

Is Parental Rating of Child's Oral Health Associated with Caries Experience in Children? A Cross-Sectional Study

Faisal F. Hakeem¹, Hassan A. Hammudah², Abdulmajid A. Masoudi², Abdulsamad T. Habeeb², Rola M. Aljohani², Shahad N. Almutairi²

¹Department of Preventive Dental Sciences, College of Dentistry, Taibah University, Al-Madinah al-Munawwarah, Saudi Arabia, ²College of Dentistry, Taibah University, Al-Madinah al-Munawwarah, Saudi Arabia

Received : 19-07-23
Revised : 25-09-23
Accepted : 09-11-23
Published : 27-12-23

ABSTRACT **Aim:** The Parents' view to the oral health of their children is a significant factor that can impact oral health practices and behaviors. The aim of this research was to investigate how parental assessment of their child's oral health associates with caries experience in children receiving dental treatment at the hospital of Taibah University Dental College. **Materials and Methods:** This cross-sectional study enrolled 127 children who underwent dental treatment at Taibah University Dental College and Hospital during 2020-2021. Dental caries experience was assessed using the dmft/DMFT index, and parental rating of oral health was obtained through a questionnaire. Three logistic regression models were used to assess the correlation between dental caries experience and parental rating of oral health while controlling for sociodemographic and behavioral factors. **Results:** Most parents rated the oral health of their child as good (60.4%), followed by excellent (18.8%) and very good (15.6%). The mean dmft/DMFT score was 3.47 ± 3.46 , with 43.8% of children having high/very high dental caries experience. Logistic regression analysis showed that children whose parents rated their oral health as poor were more likely to have high/very high dental caries experience compared to those rated as excellent/very good/good/fair (adjusted odds ratio = 4.45, 95% confidence interval 1.23-16.07). **Conclusion:** This study suggests a link between parental assessment of their child's oral health and an elevated prevalence of dental caries in children. The study found that children whose parents rated their oral health as suboptimal had higher odds of having high dental caries experience. These findings emphasize the significance of parental perception of their child's oral health and suggest a necessity for customized interventions to enhance parental knowledge and practices concerning children's oral health.

KEYWORDS: Child, dental caries, oral health, oral health, parents, self-perception

INTRODUCTION

Dental caries, a multifactorial ailment, correlates with biological, behavioral, and sociodemographic determinants.^[1] It remains the predominant dental disease in infancy and childhood.^[2] Parental oversight of children's oral hygiene can influence caries severity.^[3] Among the primary factors leading to dental caries are deficient dietary habits and poor oral hygiene, Streptococcus mutant infection, tooth development

anomalies, and underutilization of dental services.^[4,5] When caries is left without treatment, it leads to pain, infection, and systemic signs and symptoms which impact the quality of life.^[6,7] Parents and especially

Address for correspondence: Faisal F. Hakeem, College of Dentistry, Department of Substitutive Dental Sciences, Taibah University Dental College & Hospital, Prince Abdulmajeed Ibn Abdulaziz, Bani Muawiyah, Al-Madinah al-Munawwarah 42313, Saudi Arabia. E-mail: Faisal.Hakeem@kcl.ac.uk

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Hakeem FF, Hammudah HA, Masoudi AA, Habeeb AT, Aljohani RM, Almutairi SN. Is parental rating of child's oral health associated with caries experience in children? A cross-sectional study. J Int Soc Prevent Communit Dent 2023;13:485-92.

Access this article online

Quick Response Code:



Website: <https://journals.lww.com/jpcd>

DOI: 10.4103/jispcd.JISPCD_110_23

mothers have a significant part in initiating and adjusting their children's health-related behaviors in early life.^[8] Children's oral health practices are primarily determined by their mothers. Parents frequently teach their children good oral hygiene habits, and over time, maternal habits are passed down through the generations.^[9,10] People who rate their oral health as poor have more teeth loss and poor periodontal health.^[11,12] Also, when it comes to parents, there is an association between how parents rate the status of the oral cavity and the severity of their children's oral health condition.^[13] Understanding what good oral health means can differ from one parent to another.^[12,14,15] Previous studies have shown variability in how parents rate their children's oral health and how the children would rate their own oral health.^[16] This could be due to some parents having insufficient knowledge about their children's oral health status.^[17,18] The rating of children's oral health by parents, which ranges from "excellent" to "poor," offers a glimpse into the comprehension of oral health and disease by parents, along with their priorities and concerns. Moreover, parents can provide reliable and trustworthy information on this matter.^[14] Prior research indicates a direct correlation between mothers' knowledge of children's dental health and the severity of caries in children.^[19,20] Moreover, parents who hold the belief that their child's oral health is in good condition tend to be more inclined to be conscious of their child's teeth cleaning practices in comparison to parents who do not share the same belief.^[21] While parental ratings may be constrained by insufficient knowledge about particular experiences, they still offer valuable insights.^[14] Furthermore, dental caries and children's oral health have both been linked to parents' attitudes about nutrition and oral hygiene.^[22] This emphasizes the significance of adults being knowledgeable about the oral health status of their children and acknowledging their requirements.^[17] Little is known regarding the association between parental factors and children's oral health in Saudi Arabia. There is a need to assess the parental factors associated with children's dental caries experience, as this could be important for tailoring health promotion interventions and educational programs which could potentially lead to reducing caries prevalence. The aim of this study was to investigate how parental assessment of their child's oral health is associated with caries experience in children receiving dental treatment at the hospital of Taibah University Dental College.

MATERIALS AND METHODS

This is a cross-sectional study. A total of 127 dental records of children who were treated in 2020-2021 at the dental clinics of Taibah University Dental College

and Hospital were used in this study. The inclusion criteria were children who received dental treatment in Taibah University Dental College and Hospital in 2021-2022, who had parental written and informed consent, completed data in previous dental records, and properly filled out questionnaires. A minimum of 109 participants was necessary to identify a small effect size, considering the established prevalence of dental caries in children in Madinah (67.6%),^[23] and an estimated occurrence rate of 80% in the study group while utilizing a significance level of 0.5 and 80% power. We adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines in preparing and reporting the findings of this manuscript.^[24]

The parents of children who received treatment in dental clinics were invited to take part in the study. Each parent received an online questionnaire along with a consent form. Full confidentiality of the collected information was provided to the research participants. The dental records of pediatric patients contained information regarding medical history, dental history, clinical examination, radiographic interpretation, dental chart, diagnosis, problem list, and treatment plan. The dental chart in the patient's records was used to retrieve information. The dmft/DMFT index was calculated for each child by counting the number of decayed, missing, and filled teeth.^[25] The severity scale used to categorize the mean dmft/DMFT was based on the WHO's criteria, which include very low (0 – 1.1), low (1.2 – 2.6), moderate (2.7 – 4.4), high (4.5 – 6.5), and very high (>6.6).^[26-28] The parents were contacted to fill out a questionnaire containing questions related to sociodemographic factors and behavioral factors. The sociodemographic variables included both parents' education and family income. The level of education was determined based on the highest qualification attained using a five-point scale ranging from illiterate to university and higher degree. Family income was measured using one question asking whether the family income was above or below 8,699 SAR.^[29,30] The behavioral variables comprised of the parent's assessment of their child's teeth, which was categorized as excellent, very good, good, fair, or poor.^[14,31] This variable was later compared to the dmft/DMFT obtained from dental charts. Each dental record was assigned a specific code that was later matched to the survey by instructing parents to fill in the matching form number before starting the questionnaire.

CONSTRUCTION, RELIABILITY, AND VALIDITY OF THE QUESTIONNAIRE

The questionnaire was crafted using questions derived from previously validated instruments including the WHO Oral Health Survey Basic Methods,^[25]

national surveys by the Saudi National Authority for Statistics,^[30] and the Parental Perceptions of Children's Oral Health: The Early Childhood Oral Health Impact Scale (ECOHIS).^[32] After a thorough literature review and expert consultations in pediatric dentistry and Dental Public Health, a pilot test with 30 parents was conducted for clarity optimization. Reliability was established with a Cronbach's alpha surpassing 0.7 and consistent test-retest results. Expert reviews ensured content comprehensiveness, corroborating content validity.

EXPLANATORY VARIABLE

The parental rating of the child's oral health was used as an explanatory variable. Each parent was asked "How would you rate your child's oral health? with possible answers ranging from "excellent to "poor."^[32]

THE OUTCOME VARIABLE

The outcome variable was the caries experience. Caries experience was dichotomized to "low/moderate" versus "high/very high" based on the dmft/DMFT index calculated from the child's dental records.

COVARIATES

This study adjusted for various covariates, including sociodemographic factors like the child's age and gender, as well as both parents' education, family income, dental visits, and dental history.

STATISTICAL ANALYSIS

The study presented categorical variables using frequencies and percentages, and numerical variables using mean and standard deviation. Logistic regression analysis was used to investigate the relationship between parental rating of child oral health and dental caries experience, with parental rating categorized as either "excellent/very good/good/fair" or "poor." The study used three models: a crude model, a second model adjusted for age and gender, and a final model adjusted for all sociodemographic and behavioral factors. The association was presented as odds ratios and 95% confidence intervals. The analysis was based on the conceptual model of "Influences on children's oral health."^[33] The statistical analysis was performed using Stata version 17 software, which was developed and distributed by StataCorp LLC.

RESULTS

SAMPLE CHARACTERISTICS

The study included 127 patients who received dental treatment in 2021/2022. The mean age of the study participants was 7.57 years (SD 1.47). Most of the study participants were females ($n = 77$, 61%). Around half

of the study participants had fathers with education of university or higher degrees ($n = 62$, 48.8%), whereas the majority had mothers with education of high school degree ($n = 46$, 36.2%), followed by university or higher degrees ($n = 40$, 31.5%). In terms of family income, the majority of the sample indicated that they earn less than 8,700 Saudi Riyals monthly ($n = 96$, 75.6%). Upon reviewing the dental records of the study participants, most of the study sample had a high caries experience ($n = 87$, 68.5%). There were no significant statistical differences between participants who had low or moderate caries experience and participants who had high caries experience across the demographics and general variables [Table 1].

ORAL HEALTH-RELATED VARIABLES

Most of the study participants visited the dentist only when they have symptoms ($n = 103$, 81.1%), whereas only a few were regular dental visitors ($n = 11$, 8.7%). An almost equal distribution of participants had a previous dental history ($n = 67$, 53.2%). Only 17.3% and 24.4% of the parents rated the oral health of their children as poor and fair, respectively. Participants with high caries experience had significantly higher frequencies of fair and poor parental ratings of oral health [Table 2]. The mean dmft score for children whose parents rated their oral health as excellent, very good, good, fair and poor was 5.23, 7.6, 7.64, 7.51 and 9.86, respectively. These findings suggest that there is a positive correlation between the perceived oral health of children by their parents and their actual dental status [Table 3].

LOGISTIC REGRESSION MODEL

Table 4 shows the association between the parental rating of child's oral health and caries experience (low/moderate vs. high) using a fully adjusted logistic regression model. Poor parental rating of child's oral health was associated with higher odds of having high caries experience compared to better parental ratings in the unadjusted model (OR 5.67; 95% CI: 1.25- 25.59). The association slightly attenuated and remained significant after further adjustment for age and gender (OR 5.62; 95% CI: 1.24- 25.51). After further adjustment for socioeconomic status (family income and parents' education) and behavioral factors (dental visits, and previous dental history), poor parental rating of child's oral health was still significantly associated with higher odds of having high caries experience (OR 5.81; 95% CI: 1.23- 27.36).

DISCUSSION

This study aimed to examine the association between the parental rating of child's oral health and child's

Table 1: Demographics and general characteristics of the study participants (n = 127)

Variable	Caries experience		Total sample	P Value	
	Low or moderate	High			
	n = 40	n = 87			
Age, mean (SD)	7.65 (1.53)	7.53 (1.45)	7.57 (1.47)	0.68	
Gender, n (%)	Male	14 (35.0)	35 (4.7)	49 (38.9)	0.54
	Female	26 (65.0)	51 (59.3)	77 (61.1)	
Father education, n (%)	Primary school degree	5 (12.5)	14 (16.1)	19 (15.0)	0.12
	Intermediate school degree	3 (7.5)	15 (17.2)	18 (14.2)	
	High school degree	8 (20.0)	20 (23.0)	28 (22.0)	
	University and higher degree	24 (60.0)	38 (43.7)	62 (48.8)	
Mother education, n (%)	Primary school degree	4 (10.0)	10 (11.5)	14 (11.0)	0.26
	Intermediate school degree	5 (12.5)	22 (25.3)	27 (21.3)	
	High school degree	17 (42.5)	29 (33.3)	46 (36.2)	
	University and higher degree	14 (35.0)	26 (29.9)	40 (31.5)	
Family income, n (%)	0 - 8,699 SAR	26 (65.0)	70 (80.5)	96 (75.6)	0.06
	More than 8,699 SAR	14 (35.0)	17 (19.5)	31 (24.4)	

Table 2: Oral health variables of the study participants (n = 127)

Variable	Caries experience		Total sample	P Value	
	Low or moderate	High			
	n = 40	n = 87			
Dental visits, n (%)	Only when toothache	31(77.5%)	72 (82.8%)	103 (81.1%)	0.53
	Occasionally	5 (12.5%)	8 (9.2%)	13 (10.2%)	
	Once in a year	4 (10.0%)	7 (8.0%)	11 (8.7%)	
Dental history, n (%)	Yes	19 (47.5%)	48 (55.8%)	67 (53.2%)	0.38
	No	21 (52.5%)	38 (44.2%)	56 (46.8%)	
Parental rating of Child oral health, n (%)	Excellent	7 (15.5%)	6 (9.6%)	13 (10.2%)	0.033
	Very good	8 (20.0%)	16 (18.4%)	24 (18.9%)	
	Good	11 (27.5%)	26 (29.9%)	37 (29.1%)	
	Fair	12 (30.0%)	19 (21.8%)	31 (24.4%)	
	Poor	2 (5.0%)	20 (23.0%)	22 (17.3%)	

Table 3: DMFT distribution across the categories of Parental rating of Child oral health

Parental rating of child oral health	DMFT score				
	N (%)	Mean	SD	Min	Max
Excellent	13 (10.2%)	5.23	3.13	1	10
Very good	24 (18.9%)	7.6	4.38	2	17
Good	37 (29.1%)	7.64	3.22	2	14
Fair	31 (24.4%)	7.51	3.38	3	16
Poor	22 (17.3%)	9.86	4.08	4	18

dental caries experience. We found that poor parental rating of child oral health was associated with higher odds of having high caries experience. This study offers valuable insights into the landscape of oral health in Saudi Arabia. While previous studies have acknowledged the prevalence of dental caries, our research provides empirical evidence linking parental rating of their child's oral health to actual caries experience. This establishes parental rating as not just a subjective measure but one with substantial clinical relevance. Our findings also underscore the need for a more comprehensive national oral health survey in

Saudi Arabia, emphasizing the challenges associated with purely clinical examinations. By highlighting the utility of the single-item parental rating, this study introduces a potential alternative or complementary tool for oral health assessments, especially in settings where clinical evaluations might be challenging.

Our results indicated that when parents rated their child's oral health poorly, there was a greater likelihood of the child having significant caries experience. This is in line with previous studies that found that maternal/parental perception of child oral health was associated with high dental caries experience in Brazil,^[8] and in

Table 4: Logistic regression model showing the association between parental ratings of child oral health and high caries experience among the study sample (n = 127)

Variable	Fully adjusted model		P Value	
	OR	(95% CI)		
Age	0.94	0.70-1.25	0.68	
Gender	Male	(Reference)		
	Female	0.62	0.25-1.50	0.29
Parental rating of Child oral health	Fair, good, very good, or excellent	(Reference)		
	Poor	5.81**	1.23- 27.36	0.02
Family income	0 - 8,699 SAR	(Reference)		
	More than 8,699 SAR	0.48	0.15-1.55	0.22
Mother education	Primary school degree	(Reference)		
	Intermediate school degree	1.59	0.31-8.23	0.57
	High school degree	0.80	0.16- 3.87	0.78
	University and higher degree	1.06	0.20- 5.53	0.94
Father education	Primary school degree	(Reference)		
	Intermediate school degree	2.28	0.38-13.74	0.36
	High school degree	1.48	0.29-7.58	0.63
	University and higher degree	0.93	0.19-4.47	0.93
Dental visits	Only when toothache	(Reference)		
	Occasionally	1.05	0.27- 4.13	0.93
	Once in a year	1.15	0.23-5.59	0.85
Dental history	No	0.66	0.27- 1.64	0.38

the US.^[34] The association between parental rating of child oral health and higher caries experience suggests that parental perception about their children's oral health could play a role in their children's oral health.^[14,21] It is possible that parents who rate their child's oral health as poor may not have the necessary knowledge or resources to ensure their child's oral health is maintained properly. In addition, they may not seek dental care as frequently or take preventive measures as frequently as they should. This lack of attention and care may result in a higher incidence of caries experience in children.^[35] The validity and utility of the single-item parental rating of child oral health have been established in identifying poor oral health outcomes, as shown in our study, which used a sample with a high prevalence of caries. However, a national oral health survey to accurately measure the prevalence of dental caries among children in Saudi Arabia is still lacking. Published studies and systematic reviews on oral health and caries in Saudi Arabia have consistently shown that the prevalence of caries is high and remains a public health concern, despite efforts to address it.^[36,37] One challenge in conducting a national oral health survey in Saudi Arabia is the need for clinical examination. In such situations, the single-item parental rating of child oral health can be utilized as a valuable tool for identifying children who require treatment and prioritizing their care, especially when a clinical examination is not feasible.^[14]

Our findings of the association between parent's perception of their child's oral health and the actual caries experience could be explained by the valuable insights parents inherently possess about their child's wellbeing. Such insights are grounded not just in their daily interactions and observations, but also in the nuanced understanding they have of their child's habits, discomforts, and complaints.^[14] Our findings align with previous studies, which suggested that parental ratings of child oral health, often dismissed as subjective, are indeed anchored in discernible facts and consistent patterns related to their children's oral health.^[14] Emphasizing the importance of parental involvement, a previous study conducted on Saudi parents highlighted that when parents are well-versed with oral health information and have adequate access to resources, early detection and intervention become significantly more feasible.^[38] In our study, we did not observe any socioeconomic variation in caries experience or in parental ratings of child oral health. A potential reason for this lack of variation could be the nature of our sample population. Nevertheless, our findings align with those of Locker (2008), suggesting the robustness and credibility of parental reports in assessing children's oral health. Locker's research has postulated that the validity of parental assessments regarding their children's oral health is consistent and not influenced by their membership in different social groups.^[14] This implies that parents, irrespective of their socioeconomic status or cultural background, have a

keen insight into their children's oral health conditions. Such uniformity in reporting, regardless of social group membership, strengthens the case for using parental ratings as a valid tool in oral health research.

The observed association between parental ratings of child oral health and caries experience highlights the significance of targeting parents in promoting and maintaining oral health for their children.^[35] From a dental professional perspective, more efforts should be directed toward educating and promoting oral health among parents, who play a crucial role in maintaining good oral health for their children.^[39] In addition, our study found that most participants only visited the dentist when they had symptoms and only a few were regular dental visitors. This highlights the need for increased dental education and access to dental care, particularly for low-income families.^[40] The Saudi government prioritizes oral health, offering free oral healthcare services to its citizens and residents within the healthcare system.^[18] Further efforts should be made to increase dental visit frequency and behaviors, to improve overall oral health in the country. This can be achieved through increasing public education and awareness about oral health, providing access to low-cost or free dental services, offering financial incentives for regular dental check-ups, encouraging dental providers to educate patients, integrating oral health with other healthcare services, and supporting community-based oral health programs. These strategies can help individuals and communities prioritize their oral health and increase the frequency of dental visits, leading to better oral health outcomes.^[41]

The findings from our study not only offer a fresh perspective on the correlation between parental perceptions and children's oral health, but also underscore the importance of refining and expanding our research parameters in this domain. Implications for research include the need for more in-depth qualitative studies to understand the underlying factors that shape parental perceptions and their potential effects on oral healthcare behaviors.^[42] In addition, there is a palpable demand for longitudinal investigations to discern if these parental evaluations evolve over time and how they might influence long-term oral health outcomes as this area has not been fully addressed.^[43] Further research questions that arise from our study include: How do socioeconomic factors and cultural beliefs intersect to shape parental perceptions? To what extent do parental perceptions influence the frequency and quality of oral healthcare their children receive? Are there interventions or educational programs that can align parental

perceptions more closely with clinically observed oral health outcomes? By addressing these questions, we can pave the way for more effective strategies in pediatric oral healthcare promotion and intervention.^[44]

It is crucial to acknowledge the limitations of our study. Firstly, the small sample size may limit the generalizability of the results to the entire Saudi population. Moreover, given that our participants were primarily sourced from a hospital setting, this could inherently limit the diversity in social groups. Hospital-based samples can often represent a more homogeneous cohort in terms of certain demographic or socioeconomic characteristics. This can inadvertently mask underlying disparities or variations that might be evident in a broader community-based sample. Secondly, the exposure in the study was self-reported, which may have introduced recall or information bias. Thirdly, as the study focused on a population with high caries experience, the results may not be applicable to populations with different demographic profiles. Fourthly, the cross-sectional design of the study cannot establish causality or predict the persistence of our findings over time. Lastly, the use of only one oral health outcome may not provide a comprehensive representation of oral health status. These limitations should be considered when interpreting the results of the study. Further studies with larger sample sizes, a prospective design, and multiple oral health outcomes are needed to provide a more comprehensive understanding regarding the association between the parental rating of child's oral health and dental caries experience.

CONCLUSION

Poor parental rating of child's oral health was associated with high childhood caries experience. Parental rating of child's oral health could be a useful tool for providing information related to child's oral health condition and their need for treatment. Using parental rating of child's oral health should be considered in future surveys and studies in Saudi Arabia, especially when conducting clinical examinations of children is not feasible.

ACKNOWLEDGEMENT

Not available.

FINANCIAL SUPPORT AND SPONSORSHIP

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

AUTHORS CONTRIBUTIONS

FFH conceptualized the study, developed the methodology, performed the formal analysis, wrote the original draft, reviewed and edited the manuscript, and provided supervision. HAH contributed to the conceptualization and methodology, curated the data, and wrote the original draft. AAM contributed to the conceptualization and methodology, curated the data, and wrote the original draft. ATH contributed to the conceptualization and methodology, curated the data, and wrote the original draft. RMA contributed to the conceptualization and methodology, curated the data, and wrote the original draft. SNA contributed to the conceptualization and methodology, curated the data, and wrote the original draft.

ETHICAL POLICY AND INSTITUTIONAL REVIEW BOARD STATEMENT

The study was approved by the College of Dentistry Research Ethical Committee of Taibah University (TUCDREC/5032022/FHakeem).

PATIENT DECLARATION OF CONSENT

The dental treatment records of Taibah University Dental College and Hospital in 2021-2022, who had parental written and informed consent, completed and properly filled out questionnaires, were included in the study.

DATA AVAILABILITY STATEMENT

Not available

REFERENCES

1. Julihn A, Soares F, Hjern A, Dahllöf G. Socioeconomic determinants, maternal health, and caries in young children. *JDR Clin Trans Res* 2018;3:395-404.
2. Kazeminia M, Abdi A, Shohaimi S, Jalali R, Vaisi-Raygani A, Salari N, *et al.* Dental caries in primary and permanent teeth in children's worldwide, 1995 to 2019: A systematic review and meta-analysis. *Head Face Med* 2020;16:1-21.
3. Matsuyama Y, Isumi A, Doi S, Fujiwara T. Poor parenting behaviours and dental caries experience in 6-To 7-year-old children. *Community Dent Oral Epidemiol* 2020;48:493-500.
4. Nicolau B, Marcenes W, Bartley M, Sheiham A. A life course approach to assessing causes of dental caries experience: The relationship between biological, behavioural, socio-economic and psychological conditions and caries in adolescents. *Caries Res* 2003;37:319-26.
5. Giacaman RA, Fernández CE, Muñoz-Sandoval C, León S, García-Manríquez N, Echeverría C, *et al.* Understanding dental caries as a non-communicable and behavioral disease: Management implications. *Front Oral Health* 2022;3:764479.
6. Singh N, Dubey N, Rathore M, Pandey P. Impact of early childhood caries on quality of life: Child and parent perspectives. *J Oral Biol Craniof Res* 2020;10:83-6.
7. Ribeiro Junior CA, Vettore MV, Rebelo Vieira JM, Corrêa de Queiroz AP, de Queiroz AC, Pereira JV, *et al.* The role of dental pain and psychosocial factors on the relationship between dental caries and oral health-related quality of life in children. *BMC Oral Health* 2022;22:340.
8. Cademartori MG, Custodio NB, Harter AL, Goettens ML. Maternal perception about child oral health is associated to child dental caries and to maternal self-report about oral health. *Acta Odontol Scand* 2019;77:359-63.
9. Goettens ML, Nascimento GG, Peres MA, Santos IS, Matijasevich A, Barros AJ, *et al.* Influence of maternal characteristics and caregiving behaviours on children's caries experience: An intergenerational approach. *Community Dent Oral Epidemiol* 2018;46:435-41.
10. Ludovichetti FS, Zuccon A, Lucchi P, Cattaruzza G, Zerman N, Stellini E, *et al.* Mothers' awareness of the correlation between their own and their children's oral health. *Int J Environ Res Public Health* 2022;19:14967.
11. Locker D, Wexler E, Jokovic A. What do older adults' global self-ratings of oral health measure? *J Public Health Dent* 2005;65:146-52.
12. Nakahara M, Toyama N, Ekuni D, Takeuchi N, Maruyama T, Yokoi A, *et al.* Trends in self-rated oral health and its associations with oral health status and oral health behaviors in Japanese university students: A cross-sectional study from 2011 to 2019. *Int J Environ Res Public Health* 2022;19:13580.
13. Chawłowska E, Karasiewicz M, Lipiak A, Cofta M, Fechner B, Lewicka-Rabska A, *et al.* Exploring the Relationships between Children's Oral Health and Parents' Oral Health Knowledge, Literacy, Behaviours and Adherence to Recommendations: A Cross-Sectional Survey. *Int J Environ Res Public Health* 2022;19:11288.
14. Locker D. Validity of single-item parental ratings of child oral health. *Int J Paediatr Dent* 2008;18:407-14.
15. Isaksson H, Koch G, Alm A, Nilsson M, Wendt LK, Birkhed D. Parental factors in early childhood are associated with approximal caries experience in young adults—A longitudinal study. *Community Dent Oral Epidemiol* 2019;47:49-57.
16. Daly JM, Levy SM, Xu Y, Jackson RD, Eckert GJ, Levy BT, *et al.* Factors associated with parents' perceptions of their infants' oral health care. *J Primary Care Commun Health* 2016;7:180-7.
17. Castilho ARF, Mialhe FL, Barbosa TS, Puppim-Rontani RM. Influence of family environment on children's oral health: a systematic review. *J Pediatr* 2013;89:116-23.
18. Moghaddam LF, Vettore MV, Bayani A, Bayat A-H, Ahounbar E, Hemmat M, *et al.* The Association of Oral Health Status, demographic characteristics and socioeconomic determinants with Oral health-related quality of life among children: A systematic review and Meta-analysis. *BMC Pediatr* 2020;20:1-15.
19. Skinner JD, Carruth BR, Bounds W, Ziegler PJ. Children's food preferences: A longitudinal analysis. *J Am Diet Assoc* 2002;102:1638-47.
20. Sari GD, Amalia NM, Hatta I. Correlation between the knowledge level of mother on dental health and the caries severity level of children in Barito Kuala. *Dentino: J Kedok Gigi* 2021;6:122-5.
21. Shaghaghian S, Savadi N, Amin M. Evaluation of parental awareness regarding their child's oral hygiene. *Int J Dent Hyg* 2017;15:e149-55.
22. Tiwari T, Mulvahill M, Wilson A, Rai N, Albino J. Association between maternal acculturation and health beliefs related to oral health of Latino children. *BMC Oral Health* 2018;18:1-7.
23. Mahrous MS, Bhayat A, Hifnawy T, Bakeer H, Ahmad MS. Can the prevalence of dental caries be used as an indicator of the quality of dental services? A cross-sectional study among

- children in Almadinah Almunawwarah, KSA. *J Taibah Univ Med Sci* 2016;11:41-5.
24. Cuschieri S. The STROBE guidelines. *Saudi J Anaesth* 2019;13:S31-4.
 25. World Health Organization. Oral Health Surveys: Basic Methods. World Health Organization; 2013.
 26. Petersen PE, Baez RJ, World Health Organization. Oral Health Surveys: Basic Methods. 2013.
 27. World Health Organization. Global data on dental caries prevalence (DMFT) in children aged 12 years. Global Oral Data Bank. Oral health country/area profile programme, Management of noncommunicable diseases Geneva. 2000.
 28. Al-Darwish M, El Ansari W, Bener A. Prevalence of dental caries among 12–14 year old children in Qatar. *Saudi Dent J* 2014;26:115-25.
 29. Alrumyyan A, Quwayhis S, Meaigel S, Almedlej R, Alolaiq R, Nafesah RB, *et al.* Oral health-related quality of life and oral hygiene practice of adults with fixed dental prostheses in Riyadh, Saudi Arabia. *J Int Soc Prevent Commun Dent* 2020;10:62.
 30. General Authority for Statistics L. Population estimates. General Authority for Statistics Riyadh. Saudi Arabia: 2020.
 31. Buldur B. Pathways between parental and individual determinants of dental caries and dental visit behaviours among children: Validation of a new conceptual model. *Community Dent Oral Epidemiol* 2020;48:280-7.
 32. Pahel BT, Rozier RG, Slade GD. Parental perceptions of children's oral health: the Early Childhood Oral Health Impact Scale (ECOHIS). *Health Qual Life Outcomes* 2007;5:1-10.
 33. Fisher-Owens SA, Gansky SA, Platt LJ, Weintraub JA, Soobader M-J, Bramlett MD, *et al.* Influences on children's oral health: a conceptual model. *Pediatrics* 2007;120:e510-20.
 34. Snell AK, Burgette JM, Weyant RJ, Crout RJ, McNeil DW, Foxman B, *et al.* Association between a child's caries experience and the mother's perception of her child's oral health status. *J Am Dent Assoc* 2019;150:540-8.
 35. Çolak H, Dülgergil CT, Dalli M, Hamidi MM. Early childhood caries update: A review of causes, diagnoses, and treatments. *J Nat Sci Biol Med* 2013;4:29-38.
 36. Alshammari FR, Alamri H, Aljohani M, Sabbah W, O'Malley L, Glennly A-M. Dental caries in Saudi Arabia: A systematic review. *J Taibah Univ Med Sci* 2021;16:643-56.
 37. Al Agili DE. A systematic review of population-based dental caries studies among children in Saudi Arabia. *Saudi Dent J* 2013;25:3-11.
 38. Kotha SB, Alabdulaali RA, Dahy WT, Alkhaibari YR, Albaraki ASM, Alghanim AF. The influence of oral health knowledge on parental practices among the Saudi parents of children aged 2–6 years in Riyadh City, Saudi Arabia. *J Int Soc Prevent Commun Dent* 2018;8:565-71.
 39. Duijster D, de Jong-Lenters M, Verrips E, van Loveren C. Establishing oral health promoting behaviours in children—parents' views on barriers, facilitators and professional support: a qualitative study. *BMC Oral Health* 2015;15:1-13.
 40. Northridge ME, Kumar A, Kaur R. Disparities in access to oral health care. *Annu Rev Public Health* 2020;41:513-35.
 41. Ghoneim A, D'Souza V, Ebnahmady A, Kaura Parbhakar K, He H, Gerbig M, *et al.* The Impact of Dental Care Programs on Individuals and Their Families: A Scoping Review. *Dent J* 2023;11:33.
 42. Chai HH, Gao SS, Chen KJ, Duangthip D, Lo ECM, Chu CH. A concise review on qualitative research in dentistry. *Int J Environ Res Public Health* 2021;18:942.
 43. Daly JM, Levy SM, Xu Y, Jackson RD, Eckert GJ, Levy BT, *et al.* Changes in parental perceptions of their care of their children's oral health from age 1 to 4 years. *J Primary Care Community Health* 2019;10:2150132719836908.
 44. Bramantoro T, Santoso CMA, Hariyani N, Setyowati D, Zulfiana AA, Nor NAM, *et al.* Effectiveness of the school-based oral health promotion programmes from preschool to high school: A systematic review. *PLoS One* 2021;16:e0256007.