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Relationship between Oral Health Literacy (OHL) and Dental Anxiety in Parents of Children with dental caries visiting Tertiary Health Care Centre

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ABSTRACT

Objectives: Mothers attitude towards oral health can significantly impact a child's oral health. If a mother lacks oral health literacy (OHL), it may affect her behavior and lead to dental anxiety, potentially causing dental problems in the family, especially for young children. To determine the association between oral health literacy (OHL), socioeconomic status, dental anxiety of mothers and dental caries status of mothers and children. **Materials and Methods**: An observational, cross-sectional study was done, involving 170 mother-child (3 to 12 years of age) dyads who visited the OPD of clinics of Pediatric Dentistry. Dental anxiety of mothers' was assessed using the Modified Dental anxiety scale (MDAS) and their observation of presence of dental anxiety in their children was assessed using dental anxiety question (DAQ). REALD-30 scale was used to assess mothers' oral health literacy.

Results: The mothers' mean REALD-30 and DMFT scores were 7.07±6.01 and 2.02±2.3, respectively. Statistically significant inverse relationship was seen between REALD scores and dental anxiety among mothers of children. (r=-.142, p≤0.05). Statistically significant relationship was observed between dental anxiety of the mother and the child (r=0.304, p<0.01). Statistically Significant relationship was seen between socioeconomic status and oral health literacy of mothers and dmft of child. **Conclusion:** 16.8% of variability in oral health literacy of mothers could be predicted by SES; while 2.6% of variability in dental anxiety of mothers can be predicted by REALD scores of mother.

Keywords: Dental Anxiety, Dental Caries, , dmft/DMFT, Oral Health Literacy, socioeconomic status.

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Introduction

The importance of health literacy in the healthcare system is widely recognized.[1] It refers to the capacity to get, comprehend, and apply fundamental health information and services in order to make informed decisions about their health.[2] This includes reading and communicating health-related facts efficiently, navigating the healthcare system, and maintaining good health. Evidence in the literature has established that a person's degree of health literacy is a powerful predictor of their health, health-associated behaviors, and health outcomes.[3,4] Low health literacy is linked to inaccurate health self-assessments, non-adherence to medical advice, lack of self-management skills, adverse health outcomes, increased mortality risks, and increased healthcare costs.[4] This concept in dentistry has been termed oral health literacy (OHL). It is regarded as a measure of how well patients comprehend the relationship between health and illness as the significance of the preventative measures that dental professionals recommend.[5] The absence of such kind of awareness can influence behavior and result in dental anxiety, which may increase the risks of dental problems in the family, especially in children. Since the primary caregivers are in charge of making health-related decisions and instilling good behaviors that can promote children's growth and development, this capacity has a beneficial impact on children's dental health.[6] The Rapid Estimate of Adult Literacy in Dentistry (REALD-30) is a tool that aims to measure and evaluate oral health literacy. It relies on an understanding of terms linked to the anatomy, etiology, prevention, and management of dental issues.[7]

In addition, a child's general and oral health is also negatively affected by dental anxiety. Unreasonable concern about dental operations coupled with an unnatural fear or dread of going to the dentist for treatment or preventative care is known as dental anxiety. It might have an impact on behavior, cognition, and psychology.[8] One way to characterize anxiety is as apprehension and fear regarding a non-objective risk.[9] This phenomenon is widespread and involves a significant portion of the population. Dental professionals

experience this aspect across genders and age groups, and have found women and younger individuals suffer from it frequently.[10] Additionally, a mother's psychological state and behavior can have a direct or indirect impact on her child's ability to protect their dental health. This can adversely have an impact on the child's general behavior and sense of oral health.[11-13]

In summary, both dental anxiety and OHL of parents impact oral and dental health. Although caries prevention has improved over the past few years, dental caries is still prevalent as a chronic ailment in children globally. Family and parents have a crucial role in the environment that shapes oral health behaviors. A child's oral hygiene is influenced immensely by the attitude and abilities of its mother.[14] It is important to note that in recent years, dental research has shifted its attention to the psychological and social factors associated with childhood dental caries, emphasizing the connection between parents' psychological well-being and their children's oral health.[4] Although there is surplus data in the literature on the prevalence of dental anxiety, dental caries, and OHL, there is insufficient data and a gap in the research analyzing the association and inter-relationship between dental anxiety, caries, and OHL. The connection between dental anxiety and OHL and how the interplay of these variables influences oral health remains unknown. With these objectives, we planned a study to determine the relationship between oral health literacy (OHL) and dental anxiety in mothers of children with dental caries. The study also tried to establish, if there is any relationship between oral health literacy and dental caries status of the child.

Material and Method

An observational, cross-sectional study was done involving a sample of 170 mother-child (3 to 12 years of age) dyads visiting for treatment in the outpatient department (OPD) of Clinics of the University Hospital. The study was approved by the Institutional Ethical Committee of the university (24/5/328/JMI/IEC/2021).

By taking into account a confidence limit of 80%, a maximum error of 5% of the mean dental anxiety among mothers, and maintaining the population proportion at 50%, the sample size was determined to get a dependable estimate of the average population. Written informed consent was obtained before the commencement of the study. Mothers with no vision or hearing impairment and no history of any psychological disorder were included. Participants who refused to be the part of the study, parents of children with fixed orthodontic appliances and with compromised health conditions were also excluded.

Training was provided to an examiner regarding the use of the WHO proforma of decayed missing and filled permanent and primary teeth (DMFT/dmft) and the REALD-30 scale. Since dental terms are used in REALD-30 scale, so verbatim forward and reverse translation of the scale was conducted with the assistance of a language specialist and two subject matter experts. Translated scale was then sent to 3 subject experts for content validation. After the complete validation, scale was used.

Demographic details were recorded using a modified Kuppawsamy scale (2019)**.**[15] The mothers' dental anxiety and their perceptions of dental anxiety in their children was assessed using the Modified Dental Anxiety Scale and dental anxiety question (DAQ), respectively.[16]

The modified dental anxiety scale comprises five questions describing the level of anxiety a person experiences when making an appointment, waiting in the lobby before an appointment, and waiting to be treated with a drill or other dental tools before extraction. Final scores range from five to 25.[17] Specific items about various elements of dental treatment are included in this five-point scale. Scores range from 5 to 25, with 5 representing mild anxiety, 10-18 representing moderate anxiety, and 19 or more representing severe dental treatment phobia.[18,19] Translated version of this scale was already available online freely, so the same version was used.

"*Is your child afraid of going to the dentist?*" is the sole question the DAQ poses. One may select 1. "no," 2. "yes, a little," 3. "yes, quite," and 4. "yes, very" as their available answers. Offspring of mothers who replied in the affirmative were considered to be anxious.[20]

The REALD-30, used to assess OHL comprises of 30 words related to oral health, placed in the ascending order of difficulty. Each word familiar to the parent was regarded as score one. Scores of OHL scale range from zero to 30, with higher scores indicating a higher level of oral health literacy.[7]

Descriptive statistics was used to obtain frequencies, percentages, means and standard deviations. Pearson product-moment correlation coefficient was used to assess the relationship between variables followed by regression analysis. Significance was set at a p-value of < 0.05. Data was analyzed using Statistical Package for Social Sciences software (SPSS) 23.0.

Results

Of all the children, 44.7 percent (n =76) were male, and 55.3 percent (n = 94) were female. The mean age of child participants was 6.4±2.3 years. The mean Decayed, Missing, Filled Teeth (DMFT) score of mothers was 2.02±2.3 while deft/DMFT of children was 4.08±3.46 (Table 1). 53 percent (n = 90) of them belonged to upper and upper middle class while 47 percent (n=80) belonged to the lower middle and lower class according to Modified Kuppaswamy Scale 2019.[15] 50.5 percent of mothers had educational status of graduation and post-graduation (n=86), while 49.5 percent had only done schooling. (Table 2)

Statistically significant relationship was observed between dental anxiety of the mother and the child ($r=0.302$, $p<0.05$)**.** (Table 3)

Mean REALD scores for the mother was 7.07±6.01. Statistically significant positive relationship was observed between socioeconomic status and REALD scores ($r=0.41$, $p<0.05$). Regression analysis showed that 16.8% of variability

in REALD is predicted by SES. (Table 4) Statistically significant negative relationship was observed between SES and dmft/DMFT of the child (r=-.157, p<0.05). (Table 3) Regression analysis displayed that 2.5% of variability in deft/DMFT scores of child is predicted by SES. (Table 4) Statistically significant negative relationship was observed between REALD scores and dental anxiety amongst mothers of children. (r=-.142, p≤0.05). (Table 3) Regression analysis showed that 2.6% of variability in dental anxiety of parents can be predicted by REALD scores of mother. (Table 4)

The results suggested a statistically significant impact of dental anxiety of mothers on dmft scores of children (r=0.175, p<0.05) as 3.1% of variability in dmft of child could be predicted by dental anxiety levels of mother. (Table 4)

Table 1: Mean of Various Variables

Variable	Mean±SD
Age of the child	6.4±2.3
Socio-economic Status	15.4±5.9
READL score	7.07±6.01
Dental Anxiety parent	9.9±4.3
Dental Anxiety child	1.7±1.01
DMFT parent:	2.02±2.3
deft/DMFT Child	4.08±3.46

Table 2: Educational Status Of Mothers

Education of mother	Count
Post graduate	21
Graduate	65
Intermediate	27
High School	16
Primary and Middle school	41

Table 3: Correlation Between Various Variables

Variable with socio economic status (SES)	Correlation Co-efficient ®	Level of Significance (p-value)	Statistical Significance
READL	.41*	<.01	+ Statistically significant relationship
Dental anxiety_ mother	.027	.728	Non-significant relationship
Dental anxiety_child	-.087	.260	Non-significant relationship
dmft/DMFT_child	-.157*	.041	- Statistically significant relationship
DMFT_mother	-.101	.189	Non-significant relationship
Variables with Oral health literacy of mother (READL scores)	Correlation Co-efficient ®	Level of Significance (p-value)	Statistical Significance
dmft/DMFT_child	-.032	.678	Non-significant relationship
DMFT_mother	-.138	.063	-Non-significant relationship
Dental anxiety_mother	-.142*	.05	- Statistically significant relationship
Variables with Dental anxiety of mother	Correlation Co-efficient ®	Level of Significance (p-value)	Statistical Significance
dental anxiety_ child	.304*	<.01	+ Statistically significant relationship
dmft/DMFT_child	.175*	0.02	+ Statistically significant relationship
DMFT _mother	0.004	.963	Non-significant relationship

*. Correlation is significant at the 0.05 level (two-tailed)

Table 4: Regression Analysis

Between SES & dmft/DMFT child					
Model	R	R Square	Adjusted R Square	F	Sig. F Change
1	-.157[a]	.025	.019	4.247	.041*
*. Correlation is significant at the 0.05 level (2-tailed).					
a. Predictors: (Constant), SES					
Regression analysis between SES & REALD					
Model	R	R Square	Adjusted R Square	F	Sig. F Change
1	.410[a]	.168	.163	34.009	0.01*
*. Correlation is significant at the 0.05 level (2-tailed).					
a. Predictors: (Constant), SES					
Between REALD & Dental Anxiety mother					
Model	R	R Square	Adjusted R Square	F	Sig. F Change
1	-.142[a]	.026	.014	3.460	.05*
*. Correlation is significant at the 0.05 level (2-tailed).					
a. Predictors: (Constant), REALD score mother					
Between Dental anxiety mother & dmft/DMFT child					
Model	R	R Square	R Square	F	Sig. F Change
1	0.175[a]	.031	.025	5.331	.02*
*. Correlation is significant at the 0.05 level (2-tailed).					
a. Predictors: (Constant), Dental Anxiety mother					

Discussion

The current study was conducted in the outpatient department of the Clinics of Pediatric Dentistry of dental college, on 170 mother-child (3 to 12 years of age) dyads visiting the dental operatory for treatment. Approximately half of the participants (53 percent) belonged to upper class and upper middle class, and had educational status of graduation and post-graduation (50.1%).

Most studies present in the literature have observed a direct correlation between primary caregiver's health literacy and academic qualification.[21] Low literacy has been linked to negative health outcomes, such as a lack of health knowledge, an increase in illness, and inappropriate use of health resources, according to systematic evaluations in the medical field.[21,22] According to two recently published reports, there is a strong association between low parental health literacy and harmful health behaviours which can impact a child's health,[23] and child health outcomes.[24] In the present study, the authors preferred to use the pre-validated scale, REALD-30 to investigate the mothers' oral health literacy, as compared to other scales like OHLI, TOFHLiD and REALMD.[25] Studies utilising this instrument have shown that a higher proportion of patients with fair or poor oral health status and those who misinterpreted dental questions have lower literacy than those who understood the questions correctly.[21]

The mean REALD score of the present study group was 7.07±6.01, which is a low OHL score. There are no predefined criteria for what qualifies as "low oral health literacy (OHL);" nonetheless, in earlier studies, a group classified as "low OHL" was characterised by an arbitrary threshold value of less than thirteen.[7,26] The present study reports a statistically significant relationship between socioeconomic status (SES) and REALD, i.e., mothers with better socioeconomic status were associated with higher oral health literacy; rather, 16.8% of the variability in REALD has been shown to be predicted by SES. In the present study, lower dmft scores in the children were significantly related to higher levels of SES in their mothers. This finding corroborates the results of previous studies conducted by Oliveira *et al.*[27], Narang *et al.*[28] and Chan *et al.*[29], who demonstrated a relationship between the proportion of children with a higher amount of carious lesions and low maternal education and low family financial status. The reason for this inverse association could be that mothers with lower socioeconomic backgrounds are not adequately aware of caries preventive habits and follow inefficient oral health practices. Also, low household income is linked to limited capacity of payments, interrupting their access to proper and timely dental care.[30,31]

Many studies in the past have reported a mother's inadequate OHL is significantly associated with higher dental treatment needs, a high dmft index and adverse oral health outcomes in their children. It could be because the mothers are the prime decision-makers when it comes to their children's health.[25,32] Also, mothers with lower academic qualifications and belonging to lower economic strata have been reported to be worried more about the pain during the treatment, leading them to avoid visiting the dentist. It can have a detrimental effect on the children's oral health.[33] When it comes to preventing dental issues, mothers' awareness, positive outlook, and strong preventive habits are found to be crucial.[34] The mean DMFT value of the mothers was 2.02±2.3, while the mean deft/DMFT of child participants was 4.08±3.46. The present investigation demonstrated a negative relationship between REALD scores and DMFT of mothers; however, it was found to be statistically nonsignificant. It was an unexpected finding since there is a correlation between literacy and health knowledge, as demonstrated in numerous studies. It could be attributed to a nonprobability convenience sample of patients selected from a dental clinic located in a university campus. Also, the mothers' health-seeking behaviors were determined by their children's dental problems rather than their own. More clinical trials or long-

term studies are required to elaborate on the findings reported in the present study.

The prevalence of dental anxiety (DA) worldwide is high and ranges from 2 to 30% [35] and is observed more commonly in young children and females.[36] It might be challenging to evaluate fear and anxiety in children and their parents/guardians. In this study, the mothers' dental anxiety and their understanding of dental anxiety in their children were assessed using the Modified Dental Anxiety Scale and Dental Anxiety Question (DAQ), respectively,[16] and a statistically significant correlation between mother's dental anxiety and children's dental anxiety was found. The mean dental anxiety scores for mothers and children were 9.9±4.3 and, 1.7±1.01 respectively. Typically, mothers are held responsible for their children's anxious behavior in a dental clinic. Mothers' dental anxiety significantly impacts the holistic health of their children, including dental wellness. A significant relationship between maternal anxiety and high caries experience in their children has been reported by many authors across the globe.[37,38] Many authors have found that the mean DMFT is highest in mothers with higher levels of dental anxiety.[39,40] Goyal J, *et al.*[41] reported that caries involvement was higher in pediatric patients with highly anxious mothers compared to less anxious and non-anxious mothers. The highest mean dmft was observed in the children whose mothers were "extremely apprehensive" (phobic). Many researchers have reported an indirect correlation between parental dental anxiety and dental caries. However, in the current study, a significant relationship was observed between the dental anxiety of mother and DEFT/DMFT of the child, i.e., with higher dental anxiety, so were the levels of dental caries. The presence of dental anxiety in mothers and children may lead to frequent missed dental appointments. Dental professionals should make the mother with dental anxiety aware of this negative aspect. Mothers should be motivated to take their children to the dentist for preventative care and routine dental services. It might make the child's dental visits more enjoyable and improve their behavior during the treatment.

The present study demonstrated a significant inverse relationship between oral health literacy (OHL) and dental anxiety amongst mothers of children, i.e., high levels of oral health literacy were associated with lower levels of dental anxiety. Also, a significant relationship was observed between socioeconomic status and oral health literacy. Low socioeconomic status was also associated with low oral health literacy. The evidence in the literature is conflicting on dental anxiety and educational status. Cagiran *et al.*[42] contest that there exists a correlation connecting parental educational status and the anxiety levels of their children and themselves, nonetheless, Gustafsson *et al.*[43] also pointed out these associations. Also, a previous study of 187 female primary caretakers and their children below 12 years of age observed a significant relationship between the dental anxiety of mothers and their oral health literacy. The authors also found a multivariate relationship between REALD-30 scores and their income.[44] Similar findings were observed by Barasuol *et al.*[45], who found a correlation between lower family income and inadequate oral health literacy and an elevated degree of dental anxiety among parents.

The study has a few limitations. For instance, in the current study, convenience sampling has been used with patients selected from a university-affiliated dental clinic. The results could be applied on a bigger population if a larger sample is taken through random sampling with multicentric approach in mind. This is a quantitative study, however, from the future prospective, qualitative studies in this field could be further beneficial to understand the in-depth the reasons for the oral health literacy status of mothers and what can be done on clinician's part to improve the present condition.

Developing nations like India encounter numerous challenges when delivering oral health care to children ages 1 to 5, particularly in remote areas.[46] To promote health and prevent disease at an earlier stage, dental professionals must make the parents aware of the importance of their children's oral health care and oral hygiene habits, including their diet, feeding practices, and routine dental checkups.[47] Lack of adequate knowledge related to dental health issues may lead to dental anxiety in parents and adverse consequences in children and their primary caretakers.[44,45,48-50] Understanding the oral health literacy of parents can aid in the development and dissemination of preventative and instructional oral health information to communities, enabling them to accurately comprehend the process of illness and suggested treatments. Furthermore, the capacity to recognise particular behavioural traits in individuals exhibiting an elevated level of both dental and general anxiety may facilitate a more accurate diagnosis of this condition and aid in creating better individualised and effective dental care.

Conclusions

Parents play a significant role in developing and promoting good oral habits in children. In the current study, socioeconomic status and OHL of mothers are inversely related to the dmft scores of their children. OHL is also inversely related to anxiety in the mother and child. The study's findings also highlight how knowledge of parents' oral health literacy can aid in creating and disseminating preventative and educational oral health information to populations, enabling them to accurately comprehend the relationship between health and illness and suggested treatments. In order to provide more individualized and effective dental care, dental practitioners should also be able to identify particular behavioral characteristics in their patients who have greater degrees of dental and general anxiety.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Data Availability Statement

All data generated or analyzed during this study are included in this article. Further enquiries can be directed to the corresponding author.

References

1. Nielsen-Bohlman L, Panzer AM, Kindig DA, Committee on Health Literacy (2004). Health literacy: a prescription to end confusion. Washington, DC: National Academies Press.
2. Ratzan SC, Parker RM. Introduction. In: Selden CR, Zorn M, Ratzan SC, Parker RM, editors. National Library of Medicine current bibliographies in medicine: health literacy NLM Publ. No. CBM 2000–1. Bethesda: National Institutes of Health; 2000. v-viii.
3. Berkman ND, Davis TC, McCormack L. Health literacy: what is it? J Health Commun. 2010;15(Suppl 2):9–19.
4. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med. 2011;155(2):97–107.
5. Junkes MC, Fraiz FC, Sardenberg F, Lee JY, Paiva SM, Ferreira FM. Validity and reliability of the Brazi- lian version of the Rapid Estimate of Adult Literacy in Dentistry: BREALD-30. PLoS One 2015;10(7):e0131600.
6. Stowers ME, Lee JY, Majewski RF, Estrella MR, Taylor GW, Boynton JR. Oral health literacy: awareness and practices among pediatric dentists. Pediatr Dent 2013;35(5):430-434.
7. Lee JY, Rozier RG, Lee SY, Bender D, Ruiz RE. Development of a word recognition instrument to test health literacy in dentistry: the REALD-30–A brief communication. J Public Health Dent 2007;67(2):94-98.
8. Assunção CM, Losso EM, Andreatini R, de Menezes JN. The relationship between dental anxiety in children, adolescents and their parents at dental environment. J Indian Soc Pedod Prev Dent 2013;31:175-179.
9. Zerrin Hatipo-glu and Damla Aks¸it-Bıc¸ak. Maternal anxiety, social status, and dental caries formation in children: a cross-sectional study. Journal of International Medical Research 2019;47(12): 6206–6214.
10. Samami M, Farrahi H, Alinia M. The relationship between dental anxiety and oral health literacy with oral health-related quality of life. BMC Oral Health. 2024;14;24(1):567.
11. Costa FDS, Azevedo MS, Ardenghi TM, Pinheiro RT, Demarco FF, Goettems ML. Do maternal depression and anxiety influence children's oral health-related quality of life? Community Dent Oral Epidemiol 2017;45:398–406.
12. Tomar B, Bhatia NK, Kumar P, et al. The psychiatric and dental interrelationship. Delhi Psychiatry J 2011;14:138–142.
13. Shabnam Gulzar Khawja, Ruchi Arora, Altaf Hussain Shah, Amjad Hassan Wyne, Anshu Sharma. Maternal Dental Anxiety and its Effect on Caries Experience Among Children in Udaipur, India. Journal of Clinical and Diagnostic Research. 2015;9(6): ZC42-ZC45.
14. Togoo RA, Luqman M, Hammadi A, Al-Rabai NA, Ahmasani SM, Al-Qahtani BD. Caregivers' knowledge, attitudes, and oral health practices for infants attending day-care centers in two cities in southern Saudi Arabia. Gulf Med J 2017;6: 35–41.
15. Saleem SM, Jan SS. Modified Kuppuswamy socioeconomic scale updated for the year 2019. Indian J Forensic Community Med. 2019;6(1):1-3.
16. Viana Filho JMC, Clementino MA, Lima LCM, Garcia AFG, Carvalho MMP, Ferreira JMS. Anxiety of parents and children in dental care. RGO, Rev Gaúch Odontol. 2018; 66(4): 321-329.
17. Humphris GM, Dyer TA, Robinson PG. The modified dental anxiety scale: UK general public population norms in 2008 with further psychometrics and effects of age. BMC oral health. 2009;9:1-8
18. Marya CM, Grover S, Jnaneshwar A, Pruthi N. Dental anxiety among patients visiting a dental institute in Faridabad, India. West Indian Medical Journal. 2012;61(2):187.
19. https://www.england.nhs.uk/long-read/clinical-guide-for-dental-anxiety-management)
20. Neverlien PO. Assessment of a single-item dental anxiety question. Acta Odontol Scand. 1990;48:365–369
21. Dewalt DA, Berkman ND, Sheridan S, Lohr KN, Pignone. Literacy and health outcomes: a systematic review of the literature. J Gen Intern Med.2004; 19:1228-1239.
22. Andrus MR, Roth MT. Health literacy: a review. Pharmacotherapy.2002; 22:282-302.
23. Sanders LM, Federico S, Klass P, Abrams MA, Dreyer B. Literacy and child health: a systematic review. Arch Pediatr Adolesc Med. 2009a; 163:131-140.
24. DeWalt DA, Hink A. Health literacy and child health outcomes: a systematic review of the literature. Pediatrics 124(Suppl 3): 2009; 265-274.
25. Khodadadi E, Niknahad A, Sistani MM, Motallebnejad M. Parents' Oral Health Literacy and its Impact on their Children's Dental Health Status. Electron Physician. 2016 Dec 25;8(12):3421-3425.
26. Wehmeyer MM, Corwin CL, Guthmiller JM, Lee JY. The impact of oral health literacy on periodontal health status. J Public Health Dent. 2014;74(1):80-87.
27. Oliveira LB, Sheiham A, Bönecker M. Exploring the association of dental caries with social factors and nutritional status in Brazilian preschool children. Eur J Oral Sci. 2008;116:37-43.
28. Narang R, Mittal L, Jha K. Caries experience and its relationship with parent's education, occupation and socio economic status of the family among 3–6 years old preschool children of Sri Ganganagar city, India. Open J Dent Oral Medicine. 2013;1(01):1–4.
29. Chan SCL, Tsai JSJ, King NM. Feeding and oral hygiene habits of preschool children in Hong Kong and their caregiver's dental knowledge and attitudes. Int J Paediatr Dent. 2002;12:322–331.
30. Edelstein BL, Chinn CH. Update on disparities in oral health and access to dental care for America's children. Acad Pediatr 2009; 9: 415–419.
31. BaniHani A., Tahmassebi J., Zawaideh F. Maternal knowledge on early childhood caries and barriers to seek dental treatment in Jordan. European Archives of Paediatric Dentistry . 2021;22(3):433–439.]
32. Vann WF Jr, Lee JY, Baker D, Divaris K. Oral health literacy among female caregivers: impact on oral health outcomes in early childhood. J Dent Res. 2010;89(12):1395-1400.
33. Tellez M, Kaur S. Caregivers' satisfaction with pediatric dental care in a university clinical setting in North Philadelphia. J Dent Educ 2013;77(11):1515-1520.
34. Sowmya, KR; Puranik, Manjunath P.; Aparna, KS1,. Association between Mother'S Behaviour, Oral Health Literacy and Children'S Oral Health Outcomes: A Cross-Sectional Study. Indian Journal of Dental Research 2021;32(2):147-152.
35. Grisolia B, Santos A, Dhyppolito I, Buchanan H, Hill K, Oliveira B. Prevalence of dental anxiety in children and adolescents globally: a systematic review with meta-analyses. Int J Paediatr Dent. 2020;00:1–16.
36. Yakar B, Kaygusuz T, Pirincci E. Evaluation of Dental anxiety and fear in patients who admitted to the Faculty of Dentistry:

which patients are more risky in terms of Dental anxiety. Ethiop J Health Sci. 2019;29(6):719–725.
37. Goettems ML, Ardenghi TM, Romano AR, Demarco FF, Torriani DD. Influence of maternal dental anxiety on the child's dental caries experience. Caries Res. 2012;46:3–8.
38. Khawja SG, Arora R, Shah AH, Wyne AH, Sharma A. Maternal dental anxiety and its effect on caries experience among children in Udaipur, India. J Clin Diagn Res. 2015;9:42–45.
39. Taani DQ, El–QaderiSS, Abu Alhaija ES. Dental anxiety in children and its relationship to dental caries and gingival condition. Int J Dent Hyg. 2005;3:83–87.
40. Eitner S, Wichmann M, Paulsen A, Holst S. Dental anxiety--an epidemiological study on its clinical correlation and effects on oral health. J Oral Rehabil. 2006;33:588–593.
41. Goyal J, Menon I, Singh RP, Sharma A, Passi D, Bhagia P. Association between maternal dental anxiety and its effect on the oral health status of their child: An institutional cross sectional study. J Family Med Prim Care. 2019;8(2):535-538.
42. Cagiran E, Sergin D, Deniz MN, Tanattı B, Emiroglu N, Alper I. Effects of sociodemographic factors and maternal anxiety on preoperative anxiety in children. J Int Med Res. 2014;42(2):572-580.
43. Gustafsson A, Arnrup K, Broberg AG, Bodin L, Berggren U. Psychosocial concomitants to dental fear and behaviour management problems. Int J Paediatr Dent. 2007;17:449-459.
44. Shin W, Braun T, Inglehart M, Habil P. Parents' dental anxiety and oral health literacy: effects on parents' and children's oral health-related experiences. J Public Health Dent. 2014;74:195–201.
45. Barasuol JC, da Silva Assunção LR, Fraiz FC, Menezes JVNB. Oral Health Literacy as a Predictor of Dental Anxiety in Parents of Children Undergoing Dental Treatment. J Dent Child (Chic). 2017;15;84(3):125-131.
46. Grewal N, Kaur M. Status of oral health awareness in Indian children as compared to Western children: A thought provoking situation (a pilot study). J Indian Soc Pedod Prev Dent 2007;25:15-19.
47. Green W, Kreuter M. Health Promotion Planning: An Educational and Ecological Approach. 3rd ed. Mountain View, CA: Mayfield Pub. Co.; 1999.
48. Bridges SM, Parthasarathy DS, Wongb HM, Yiu CKY, Au TK, Mcgrath CPJ. The relationship between caregiver functional oral health literacy and child oral health status. Patient Educ Couns 2014;94(3):411-416.
49. Bayirli AB, Kisakurek S. Evaluation of the Effect of Socioeconomic Status on Oral Hygiene Habits. Cumhuriyet Dental Journal 2024;27(3):147–157.
50. Dieng S, Cisse D, Lombrail P, AzoguiLe´vy S. Mothers' oral health literacy and children's oral health status in Pikine, Senegal: A pilot study. PLoS ONE.2020;15(1):e0226876.