Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15604 - 15614
Received 05 March 2021; Accepted 01 April 2021.

The Effect of Mother's Education Level on Oral Hygiene Awareness and Practices among Pre-School Children of Zulfi Region, Saudi Arabia

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Annals of R.S.C.B., ISSN:1583-6258, Vol. 25, Issue 4, 2021, Pages. 15604 - 15614
Received 05 March 2021; Accepted 01 April 2021.

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Abstract –

Background: Mother's attitude towards oral hygiene practices plays a major role in their children's oral health. The high prevalence of dental caries in Saudi Arabia has been reported in numerous studies. However, none of these studies have evaluated the mother's' role of awareness and attitude towards oral hygiene.

Objective: To assess the relationship between the education level of mothers and oral hygiene practices

Methods: A questionnaire in Arabic was designed for this study. The study was carried out for a duration of seven months (August 2019 to February 2020). The participants were 108 mothers of children aged between one to seven years. Questionnaires were distributed and collected manually, the results were tabulated, and statistical analysis was done using one-way ANOVA and Chi-square test of independence.

Results: Significant decline in caries was found with a rise in levels of mother's education. Oral hygiene practices and frequency of visits to dental clinics were considerably low, and even the groups with mothers having a higher level of education did not have any statistically significant better oral hygiene practices.

Conclusions: An inverse relation between mothers' education level and caries prevalence was evident in this study, but that the overall awareness of oral hygiene practices in the city of Zulfi was low even among the mothers having higher education levels. This needs to be prioritized by the public health authorities to create awareness campaigns with a particular focus on pre-school children's mothers.

Keywords: Mothers education, Earlychildhood caries, Dental caries, oral hygiene awareness, oral hygiene practices, Pre-school children

1. Introduction:

Dental caries is one of the most prevalent chronic diseases globally. It is a multifactorial disease in nature, where it involves a multifaceted interplay of genetic, microbial, social, and biochemical factors. The impacts of dental caries include inadequate nutrition, pain, sleep disturbances, problems with speech, as well as orthodontic challenges among children[1-3]. The prevalence of early childhood caries (ECC) ranges between 6-90% in various studies conducted across the world [4]. Recent research and reports from developing and developed countries have indicated unequal distribution in the prevalence of dental caries among pre-school going children, with higher severity and prevalence, in some immigrant and ethnic groups [5-8], and the prevalence in cities of Saudi Arabia is towards the higher end of this spectrum [9-12]. Most behavioral theories, including the Theory of Reasoned Action and the Health Belief Model have confirmed the important role of attitudes and knowledge in explaining changes in behaviours[13]. These aspects are particularly emphasized when the

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role of knowledge in parents, alongside their attitudes towards their children's health status and behaviour, is assessed. Parents have been found to play critical roles in encouraging children and giving them the information required for their adoption of healthy lives [14-17]. Oral health-related beliefs, attitudes, and knowledge among parents have been found to be important in influencing toothbrushing behaviors among children [18,19]. Moreover, research has found that parents' attitudes can have a substantial positive influence on children's gingival and dental caries health [20-22].

The oral health of pre-school children depends entirely on knowledge, attitude, and practices instilled into them by their parentsand their caretakers[23].Research maintains that in health-related lifestyle among children, mothers continue playing key roles irrespective of the changing areas and roles of parental responsibilities within the family setting. Since children under the age of five years spend most of their time with mothers, their oral hygiene is directly influenced by their mothers' level of education and attitude towards development of tooth brushing habits and use of oral hygiene aids like toothbrush and toothpaste. [24,25] The habit of taking children to a dentist for a regular check-up during the pre-school stage, helps to promote oral hygiene practices and increases awareness among the children [26-29]. It also shows the preventive attitude of mothers towards maintaining a caries-free mouth and their knowledge about the importance of primary teeth.[30]Consequently, when assessing factors that promote oral health behaviors among children, more research has been suggested on family characteristics, particularly relations between children and their parents. While numerous studies have been carried out to determine the significance of parents' knowledge on oral health among school-going children [31,32], few studies have been conducted to assess the importance of the level of education among parents on issues of oral health in improving children's oral health and to minimize dental visits as a result of dental caries. Moreover, most studies have been conducted in bigger cities like Riyadh, Jeddah, Abha, etc. [33-36]. Hence this study was designed to evaluate the relationship between mother's education level and oral hygiene practices, and oral health status among pre-school children in Zulfi city, Saudi Arabia.

2. Materials and Methods:

The study was conducted in Zulfi, Riyadh region, Kingdom of Saudi Arabia. It is a cross sectional survey based on a simple, short, and direct questionnaire, written in Arabic language (participant's mother tongue) containing questions regarding mother's education status, awareness about a dental visit, use of oral hygiene aids, and presence of dental caries in their children. It was carried out for a duration of seven months from August 2019 to February 2020. Research ethic committee of the institute approved the study protocol (Approval number (approval number: MUREC-Feb 25/COM 2020/22-1). All study parts confirmed to the declaration of Helsinki Ethical Principles. The participants included mothers of children aged between one to sevenyears. Children who had any known syndromes, anomalies, chronic diseases were excluded from the study.All the participants belonged to similar socio-economic backgrounds and had been assessed to adequate healthcare and education. The authors conducted this study, who personally met the participants at their

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house after obtaining prior permission via a phone call or message. Thestudy's purpose was explained to the mothers, and written consent was obtained before distributing the questionnaires.The questionnaire consisted of six questions regarding the mother's education and oral hygiene habits of the children, frequency of dental visits, use of pacifier etc. The questions related to oral hygiene had yes or no answering options and accordingly a score of 1 and 0 was given respectively. This was a community-based study, only visual detection of carious teeth was done by the authors who are qualified dentists,and only the number of carious teeth were recorded. Statistical analysis included one-way ANOVA to determine the variation of number of carious teeth among children with different levels of education of their mother. A Chi-square test was used to compare the tendency to use oral hygiene aids with the mother's educational level and compare the history of a dental visit to a mother's educational level. The SPSS version 17 (illionois , Chicago, USA) was used for statistical analysis, and the significant level was considered at a p-value less than 0.05.

3. **Results**:

A total of 137 questionnaires were distributed. Among the total distributed questionnaires, 79% (108) of were completely answered, and 21%(29) questionnaires were incomplete. It revealed that 65.8 % of mothers had a high level of education (**Fig. 1**), most of the mothers (70.4%) had no history of any dental visit (Table 1). A score of 82.4 % was obtained for regular oral cleansing habits (Table 2), and 17.6% of them did not have a regular cleansing habit. It appeared that 60.2% of them used toothpaste & toothbrush for oral hygiene (Table 3), the reasons for not using toothpaste and toothbrush were recorded and 53.4% of the participants felt that it was too early to start using these aids (Table 4). We computed a one-way ANOVA comparing the number of carious teeth among children and different education levels of mother. A significant difference in caries occurrence was found between different levels of mother's education [$p < .05$](Table 5).A chi-square test of independence was calculated comparing the frequency of usage vs. non-usage of oral hygiene aids with mother's educational level. No significant relationship was found ($p > .05$) (Table 6). A chi-square test of independence was calculated comparing the frequency of visit to dentist vs. not visiting a dentist in the past, with mother's educational level. No significant relationship was found ($p > .05$) (Table 7).

4. **Discussion**:

Parents, and especially mothers, greatly influence their children's oral health. Mothers' attitudes towards and knowledge of oral health, in particular, play a significant role in the oral health of pre-school children. Many studies have investigated the education levels with the level of oral hygiene knowledge and practices. Almost all studies have reported that as the subjects' education level increased, so did the level of oral health knowledge [37-39]; however, the relationship between oral health knowledge and oral health practices is not consistent. [40-42].

Mothers education is considered to be an important factor for overall growth and health status of the children. In our study, 65.8% of the subjects had a higher level of education, and this proportion was higher when compared to Begzati*et al* study [43]. The authors found that an

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inverse relationship between a higher level of education and number of carious teeth was reported. [43]. These findings were in agreement with priorly published studies [44-49] reported that mother's general care of children is an essential contributing factor for dental caries.

Various researchers have studied the prevalence of caries among pre-school children. It has been noted that ECC are more common in pre-school children from low socio-economic status groups, among children brushing without parent supervision [23] and related to the use of sweetened pacifiers. The subjects in our study belonged to an upper and upper-middle socio-economic group, however even in our study, 53.7% of the participants showed the presence of carious teeth, this was higher than other many developed countries such as South Africa (49%) , England (32%) and Italy (16%) [51-56]. One of the factors to note in our study was that only a visual method was used to identify carious lesions, and if proper diagnostic aids were utilized then the caries rate could be higher, which is a grave concern for this community.

Oral hygiene practices and aids play a major role in caries prevention, in our study more than 60.2% children used toothbrushes and toothpaste for cleaning their teeth. Similar results have been reported in a study done in Dammam by Alhumaid*et al* [57] reported that more than 50% of the children used toothpaste and brush but contrasted with the findings of Amin and Al-Abad,who reported a lower prevalence (24.5%) among male Saudi primary schoolchildren. [58]. Manyother studieswere done in Saudi Arabia and India have reporteda similar range of use of toothpaste and brush as aids [18,20,26,32] but was this proportion of subjects is low as compared to other international standards and also low when compared to oral hygiene practices in the study done in the eastern region of Saudi Arabia (76.3%). [12]. Our study showed that the mothers did not use toothbrushes and toothpaste due to misconceptions regarding these oral hygiene aids, and this further emphasizes the need to educate the mothers regarding acceptable oral hygiene practices. One of the factors to note was that there was no significant relationship between the frequencies of usage of oral hygiene aids concerning mother's educational level in our study, which is consistent with the findings of Mariquez et al [59].One of the reasons for low oral hygiene awareness could be delay in introduction to oral hygiene aids such as tooth brush and paste until after the age of 7 years. The frequency of consumption of processed diet and sweetened drinks also contributes to the increased caries incidence and poor oral hygiene among this population.

According to American Academy of Pediatric Dentistry the first dental visit should be with the eruption of the first primary tooth and no later than twelve months of age [60].Moulana*et al*. and Chan *et al*. [61, 62] had a higher percentage of positive responses from mothers of children regarding the previous dental visit. On oral examination, those children were found to have low caries index. It was suggested that the earlier a child visits to the dentist, the greater would be his likelihood of being caries free [63]. In our study, even though 65.8% of mothers had a high educational status, 70.4% of the mothers didn't visit any dentist before, this was very high compared to MahaAlSarheed's study reported that 76% of them had seen a dentist [64]. Other studies were done among Saudi populations Alhumaid*et al* [57]reported the percentage of children with no previous visits as 38.3%, which is low compared to our study. These observations are in agreement with Farsi *et al*. [35]who showed that utilization

of dental services among Saudi children was of low-to-medium frequency and irregular, being mainly for pain relief.

Our study showed low awareness regarding the importance of dental visits, frequency, and type of oral hygiene aids even among parents with high education. It shows the necessity to create awareness towards dental visits among people irrespective of their educational statusProper public health education is critically required in schools or in public areas; it should be directed to the children and their parents as well.

Recent research demonstrates the impact of dental caries and its effect on a child's quality of life. Children who have received dental treatment for ECC showed a significant improvement in oral health-related quality of life [65-67]. Hence community-based solutions must be explored and used in conjunction with the existing and emerging strategies to prevent dental caries [68,69]. It should include mothers' health education, promoting first dental visit by 12 months, and self-examination. Appropriate parenting practices lead to behavioral change among parents and minimize caries in their children. [70-74].

This is one of the first studies done to assess the oral hygiene practices and attitudes of mothers of pre-school children in the Zulfi region, as this is among the interior regions of Saudi Arabia, this study would act as a pioneer for other similar studies in this population. Zulfi is a small town in the central province of Saudi Arabia, and most of the authors are residents of the same village and part of a very close-knit community. This study was a convenience sample and did not accurately represent Zulfi city's status as a whole and should be addressed in further studies. AsECC is preventable, parents' education on good oral hygiene, dietary practices, use of fluoride, and regulardental visits helps the parents prevent caries in their children. Prevention begins from pre-and peri-natal period for improving attitude and awareness of pregnant women. Caries is regarded as a multifactorial disease and a regression analysis of our data would have provided a better insight into the relationship of dental visit, mother education and other factors with dental caries and this is one of the limitations of our study and any similar study should analyse this as well.[75,76].

5. **Conclusion:**Mothers are role model for children, their attitude towards general and oral health influences their children. Despite a well-established public health system in Saudi Arabia, the awareness of oral hygiene practices in the city of Zulfi is very less, and this needs to be prioritized by the public health authorities, and awareness campaigns should be organized with a particular focus towards the mothers of pre-school children.

6. **FUNDING:** No funding was received for this project from any authorities

7. Availability of Data and Materials: The author will provide the data supporting the findings of this article upon request

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