PDF version

Hani T. Fadel,[1] Shooq F. Alamray,[2] Shayma S. Alsayed,[3] Ghayda Y. Zolaly,[4] Layan H. Alsisi[5] and Sarah A. Bahammam
[6]

[1]Department of Preventive Dental Sciences, College of Dentistry, Taibah University, AlMadinah AlMunawwarah, Saudi Arabia (Correspondence to: Hani Fadel: hani.fadel@yahoo.com). [2]Priva te Practice, AlMadinah AlMunawwarah, Saudi Arabia.
[3]

Private Practice, AlMadinah AlMunawwarah, Saudi Arabia.
[4]

Private Practice, AlMadinah AlMunawwarah, Saudi Arabia. 5Private Practice, AlMadinah AlMunawwarah, Saudi Arabia.
[6]

Department of Paediatric Dentistry and Orthodontics, College of Dentistry, Taibah University, AlMadinah AlMunawwarah, Saudi Arabia.

Abstract

Background: Dental caries is a common but preventable, multifactorial disease in children. Among several others, it is influenced by child- and parent-related factors.

Aims: To describe knowledge, attitude and practices about oral health among parents of kindergarten children and assess factors influencing caries distribution among the children.

Methods: Parents of 290 kindergarten children in AlMadinah, Saudi Arabia, answered questions concerning their oral health knowledge, attitudes and practices. The children underwent an oral clinical examination. Data were collected between February and April 2018. Comparison between groups was done using the Kruskal–Wallis test.

Results: All parents agreed on the importance of fluoride to strengthen teeth, while 91.7% thought that sweets have a negative impact on teeth. Almost all children ate sweets and

candies (99%), while most of them used toothbrushes and fluoride to clean their teeth (98%). Only 66% of parents took their children to the dentist. The 2-step cluster analysis revealed that clusters of children with high body mass index (BMI) and those whose parents had only primary education had the highest caries prevalence compared to clusters of children with lower BMI and parents with higher education (P

Conclusions: Within the study limits, parents demonstrated good oral health knowledge, attitudes and practices. Kindergarten children had high caries, especially those with high BMI and whose parents had low educational levels.

Keywords: kindergarten children, dental caries, knowledge, attitudes and practices, parents

Citation: Fadel HT; Alamray SF; Alsayed SS; Zolaly GY; Alsisi LH; Bahammam SA. Parents' education level and children's BMI explain caries distribution among kindergarten students: a cross-sectional study. East Mediterr Health J. 2022;28(3):190–196. https://doi.org/10.26719/emhj.21.074
Received: 02/03/21; accepted 16/06/21

Copyright © World Health Organization (WHO) 2022. Open Access. Some rights reserved. This work is available under the CC BY-NC-SA 3.0 IGO license (https://creativecommons.org/licenses/by-nc-sa/3.0/igo).

Introduction

Oral health is an essential part of the general health of the child as it has a major effect on psychological and physiological well-being (1). Dental caries is considered one of the most common infectious diseases of childhood (2). The prevalence of dental caries among children indicates the need for special attention to resolve this problem. In the United States of America, over 50% of 5–9-year-old children have at least one cavity or restoration (3). Southeast Asia registered a median caries experience of 79% in children aged 5–6 years (4). The Gulf Cooperation Council countries had an overall estimation of 80% prevalence of caries in primary teeth (5): in particular, Saudi Arabia indicated a high proportion of decayed, missing and filled teeth (dmft) among preschool and primary school children in different parts of the country (6).

Dental caries is well established as a multifactorial disease that can be principally prevented by

effective oral hygiene and avoiding frequent consumption of sugary food (7). Accordingly, considerable efforts have been directed towards studying attitudes and behaviour towards dental hygiene. In children, the child's attitude has been connected to several factors such as mother's education level, parent's attitude, demographics and the socioeconomic status of the family (8). The key elements that have shown an impact on children's oral hygiene behaviour and oral health status are parents' oral health-related attitudes, general knowledge and health status (9). Parental and related factors play a major role in the child's attitude towards dental health, and their positive reinforcement may ultimately affect the child's caries experience (10).

To the best of our knowledge, no study has attempted to categorize dental caries distribution among preschool children based on child- and parent-related data in Saudi Arabia. The aims of this study were thus to describe parents' oral health knowledge, attitudes and practices and their children's caries experience, and to categorize the children's caries distribution based on child- and parent-related data in a number of schools in AlMadinah AlMunawwarah.

Methodology

Study design and sample

We carried out a cross-sectional analytic investigation involving public kindergartens in AlMadinah AlMunawwarah city, Saudi Arabia. AlMadinah AlMunawwarah is one of the largest administrative regions in the country. It is also one of the 2 holy sites and a destination for religious tourists alongside Makkah AlMukarramah. It has a growing, diverse metropolitan population of approximately 1.1 million (11).

There are 76 public kindergartens in AlMadinah, with more than 7 thousand students. These kindergarten schools are divided over 3 administrative areas according to their geographic location: northern, eastern and western (12). We selected 6 kindergartens for the study, 2 from each administrative area. The kindergartens were selected through randomized cluster sampling, however, participants were recruited consecutively as a convenience sample based on fulfilment of inclusion criteria.

The sample size was estimated using a sample size calculator (Creative Research Systems, Sebastopol, CA). Considering the total population size (N) for finite population correction (fpc) factor = 7541, with a hypothesized frequency (%) of the outcome variable number of dmft in the population (p) of 50% (+/– 5), and confidence limits as percentage of 100 (absolute +/– %) (d) of 5%, with an anticipated design effect (for cluster surveys-DEFF) for the outcome variable of 1, and by adapting the sample size equation (n) = [DEFF × Np(1–p)]/ [(d2/Z21–α/2 × (N–1)+p × (1–p)] × (1–p)], a minimum sample size of 290 students was required to conduct the study.

Study overview

The participants, parents from the selected kindergartens, responded to a questionnaire that measured their knowledge, attitude and practices regarding the oral health of their children. They received an electronic version of the questionnaire on their smart mobile devices via popular application (WhatsApp, California, USA) used for social communication and portable file exchange.

All children from the selected schools completed an oral health promotion programme to educate them about oral disease, risk factors, the importance of their teeth and how they can maintain them in good health. The correct way of tooth brushing was also demonstrated. Then, those children whose parents had filled out the questionnaire and signed the consent form were given a clinical examination. This included measuring the height and weight of the child to calculate body mass index (BMI), and an oral clinical examination. Data collection was carried out between February and April 2018.

Inclusion and exclusion

Children aged 4–6 years attending public kindergartens whose parents had completed the questionnaires and signed the consent forms were included in this study. Other children or those who were enrolled in private kindergartens were excluded.

Study tools

A pre-structured, self-administered Arabic language questionnaire was distributed among the parents. The majority of questions were adopted from a previously validated questionnaire (13). Questions were added to the original version to cover aspects of practices and attitudes of the children at a young age. The answer format for some questions was changed from a dichotomous (yes/no) format to a 5-point Likert scale format. The modified questionnaire was pilot tested on 23 parents of children in the selected kindergartens, and their responses showed understanding of the questions. No modification to the finalized questionnaire was required after the pilot phase. Thus, responses from the pilot phase were included in the final analysis.

The questionnaire comprised 2 parts. The first covered demographic information of the parents and children such as parent's age, education level and occupation, relation to the child, and child's age and sex. The second part included 33 items designed to evaluate the knowledge, attitudes and practices of the parents and their children regarding their child's oral health. The section on parents' knowledge included items asking about causes of dental caries and their prevention, the meaning of dental plaque and its effects, and the effects of brushing and using

fluoride on the teeth. Knowledge of the effects of sweets and soft drinks on the teeth was also recorded. Assessment of children's oral health practices included asking the parents about their child's brushing activities such as brushing aids, frequency, duration and time and their nutritional habits, and negative practices such as nail biting and teeth clenching. Some questions probed the parents' attitudes towards their child's oral health. These included the child's feeding pattern and their influence on their child's oral hygiene such as advice and encouragement to brush, watching their child during brushing and taking their child to the dentist.

The children then had their height and weight measured using a measuring tape and a regular scale. This was followed by a full-mouth, oral clinical examination performed using a disposable mouth mirror and a light source to detect the number of dmft. This was carried out according to the World Health Organization's basic methods for assessing children's oral health (14). The examination was limited to the primary teeth, as the first permanent molar was only occasionally present, and when present it was often only partially erupted. Accordingly, the decision was made to exclude the first permanent molar for standardization purposes. The examinations were conducted by 8 final-year senior dental students after being carefully trained by an experienced faculty member.

Ethical considerations

The study was approved by the ethical committee at the Taibah University College of Dentistry, AlMadinah AlMunawwarah (approval NO. TUCDREC/20180115/Alsisi; 30/01/2018). It followed the ethical principles outlined in the Declaration of Helsinki (15). Parent's approval and informed consent were obtained before recruiting their children into the study. Parents were informed that data would be anonymous and treated with confidentiality. They were assured that there would be no intervention and no harm to them or their children. The participants were informed about the results of their oral examination. Participation was voluntary, and no negative repercussions resulted as a consequence for children who were excluded or who chose not to participate in the study.

Data analysis

Descriptive statistics in terms of measures of central tendency and dispersion, and frequency distribution and percentages were used to illustrate the demographic variables, the parent's knowledge and attitudes and the child's practices relating to oral health, and the caries experience. For illustrative purposes, the 5-point answers were combined into 2 during the presentation of the data. Inferential statistics were performed to compare different parent characteristic groups with regard to their children's caries experience. However, no specific patterns were observed that would answer the study questions (data not shown). Accordingly, a 2-step cluster analysis was performed to categorize the studied sample into clusters based on parent- and child-related variables. This was done to explain the distribution of dental caries

among the studied sample within clusters of certain characteristics. Different parent- and child-related variables were tried out in the model until the model cohesion read "good" following the entry of the variables: parent education level, sex of child and BMI of child.

The Kruskal–Wallis test was used to compare the resulting clusters in regard to the mean number of dmft. The significance level was set at 0.05. Data were entered and analysed using SPSS, version 20.0 (IBM, Armonk, New York, USA).

Results

Out of the entire school population of 7541 children, a total of 290 children were included from the 6 schools selected in the 3 main administrative areas: 133 from eastern schools, 82 from northern schools and 75 from western schools. The children's mean age was 5 [standard deviation (SD) 1] years; 51% were females. The mean BMI was 16 (SD 3) kg/m2, while the mean number of dmft was 4 (SD 4) (Table 1). No significant differences were observed among children of different sexes or BMI in terms of caries experience (data not shown). Seventy-one percent of the parents or guardians held a higher education degree, while 32% were unemployed (Table 1).

With regard to parents' oral health knowledge, the majority of parents agreed on statements such as the importance of fluoride for strengthening teeth (91.4%) and the negative impact of soft drinks and sweets on teeth (91.7%) (Table 2). Only a few parents agreed that oral bacteria may possibly transfer from parents to their children (14.1%) and that caries affecting primary teeth was permanent (18.6%).

With regard to child practices, the majority of parents indicated that their children ate sweets and candy (99.7%) but also cleaned their teeth using a toothbrush and toothpaste (96.9%); 18.6% had nail-biting habits (Table 3).

Parents' attitudes towards their children's oral health is described in Table 4 : 93.8% reported caring about their child brushing their teeth, while 55.9% reported that they had taken their child to the dentist.

Following the 2-step cluster analysis based on parents' education level, child's sex and BMI, 4 clusters resulted (Figure 1). Parents in the 3rd and 4th clusters had a higher level of education;

clusters 1 and 2 comprised 56% females (Figure 1). The mean number of decayed teeth in the 2nd cluster was 6.3 (SD 4.5), compared with around 3 (SD 3) to 4 (SD 4) in the remaining clusters (P Table 5). No statistically significant differences in the number of dmft were observed between the clusters (P > 0.05).

Discussion

This study aimed at describing parent's oral health knowledge, attitudes and practices and their children's caries experience. The findings suggest better parental general oral health knowledge, attitudes and practices when compared with other studies (16,17). This might be due to the observed rapid increase in provision of health maintenance information across the media, which presumably reflects on improved oral health awareness among parents (18).

The prevalence of caries among children in AlMadinah was similar to that in some European countries (19). No differences were observed between the 6 kindergartens or the 3 educational areas with regard to caries prevalence (data not shown). Available literature shows that the number of dmft among preschool children has notably been decreasing since 2013 (20). A possible factor could be the growing influence of the health insurance market in the country. One study showed that uninsured children were 2.5 times less likely to receive dental care than insured children (3). Children from families without dental insurance were 3 times more likely to have dental care needs than children with either public or private insurance (3).

When dividing our sample into clusters, caries prevalence was highest in the cluster with less educated parents. This is in line with a study from Italy where increased caries in children was associated with lower education level of parents and lower income level (21). It has been observed that families within the same local community differ in their views regarding prioritizing oral healthcare, where educational background and treatment expenses may be among several contributory factors (22).

A higher caries prevalence was observed in the cluster with more girls. This is in contrast to a study in West Virginia in which girls aged 1–5 years had lower caries levels than boys of the same age (23). It was suggested that differences in caries experience between boys and girls were related to psychological, economic, hormonal and even cultural reasons (24).

Similarly, the cluster with higher BMI demonstrated higher caries experience. Although it is controversial, a systematic review reported that only one-third of the included studies showed a positive relationship between BMI and dental caries in children and adolescents (25). It is

plausible to assume that children with obesity have an increased risk of caries since unhealthy dietary habits are a common risk factor for obesity and dental caries (26).

Our investigation adopted a cross-sectional design, and used a convenience sample with unequal recruitment of the sample from the participating kindergartens. This may have limited the generalizability of the study findings and possible causes. Despite this, the suggested associations due to the study limitations may open numerous possibilities for future research. Second, the questionnaire we used was mostly new, although based on previous versions in the literature. This may affect the validity of the tool. However, the tool was pilot tested to assure the use of an appropriate measure for the study variables. The clinical examination only measured the number of dmft, which may have limited the possible interpretation of the study findings. Nevertheless, the included variables were decided upon based on previous similar studies to facilitate meaningful comparisons. Moreover, permanent first molar teeth were excluded from the examination, which may have resulted in underestimation of the reported caries prevalence. However, this report from Saudi Arabia on the primary dentition may still have value from an epidemiological perspective. The clinical examination was conducted by 8 examiners, which may have impacted its reliability. Training of the examiners by an experienced clinician may have reduced the negative impact of this detail.

Within the limitations of this study, it can be concluded that parents of kindergarten children demonstrated high levels of oral health knowledge. The children exhibited negative dietary and personal habits, but used appropriate tooth cleaning aids. Parents showed positive attitudes towards maintaining their children's oral health. A high caries prevalence was observed, especially in children with obesity and whose parents were of low educational levels.

Findings of this study necessitate the conduct of oral health educational programmes for parents and their children, and highlights the influence of parents and lifestyle on the child's oral and general health.

Acknowledgment

The authors would like to thank the school administrations for their active participation and facilitation of the study, and Dr. Saba Kassim, Department of Preventive Dental Sciences at Taibah University for her statistical advice.

Funding: None.

Competing interests: None declared.

Le niveau d'éducation des parents et l'indice de masse corporelle des enfants comme causes de la distribution des caries chez les enfants des crèches : étude transversale

Résumé

Contexte : La carie dentaire constitue une affection multifactorielle courante mais évitable chez les enfants. Comme plusieurs autres affections, elle est influencée par des facteurs liés à l'enfant et aux parents.

Objectifs : Décrire les connaissances, attitudes et pratiques en matière de santé bucco-dentaire chez les parents d'enfants de crèches et évaluer les facteurs influençant la distribution des caries chez les enfants.

Méthodes : Les parents de 290 enfants de crèches à AlMadinah (Arabie saoudite) ont répondu à des questionnaires concernant leurs connaissances, attitudes et pratiques en matière de santé bucco-dentaire. Les enfants ont fait l'objet d'un examen clinique oral. Les données ont été collectées entre février et avril 2018. La comparaison entre les groupes a été effectuée à l'aide du test de Kruskal-Wallis.

Résultats : Tous les parents convenaient de l'importance du fluor pour renforcer les dents, tandis que 91,7 % pensaient que les sucreries ont un impact négatif sur les dents. Presque tous les enfants consommaient des sucreries et des bonbons (99 %), tandis que la plupart utilisaient des brosses à dents et du fluor pour nettoyer leurs dents (98 %). Seuls 66 % des parents emmenaient leurs enfants chez le dentiste. L'analyse par grappes en deux étapes a révélé que les grappes d'enfants ayant un indice de masse corporelle (IMC) élevé et ceux dont les parents n'avaient qu'un niveau d'éducation primaire présentaient également la prévalence de caries la plus élevée par rapport aux grappes d'enfants ayant un IMC plus faible et dont les parents avaient un niveau d'éducation supérieur (p

Conclusions : Dans les limites de l'étude, les parents ont démontré de bonnes connaissances, attitudes et pratiques en matière de santé bucco-dentaire. Les enfants de crèches ont un grand nombre de caries, notamment ceux avec un IMC élevé et un niveau d'éducation parental inférieur.

ء :

:

.

.

.

.

ج .

.

.

.

.

doi:10.1590/s1806-83242012000700015

2. Mathur VP, Dhillon JK. Dental caries: a disease which needs attention. Indian J Pediatr. 2018;85(3):202–6. doi:10.1007/s12098-017-2381-6

3. Bagramian RA, Garcia-Godoy F, Volpe AR. The global increase in dental caries. A pending public health crisis. Am J Dent. 2009;22(1):3–8. PMID:19281105

4. Duangthip D, Gao SS, Lo ECM, Chu CH. Early childhood caries among 5- to 6-year-old children in Southeast Asia. Int Dent J. 2017;67(2):98–106. doi:10.1111/idj.12261

5. Al-Ayyan W, Al-Halabi M, Hussein I, Khamis AH, Kowash M. A systematic review and meta-analysis of primary teeth caries studies in Gulf Cooperation Council States. Saudi Dent J. 2018;30(3):175–82. doi:10.1016/j.sdentj.2018.05.002

6. Khan SQ, Khan NB, Arrejaie AS. Dental caries. A meta analysis on a Saudi population. Saudi Med J. 2013 Jul;34(7):744–9. PMID:23860895

7. Lucaciu PO, Mester A, Constantin I, Orban N, Cosma L, Candrea S, et al. A WHO pathfinder survey of dental caries in 6 and 12-year old transylvanian children and the possible correlation with their family background, oral-health behavior, and the intake of sweets. Int J Environ Res Public Health. 2020;17(11):4180. doi:10.3390/ijerph17114180

8. Garbin CAS, Soares GB, Dócusse FRM, Garbin AJÍ, Arcieri RM, Garbin CAS, et al. Oral health education in school: parents' attitudes and prevalence of caries in children. Rev Odontol da UNESP. 2015 Oct;44(5):285–91. https://doi.org/10.1590/1807-2577.0097

9. De Castilho ARF, Mialhe FL, De Souza Barbosa T, Puppin-Rontani RM. Influence of family environment on children's oral health: a systematic review. J Pediatr (Rio J). 2013;89(2):116–23. doi:10.1016/j.jped.2013.03.014

10. Vermaire JH, van Exel N. Parental attitudes towards oral health and caries-risk in their children. Int J Dent Hyg. 2017 Jun;16(2):241–8. doi:10.1111/idh.12296

11. Population by sex, administrative area and nationality – AlMadinah AlMunawwarah. In: Demography Survey. Riyadh: General Authority for Statistics; 2016:48.

12. Governmental kindergartens in AlMadinah AlMunawwarah. In: Strategic plan for the education administration in AlMadinah AlMunawwarah. AlMadinah AlMunawwarah: Planning and Development Administration, Ministry of Education; 2018:22.

13. Al-Omiri MK, Al-Wahadni AM, Saeed KN. Oral health attitudes, knowledge, and behavior among school children in North Jordan. J Dent Educ. 2006;70(2):179–87. PMID:16478932

14. Petersen PE, Baez RJ, WHO. Oral health surveys – basic methods, 5th ed. Geneva: World Health Organization; 2013:1–137.

15. World Medical Association Declaration of Helsinki: ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191–4. doi:10.1001/jama.2013.281053

16. Petersen PE, Aleksejuniene J, Christensen LB, Eriksen HM, Kalo I. Oral health behavior and attitudes of adults in Lithuania. Acta Odontol Scand. 2000;58(6):243–8. doi:10.1080/00016350050217073

17. Rajab LD, Petersen PE, Bakaeen G, Hamdan MA. Oral health behaviour of schoolchildren and parents in Jordan. Int J Paediatr Dent. 2002;12(3):168–76. doi:10.1046/j.1365-263x.2002.00359.x

18. Althunayan A, Alsalhi R, Elmoazen R. Role of social media in dental health promotion and behavior change in Qassim province, Saudi Arabia. Int J Med Heal Res. 2018;4(2):98–103.

19. Szöke J, Petersen PE. Evidence for dental caries decline among children in an East European country (Hungary). Community Dent Oral Epidemiol. 2000;28(2):155–60. doi:10.1034/j.1600-0528.2000.028002155.x

20. Wyne AH. Caries prevalence, severity, and pattern in preschool children. J Contemp Dent Pract. 2008;9(3):24–31. PMID:18335116

21. Cianetti S, Lombardo G, Lupatelli E, Rossi G, Abraha I, Pagano S, et al. Dental caries, parents educational level, family income and dental service attendance among children in Italy. Eur J Paediatr Dent. 2017;18(1):15–8. doi:10.23804/ejpd.2017.18.01.0

22. Nayee S, Klass C, Findlay G, Gallagher JE. Parenting and oral health in an inner-city environment: a qualitative pilot study. BMC Oral Health. 2018;18(1):168. doi:10.1186/s12903-018-0584-5

23. Shaffer JR, Leslie EJ, Feingold E, Govil M, McNeil DW, Crout RJ, et al. Caries experience differs between females and males across age groups in northern Appalachia. Int J Dent. 2015;1–8. doi:10.1155/2015/938213

24. Ferraro M, Vieira AR. Explaining gender differences in caries: a multifactorial approach to a multifactorial disease. Int J Dent. 2010;1–5. doi:10.1155/2010/649643

25. Hooley M, Skouteris H, Boganin C, Satur J, Kilpatrick N. Body mass index and dental caries in children and adolescents: a systematic review of literature published 2004 to 2011. Syst Rev. 2012;1–26. doi:10.1186/2046-4053-1-57

26. Alshihri AA, Rogers HJ, Alqahtani MA, Aldossary MS. Association between dental caries and obesity in children and young people: a narrative review. Int J Dent. 2019;1–8. doi:10.1155/2019/9105759

Thursday 11th of July 2024 05:22:02 AM