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Review Article

Epidemiology, etiology, types and outcomes of dental neglect in children

Mohanad Abdulwahab Alsaadi[1]*, Mohammed Ali Assiri[2], Mohanad Abdullah Alhedbany[3], Fadiyah Falah Alanazi[4], Lujain Khalil AlShaikh[5], Afnan Suliman Alblewi[6], Malak Fahd Shaoush[5], Saba Mohammad Alshareef[7], Khadijah Mustafa Saidi[8], Sara Abdulmajeed Alkhars[9], Ghufran Abdulmohsen Bukhamis[10], Ghaidaa Mohammed Maarouf[11]

[1]MclinDent in Paediatric Dentistry, Khulais General Hospital, Khulais, Saudi Arabia
[2]General Dentist, Ministry of Health, Abha, Saudi Arabia, Ministry of Health, Abha, Saudi Arabia
[3]College of Dentistry, King Abdulaziz University, Jeddah, Saudi Arabia
[4]General Dentist, Ministry of Health, Abha, Saudi Arabia, Ministry of Health, Riyadh, Saudi Arabia
[5]General Dentist, Ministry of Health, Medina, Saudi Arabia
[6]College of Dentistry, Riyadh Elm University, Riyadh, Saudi Arabia, Riyadh Elm University, Riyadh, Saudi Arabia
[7]General Dentist, Ministry of Health, Tabuk, Saudi Arabia, Ministry of Health, Tabuk, Saudi Arabia
[8]General Dentist, Ministry of Health, Taif, Saudi Arabia, Ministry of Health, Taif, Saudi Arabia
[9]General Dentist, Ministry of Health, Dammam, Saudi Arabia, Ministry of Health, Dammam, Saudi Arabia
[10]General Dentist, Ministry of Health, Al Ahsaa, Saudi Arabia, Ministry of Health, Al Ahsaa, Saudi Arabia
[11]College of Dentistry, Al Farabi Colleges, Jeddah, Saudi Arabia

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***Correspondence:**
Dr. Mohanad Abdulwahab Alsaadi,
E-mail: dralsaadi2@gmail.com

ABSTRACT

Dental neglect is a common condition among children and it can be associated with several adverse events as dental caries, dental pain and inflammation, infections, trauma, bleeding and other complications that might result from inadequate administration of adequate prevention and treatment modalities. However, many children and parents are not adequately aware of these events and the potential diseases that might be associated secondary to them. Dental neglect is a common condition that might affect children of different age groups and might also extend to adult groups and is affected by the demographics and socioeconomic characteristics of the affected populations. Furthermore, the etiology of dental neglect is variable and parenteral, child and clinical care should all be integrated to achieve better oral health. Many adverse events have been reported as dental caries and other periodontal diseases that might have a significant impact on the affected teeth and the succeeding permanent ones, which might impact the quality of life in the affected children. Accordingly, dental neglect should be given full care to enhance the outcomes of oral health in children.

Keywords: Dental neglect, Children, Epidemiology, Dental caries, Etiology

INTRODUCTION

Evidence in the literature indicates that children should be provided with better practices to reduce any potential forms of neglect and malpractices and enhance their quality of life. Moreover, in the United Kingdom, the National society for the prevention of cruelty to children estimated that 1 in 10 adults have suffered from neglect events when they were younger.[1] Dental neglect is a common condition among children and can be associated

with several adverse events as dental caries, dental pain and inflammation, infections, trauma and bleeding and other complications that might result from inadequate administration of adequate prevention and treatment modalities.[2,3] However, many children and parents are not adequately aware of these events and the potential diseases that might be associated secondary to them. Studies in the literature furtherly explain that even with adequate explanation by the healthcare workers to the caregivers and parents about the hazards of reduced dental care to their children. Although many treatment modalities and healthcare resources are now adequately available, dental neglect is still a common condition.[3,4]

METHODS

This literature review was based on an extensive literature search in Medline, Cochrane and EMBASE databases which was performed on 25 July 2021 using the medical subject headings (MeSH) or a combination of all possible related terms. This was followed by the manual search for papers in Google Scholar while the reference lists of the initially included papers. Papers discussing epidemiology, etiology, types and outcomes of dental neglect in children were screened for relevant information, with no limitation placed on date, age of participants or publication type.

EPIDEMIOLOGY

Many studies in the literature were published to report the different epidemiological aspects of dental neglect in children within different countries. Previous estimates showed that dental caries disease was the most common chronic condition in children.[5] Besides, it was also demonstrated that around 60% of the children had experienced having caries affecting their primary dentition by the age of five years old.[6] It was also reported that 88% of their pediatric Portuguese children had at least one carious lesion by the age of six years old. Reports from worldwide investigations as Australia, the Philippines, Hong Kong and the Czech Republic, the incidence of dental neglect and dental caries was high among children, which was probably owing to the reduced access to the primary health care interventions in these countries and reduced care of teeth.[7,10,11] In Brazil, an investigation led by Lourenço et al in 2013 showed that there was a significant correlation between dental neglect and dental caries in their included five year old population.[7] Besides, they indicated that around 60% of the parents of the included children had low educational levels, suggesting a strong correlation between dental care and dental outcomes.[7] In the same context, Carmona et al also showed that 78% of their pediatric population from the United States suffered from carious lesions by the age of 17 years old.[12] Another investigation indicated that fissures and pits were the main characteristics of carious lesions as observed in around 90% of the cases around school age.[13] Similar findings were also reported by Valencia-Rojas et al in their Canadian investigation showing that children that experienced maltreatment significantly had 50% more decayed teeth than other normal children that were included in the control group.[14] In Italy, Scorca et al indicated the presence of a strong association between dental caries and dental neglect among children. The authors estimated that 61.9% of their included population had early childhood caries, particularly when being a female with reduced socioeconomic status.[15] Gurunathan et al conducted a large investigation that included a total of 6000, 15-18 aged teenagers to study the association between oral health, dental caries and dental neglect in the included population, which can furtherly help draw relevant conclusions about the disease in the general pediatric population.[16] The authors reported that dental neglect was significantly associated with the demographic and social parameters of their included population. In the same context, Kvist et al conducted a study in Sweden and reported that the incidence of dental caries was significantly more common in children that were exposed to general anesthesia within a pediatric dental clinic as indicated in their population from 0-6 aged children between 2006 and 2011.[17]

ETIOLOGY

Studies in the literature have adequately discussed the potential causes that might result in dental neglect in children. Adequately understanding these etiologies might significantly enhanced the related outcomes by increasing the awareness and enhancing the attitudes to dental neglect and the potentially associated adverse events. Furthermore, various investigations have demonstrated the significant correlation between gender, age, socio-economic status and other sociodemographic parameters and the practice of dental neglect among children.[18-20] Studies investigating the effect of gender have reported that males were more subjected to develop dental neglect than females.[11,18,21] Moreover, decreased educational levels, increased financial issues, unemployment and reduced socio-economic profiles were also reported to be common factors that were associated with developing dental neglect and other teeth-related disorders.[18,19,21,22] In another context, research suggested that patients with significant disabilities were more significantly subjected to dental neglect from their caregivers, including the home-care attending personnel, family members, attending physicians or even by neglecting themselves due to their inability to brush their teeth by themselves.[23] Furthermore, physical disabilities or financial issues played a role in neglect and incapability to provide all the requirements for those children. Besides, it has been demonstrated that having a disability, being a pre-school child, a refugee or someone that needs continuous care are significant risk factors for dental neglect and developing secondary adverse events and related complications.[24]

Although dental neglect-related disorders have been reported in different age groups, research showed that they were more prevalent in individuals with age

extremities including children and elderly patients.[21] This happened in the elderly population because individuals within this age group usually have reduced cognitive and physical capabilities, leading to reduced attendance to the primary care dental clinics and decreased oral health.[25] On the other hand, it was also previously demonstrated that older adolescents had a more tendency to develop neglect disorders than younger individuals within the same age group.[22,26] In this context, many previous investigations had reported the development of dental neglect-related disorders among adolescents.[20,21,26] Specifically, during this age group, children were more prone to develop carious lesions and periodontal diseases because during this period, as a result of teeth eruption and the occurrence of permanent dentition, the surface area of the erupted teeth were more prominent, subjecting them to be neglected more and furtherly affected by various pathological factors. Besides, it was also known that children in this age group began to create their oral care habits, as they gradually become independent from their parents. Accordingly, it had been suggested that parents should be more involved in their children's routine dental care at least for the age of 7 years old.[7] In another context, studies also demonstrated that there was a significant correlation between the health status of the child's teeth and their parenteral oral health.[8,27,28] Freeman et al previously found an association between children's dental neglect by their parents that had a history of bad dental experiences or others that did not adequately take care of their teeth or had a fear of dentists.[28] Another investigation by Gosh et al indicated this by showing that dental neglect was strongly significantly associated with dental anxiety.[29] Reduced interest in adequately taking care of their children's teeth, by reduced follow up for periodontal and restorative management modalities, was also significantly associated with the practice of parenteral neglect and reduced compliance to their dental treatment plans.[30] Among studies in the literature, some had reported that these parents were characterized by frequent exposure to emergency pain-relieving modalities, reduced show-up at dental clinics, decreased interest in alleviating their dental education and reduced oral hygiene self-practices.[7,31]

TYPES

Passive, active or self-neglect are three main categories of dental neglect, which majorly depended on the etiologies of dental neglect. Reduced adequate care to the tooth provided by the children's parents or their caregivers was generally associated with the development of active dental neglect. In another context, these events usually occured because the corresponding parents might not be aware of the available best oral health care practices, not aware of the management modalities or were not able to provide adequate oral healthcare to their children as a result of physical disabilities or financial issues. Accordingly, studies referred to dental neglect in such situations as passive. On the other hand, as a result of the potential presence of mental, physical or developmental incapabilities, children might develop oral self-neglect because they were not able to stick to their routine oral healthcare.[31] Prevention and treatment-related dental neglect were also two common subclassifications for dental neglect in children. These usually happened as a result of the reduced exposure to adequate interventions or lack of appropriate application of treatment modalities. Traumatic dental injuries, complicated or persistent dental caries or dental inflammation and pain might develop secondary to these events.[24] Estimates showed that the prevalence rate of untreated or complicated dental traumas was 10% in children with an age range of 18 months to years and who suffered from dental neglect.[32] Many complications can result secondary to dental traumas affecting either or all of the dental pulp, dental tissues and periodontal structures. These types of lesions were commonly reported in children aged 1-3 years old as a result of falls and physical abuse. Estimates also showed that the upper incisors were the most commonly reported to be affected by these events. Associated management of the root canal might also be indicated in cases of severe and extensive injuries and traumas. The traumatized teeth might also require extraction, which might have a significant impact on the succeeding permanent teeth. Accordingly, dental interventions and dentist's clinical and surgical decisions are crucial in such events and were strongly associated with the prognosis.[32,33]

Evidence showed that early childhood caries, which was also termed baby-bottle tooth decay and nursing bottle caries, were common lesions that were usually observed in children as a result of early continuous dental neglect. It had been reported that one or more carious lesions might be observed in these children, which might also be associated with cavity formation. In addition, it had been reported that the potential presence of extractions secondary to dental caries and fillings within the affected primary teeth of children that were below school age, according to the American academy of pediatric dentistry.[34] Complicated or neglected carious lesions were the most commonly reported types of dental neglect.[3] The development of tooth decay or dental caries was attributable to an existing potential interaction between fermentable carbohydrates, that were usually presented in the routine diet, especially sucrose and bacteria that produced acids that were usually present in the dental microbial plaques.[35-37] The first sign to be observed for dental caries and tooth decays was the development of white spot lesions and cavities can also be furtherly observed in cases of neglected treatment to these lesions later on. Among the various teeth in children, estimates showed that the upper primary incisors were the most commonly affected and more commonly subjected to complications from carious lesions followed by the primary first molars, canines and the primary second molars. On the other hand, it had been previously demonstrated that the primary lower incisors possessed the least risk of developing carious lesions, which was mainly attributable to removing the potentially present

plaques by the underlying tongue movement and as a result of the presence of extensive salivary secretions in this region which resulted in severe dental neglect.[38] As a result of untreated dental caries and/or periodontal diseases such cases might be furtherly complicated by the development of malocclusion, which had been reported to be common in such situations. Many factors can be associated with the development of malocclusion as bad oral practices and habits and abnormalities in shape, number and the developmental positions of the corresponding teeth. Furthermore, many additional complications might also occur in situations where inadequate or neglected treatment modalities were applied. Some of the reported adverse events among studies in the literature include periodontitis, further dental caries and dysfunctions in the temporomandibular joints.[39,40]

Figure 1: A case of dental neglect in children.

OUTCOMES AND CLINICAL SIGNIFICANCE

Dental neglect-related adverse events might result in serious outcomes that might the application of certain treatment modalities and might even lead to impaired child's development and growth. Therefore, adequate management of these events was important to avoid these complications. The adverse events that might result from children's dental neglect like dental caries, might have a significant impact on the community and the affected child (Figure 1).[41] Reduced quality of life and deteriorated oral and general health in children might occur as a result of dental neglect.[42-44] Swelling, pain, inflammation, increased administration of antibiotics, delayed linguistic development and reduced physical activities which might impact everyday activities as learning, playing and socializing. Decreased self-esteem, increased frequencies of school or pre-school dropouts and absence might also occur in these situations.[45,46] Space loss, misdisplacement or rotations of the adjacent teeth might necessitate the need to applying future orthodontic management modalities to the permanent teeth.[41,47] Affected enamels of the succeeding permanent teeth were also potential complications that might result from the extensive presence of dental caries.[48] Besides, it had been clinically demonstrated that managing dental caries in young infants might be performed under general anesthesia.[7] Accordingly, dental neglect should be given full care to enhance the outcomes of oral health in children.[49]

CONCLUSION

The epidemiology, etiology, types and outcomes of dental neglect in children were discussed in details. Dental neglect is a common condition that might affect children of different age groups and might also extend to adult groups and is affected by the demographics and socioeconomic characteristics of the affected populations. The etiology of dental neglect is variable and parenteral, child and clinical care should all be integrated to achieve better oral health. Many adverse events have been reported as dental caries and other periodontal diseases that might have a significant impact on the affected teeth and the succeeding permanent ones, which might impact the quality of life in the affected children. Accordingly, dental neglect should be given full care to enhance the outcomes of oral health in children.

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REFERENCES

1. Radford L, Corral S, Bradley C, Fisher HL, Basssett C, Howat M, et al. Child abuse and neglect in the UK Today. 2011.
2. Fisher-Owens SA, Lukefahr JL, Tate AR, American academy of pediatrics, section on oral health, committee on child abuse and neglect, American academy of pediatric dentistry, et al. Oral and dental aspects of child abuse and neglect. Pediatrics. 2017;140(2):20171487.
3. Schwartz S, Woolridge E, Stege D. Oral manifestations and legal aspects of child abuse. J Am Dent Assoc. 1977;95(3):586-91.
4. Clarke AM. The choice to refuse or withhold medical treatment: the emerging technology and medical-ethical consensus. Creighton Law Rev. 1980;13(3):795-841.
5. Oral health in America: a report of the Surgeon General. J California Dent Assoc. 2000;28(9):685-95.
6. Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et al. Trends in oral health status: United States, 1988-1994 and 1999-2004. Vital Health Stat 11. 2007;248:1-92.
7. Lourenço CB, Saintrain MV, Vieira AP. Child, neglect and oral health. BMC Pediatr. 2013;13:188.

8. Chu CH, Ho PL, Lo EC. Oral health status and behaviours of preschool children in Hong Kong. BMC Pub Health. 2012;12(1):1-8.
9. Benzian H, Monse B, Heinrich-Weltzien R, Hobdell M, Mulder J, Helderman WVP. Untreated severe dental decay: a neglected determinant of low body mass index in 12-year-old Filipino children. BMC Pub Health. 2011;11:558.
10. Arora A, Scott JA, Bhole S, Do L, Schwarz E, Blinkhorn AS. Early childhood feeding practices and dental caries in preschool children: a multi-centre birth COHORT study. BMC Pub Health. 2011;11:28.
11. Begzati A, Berisha M, Meqa K. Early childhood caries in preschool children of Kosovo-a serious public health problem. BMC Pub Health. 2010;10:788.
12. Office of the Surgeon General. Reports of the Surgeon General. National Call To Action To Promote Oral Health. Rockville (MD): National Institute of Dental and Craniofacial Research (US); 2003.
13. Fisher-Owens SA, Lukefahr JL, Tate AR. Oral and dental aspects of child abuse and neglect. Pediatrics. 2017;140(2).
14. Valencia-Rojas N, Lawrence HP, Goodman D. Prevalence of early childhood caries in a population of children with history of maltreatment. J Pub Health Dentist. 2008;68(2):94-101.
15. Scorca A, Santoro V, DeDonno A, Grattagliano I, Tafuri S, Introna F. Early childhood caries (ECC) and neglect in child care: analysis of an Italian sample. La Clinica terapeutica. 2013;164(5):365-71.
16. Gurunathan D, Shanmugaavel AK. Dental neglect among children in Chennai. J Indian Soc Pedodont Prevent Dent. 2016;34(4):364-9.
17. Kvist T, Zedrén-Sunemo J, Graca E, Dahllöf G. Is treatment under general anaesthesia associated with dental neglect and dental disability among caries active preschool children? Eur Aca Paediatr Dent. 2014;15(5):327-32.
18. Thomson WM, Spencer AJ, Gaughwin A. Testing a child dental neglect scale in South Australia. Commun Dent Oral Epidemiol. 1996;24(5):351-6.
19. Acharya S, Pentapati KC, Bhat PV. Dental neglect and adverse birth outcomes: a validation and observational study. Int J Dent Hyg. 2013;11(2):91-8.
20. Jamieson LM, Thomson WM. The dental neglect and dental indifference scales compared. Commun Dent Oral Epidemiol. 2002;30(3):168-75.
21. 21. McGrath C, Sham AS, Ho DK, Wong JH. The impact of dental neglect on oral health: a population based study in Hong Kong. International dental journal. 2007;57(1):3-8.
22. Jamieson LM, Thomson M. Dental health, dental neglect, and use of services in an adult Dunedin population sample. N Z Dent J. 2002;98(431):4-8.
23. Prabhakar D. Child abuse and neglect: diagnosis, treatment and evidence. JAMA. 2011;306(5):554-5.
24. Sarri G, Evans P, Stansfeld S, Marcenes W. A school-based epidemiological study of dental neglect among adolescents in a deprived area of the UK. Brit Dent J. 2012;213(10):17.
25. Katz RV, Smith BJ, Berkey DB, Guset A, O'Connor MP. Defining oral neglect in institutionalized elderly: a consensus definition for the protection of vulnerable elderly people. J Am Dent Assoc. 2010;141(4):433-40.
26. Skaret E, Astrøm AN, Haugejorden O, Klock KS, Trovik TA. Assessment of the reliability and validity of the dental neglect scale in Norwegian adults. Commun Dent Health. 2007;24(4):247-52.
27. Amin MS, Harrison RL. Understanding parents' oral health behaviors for their young children. Qualitative Health Res. 2009;19(1):116-27.
28. Freeman R. The role of the primary care dentist in safeguarding children. In: Taylor J, Themessl-Huber M, eds. Safeguarding children in primary dental care. Jessica Kingley Publishers; 2009: 60-75.
29. Goh EZ, Beech N, Johnson NR. Dental anxiety in adult patients treated by dental students: a systematic review. J Dent Educ. 2020;84(7):805-11.
30. Pretty IA, Sweet D. Anatomical location of bitemarks and associated findings in 101 cases from the United States. J Forens Sci. 2000;45(4):812-4.
31. Bradbury-Jones C, Innes N, Evans D, Ballantyne F, Taylor J. Dental neglect as a marker of broader neglect: a qualitative investigation of public health nurses' assessments of oral health in preschool children. BMC Pub Health. 2013;13:370.
32. Perez R, Berkowitz R, Mcllveen L, Forrester D. Dental trauma in children: a survey. Dent Traumatol. 1991;7(5):212-3.
33. Josell SD, Abrams RG. Managing common dental problems and emergencies. Pediatr Clinic North Am. 1991;38(5):1325-42.
34. Policy on early childhood caries (ECC): classifications, consequences, and preventive strategies. Pediatric Dent. 2008;30(7):40-3.
35. Loesche WJ. Role of *Streptococcus mutans* in human dental decay. Microbiol Rev. 1986;50(4):353-80.
36. Douglass JM, Li Y, Tinanoff N. Association of mutans streptococci between caregivers and their children. Pediatr Dent. 2008;30(5):375-87.
37. Loveren C, Buijs JF, Cate JM. Similarity of bacteriocin activity profiles of mutans streptococci within the family when the children acquire the strains after the age of 5. Caries Res. 2000;34(6):481-5.
38. Raphael S. Bottle caries and dental neglect. New South Wales Pub Health Bull. 1999;10(4):31-2.
39. Machado AW, MacGinnis M, Damis L, Moon W. Spontaneous improvement of gingival recession after correction of tooth positioning. Am Board Orthodont. 2014;145(6):828-35.
40. Fushima K, Inui M, Sato S. Dental asymmetry in temporomandibular disorders. J Oral Rehab. 1999;26(9):752-6.

41. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. Lancet (London, England). 2019;394(10194):249-60.
42. Reisine ST. Dental health and public policy: the social impact of dental disease. Am J Pub Health. 1985;75(1):27-30.
43. Low W, Tan S, Schwartz S. The effect of severe caries on the quality of life in young children. Pediatr Dent. 1999;21(6):325-6.
44. Filstrup SL, Briskie D, Fonseca M, Lawrence L, Wandera A, Inglehart MR. Early childhood caries and quality of life: child and parent perspectives. Pediatr Dent. 2003;25(5):431-40.
45. Badran SA. The effect of malocclusion and self-perceived aesthetics on the self-esteem of a sample of Jordanian adolescents. Eur J Orthodont. 2010;32(6):638-44.
46. Kiekens RM, Maltha JC, van'tHof MA, Kuijpers-Jagtman AM. Objective measures as indicators for facial esthetics in white adolescents. Angle Orthodont. 2006;76(4):551-6.
47. Sheiham A. Dental caries affects body weight, growth and quality of life in pre-school children. Brit Dent J. 2006;201(10):625-6.
48. Broadbent JM, Thomson WM, Williams SM. Does caries in primary teeth predict enamel defects in permanent teeth? A longitudinal study. J Dent Res. 2005;84(3):260-4.
49. Harris JC, Elcock C, Sidebotham PD, Welbury RR. Safeguarding children in dentistry: 2. Do paediatric dentists neglect child dental neglect? Brit Dent J. 2009;206(9):465-70.
50. Katner D, Brown C, Fournier S. Considerations in identifying pediatric dental neglect and the legal obligation to report. J Am Dent Assoc. 2016;147(10):812-6.

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