



MATERNAL EDUCATION AND ITS ROLE IN SHAPING CHILDREN'S ORAL HEALTH

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ABSTRACT

Background: Oral health plays an important role in overall health of the body because it has a close relation to optimal physical health. Healthy oral cavity does not merely mean caries free teeth, but it means healthy gums and supporting structures. Most prevalent yet preventable disease of oral cavity is dental caries which is a multifactorial disease but is mostly caused by the vertical transmission of *S.mutans*. Children under the age of 12 are mostly influenced by their surroundings, especially mothers. So, mothers' literacy rate has a direct influence on their oral health. To improve the overall incidence rate and burden of dental caries in children, it is important that we educate mothers regardless of their socioeconomic status.

Aim: The aim of the study was to collect baseline data to evaluate Maternal Education and its role shaping children's oral health.

Method: This cross-sectional study was conducted amongst the general population of Lahore. A total of 392 mothers having children from 0-12 years of age were included. A questionnaire containing 23 questions was distributed and the results were recorded. Quantitative variables like age and number of children were presented in the form of mean and standard deviation. Qualitative data like intake of sugary food, frequency of brushing, etc. were presented in the form of frequency and percentages. A chi-square analysis was conducted to examine the association between maternal education level and responses to oral health-related questions

Results: In this study, 44.9% of mothers had an education level up to the bachelor's degree. The results showed significant associations ($p < 0.05$) between education level and several key aspects of children's oral health like awareness about caries, excessive sugary food intake (81.1%), the impact of bottle feeding on caries (71.2%), the effect of decayed milk teeth on permanent teeth (50.5%), fluoride's role in preventing caries (55.4%), and effect of

prolonged thumb sucking or bottle feeding (69.4%). However, no significant associations were found regarding the impact of breastfeeding, bacterial transmission, dental infections leading to other problems, or the likelihood of children developing caries if parents have decayed teeth.

Conclusion: The study highlights the need for targeted oral health education programs for mothers, as knowledge about oral health is limited. These programs should focus on educating mothers to reduce the oral disease burden.

INTRODUCTION:

Oral health is an integral part of the overall health and well-being of an individual. It plays an important role in a child's life.^{[1][15]} Researchers have found that there is a close relation of good oral health with optimal physical health of a person. Oral health does not merely mean having caries free teeth but also healthy supporting structures like gums, bones, surrounding mucosa, muscles, etc.^{[2][10]} A healthy oral cavity is an insurance to good nutritional intake, healthy sleep and ability to focus on daily tasks.^{[3][9][15]}

Among oral health problems dental caries is the most prevalent and severe form of disease affecting children. ^[3] The etiology of Dental caries may be bacterial via vertical transmission of *S. mutans* directly from mother to child, but it is still a multifactorial disease.^{[4][11]} The incidence of caries is increased by the frequent intake of sugary foods, infrequent brushing, low literacy rate, nocturnal bottle feeding, etc. Carriers affect the deciduous teeth more severely as compared to permanent teeth. Carious deciduous teeth have serious consequences on a child's general health, future oral health and quality of life. ^{[4][5][7]}

Children under the age of 12 are easily influenced by their surroundings and spend most of their time with their mothers. Several studies have shown that parents, especially mothers, play an important role in the overall health of their children. ^[5] So, a family-based approach should be utilized for the effective

prevention of dental caries. Mothers should be encouraged to visit dentists regularly to reduce cariogenic load from oral cavity to prevent caries.^{[6][16]} They should also be educated about how to maintain their children's oral hygiene as they will eventually influence their children's oral health directly or indirectly. ^{[6][8][13]}

The first step in improving a child's oral health is to motivate mothers, regardless of their socioeconomic situation, to practice good oral hygiene, which will eventually lead to good oral hygiene habits in their children, lowering the burden of preventable oral diseases. ^{[8][10][13]} The relevance of mothers' knowledge and habits regarding their children's oral hygiene and dental caries is critical^{[8][20]}, yet Pakistan, as a developing country, has scant published data on the subject.

Therefore, the aim of the study was to collect baseline data to evaluate the impact of Maternal Education towards awareness of Children's Oral Health in population of Lahore.

These types of studies will be helpful in the implementation of long-term awareness programs for mothers related to oral hygiene practices to prevent oral disease in their children.

Methodology:

For this study total 392 participants who were; women aged between 18-50 years, having

children under the age of 12 selected. After the approval from the IRB department of Azra Naheed Dental College, a questionnaire containing 23 questions was provided to the mothers coming for dental checkups at different institutions including Azra Naheed Dental College, CMH Lahore Dental College and Shaikh Zayed Medical Complex Lahore. The first part contained all the demographic details of the mothers regarding age and educational level. The second part contained questions regarding dental awareness of their children. The collected data was entered in SPSS version 23. Quantitative variables like age and number of children were presented in the form of mean and standard deviation. Qualitative data like intake of sugary food, etc. were presented in the form of frequency and percentages.

Inclusion criteria:

- Mothers aged between 18-50.
- Mothers who had children from 0-12 years of age.

Exclusion Criteria:

- Women who had medically handicapped children.
- Health Professionals

Results:

A convenience sampling was used, and 392 mothers were included in this study. Most mothers (44.9%) had bachelor’s degrees, and 36.7% mothers had post-graduation degrees. Only 5.4% women were under matriculation and the questionnaire was dictated to them by the principal investigator to get their responses. **(Table 1)**

Table 1

| Education | N (%) |
|---------------------|-------------|
| Under matriculation | 21 (5.4%) |
| Matriculation | 20 (5.1%) |
| Intermediate | 31 (7.9%) |
| Graduation | 176 (44.9%) |
| Post-graduation | 144 (36.7%) |

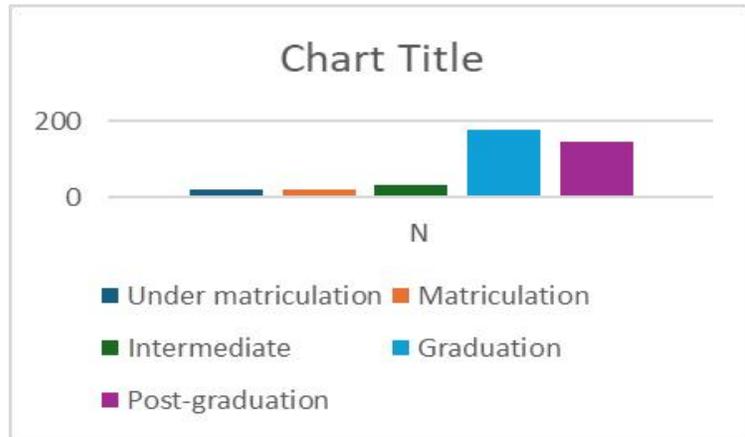
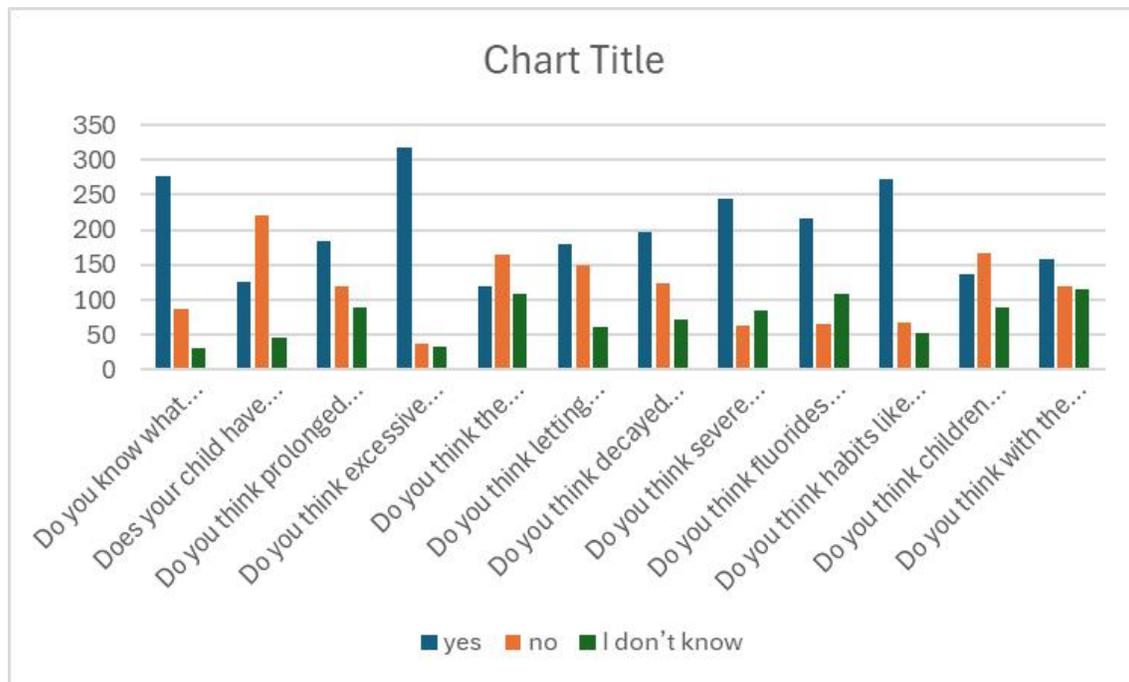


Table 4 shows the detailed answers:

| Questions | Yes N (%) | No N (%) | I don't know N (%) |
|---|--------------|-------------|-----------------------|
| Do you know what dental caries is? | 276 (70.4%) | 86(21.9%) | 30(7.7%) |
| Does your child have dental caries? | 125 (31.9%) | 220 (56.1%) | 47 (12%) |
| Do you think prolonged breast feeding or bottle feeding causes dental caries? | 184 (46.9%) | 119 (30.4%) | 89 (22.7%) |
| Do you think excessive intake of sugary foods causes dental caries in children? | 318 (81.1%) | 38 (9.7%) | 32 (9.2%) |
| Do you think the bacteria responsible for causing dental caries can be transmitted from mother to child directly? | 119 (30.4%) | 164 (41.8%) | 109 (27.8%) |
| Do you think letting your child sleep with the milk bottle in his/her mouth all night can cause caries? | 180 (45.9%) | 150 (38.3%) | 62 (15.8%) |
| Do you think decayed milk teeth can affect child's permanent teeth? | 198 (50.5%) | 123 (31.4%) | 71 (18.1%) |
| Do you think severe dental or oral infections can lead to other life-threatening problems? | 244 (62.2%) | 64 (16.3%) | 84 (21.4%) |
| Do you think fluorides prevent dental caries? | 217 (55.4%) | 66 (16.8%) | 109 (27.8%) |
| Do you think habits like thumb sucking, bottle sucking, etc. if prolonged after 4 years can affect your child's teeth? | 272 (69.4%) | 68 (17.3%) | 52 (13.3%) |
| Do you think children are likely to have decayed teeth if either of their parents have decayed teeth? | 136 (34.7%) | 167 (42.6%) | 89 (22.7) |
| Do you think with the eruption of first milk teeth parents can begin to clean them with a piece of gauze or wash cloth? | 159 (40.6%) | 119 (30.4%) | 114 (29.1%) |

Table 2



The association between the level of maternal education and parental responses to oral health-related questions was analyzed using chi-square test. Prior to analysis, categorical variables were transformed into binary variables where applicable. The chi-square test revealed mixed findings regarding the relationship between education level and oral health awareness.

No significant associations were found between the level of education and responses to questions about the association of prolonged breastfeeding or bottle feeding with oral health, the transmission of bacteria responsible for dental caries from mother to child, the impact of severe oral infections on systemic health or the likelihood of children developing dental caries if their parents have decayed teeth. These results suggest that knowledge or beliefs about these topics may not be significantly influenced by education level, as understanding them requires

expertise that is typically limited to dentists, making it a more complex issue.

In contrast, significant associations ($p < 0.05$), were observed for questions related to awareness of caries, the role of excessive sugary food intake in causing dental caries, sleeping with milk bottle can cause caries, effects of decayed milk teeth on permanent teeth, habits like thumb sucking and prolonged bottle feeding, use of fluorides to prevent caries and use of gauze to clean primary teeth. These results suggest that maternal education significantly influences awareness related to children's oral health, particularly regarding dietary habits, and early dental care, in young children.

DISCUSSION:

This cross-sectional study was aimed to assess the influence of maternal education and awareness towards their children's oral health.

The results of this study were like those studies carried out in Ethiopia. ^{[1][9]} This study showed an interrelation between maternal education level and child's oral hygiene. Children: mostly under the age of 10, spend a great amount of time with their parents, especially their mothers, so they directly influence their children. ^{[1][4][9]} As we know "prevention is better than cure", early child visits to dentists help in prevention of overall bacterial load thus reducing the caries in children. According to American Academy of Pediatric Dentistry (AAPD) "the first visit should be at the time of eruption of first primary tooth and no later than 12 months". Regular early dental visits build rapport between children and dentists. The earlier the dental education and health is introduced to a child, the firm his habits become because dental health is as important as overall body health. Most mothers take their children to the dentist after they see a dental problem. This result could be due to low education level and lack of dental awareness. ^{[3][21]} Mother's education also plays a key role in the oral health of children. Caries is still the most prevalent and chronic form of disease. Despite multiple efforts young children are still more prone to it. So, mothers who have proper knowledge of brushing technique, flossing and use of fluorides will be better able to take care of the children's oral health issues. These results are similar to another study done in Pakistan where it was observed that young mothers having higher education levels had more knowledge and awareness of dental caries and importance of oral hygiene. They also played a significant role in using toothbrushes and floss by their children. ^[19]

Socioeconomic status also plays a vital role in the promotion of oral health education. Oral health is dependent on income. Especially in today's world where inflation is on the rise, a child's oral health often takes a backseat since parents think that dental treatments are costly and unnecessary. Jiyan et al. stated in their

study that families having higher socioeconomic status were more concerned about their child's oral health. Socioeconomic status, parents' education and oral health are interlinked. ^[19,20] Other etiological factors like diet and frequency of intake of sugary foods are also related to poor oral health. It has often been observed that children from the villages have less caries load because of their diet even though they have less dental education and facilities. They have less access to sweets and toffees and prefer to eat natural food like fruit etc. This in turn reduces their bacterial load but that does not mean they do not have caries. Children from the urban areas have more access to processed food and sweets so they are more prone to caries. In contrast to previous studies 81% women in our research knew processed food and sugars cause increase caries. ^{[14][19][21]}

Not only this, prolonged bottle feeding also negatively affects children's oral health. "Baby bottle caries" is often associated with children who sleep with the milk bottle inside their mouth. Not only nutritive sucking, but non-nutritive sucking also such as thumb sucking and other parafunctional habits have negative role in overall oral health and development of children. Habits like bruxism, nail biting, and thumb sucking under the age of 5 are normal but beyond this age the effects on oral health are irreversible. Problems like prognathism and proclination of maxilla and maxillary tooth respectively as well as other problems like malocclusion, poor oral hygiene, crowding, over biting, etc. can also occur. Previous studies show that children using milk bottles and pacifiers are at a higher risk of developing Angles' Class II malocclusion. The results of our study showed that 69.4% mothers had knowledge regarding developmental jaw and dental problems in accordance with previous studies. ^{[9][23]}

As discussed previously, caries is the most prevalent and chronic form of disease in oral

cavity, and it is a multifactorial disease. In addition to this, direct transmission of *S. mutans* from mother to child is also responsible for the caries incidence. The higher the bacterial load the higher the chance of caries incidence. Since mothers have intimate contact with their children, it has been determined through various research that the majority of the *S. mutans* colony is through vertical transmission, however it can also occur through horizontal transmission as well. The findings of this study were in accordance with previous studies where the majority (77.8%) of mothers disagreed to the fact that they can be the primary source of caries via vertical transmission of *S. mutans*.^{[4][11][12][23]}

Parents usually don't pay attention to primary teeth thinking they will eventually shed off. As soon as the first primary teeth occur in the oral cavity, parents should start cleaning it with gauze or cloth. But parents tend to ignore it and start brushing when all the primary teeth have erupted in the oral cavity.^[13] Majority don't encourage children till the age of 4 to brush their teeth. Inclusion of oral hygiene habit as soon as the teeth begin to erupt has a better outcome on the overall oral and physical health of a child. Primary teeth lay the foundation of permanent teeth and predict their growth pattern. As severe oral diseases can cause other life-threatening issues, primary teeth should never be left untreated thinking they will eventually shed. Infections can cause severe bone disease or early shedding leading to malocclusion and crowding. 50% of mothers agreed in this research that decayed primary teeth somehow affect the permanent teeth, which is alarming. Primary teeth should be given the same importance as the permanent teeth. A study conducted by Setty et al showed that 74% of parents were not willing to get their children's primary teeth treated stating the fact that they will eventually shed off. The results coincide with our study as only 50% of mothers agreed

that any problem in primary teeth can cause problems in permanent teeth. This highlights a common misconception, as primary teeth are often undervalued by parents who assume they will eventually shed and be replaced, overlooking their critical role in oral health.^{[10][14][25]}

Oral health education is an essential component of oral health promotion, so while designing dental health promotions following points should be kept in mind:

- Targeting the lower socioeconomic communities
- ART programs to target large number of communities
- Educative sessions in schools to promote oral hygiene
- Using mass media to provide awareness
- Running dental awareness programs on mass scale.

Proper tooth brushing techniques and regular dental checkups should be encouraged. Early exposure to dentists helps children become comfortable with dental visits, making it easier for them to receive treatment when they develop tooth-related issues. Just as a strong educational foundation is essential for children to excel, instilling good dental habits early in life lays the groundwork for lifelong oral health. This can be achieved by educating mothers.

Limitations:

This study had limitations including the sample bias. The sample was collected from mothers who had good education and socioeconomic status living in Lahore. Regardless of the results of this research it is important to know that there are a few factors that will always determine the child's oral

health: Mother's education and awareness and the socioeconomic status of the family.

The results of this study were rational, however, there is still room for improvement. There were still some factors that mothers had less knowledge about, like the importance of primary teeth, first dental visit, when to start toothbrushing etc. The findings of this study show critical factors that have direct influence over children's oral health but due to limitations this result was confined to a small community. However, if other parts of the community are targeted the result might be discouraging because mother can have only so much knowledge. So, emphasis should be given to the awareness and importance of oral health awareness among mothers regarding their mothers.

CONCLUSION:

The result of this study shows that mothers had limited awareness regarding oral health of their children. Oral health education programs targeting mothers and mostly young children are essential to promote oral health among children and fill the gaps in knowledge for mothers regarding oral health care for young children.

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