# Mothers' Awareness, Attitude and Practices Regarding Oral Health of Preschool Children

**Asmaa Yousef Mohamed [(1)], Salwa Abbas Ali Hassan [(2)], and Asmaa Ali Elsayed Ali [(3)]**

[(1)] B.Sc. Nursing, Faculty of Nursing - Zagazig University, [(2)] Professor of Community Health Nursing, Faculty of Nursing - Zagazig University, & [(3)] Lecturer of Community Nursing, Faculty of Nursing - Zagazig University.

**Abstract**

**Background**: An essential technique for predicting a parent's perspective on their child's oral health is the evaluation of their knowledge, attitude and dental hygiene habits. It is possible to discover abnormalities early and avoid tooth cavities by practicing proper dental hygiene. **Aim of the study:** Was to assess mothers' awareness, attitude and practices regarding oral health of preschool children. **Subjects and Methods; Design:** A descriptive cross-sectional design was utilized to conduct the current study. **Setting:** Eleven governmental nursery schools in Awlad Sakr City, Al Sharkia Governorate participated in the study. **Subjects:** In this study, 400 mothers of preschoolers and their children participated. **Tools of data collection:** To gather data for the study, five tools were utilized, including: 1) an interview form with three parts: Sociodemographic data, information about the mother's pregnancy, delivery and the child's dental history. 2) Mothers' awareness tool. 3) Mothers' attitude tool. 4) Mothers' practices tool. 5) Observation checklist. **Results:** Approximately 75.5% of the mothers in the study had satisfactory level of awareness about dental health, 69.3% of them had positive attitude while 67.3% of mothers practice were poor. Additionally, there were statistically significant relation between preschoolers' dental health and their mothers' awareness, attitudes and practices. **Conclusion:** The dental health condition of the children under study is influenced by the mothers' good knowledge, positive attitude and adequate oral hygiene practices. **Recommendations:** Training program for preschool mothers about oral hygiene and optimal brushing technique for oral health promotion, and further studies are needed to confirm study findings.

**Key words:** Awareness, Attitude, Practices, Oral health, Mothers, Preschool children.

## Introduction:

Oral health is crucial, mainly in early childhood, because it influences and determines an adult's dental health. Thus, it is essential to maintain young children's dental health, and their parents have a major role who is the main decision-makers. Children's oral health is influenced by their parents' oral health-related knowledge, attitudes, and practice (KAP) [(1)].

Mothers' awareness of the importance oral health hygiene has been found to be directly associated with establishment of better brushing habits and more frequent daily brushing in children [(2)]. The dental health of children is influenced by the oral health knowledge of their mothers since early childhood is a critical period for the establishment and maintenance of dental hygiene and nutrition practices [(3)].

Mothers' attitude toward children's oral health plays an important consideration to improve children's oral health [(4)], moreover; mothers' positive attitudes towards oral health were associated with better children's dental and gingival health. In addition, parental oral health behavior also found to influence the children's oral health status (gingival and dental health) either directly or indirectly by influencing kids' dental health

behaviors. Thus, it is essential to comprehend and take into account what parents know about oral health. When working on behavior change and encouraging health promotion [5].

Mothers have the responsibility of teaching good oral habits and routines, along with healthy dietary habits and hygiene techniques during early years of life, because a strong foundation of dental norms is important for the future dental health of the children [6]. While dental diseases and periodontal diseases occur due to poor oral hygiene practices [7].

Researches revealed a relationship between parents' knowledge, attitudes, and practices regarding their children's oral health. Consequently, this relationship can impact the level of parental care, which in turn impacts the children's overall health and oral health in particular [8, 9].

The Nursing and Midwifery Council states that a nurse should "assess needs for and provide appropriate oral, dental care and decide when an onward referral is needed". This statement highlights the significance of the nurse's involvement in oral health care [10].

**Significance of the study:**

Preschoolers are particularly vulnerable to dental disorders, making oral health a key component of overall health [11]. In order to create and uphold significant dental standards in the future, it is imperative to establish fundamentally sound oral hygiene practices in children. The influence of family history on the adoption of dental hygiene habits is significant. Indeed, when parents have proper knowledge regarding oral illnesses and healthy dental practices, they can play a crucial role in helping their children develop a favorable dental attitude as well as appropriate food and hygiene behaviors [12].

The majority of a child's life under five years old is typically spent with their parents or carers, particularly mothers. Since the earliest childhood routines and habits are formed during these formative years, they are crucial building blocks for children's overall health, including dental health [13].

**Aim of the study:**

The current study aimed to assess mothers' awareness, attitude and practices regarding oral health of preschool children.

**Research Questions:**

1. What is mothers' awareness level regarding oral health of preschool children?
2. What is mothers' attitude regarding oral health of preschool children?
3. What are mothers' practices regarding oral health of preschool children?
4. Are there relation between mothers' awareness, attitude, practices and oral health of preschool children?

**Subjects and Method:**

**Design:**

This study was carried out using a cross-sectional descriptive design.

**Setting:**

Eleven governmental nursery schools in Awlad Sakr City, Al Sharkia Governorate participated in the study.

**Subjects:**

There were 400 preschool-aged children and their mothers as total subjects in this study plus an additional 40 preschool mothers who were enrolled in a pilot study then excluded from the main study.

- **Inclusion criteria:**
  1. Both genders.
  2. Age range: 3-5 years.
  3. Free from long-term illness or physical or mental impairment.

**Sampling technique:**

A random multistage cluster sampling approach was employed in this study's recruitment participants as follows:

- **Stage 1:** Out of the 23 districts in the Sharkia Governorate, Awlad Sakr was chosen in random way.
- **In the second stage:** 11 randomly selected nursery schools were chosen from among the 41 nursery schools that make up the Awlad Sakr educational administration.
- **In the third stage:** One class from each nursery was chosen randomly There were eleven classes in all, every student in the chosen classes was a part of the sample.

**Sample size:**

According to **Mahmoud and ELsayed** [14], the sample size is calculated to estimate the prevalence of mothers' sufficient knowledge or appropriate practice for the dental health of their preschool-aged children, which is 47.0% and 44.3%. A sample size of 380 mothers is needed for prevalence, with a 95% confidence level and 5% absolute precision, according to the Open EPi software programme. This raised to 400 in order to accommodate for the anticipated 5% non-response.

**Tools for data collection:**

To gather data, the following five tools were used:

**Tool (I): An Interview questionnaire:** Questionnaire for interviews created by the researcher based on the most recent research in the field and it is made up of the following:

- **Part A: Sociodemographic data** of the mothers of preschoolers include items like the number of family members, housing, family income, presence of a computer, and the education and occupation of the father and mother. The house's room count, crowded index and the type of family. Additional information about preschoolers, including age, gender, order of birth, and name of nursery.

**Scoring System:**

This part was utilized to assess the participants' social status which include age, class, place of residence, parents' educational attainment, the occupation of fathers and mothers, the number of rooms in the house, the number of family members, and the family income, and housing quality are among the factors that adapted by **El-Gilany et al.** [15].There are 48 grades in total.

**If the total social score:**

- From ≥ 70% (33.6-48) seen as belonging to a higher social class.
- From 40-70% (19.2-<33.6) are regarded as medium.
- While 19.2 grades, or less than 40% are classified as low social class.

- **Part B:** Four questions make up the **children's dental history:** Whether the child has dental or oral health issues, what kind of issues the child has (tooth decay, gingivitis, tooth abscess, damaged teeth, and gingival bleeding, for example). Is the child's mouth injured?. Furthermore, the location of the injury.
- **Part C:** Information about the **mother during pregnancy and labour:** Four questions were asked, including the mother's age at marriage, the number of pregnancies, the number of labours, and the pregnancy follow-up.

**Tool (II):** The following were the components of **mothers' oral health awareness:** These 16 questions, which were taken from **Mahmoud et al.** [16], were as follows:

**A.** Knowledge of milky teeth: Consists of three questions: How many milky teeth does the child have? When did you take your child to the dentist? What resources do you use to learn about oral health?

**B.** Two questions consisted of knowledge **about dental paste:**

Whether fluoride is present in the paste and how important it is.

C. **Knowledge about the most prevalent dental diseases, their causes, and ways to prevent them:** Consisting of four inquiries: The most prevalent dental condition affecting children, the reasons behind gum disease, and extra preventative actions for gingivitis and gingival hemorrhage.

D. **Knowledge** about the beauty of teeth consisted of four questions: Why do irregular teeth occur; should the misaligned teeth be straightened into their proper positions; and should a child brush their teeth after every meal? In addition, the youngster may brush their teeth by themselves, with their parents, with their grandparents, or they may not be able to brush at all.

E. **Dietary awareness questions** drawn from **Alkhtib and Morawala** [17] consisted of three questions: For instance: The effect of diet on children's oral health sweets, beverages with added sugar, and meals like cheese, milk, and veggies, frequently consuming sweets and Infant feeding technique (bottle feeding, breast feeding, or both).

**Awareness scoring system:**

The knowledge items were scored with a 1 for a correct response and a 0 for a wrong response. The item scores were added up for each area of expertise, and the total was divided by the total number of items to get a mean score for the part. These scores converted into a percent score, averages and standard deviations were calculated. With a total score of 25, knowledge was deemed adequate if the percent score was (>15) 60% or higher and inadequate if it was (<15) 60%.

**Tool (III): Mothers practices** regarding oral health, it included **practice check list** and guided by **Rajana et al.** [18] **and Ibrahim et al.** [19], it was multiple choice items. The mothers choose the best option to assess the basics of the oral care and technique of dental hygiene. It contains ten questions about practice of brushing teeth and equipment to be used. This part composed of A, and B sections.

**Section A:** Contains questions about age of starting teeth brush, equipment need, type of tooth brush, when should change the brushes, duration brushing teeth, timing (among, before sleep …et.), way of brushing and the amount of tooth paste.

**Section B:** Covered the seven steps for brushing teeth.

**Practice scoring system:**

One was awarded for a correct response on the practice questions, and zero for a wrong one. The mean score for each practice area was calculated by adding up all of the item scores and dividing the result by the total number of items. The averages and standard deviations were calculated, and these scores were transformed to a percentage score. Ten was the total score. If the practice scored between 70 and 100 (7-10), it was deemed good; if it scored below 70%, it was deemed poor.

**Tool (IV): Mothers' attitude** regarding oral health and it adapted from **Duguma and Wassihun** [3], it included 8 questions such as: Everyone should have regular visit to dentist for dental health care, regular use of toothpastes is important, Used of anti-cares paste for milky teeth is unnecessary, teach the child how to brush the teeth, rinsing the oral cavity post every meal, daily teeth brushing with paste can cause mouth bad oder and bleeding gum. Believed not give any attention to oral health until presence of problem and I believed tooth ache affect the child growth and general health.

**Attitude scoring system:**

The responses "strongly agree", "agree", "no opinion", "dis agrees" and

"strongly disagree" were respectively scored 5, 4, 3, 2, and 1. The scoring was reversed for negative statements; the items including negative attitude sentences (3, 6, and 7) were reversely coded. A mean score was obtained by adding up all of the item scores and dividing the result by the total number of things. The median is used as the cutoff point after these scores were converted to a percent score and means and standard deviations were calculated. The final score was 40, with a score of 21 or above indicating a positive attitude and a score of less than 21 indicating a negative attitude.

**Tool (V): observation checklist:** Using an oral health assessment tool for non-dental professionals, such as nurses, the researcher evaluated the oral health of preschool-aged children using an observation checklist. The tool was adapted from **Chalmers et al.** [20] and comprised seven categories, including those related to lips, tongue, gums and tissues, saliva, natural teeth, oral cleanliness, and dental pain.

**Scoring system:**

Each category received a score of two (unhealthy oral cavity) or zero (healthy oral cavity). The range of total points was 0 to 14. The greater the rating (>8.4) regarded as having poor oral health.

**Preparatory phase:**

In order to fully comprehend the research problem and the methodology, the investigator allocated sufficient time to examine the existing literature in the field and gain theoretical understanding of the various research facets through the use of books, articles, online periodicals, magazines, and other media. Additionally, the investigator developed tools for gathering data relevant to the research topic.

**Content validity and reliability:**

Three experts, two community health nursing professors and one assistant professor from Zagazig University, reviewed the tools' content for comprehensibility, understandability, and clarity. Their feedback and criticisms were taken into consideration when modifying the tools.

The tools' internal consistency was evaluated by computing their Cronbach alpha coefficients. The following table's Cronbach alpha coefficient values demonstrate their satisfactory reliability.

| Tool | Cronbach Alpha |
|---|---|
| Awareness | .860 |
| Practice | .75 |
| Attitude | .63 |
| Oral health standard | .84 |

**Pilot study:**

A pilot study was conducted with 40 participants, or 10% of the overall sample under study, who were enrolled in the nursery schools run by the Awlad Sakr educational administration. The goals of the pilot study were to assess the study tools' applicability, clarity, and feasibility as well as how long it would take to finish the data collection. Every participant was given a detailed explanation of the study's objectives. Pilot study was not included in the sample under study.

**Field work:**

After authorization to continue with the study was given. After getting the mothers' consent to participate in the study, the researcher evaluated each child's oral health in the morning using an observation check list, taking five minutes for each child. Next, the researcher collected the mothers and gave them interview questionnaires, which each mother completed in a total of twenty to twenty-five minutes. Work was done three days a week, on Saturday, Monday, and Wednesday, from 9:00 AM to 1:00 PM. Six months of data collection from the beginning of October 2022 and ended in March 2023.

**Administrative and Ethical considerations:**

The first came from the Zagazig University Faculty of Nursing's

Research Ethics Committee (REC). Then parents (mothers) have been fully informed of the study's purpose, their consent will be requested. In addition to being informed that they can withdraw from the study at any point throughout data collection. They will also be guaranteed that the data would be kept private and utilized exclusively for research. The researcher guarantees that the subject's data will remain confidential and anonymous.

The Post-graduate Department of the Faculty of Nursing at Zagazig University sent an official letter outlining the study's purpose to the director of Awlad Sakr Educational Administration, in order to implement the administrative design. The researcher was directed by the director general to the directors of the designated nursery schools who provided letters of consent. The researcher then visited with each of them and gave an explanation of the purpose of the study as well as the type of tool being used to collect data. A copy of the tool and the official letters were given by the researcher to the social worker and the nursery school director.

**Statistical analysis:**

Using the statistical software programme SPSS 22.0, data input and statistical analysis were completed. For qualitative variables, data were presented as frequencies and percentages; for quantitative variables, means, standard deviations, and medians were used in place of descriptive statistics. To evaluate the internal consistency of the produced tools and determine their reliability, the Cronbach alpha coefficient was computed.

A chi-square test was used to compare qualitative categorical variables (X2). The Fisher exact test was utilized in place of other tests where the predicted values in one or more of the cells in a 2x2 table were less than 5. To evaluate the associations between ranked and quantitative variables, the Spearman rank correlation was employed. Using multiple linear regression analysis, the independent predictors of the awareness, practice, attitude, and oral health assessment scores were determined after homoscedasticity and normality tests were completed, as well as an analysis of variance for the full regression models. A p-value of less than 0.05 was deemed to be statistically significant.

**Results:**

**Part I: Demographic characteristics of preschooler's family**

**Table (1):** Shows 52.5% of fathers and 49.5% of mothers graduated from university, considered the parents work 39.7% of fathers were employee and 78.34% of the mothers were house wife, and 47% of parents reported the family income were enough for daily needs.

**Part II: Mothers awareness, attitude and practices among preschool children**

**Figure (1):** Demonstrates the mothers' level of awareness regarding oral health; 75.5 % of them had a satisfactory level of knowledge.

**Figure (2):** Shows the total mothers' attitude toward oral health, according to the figure 69.3% of them had positive attitude and 30.7% had negative.

**Figure (3):** Indicates total level of mother's oral practice was poor among 67.3% of them.

**Part III: Relations between mothers' awareness, practice, attitude regarding oral health**

**Table (2):** Reveals statistical significant relation between mothers' total awareness and their total practice, attitude and child oral status (p=.004).

**Part IV: Correlates and predictors of mothers' awareness, practice, attitude regarding oral health**

**Table (3):** Illustrates statistically significant positive correlation were

found between awareness, practice and attitude (R=.424, .412) respectively. While statistically significant negative correlation was found between awareness and child oral health assessment (R=-.257). On the other hand statistically significant positive correlation was found between practice and attitude (R=.350). While statistically significant negative correlation was found between practice and children oral health assessment (R=-.240). Additionally statistically significant negative correlation was found between attitude and children oral health assessment (R= -.184).

Correlation matrix of mothers' awareness, practice, attitude and their personal characteristics, **Table (4)** shows statistically significant positive correlation were found between awareness, age of mother at marriage, educational level, and social class (R=.235, .419, .226 respectively). More over statistically significant positive correlation were found between practice and attitude and their personal characteristics.

**Table (5):** Provides the maternal awareness score's best-fitting linear regression model. It shows that the mother's educational attainment and age at marriage were statistically independent positive predictors of the mother awareness score. The r square result indicates that 42% of the variation in the mother awareness score can be explained by the regression model.

**Table (6):** Shows best fitting multiple linear regression model for mothers' practice score, age at marriage and overall awareness score were found to be statistically independent positive predictors of mothers' practice scores. The r square value of the regression model suggests that it accounts for 45% of the variation in mothers' practice scores.

The optimal linear regression model for mothers' attitude score is shown in **table (7)** shows that the total awareness score, Mothers' attitude score was statistically significantly positively predicted by social class. According to the r square value, the regression model accounts for 43% of the variation in mothers' attitude scores.

**Discussion:**

The oral health care that parents give their preschool-aged children is extremely important because it not only establishes the child's current oral health status but also forms the foundation for the attitudes and behaviors that a child adopts at this age and will carry into adulthood. Parents' awareness and education is the key to improving their children's dental health [(21)].

**Concerning demographic characteristics of preschool children' family,** the results of the current investigation showed that about half of the mothers had a university degree due to the fact that employment opportunities in Egypt require higher educational levels. This finding disagreed with the finding of the study conducting in Chennai by **Gurunathan et al.** [(4)] who found that more than one third of mothers had studied up to school level and more than half of them than half of them had completed diploma/degree. This discrepancy might be related to socioeconomic differences between both study subjects.

According to the findings of the current investigation, over three quarters of mothers were house wives, and the rest worked mother. This might be attributed to socioeconomic and cultural status of the study sample. These results are consistent with the outcome of a research in Malaysia carried out **Adil et al.** [(22)] found that the parents in the study, over half of them, had jobs. Also, the study finding was consistent with **Hamasha et al.** [(23)] who revealed that about half of the Saudi Arabian parents were governmental employees.

Additionally, near to half of the studied family income was only enough for daily needs. This could be explained by the high cost of living in Egypt right now. Likewise, research conducted by **Helal et al.** [24] in Egypt and declared that almost half of the studied respondents had enough monthly income only for their daily demands. On the other hand, **Alshammari et al.** [25] in Saudi Arabia declared that most of the studied participants had medium monthly income level.

One of the most important things parents can do to protect their children's oral health and avoid oral disorders is to raise their awareness of the issue [26].

**With reference to responding to the initial research question about mothers' awareness of preschoolers' dental health.** The current study's findings showed that, in terms of oral health, around three quarters of the mothers who were evaluated had satisfactory overall awareness, whereas nearly one quarter had inadequate overall awareness. This might be the result of social media campaigns or educational programmes, and the parents in the current study had high levels of education and heightened consciousness.

This finding was consistent with a study conducted in South Africa by **Nepaul and Mahomed** [27], who discovered that the majority of parents possessed adequate knowledge regarding their children's dental health. In accordance with this, an Iranian study conducted in 2022 by **Basir et al.** [28] confirmed that parents' level of knowledge regarding their children's dental health was enough. The results of this study contradict those of a study conducted in the USA by **Naidu and Nunn** [21], which found that the parents and carers of preschool-aged children in this sample had a fair knowledge of oral health.

Conversely, the findings of the present study were at contrast with those of **Khanduri et al.** [9], who conducted a study in Nepal and reported that parents' levels of knowledge were often low, coming to the conclusion that, It is necessary to raise public knowledge of the value of teeth that are deciduous, encourage routine examinations for dental health, and provide parents education programmes on oral health. The socioeconomic disparities and educational attainment of the two study subjects may be connected to this discrepancy.

The present study revealed that parents' oral health-related attitudes can affect their children's oral health. Therefore, parents should favorable oral health behaviors and satisfactory attitude to inculcate necessary oral health habits in their children [29].

**With reference to responding to the second research question concerning mothers' attitudes towards preschoolers' oral health.** The result conveyed that more than two thirds of them had positive attitude, while less than one third of them had negative attitude. This could be because the majority of the mothers in the study had high level of awareness and education.

This result was in same line with the study performed by **Babu et al.** [30] in India who stated that over 50% of mothers had positive attitude regarding oral health of their children. Likewise in United Arabs Emirates, **Mahmoud et al.** [16] stated that the majority of the studied mothers had excellent attitude toward their children's oral health issues. On contrary, in India a study performed by **Dhull et al.** [31] revealed that, maybe as a result of their lack of education, Indian mothers had a generally negative attitude towards the dental health care of their kids.

**Considering the third research question answering about mothers' practices towards preschoolers' oral health,** the findings of the current study represented that total level practice of mothers was poor among more than two thirds of them. This

may be attributed to level of education, social standard and family income that may play a role in level mother's practices of children oral health.

This result was consistent with **Khubchandani** [32] who carried out a study in India discovered that the majority of mothers' practices regarding their children's dental health were inadequate. So, preschoolers and early children require better dental health care practices. In the same context, the present study outcome was in line with a study in India, performed by **Kumar et al.** [33] and mentioned that most of the studied parents had poor practices towards dental health of their children. Consistently, a study in Morocco by **Chala et al.** [8] confirmed that limited oral health practices scores were observed among the studied mothers.

**Regarding the fourth research question answering about the relation between mothers' awareness, attitudes, and practices and preschoolers' oral health.** The current study found highly statistically significant relationships between mothers' awareness, practice, and attitude towards oral health and the oral health assessment of their children. These relationships were found to be related to the oral health condition of the children. According to the study, this could be due to more mothers are aware of the need of good oral hygiene practices and having a positive attitude, which in turn reflects optimum dental health for their children.

Similarly, in India, **Pawar et al.** [34] found that a strong correlation between mothers' dental health status and their children and their knowledge, practice, and attitude. They came to the conclusion that mothers' good knowledge, upbeat attitudes, and satisfying practices about their children's oral hygiene had a positive impact on the dental health of the children under study. Within the same framework, research by **Chala et al.** [8] in Moroco and **Khanduri al.** [9] in Nepal made clear that there was a relationship between parents' knowledge, attitudes, and practices regarding their children's oral health. As a result, it could influence the degree of parental care, which in turn could impact the children's overall health as well as their oral health.

**Pertaining to correlations between mothers' awareness, practice, attitude regarding oral health and children oral health assessment**, the current investigation showed that Practice, attitude, and awareness were shown to be statistically significantly positively correlated, whereas awareness and the assessment of children's dental health were found to be statistically significantly negatively correlated. On the other hand, statistically significant positive correlation was found between practice and attitude.

However, there was a statistically significant negative association found between mothers' practices and attitudes and the oral health assessment of their children. This might be taken to indicate that mothers with high levels of awareness have a positive and significant influence on their attitude and practices towards the oral health of their children, which reduces the occurrence of oral health issues. According to **Alshammary et al.** [35] who conducted a study in Saudi Arabia, one of the key elements in preventing oral disorders and enhancing their children's oral health is parental knowledge

Likewise in Iran, **Basir et al.** [28] revealed that there was a significantly strong negative correlation between oral health assessment score and practice adequacy percentage. Also, a study done by **Chandran et al** [36] in Kerala, India found that there was significant positive correlation between parents' knowledge, attitude and practice regarding their children oral health.

In India, according to **Gurunathan et al.** [4] parental

knowledge had significant effects on the oral health assessment score of the study participants' children and practice but weakly affected by their beliefs and attitudes, as the oral health problems in many children was high although the high attitude scores of their parents.

**Concerning correlation between mothers' awareness, practice, attitude and their personal characteristics,** the present study showed that highly statistically significant positive correlations were found between awareness, age of marriage, educational level, and social class. Moreover, statistically significant positive correlations were found between practice and attitude and their personal characteristics. This can be explained as mothers with older age of marriage, high level of education and social class are more likely to have level of awareness, positive attitude and satisfactory practices regarding their children oral health.

In this concern, a study by **Naidu and Nunn** [(21)] in India declared that the level of knowledge increased with educational level and marriage age. Mothers with higher education and older mothers are thought to have better opportunity to obtain information and experience about childcare than mothers with lower education levels.

Also, **Nepaul and Mahomed** [(27)] in Kwazulu-Natal, South Africa mentioned that the level of family socioeconomic status was identified as significant predictor of knowledge, practice and attitude scores among the studied population. Also, study done by **Al Mejmaj et al.** [(37)] in Saudi Arabia found that statistically significant positive correlation between practice, attitude and their personal characteristics.

The results of the current study showed that mother's educational level and age of marriage were statistically independent positive predictors of mother awareness score, **which led to the development of the best fitting linear regression model for mother awareness score.** This might be taken to indicate that mothers' awareness is greatly influenced by their educational attainment and marital age; **Chen et al.** [(38)] found that mothers in China who married at a younger age and had less education also tend to know less about dental health. Improved general education levels may enable mothers to identify reliable sources of information and comprehend them more thoroughly.

**Regarding best fitting multiple linear regression model for mothers' practice score,** the current findings displayed the total awareness score and the age of marriage were both statistically significant positive predictors of the mothers' practice score. This could be explained by the fact that mothers who are married later in life and who are more conscious of oral health issues are more likely to practice good oral hygiene with their children.

Regarding this matter, in Saudi Arabia **Kotha et al.** [(13)] whose study mentioned that any decrease in the oral health awareness among the parents will influence in maintaining diet and hygiene practices within their children. Consistently, in Lithuania, Europe a study by **Petrauskienė et al.** [(39)] claimed that mothers who are younger when they were married have less knowledge, which affects their parental practices. Parents who are well-informed about dental health would monitor their child's food and, consequently, their cleanliness habits, which are all strongly correlated with one another.

**Regarding best fitting multiple linear regression model for mothers' attitude score,** the current study represented that total awareness score, mothers' attitude score was statistically independently and positively predicted by socioeconomic status. This could be explained as mothers with older age of marriage and high level of awareness are more

likely to have satisfactory practice regarding children oral health.

This result was congruent with **Hamasha et al.** [23] in Saudi Arabia, and **Al-Rashdan et al.** [40] in Jordan who reported that mothers' socioeconomic status and awareness regarding oral health directly affects attitude toward their children's dental health. Knowledge and awareness have an impact on health-related behaviors.

**Conclusion:**

**Based on the results of the current investigation:**

It can be concluded that about three quarters of the studied mothers had satisfactory level of awareness regarding oral health, more than two thirds of them had positive attitude while more than two thirds of mothers practice were poor. Furthermore, there were statistically significant relation between mothers' practices, attitudes, and awareness of their children's dental health in preschool.

**Recommendations:**

The recommendations suggested in light of the study's findings:

- Maintaining dental health education programmes for mothers of preschool-aged children.
- Training program for preschool, mothers about oral hygiene and optimal brushing technique for oral health promotion.
- Further studies are needed to assure study results.

**Table (1): Family demographics of preschool-aged children (n=400)**

| Demographic characteristics | Frequency | Percent |
|---|---|---|
| **Father's Educational level:** | | |
| Can't read & write | 22 | 5.5 |
| Read & write | 27 | 6.8 |
| Basic education | 16 | 4.0 |
| Secondary | 118 | 29.5 |
| University | 210 | 52.5 |
| Post graduate | 7 | 1.8 |
| **Father's job:** | | |
| Not work | 26 | 6.5 |
| Worker | 49 | 12.3 |
| Farmer / Craftsman | 65 | 16.3 |
| Businessman/ tradesman | 47 | 11.7 |
| Employee | 159 | 39.7 |
| Professional [teacher, doctor, lawyer…..] | 54 | 13.5 |
| **Mother's Educational level:** | | |
| Can't read & write | 13 | 3.3 |
| Read & write | 25 | 6.3 |
| Basic education | 26 | 6.5 |
| Secondary | 131 | 32.7 |
| University | 198 | 49.5 |
| Post graduate | 7 | 1.7 |
| **Mother's job:** | | |
| Not work [house wife] | 313 | 78.3 |
| Work | 87 | 21.7 |
| **Type of work** | | |
| Employee | 27 | 31.0 |
| Professional [teacher, doctor, lawyer…..] | 60 | 69.0 |
| **Family income:** | | |
| Insufficient & loan | 26 | 6.5 |
| Merely sufficient for everyday needs | 188 | 47.0 |
| Enough daily needs & emergency | 174 | 43.5 |
| Sufficient & saving | 12 | 3.0 |

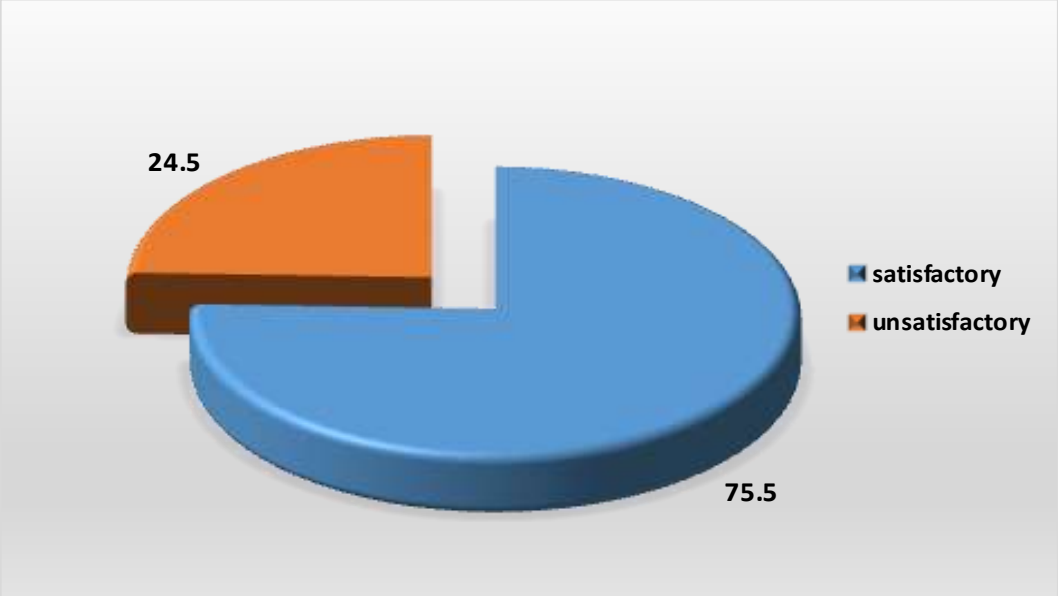


**Figure (1): Mothers' overall level of oral health awareness (n=400)**

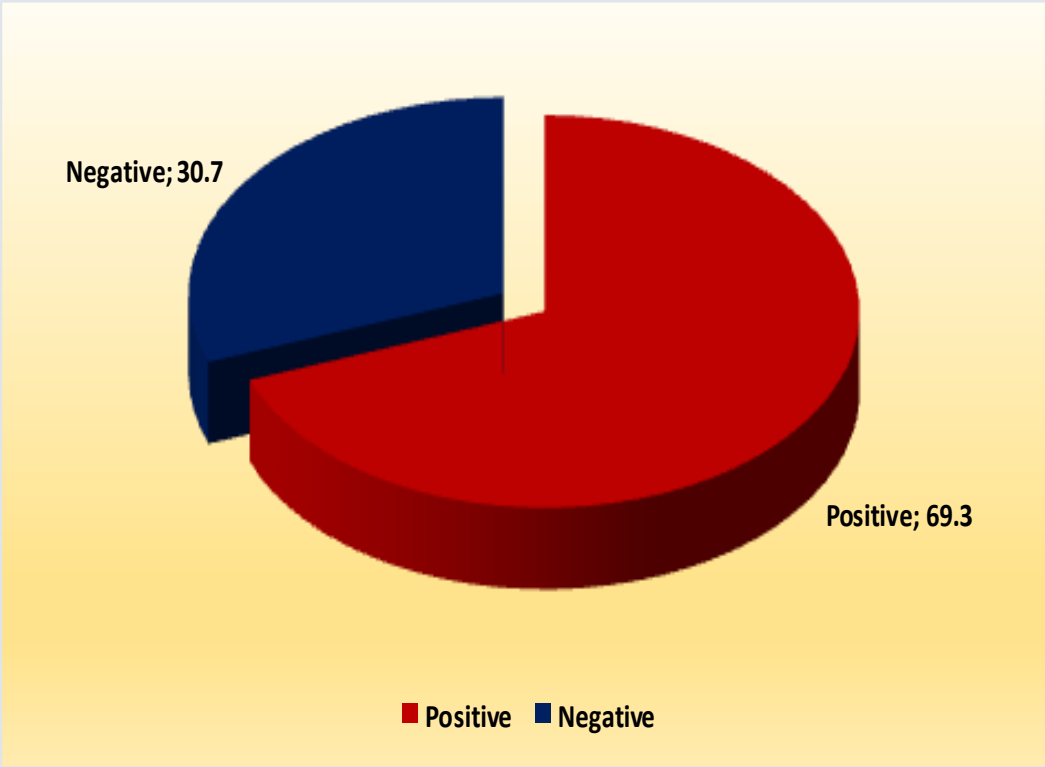


**Figure (2): Total attitude of mother regarding oral health (n=400)**

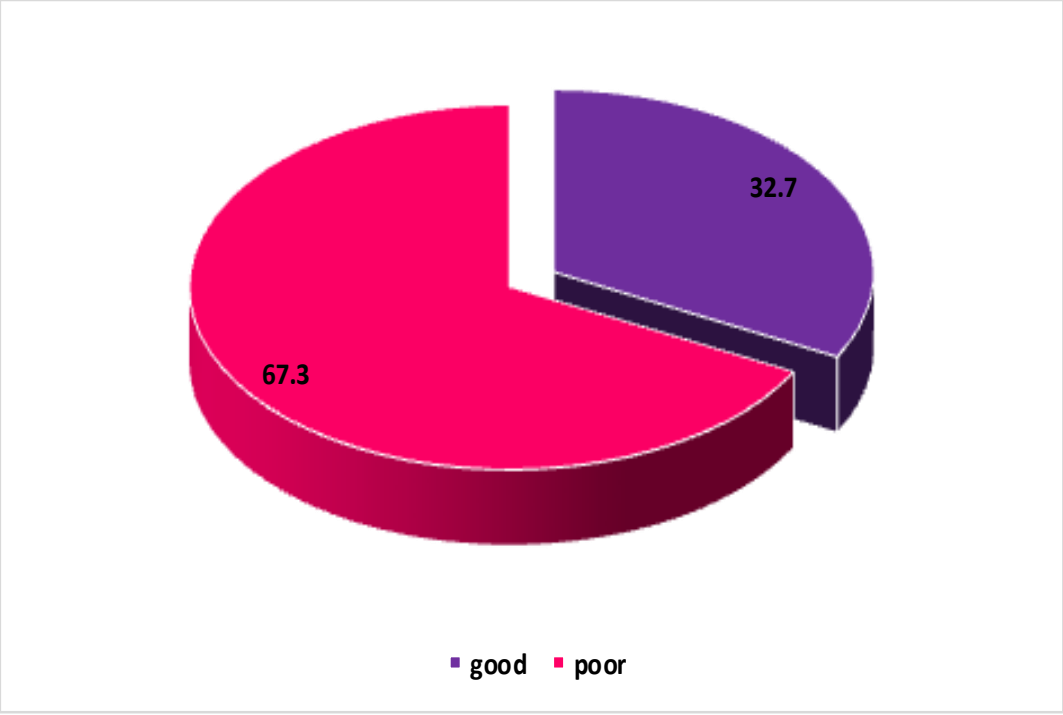


**Figure (3): Total level practice of mothers regarding oral health (n=400)**

**Table (2): Relation between the dental health of children and the awareness, practice, and attitude of mothers**

| Variables | Total awareness | | | | $X^2$ test | p-value |
|---|---|---|---|---|---|---|
| | Satisfactory (n=302) | | Unsatisfactory (n=98) | | | |
| | No. | % | No. | % | | |
| **Total practice** | | | | | | |
| Good | 119 | 90.8 | 12 | 9.2 | 24.78 | **.000**** |
| Poor | 183 | 68.0 | 86 | 32.0 | | |
| **Total attitude** | | | | | | |
| Positive | 230 | 83.0 | 47 | 17.0 | 27.63 | **.000**** |
| Negative | 72 | 58.5 | 51 | 41.5 | | |
| **Children oral health condition** | | | | | | |
| Healthy | 203 | 80.2 | 50 | 19.8 | 8.35 | **.004*** |
| Unhealthy | 99 | 67.3 | 48 | 32.7 | | |

**Table (3): Correlation matrix of awareness, practice, and attitude of the mothers**

| Scores | Total Mean score | | | |
|---|---|---|---|---|
| | Awareness | Practice | Attitude | Children oral health assessment |
| **Awareness** | | | | |
| **Practice** | **.424**** | | | |
| **Attitude** | **.412**** | .350** | | |
| **Children oral health assessment** | -.257** | -.240** | -.184** | |

**Table (4): Correlation matrix of mothers' awareness, practice, attitude and their personal characteristics**

| Personal Characteristics | Spearman's rank correlation coefficient | | |
|---|---|---|---|
| | Awareness | Practice | Attitude |
| **Age of marriage (19-32)** | **.235**** | **.224**** | **.161**** |
| **Educational level (High)** | **.419**** | **.233**** | **.221**** |
| **Mother work (yes)** | .053 | **.131**** | **.175**** |
| **Social class (High)** | **.226**** | **.200**** | **.186**** |

**Table (5): Best fitting multiple linear regression model for mother awareness score**

| Variables | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 8.178 | 1.707 | | 4.792 | **.000** | 4.823 | 11.534 |
| | Marriage Age (19-32) | 1.133 | .442 | .123 | 2.563 | **.011** | .264 | 2.002 |
| | Number of Pregnancy (high) | .095 | .390 | .012 | .244 | .807 | -.672 | .862 |
| | Educational level of mother | 1.567 | .240 | .374 | 6.535 | **.000** | 1.096 | 2.039 |
| | Level of Social class | .131 | .468 | .016 | .280 | .780 | -.789 | 1.052 |

**R-square=0.42 Model Anova: F=20.75, p<0.01**

**Table (6): Best fitting multiple linear regression model for mothers' practice score**

| Variable | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 | (Constant) | 4.864 | 1.037 | | 4.692 | **.000** | 2.826 | 6.902 |
| | Age of marriage (19-32) | .572 | .263 | .103 | 2.175 | **.030** | .055 | 1.090 |
| | Pregnancy number | .378 | .230 | .078 | 1.641 | .102 | -.075 | .831 |
| | Mother education level | -.120 | .149 | -.048 | -.806 | .421 | -.413 | .173 |
| | Social class level | -.491 | .276 | -.102 | -1.77 | .077 | -1.034 | .053 |
| | Total awareness score | .238 | .030 | .397 | 8.00 | **.000** | .179 | .296 |

**R-square=0.45 Model Anova: F=19.79, p<0.01**

**Table (7): The best multiple linear regression model that fits the attitude score of mothers.**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| 1 (Constant) | 26.010 | .808 | | 32.196 | **.000** | 24.422 | 27.598 |
| **Pregnancy number** | .344 | .229 | .072 | 1.502 | .134 | -.106 | .794 |
| **Mother education level** | -.032 | .165 | -.013 | -.195 | .846 | -.356 | .292 |
| **Total awareness score** | .223 | .029 | .378 | 7.642 | **.000** | .165 | .280 |
| **Social class** | .068 | .030 | .151 | 2.308 | **.022** | .010 | .126 |

**R-square=0.43 Model Anova: F=22.96, p<0.01**

**References:**


1. BenGhasheer, H.F., and Saub, R. Oral Health Knowledge, Attitude, Practice Perceptions and Barriers to Dental Care among Libyan Parents. *Journal Of Oral Research*. 2022; 11(1):1-14. http://dx.doi.org/10.17126/joralres.2022.009
2. Finlayson, T.L., Siefert, K., Ismail, A.I., and Sohn, W. Maternal self-efficacy and 1-5 years old children brushing habits community. *Dent oral Epidemo*. 2017; 35 (4):272-281.
3. Duguma, F.K., and Wassihun, Y. Assessment of KAP Towards Oral Health of Under Five Children Among Mothers Visiting Federal Defense Force "Torhayiloch" Hospital, Maternal and Child Health Clinic, Addis Ababa, Ethiopia, 2017. *Advances in Dentistry & Oral Health*. 2019; 11(2): 0053-0065. ADOH.MS.ID.555808 http://dx.doi.org/10.19080/ADOH.2019.11.555808
4. Gurunathan, D., Moses, J., and Arunachalam, S.K. Knowledge, attitude, and practice of mothers regarding oral hygiene of primary school children in Chennai, Tamil Nadu, India. *International journal of clinical pediatric dentistry*. 2018; 11(4): 338-343. https://doi.org/10.5005/jp-journals-10005-1535
5. Pierce, A., Singh, S., Lee, J., Grant, C., Cruz de Jesus, V., and Schroth, R.J. The burden of early childhood caries in Canadian children and associated risk factors. *Frontiers in public health*. 2019; 7: 328. https://doi.org/10.3389/fpubh.2019.00328
6. Mohandass, B., Chaudhary, H., and Pal, G.k. Knowledge and Practice of rural mothers on Oral hygiene for children. *Indian Journal of Continuing Nursing Education*. 2021; 22(1):39-43. DOI:10.4103/IJCN.IJCN_7_20
7. Renuka, and Thakur, K. Effectiveness of Planned Teaching Programme on Knowledge and Practices of oral Hygiene among School Children. *Int. J. Nur. Edu. and Research*. 2017; 5(4): 399-

402. DOI: 10.5958/2454-2660.2017.00085.0

**8.** Chala, S., Houzmali, S., Abouqal, R., and Abdallaoui, F. Knowledge, attitudes and self-reported practices toward children oral health among mother's attending maternal and child's units, Salé, Morocco. *BMC Public Health*. 2018; 18(1): 618. https://doi.org/10.1186/s12889-018-5542-2

**9.** Khanduri, N., Singhal, N., Mitra, M., and Rohatgi, S. Knowledge, attitude, and practices of parents toward their children's oral health: A questionnaire survey in Bhairahawa (Nepal). *International Journal of Pedodontic Rehabilitation*. 2018; 3(2): 59-61. DOI:10.4103/ijpr.ijpr_31_17

**10.** Nursing and Midwifery Council. Future Nurse: Standards of proficiency for registered nurses. 2018. Available at: https://www.nmc.org.uk/globalassets/sitedocuments/education-standards/future-nurse-proficiencies.pdf

**11.** Khan, I.M., Mani, S.A., and Doss, J.G. Pre-schoolers' tooth brushing behavior and association with their oral health: a cross sectional study. *BMC Oral Health*. 2021; 21: 283. https://doi.org/10.1186/s12903-021-01643-8

**12.** AlBlehed, A.K., AlThumairy, A.F., AlTurayri, W.S., Alassaf, A., Almulhim, B., Alghamdi, S, Almalki, A., and Mallineni, S.K. Assessment of knowledge, attitude and practices regarding oral hygiene among the parents of pre-school children: a cross-sectional study. *Annals of Medical and Health Sciences Research*. 2021; 11(S2): 82-86.

**13.** Kotha, S.B., Alabdulaali, R.A., Dahy, W.T., Alkhaibari, Y.R., Albaraki, A.S.M., and Alghanim, A.F. The influence of oral health knowledge on parental practices among the Saudi parents of children aged 2-6 years in Riyadh City, Saudi Arabia. *Journal of International Society of Preventive & Community Dentistry*. 2018; 8(6): 565-571. DOI: 10.4103/jispcd.JISPCD_341_18

**14.** Mahmoud, A.A., and Elsayed, D.M.S. Educational Health Program for Mothers toward Their Preschool Children's Oral Health. *Zagazig Nursing Journal*. 2017; 13(1): 48-69. https://doi.org/10.21608/znj.2017.38258

**15.** El-Gilany, A., El-Wehady, A., and El-Wasify, M. Updating and validation of the socioeconomic status scale for health research in Egypt. *East Mediterr Health J*. 2012; 18(9): 962-968. DOI: 10.26719/2012.18.9.962

**16.** Mahmoud, N., Kowash, M., Hussein, I., Hassan, A., and Al Halabi, M. Oral Health Knowledge, Attitude, and Practices of Sharjah Mothers of Preschool Children. *United Arab Emirates Published*. 2017; 7(6): 308-314.

**17.** Alkhtib, A., and Morawala, A. Knowledge, Attitudes, and Practices of Mothers of Preschool Children about Oral Health in Qatar: A Cross-Sectional Survey. *Dentistry journal*. 2018; 6(4):51. https://doi.org/10.3390/dj6040051

**18.** Rajana,V., Khanagar, S.B., and Naganandini, S. Oral Hygiene Knowledge and Practices among Mothers Of 3- to -6 years Old Preschool children visiting Anganwadis of Banalore City. *Journal of Indian Association of Public Health Dentistry Dent*. 2019; 17(1): 76-79. DOI:10.4103/jiaphd.jiaphd_117_18

**19.** Ibrahim, R.E.H.M., Helaly, M.O., and Ahmed, E.M.A. Assessment of Brushing Techniques in School Children and Its Association with

Dental Caries, Omdurman, 2019. *International Journal of Dentistry* 2021; 1-6. https://doi.org/10.1155/2021/4383418

**20.** Chalmers, J.M., Carter, K.D., Fuss, J.M., Spencer, A.J., and Hodge, C.P. Caries experience in existing and new nursing home residents in Adelaide, Australia. *Gerontology*. 2002; 19(1): 30-40. https://doi.org/10.1111/j.1741-2358.2002.00030.x

**21.** Naidu, R.S., and Nunn, J.H. Oral health knowledge, attitudes and behaviour of parents and caregivers of preschool children: implications for oral health promotion. *Oral Health Prev Dent*. 2020; 18(1), 245-252.

**22.** Adil, A.H., Eusufzai, S.Z., Kamruddin, A., Wan Ahmad, W.M.A., Jamayet, N.B., Karobari, M.I., and Alam, M.K. Assessment of parents' oral health literacy and its association with caries experience of their preschool children. *Children (Basel, Switzerland)*. 2020; 7(8): 101. https://doi.org/10.3390/children7080101

**23.** Hamasha, A.A.-H., Rasheed, S.J., Aldosari, M.M., and Rajion, Z. Parents knowledge and awareness of their children's oral health in Riyadh, Saudi Arabia. *The Open Dentistry Journal*. 2019; 13(1): 236-241. https://doi.org/10.2174/1874210601913010236

**24.** Helal, M., Moneim, S.A., and Foad, M. Parents' knowledge, attitude and practices toward oral health of their children with primary dentition: A cross sectional study. *Journal of Medicine in Scientific Research*. 2022; 5(2): 164-170. DOI: https://doi.org/10.4103/jmisr.jmisr_24_22

**25.** Alshammari, F.S., Alshammari, R.A., Alshammari, M.H., Alshammari, M.F., Alibrahim, A.K., Al Sineedi, F.A., Alkurdi, K.A., and Alshammari, A.F. Parental awareness and knowledge toward their children's oral health in the city of Dammam, Saudi Arabia. *International journal of clinical pediatric dentistry*. 2021; 14(1): 100-103. https://doi.org/10.5005/jp-journals-10005-1894

**26.** Mohamed, Y.S. Assessment of the knowledge and awareness among Egyptian parents in relation to oral health status of their children. *Egyptian Dental Journal*. 2020; 66(2-April) (Orthodontics, Pediatric & Preventive Dentistry): 737-746. https://doi.org/10.21608/edj.2020.25196.1058

**27.** Nepaul, P., and Mahomed, O. Influence of parents' oral health knowledge and attitudes on oral health practices of children (5-12 years) in a rural school in KwaZulu-Natal, South Africa. *Journal of International Society of Preventive & Community Dentistry*. 2020; 10(5): 605-612. https://doi.org/10.4103/jispcd.JISPCD_273_20

**28.** Basir, L., Khanehmasjedi, M., and Khanehmasjedi, S. Knowledge, attitudes, and practices regarding the oral health of children: a cross-sectional study among iranian parents. *Brazilian Journal of Oral Sciences*. 2022; 21: e228274. https://doi.org/10.20396/bjos.v21i00.8668274

**29.** Ramakrishnan, M., Banu, S., Ningthoujam, S., and Samuel, V.A. Evaluation of knowledge and attitude of parents about the importance of maintaining primary dentition-A cross-sectional study. *Journal of Family Medicine and Primary Care*. 2019; 8(2): 414-418. https://doi.org/10.4103/jfmpc.jfmpc_371_18

**30.** Babu, N.K., Doraikannan, S.S., Indiran, M.A., and Rathinavelu, P.

K. Assessing knowledge, attitude, and practice of parents regarding infant oral health among outpatients of private dental college in Chennai: A cross-sectional study. *Drug Invention Today*. 2018; 10.

**31.** Dhull, K.S., Dutta, B., Devraj, I.M., and Samir, P.V. Knowledge, attitude, and practice of mothers towards infant oral healthcare. *International journal of clinical pediatric dentistry*. 2018; 11(5): 435-439. https://doi.org/10.5005/jp-journals-10005-1553

**32.** Khubchandani, M.M., Thosar, N., Paul, P., Dangore, S., and Mohod, S. Assessment of Knowledge, Attitude and Practice Behaviors of Parents towards Care of Primary Dentition: A Cross Sectional Study. *Journal of Pharmaceutical Research International*. 2021; 33(42A): 363-369.

**33.** Kumar, G., Dhillon, J.K., Vignesh, R., and Garg, A. Knowledge, attitude, and practical behavior of parents regarding their child's oral health in New Delhi. *Journal of Indian Society of Pedodontics and Preventive Dentistry*. 2019; 37(1): 3-7.

**34.** Pawar, P., Kashyap, N., and Anand, R. Knowledge, attitude, and practices of mothers related to their oral health status of 6-12 years old children in Bhilai city, Chhattisgarh. *India. Eur Sci J*. 2018: 14(21), 248-60.

**35.** Alshammary, F., Aljohani, F.A., Alkhuwayr, F.S., and Siddiqui, A.A. Measurement of parents 'knowledge toward oral health of their children: an observational study from Hail, Saudi Arabia. *J Contemp Dent Pract*. 2019; 20(7): 801-5.

**36.** Chandran, V., Varma, R.B., Joy, T.M., Ramanarayanan, V., Govinda, B.S., and Menon, M.M. Parental knowledge, attitude, and practice regarding the importance of primary dentition of their children in Kerala, India. *Journal of Indian Association of Public Health Dentistry*. 2019; 17(3): 247-252.

**37.** Al Mejmaj, D.I., Nimbeni, S.B., and Alrashidi, R.M. Association between Demographic Factors Parental Oral Health Knowledge and their Influences on the Dietary and Oral Hygiene Practices followed by Parents in Children of 2-6 Years in Buraidah City Saudi Arabia: A Pilot Study. *International Journal of Clinical Pediatric Dentistry*. 2022; 15(4): 407-411. https://doi.org/10.5005/jp-journals-10005-2409

**38.** Chen, L., Hong, J., Xiong, D., Zhang, L., Li, Y., Huang, S., and Hua, F. Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. *BMC Oral Health*. 2020; 20(1): 203. https://doi.org/10.1186/s12903-020-01186-4

**39.** Petrauskienė, S., Narbutaitė, J., Petrauskienė, A., and Virtanen, J.I. Oral health behaviour, attitude towards, and knowledge of dental caries among mothers of 0-to 3-year-old children living in Kaunas, Lithuania. *Clinical and experimental dental research*. 2020; 6(2): 215-224.

**40.** Al-Rashdan, O., AlZoubi, Z., Ibrahimi, M., Al-Khraisha, A., and Almajali, N. Mother's characteristics and socioeconomic status as possible risk factors for children's caries in Jordan. *International Journal of Dentistry*.2022; 2006088. https://pubmed.ncbi.nlm.nih.gov/35342427/