Journal of Dental Sciences (2013) 8, 101—108

Available online at www.sciencedirect.com

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ORIGINAL ARTICLE

Dental caries and associated factors in mothers and their preschool and school children—A cross-sectional study

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Received 14 October 2012; Final revision received 13 November 2012
Available online 22 March 2013

KEYWORDS
children;
dental caries;
families;
mother

Abstract *Background/purpose:* Dental caries remains a major health problem in many parts of the world. The present study aimed at describing the caries experience and caries-related factors in mothers and their preschool and school children.
Materials and methods: A sample of 258 individuals (86 mothers and 2 of their children, 4—6 and 12—16 years old) was included. An interview was used to determine the socioeconomic status of the family, oral hygiene, and snacking habits. DMFT /dmft (decayed, missed, filled, teeth), plaque, and gingival indices were recorded. Chair-side tests were used to register salivary buffer capacity and bacterial counts.
Results: The caries experience (DMFT/dmft) was high in mothers and their younger and older children (12.4 ± 5.3, 9.0 ± 5.0, and 5.8 ± 4.1, respectively). The DMFT/dmft increased with higher salivary mutans streptococci counts in all age groups ($P < 0.05$). The caries experiences of the children were correlated positively with those of their mothers ($R^2_{4-6} = 0.12$, $R^2_{12-16} = 0.18$, $P < 0.01$). A positive association between mothers and both children was evident for toothbrushing habits, snacking frequency, and gingival health ($P < 0.05$). An association between plaque scores, salivary buffer capacity, and mutans streptococci counts was found between mothers and older children ($P < 0.05$).
Conclusion: The caries experience in Saudi mothers and their children is high, with similar contributory caries-related factors.

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http://dx.doi.org/10.1016/j.jds.2012.12.009

Introduction

Dental caries is one of the most prevalent chronic human diseases worldwide, and individuals are susceptible to this disease throughout their lifetime. Although in western countries the incidence of this multifactorial disease has decreased noticeably, it still remains at a high level in other parts of the world. Caries occurs as a net result of three dynamically inter-related key factors: microflora (dental plaque), carbohydrates, and the host.[1] The relationship between these factors can be influenced by a number of biological and nonbiological determinants of the carious process. Despite the importance of nonbiological determinants of caries, caries causality has mostly been related to biological processes.[2]

The adoption of consistent behavioral habits in childhood begins at home with the parents, the mother in particular, acting as the key role model.[3] Oral health-related concepts and behaviours are further adopted throughout life during the formative pre-school years, during which the child's caries pattern and risk are established.[4] Even if adolescents are more independent in their choices regarding dental health habits and routines, their family is still an important mediator in the development of health-related behaviors.[5] Parental roles therefore persist during both childhood and adolescence.[4,6–8]

In the Kingdom of Saudi Arabia, dental caries is regarded as a major public health problem, despite the availability of extensive dental health services.[9] In addition, large families are common in the Saudi society, making it feasible to determine the factors that contribute most to the caries experience in different family members as well as mother–child caries-related associations. The hypothesis of the present study is that children's caries experiences and caries-related habits and behaviors are similar to those of their mothers. The aim of this cross-sectional study was, therefore, to describe the caries experience and caries-related factors in mothers and their preschool and school children.

Materials and methods

Participants

The study was granted ethical approval by the Faculty of Dentistry at King Abdulaziz University (KAAU) and conducted in accordance with the Declaration of Helsinki. The dental records at one of the main government hospitals [King Abdulaziz University Hospital (KAAUH)] in Jeddah, Kingdom of Saudi Arabia, were screened to identify suitable candidate families. Of 6705 dental records examined, 142 candidate families met the following inclusion criteria: having Saudi nationality, having at least two siblings in the family aged 4–6 and 12–16 years, and all family members being healthy. The families were contacted by telephone, and a total of 86 families agreed to participate in the study. From each family, the mother and two of her children, aged 4–6 years (C_{4-6}) and 12–16 years (C_{12-16}), volunteered, making a total of 258 participants. Verbal information about the study was given to the parents and written informed consent was obtained. All the investigations were carried out by one of the authors (AM) at the Dental Health Clinic of KAAUH.

Interview

A structured interview in the Arabic language was conducted to elicit information about the socioeconomic status of the family, oral hygiene habits of the members, and their snacking habits. The mother's education was categorized into two levels: lower education (elementary, intermediate, and secondary schooling) and higher education (bachelor's, master's, and doctor's degrees). The family income per month [in local currency: Saudi riyals (SR), 1 Euro = 5.05 SR] was recorded as low (<10,000 SR) or high (≥10,000 SR), following the national bank assessment index of income. The total number of children per family was divided into the following three categories: 2–4, 5–7, and 8–10. Information regarding diet was obtained from answers to questions on the intake of between-meal snacks (yes/no) and the intake frequency of nine commonly consumed snacks (sugar-added drinks, dates, soft drinks, sweets/chocolates, buns/biscuits/cakes, ice cream, sweetened flakes, chocolate drinks, and chips). The intake frequency was registered as no intake, once a month, once a week, two to three times a week, and once or more a day. Mothers were asked when they began to brush their children's teeth. The mothers answered the questions on behalf of the younger children, while the older children answered themselves.

Clinical investigation

States of oral hygiene and gingival health were recorded using the plaque index (PI) and gingival index (GI), according to Silness and Löe.[10,11] The facial/buccal, lingual/palatal, and approximal surfaces (mesial/distal) of teeth # 16, 12, 24, 36, 32, and 44 were examined in the mothers and their older children. Teeth # 55, 52, 64, 75, 72, and 84 were examined in the younger children. In the case of mixed dentition, the permanent molars and incisors were used (16, 12, 36, and 32), while the primary molars (64 and 84) were used if the permanent premolars (24 and 44) had not yet erupted. Firstly, the neighboring tooth and, secondly, the contralateral tooth were recorded, if an index tooth was missing. The scores from the four surfaces of the tooth were added together and divided by 4 in order to give the PI or GI for the tooth. The index for the patient was obtained by adding up the indices for all six teeth and dividing by 6.

The participants were examined under standardized conditions using optimal lighting and a tooth-drying device to register the dentition status using the DMFT index for permanent teeth and dmft for primary teeth (D/d = decayed, M/m = missed, F/f = filled, T/t = teeth). Dental caries was recorded at the D_3 level.[12] Third molars were excluded. Approximal decay was registered by taking bitewing radiographs. All approximal surfaces in the dentition, from the mesial surface of the first premolars/primary molars to the distal surface of the second molars/primary molars, were included. The radiographic caries registration was excluded