.org/10.1007/BF03262826>
4. Bastos, J. L., Peres, M. A., Peres, K. G., Araujo, C. L., & Menezes, A. M. (2008). Toothache prevalence and associated factors: a life course study from birth to age 12 yr. *European Journal of Oral Sciences*, 116(5), 458-466. <https://doi.org/10.1111/j.16000722.2008.00566.x>
5. Younger, J., McCue, R., & Mackey, S. (2009). Pain outcomes: a brief review of instruments and techniques. *Current pain and headache reports*, 13(1), 39-43. <https://doi.org/10.1007/s11916-009-0009-x>
6. Slade, G. D. (2001). Epidemiology of dental pain and dental caries among children and adolescents. *Community dental health*, 18(4), 219-227.
7. Lendrawati, L., Pintaui, S., Rahardjo, A., Bachtiar, A., & Maharani, D. A. (2019). Risk factors of dental caries: Consumption of sugary snacks among Indonesian adolescents. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, 19. <http://dx.doi.org/10.4034/pboci.2019.191.42>
8. Abidin, T., Bachtiar, A., Pintaui, S., Marsaulina, I., & Rahardjo, A. (2016). Determining validity and reliability of oral health-related quality of life instrument for clinical consequences of untreated dental caries in children. *Asian Journal of Epidemiology*, 9(1-3), 10-17. <https://doi.org/10.3923/aje.2016.10.17>
9. Achmad, H., Handayani, H., Singgih, M. F., Horax, S., Ramadhany, S., Setiawati, F., & Ramadhany, Y. F. (2020). Analysis of Dental Caries & Gingivitis with the Occurrence of Stunting in Children in Makassar City (Tamalanrea Subdistrict). *Systematic Reviews in Pharmacy*, 11(4), 371-376. <http://dx.doi.org/10.31838/srp.2020.4.55>
10. Erwanyah, E., Mudjari, S., Akbar, F. H., & Rustam, A. (2020). Relationship Between Body Mass Index and Dental Age in 8-15-Year-Old Orthodontic Patients. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, 20. <https://doi.org/10.1590/pboci.2020.062>
11. Shepherd, M. A., Nadanovsky, P. A. U. L. O., & Sheiham, A. (1999). The prevalence and impact of dental pain in 8-year-old school children in Harrow, England. *British dental journal*, 187(1), 38-41. <https://doi.org/10.1038/sj.bdj.4800197>
12. Vargas, C. M., Macek, M. D., Goodman, H. S., & Wagner, M. L. (2005). Dental pain in Maryland school children. *Journal of Public Health Dentistry*, 65(1), 3-6. <https://doi.org/10.1111/j.17527325.2005.tb02780.x>
13. Ratnayake, N., & Ekanayake, L. (2005). Prevalence and impact of oral pain in 8-year-old children in Sri Lanka. *International journal of paediatric dentistry*, 15(2), 105-112. <https://doi.org/10.1111/j.1365263X.2005.00602.x>
14. Santos, P. S., Martins-Júnior, P. A., Paiva, S. M., Klein, D., Torres, F. M., Giacomini, A., ... & Cardoso, M. (2019). Prevalence of self-reported dental pain and associated factors among eight-to ten-year-old Brazilian schoolchildren. *PloS one*, 14(4), e0214990. <https://doi.org/10.1371/journal.pone.0214990>
15. Mashoto, K. O., Åström, A. N., David, J., & Masalu, J. R. (2009). Dental pain, oral impacts and perceived need for dental treatment in Tanzanian school students: a cross-sectional study. *Health and quality of life outcomes*, 7(1), 73. <https://doi.org/10.1186/1477-7525-7-73>
16. Ferreira-Júnior, O. M., Freire, M. D. C. M., Moreira, R.

- D. S., & Costa, L. R. (2015). Contextual and individual determinants of dental pain in preschool children. *Community Dentistry and Oral Epidemiology*, 43(4), 349-356. <https://doi.org/10.1111/cdoe.12159>
17. Misrohmasari, E. A. A., Hadnyanawati, H., Prihartiningrum, B., & Putri, D. E. (2018). Family characteristics on self-reported toothache among Indonesian children aged 12–14 years. *Frontiers of Nursing*, 5(3), 235-239. <https://doi.org/10.1515/fon-2018-0031>
 18. Salmiah, S., Luthfiani, L., Amalia, Z., & Kusumah, D. (2018). The correlation between untreated caries and the nutritional status of 6–12 years old children in the Medan Maimun and Medan Marelan sub-district. *Dental Journal (Majalah Kedokteran Gigi)*, 51(1), 10-13. <http://dx.doi.org/10.20473/j.djmk.v51.i1.p10-13>
 19. Freire, M. C., Nery, N. G., Jordão, L. M., & Abreu, M. H. (2019). Individual and contextual determinants of dental pain in adolescents: Evidence from a national survey. *Oral diseases*, 25(5), 1384-1393. <https://doi.org/10.1111/odi.13100>
 20. Marjianto, A., Sylvia, M., & Wahlujo, S. (2019). Permanent tooth eruption based on chronological age and gender in 6-12-year old children on Madura. *Dental Journal (Majalah Kedokteran Gigi)*, 52(2), 100-104. <http://dx.doi.org/10.20473/j.djmk.v52.i2.p100-104>
 21. da Rosa, A. R., Abegg, C., & Ely, H. C. (2015). Sense of coherence and toothache of adolescents from southern Brazil. *J Oral Facial Pain Headache*, 29, 250-256. <http://dx.doi.org/10.11607/ofph.1383>
 22. Rahmat, R. F., Silviani, S., Nababan, E. B., Sitompul, O. S., Anugrahawaty, R., & Silmi, S. (2017, November). Identification of molar and premolar teeth in dental panoramic radiograph image. In *2017 Second International Conference on Informatics and Computing (ICIC)* (pp. 1-6). IEEE. <https://doi.org/10.1109/IAC.2017.8280614>
 23. Goes, P. S., Watt, R. G., Hardy, R., & Sheiham, A. (2008). Impacts of dental pain on daily activities of adolescents aged 14–15 years and their families. *Acta Odontologica Scandinavica*, 66(1), 7-12. <https://doi.org/10.1080/00016350701810633>
 24. American Academy of Pediatric Dentistry. (2017). Policy on acute pediatric dental pain management. *AAPD, revised*.
 25. de Paula Reis Barrêto, E., & Almeida Pordeus, I. (2004). Evaluation of toothache severity in children using a visual analogue scale of faces. *Pediatric dentistry*, 26(6), 485-491.
 26. Lee, G. Y., Yamada, J., Shorkey, A., & Stevens, B. (2014). Pediatric clinical practice guidelines for acute procedural pain: a systematic review. *Pediatrics*, 133(3), 500-515. <https://doi.org/10.1542/peds.2013-2744>
 27. American Academy of Pediatric Dentistry. (2017). Guidelines on Use of Local Anesthesia for Pediatric Dental Patients. 2015. Available at: aapd.org/media/policies_guidelines/g_localanesthesia.pdf. Accessed October, 28.
 28. Versloot, J., Veerkamp, J. S., & Hoogstraten, J. (2006). Dental Discomfort Questionnaire: assessment of dental discomfort and/or pain in very young children. *Community Dentistry and Oral Epidemiology*, 34(1), 47-52. <https://doi.org/10.1111/j.16000528.2006.00253.x>
 29. Daher, A., Versloot, J., Leles, C. R., & Costa, L. R. (2014). Screening preschool children with toothache: validation of the Brazilian version of the Dental Discomfort Questionnaire. *Health and quality of life outcomes*, 12(1), 30. <https://doi.org/10.1186/1477-7525-12-30>
 30. Versloot, J., Hall-Scullin, E., Veerkamp, J. S., & Freeman, R. (2008). Dental Discomfort Questionnaire: its use with children with a learning disability. *Special Care in Dentistry*, 28(4), 140-144. <https://doi.org/10.1111/j.17544505.2008.00032.x>
 31. Barrêto, E. R., Paiva, S. M., & Pordeus, I. A. (2011). Validation of a child dental pain questionnaire instrument for the self-reporting of toothache in children. *Pediatric dentistry*, 33(3), 228-232.
 32. Ciscar, S., et al., *EXECUTIVE FUNCTIONING, AFFECT AND EATING SELF-REGULATION IN EATING DISORDERS AND OBESITY/FUNCIONAMIENTO EJECUTIVO, AFECTO Y AUTORREGULACIÓN ALIMENTARIA EN LOS TRASTORNOS ALIMENTARIOS Y LA OBESIDAD*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 1.
 33. Quiñones, Á., et al., *PERSONAL STYLE OF THE THERAPIST: COMPARISON BETWEEN POST-RATIONALIST COGNITIVE AND SYSTEMIC THERAPISTS/ESTILO PERSONAL DEL TERAPEUTA: COMPARACIÓN ENTRE TERAPEUTAS COGNITIVOS POST-RACIONALISTAS Y SISTÉMICOS*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 48.
 34. Mas, M.B., et al., *Perceived parental rearing styles in eating disorders*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 12-21.
 35. Nardi, B., et al., *THE PROJECTIVE REACTIVE"" PRPR"": A NEW INSTRUMENT FOR THE STUDY OF PERSONAL MEANING ORGANIZATION/EL PROYECTIVO REACTIVO"" PRPR"": UN INSTRUMENTO PARA EL ESTUDIO DE LAS ORGANIZACIONES DE SIGNIFICADO PERSONAL*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 56.
 36. Fierro, C., *THE CLINICAL RESEARCH-PSYCHOPRAXIOLOGY RELATION PROBLEM IN ARGENTINA: A METHODOLOGICAL AND EPISTEMOLOGICAL ANALYSIS ON THE ISSUES OF VALIDITY AND EFFICACY/EL PROBLEMA DE LA RELACIÓN ENTRE INVESTIGACIÓN Y PSICOPRAXIOLOGÍAS CLÍNICAS EN ARGENTINA: UN ANÁLISIS METODOLÓGICO Y EPISTEMOLÓGICO DE LAS CUESTIONES DE LA VALIDEZ Y LA EFICACIA*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 32.
 37. Giraldo-O'Meara, M., J. Fernández-Álvarez, and A. Belloch, *METACOGNITIVE ASSESSMENT IN PSYCHOPATHOLOGY: THE METACOGNITIVE ABILITIES QUESTIONNAIRE (MAQ)/EVALUACIÓN METACOGNITIVA EN PSICOPATOLOGÍA: EL CUESTIONARIO DE HABILIDADES METACOGNITIVAS (CHM)*. Revista Argentina de Clínica Psicológica, 2019. 28(1): p. 67.
 38. Rubio-Garay, F., M.Á. Carrasco Ortiz, and B. García-Rodríguez, *Moral disengagement and violence in adolescent and young dating relationships: An exploratory study*. Revista Argentina de Clínica Psicológica, 2019.