



Parental perception of deleterious oral habits in children: A cross-sectional study from Coastal Karnataka, India

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Abstract

Aim: To assess parental knowledge, awareness, attitudes and practices regarding deleterious oral habits in children, and to examine the association between parental occupation and these domains.

Materials and Methods: A cross-sectional, questionnaire-based study was conducted among 113 parents/caregivers using a structured, self-administered Google Form covering demographic details (parental occupation), knowledge of oral habits, awareness of their effects, attitudes toward prevention/treatment, and practices adopted. Descriptive statistics were used for all items. Associations between parental occupation and nominal items were tested using Pearson's chi-square test (with Monte Carlo exact correction where >20% of expected cell counts were <5), ordinal items were compared using the Kruskal-Wallis H test. McNemar's exact test compared informal parental action against professional dental consultation for the same respondents. A composite knowledge score was categorised using Bloom's cut-off convention. A two-sided $p < 0.05$ was considered significant.

Results: Most parents reported an idea about oral habits (78.8%) and believed such habits could affect their child's teeth (69.9%) and could be prevented (70.8%). Thumb sucking was the most commonly observed habit (33.6%). While 77.0% of parents had tried to help their child stop the habit informally, only 36.3% had ever consulted a dentist about it — a highly significant gap (McNemar's exact test, $p < 0.001$). Parental occupation was significantly associated with only one of fourteen awareness/practice items tested: belief that oral habits can be prevented ($\chi^2 = 10.73$, $df = 4$, Monte Carlo $p = 0.027$). The composite knowledge score was fairly evenly distributed across Poor (36.3%), Moderate (29.2%) and Good (34.5%) categories.

Conclusion: Parental awareness of deleterious oral habits was reasonably high, but this awareness translated into professional dental consultation for only about a third of affected families. Parental occupation had, at most, a weak influence on awareness and practice. Targeted, universally delivered parental education — emphasising early dental consultation rather than self-management — may help close this awareness-to-practice gap.

Keywords: Parental awareness, deleterious oral habits, children, malocclusion, knowledge, attitude and practice, cross-sectional study

Introduction

Deleterious oral habits like thumb or digit sucking, tongue thrusting, mouth breathing, nail biting, lip or cheek biting, teeth clenching, and prolonged pacifier use are common in early childhood and are generally considered as normal part of development up to a certain age [7, 8]. When such habits persist beyond this developmental window, they apply sustained abnormal forces on the developing dentition and craniofacial structures, contributing to malocclusion, altered occlusal relationships, speech difficulties, and other functional problems [7, 9, 10]. A recent systematic review and meta-analysis estimated the pooled prevalence of oral deleterious habits in children at approximately 29%, with mouth breathing and bruxism among the most frequently reported [7], while a district-level mapping study in Karnataka similarly documented a substantial burden of such habits among school-going children in this region [8].

Parents are typically the first to observe these habits and are best placed to seek timely professional advice, yet several studies suggest that parental knowledge of the causes, consequences, and appropriate management of deleterious oral habits is often incomplete. Elshebani *et al.* found that parental awareness of children's oral health habits was

directly related to their child's caries experience [1], while Demircan and Demir, in a survey of 501 Turkish parents, reported that parental knowledge of oral habits varied significantly with sociodemographic characteristics [2]. AlMugairin *et al.*, studied 563 Saudi mothers and found that awareness of the general harms of oral habits was reasonably high, a substantial gap existed between this awareness and actual professional consultation, with 92.9% of mothers reporting that they had never consulted a dentist about their child's persistent habit [3]. Zhang *et al.*, using structural equation modelling in a Chinese cohort of 500 parents, demonstrated that knowledge, attitudes and practices regarding oral habits are interlinked but do not always translate from one domain to the next [4], and Abubakar *et al.* extended this line of enquiry to pregnant mothers, finding that awareness of habit-breaking appliances remained low even before children were born [5]. A large Egyptian survey similarly found that maternal education was associated with awareness of the harmful effects of oral habits, though not with the underlying prevalence of the habits themselves [6]. Assessing parental perception, knowledge, awareness, attitudes, and practice is therefore essential to understand

where gaps exist and to guide the design of targeted oral health education programmes. Improved parental awareness can promote earlier detection, more timely professional intervention, and ultimately reduce the burden of preventable malocclusion. However, comparable data from coastal Karnataka, India, are limited. The present study was therefore conducted to assess parental perception of deleterious oral habits in children in this population, and to examine whether this perception varies by parental occupation.

Materials and Methods

Study Design and Setting

This was a cross-sectional, questionnaire-based study conducted among parents/primary caregivers of children in the catchment area of a dental teaching institution in Dakshina Kannada district, coastal Karnataka, India.

Study Population and Eligibility

Parents or primary caregivers of children were eligible for inclusion if they were willing to participate, able to understand the questionnaire, and provided consent. Parents of children with craniofacial anomalies or developmental disorders known to affect oral habits, and those who declined participation or submitted incomplete responses, were excluded.

Sample Size

The sample size was calculated using the standard formula for estimating a population proportion in a cross-sectional study: $n = Z^2_{1-\alpha/2} \times p(1-p) / d^2$, where $Z = 1.96$ (95% confidence level), $p = 0.929$ (the proportion of mothers who had never consulted a dentist about their child's persistent oral habit, based on a prior cross-sectional study [3]), and $d = 0.05$ (allowable error). This yielded a minimum required sample of 102 participants; after accounting for an anticipated 10% rate of incomplete responses, the target sample size was set at 111 participants. A total of 113 complete responses were obtained.

Study Instrument and Data Collection

Data were collected using a structured, self-administered questionnaire distributed electronically as a Google Form, with an introductory section explaining the purpose of the study; proceeding to the questionnaire was taken as implied consent. The instrument captured parental occupation as a demographic variable, together with items covering: knowledge of common deleterious oral habits; awareness of

their effects on oral and facial development; attitudes toward prevention and treatment; and practices adopted by parents, including whether professional dental consultation had been sought. In total, 17 substantive items were analysed, spanning single-response categorical items (e.g., habit type observed, perceived consequence, method used to address the habit), dichotomous or three-level items (Yes/No/Don't know), and five-point frequency or importance scales (Never to Always; Not important at all to Very important).

Statistical Analysis

All analyses were performed in Python (SciPy 1.x and statsmodels 0.14). Descriptive statistics (frequencies and percentages) summarised parental occupation and all knowledge, awareness, attitude and practice items. For between-occupation comparisons, the three adequately sized occupation categories (private employee, $n = 48$; governmental employee, $n = 36$; unemployed, $n = 27$; total $n = 111$) were used; two categories with a single respondent each (business, student) were retained in descriptive analyses but excluded from group comparisons because of insufficient sample size. Nominal (unordered) items were compared across occupation groups using Pearson's chi-square test; where more than 20% of expected cell counts were below 5, the asymptotic p-value was supplemented with a Monte Carlo exact p-value based on 20,000 permutations. Ordinal frequency- and importance-scale items were compared across occupation groups using the Kruskal-Wallis H test, which exploits the natural ordering of response categories. McNemar's exact test was used to compare, within the same respondents, whether parents had informally tried to help their child stop the habit against whether they had ever consulted a dentist about it. A composite knowledge score (range 0–4) was derived from four core knowledge/attitude items and categorised as Poor (<60%), Moderate (60–80%) or Good (>80%) using Bloom's cut-off convention. A two-sided p-value <0.05 was considered statistically significant throughout.

Results

A total of 113 complete parental responses were analysed, with no missing data on any item. Parental occupation was distributed across private employees ($n = 48$, 42.5%), governmental employees ($n = 36$, 31.9%), unemployed status ($n = 27$, 23.9%), and single respondents each in the business and student categories.

Table 1: Frequency and percentage of responses for the main knowledge, awareness, attitude and practice items (N = 113)

Item	Question	Response, n (%)
Q2	Has an idea about oral habits	Yes: 89 (78.8) / No: 24 (21.2)
Q3	Frequency of observing child's poor oral habits	Often 48 (42.5) / Rarely 38 (33.6) / Always 16 (14.2) / Never 11 (9.7)
Q5	Believes oral habits can affect child's teeth	Yes 79 (69.9) / Don't know 18 (15.9) / No 16 (14.2)
Q7	Age until which habits considered normal	3 years 56 (49.6) / 18 months 30 (26.5) / 6 years 27 (23.9)
Q8	Believes oral habits can be prevented	Yes 80 (70.8) / Don't know 25 (22.1) / No 8 (7.1)
Q9	Tried to help child stop the habit	Yes 87 (77.0) / No 17 (15.0) / Child has no habit 9 (8.0)
Q11	Frequency of discussing habit impact with child	Often 43 (38.1) / Sometimes 33 (29.2) / Always 17 (15.0) / Rarely 15 (13.3) / Never 5 (4.4)
Q12	Frequency of actively seeking knowledge	Sometimes 38 (33.6) / Often 34 (30.1) / Rarely 23 (20.4) / Always 12 (10.6) / Never 6 (5.3)
Q13	Noticed improvement after habit stopped	Yes 66 (58.4) / Don't know 32 (28.3) / No 15 (13.3)
Q14	Perceived importance of parental education/guidance	Very important 54 (47.8) / Neutral 27 (23.9) / Important 23 (20.4) / Not important 6 (5.3) / Not at all 3 (2.7)

Q15	Frequency of taking child for dental check-ups	Often 41 (36.3) / Sometimes 35 (31.0) / Always 16 (14.2) / Rarely 11 (9.7) / Never 10 (8.8)
Q16	Ever consulted dentist about persistent habit	No 72 (63.7) / Yes 41 (36.3)
Q17	Believes habit-breaking treatment differs by age	Yes 60 (53.1) / Don't know 37 (32.7) / No 16 (14.2)
Q18	Habit stopped after consulting dentist ^a	Yes 83 (73.5) / No 30 (26.5)

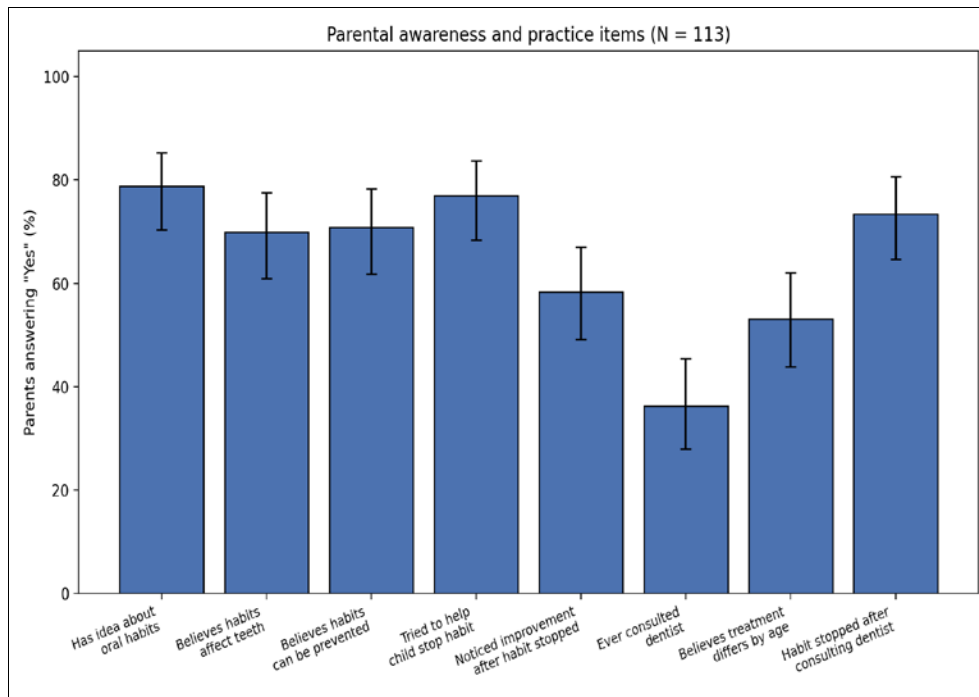


Fig 1: Percentage of parents answering “Yes” to key knowledge/awareness/practice items, with 95% Wilson confidence-interval error bars (N = 113).

The most frequently observed habit was thumb sucking (33.6%), followed by nail biting (29.2%), mouth breathing (15.9%), an inability to identify the habit (8.0%), tongue thrusting (7.1%), lip or cheek biting (4.4%), and teeth clenching (1.8%). Malocclusion (33.6%) and dental cavities (27.4%) were the most commonly cited consequences, followed by aesthetic problems (17.7%); 10.6% of parents believed the habits had no effect. Regarding the age up to which such habits were considered developmentally normal, responses were divided between 3 years (49.6%), 18 months (26.5%) and 6 years (23.9%); as a point of reference, the American Academy of Paediatric Dentistry recommends discontinuation of non-nutritive sucking habits by 36

months of age [15], suggesting that around a quarter of parents in this sample may over-estimate the age at which such habits cease to be developmentally normal. The most common method used to address a habit was frequent verbal reminders (46.9% of all respondents).

A clear gap was observed between informal parental action and professional engagement. While 77.0% of parents reported trying to help their child stop the habit, only 36.3% had ever consulted a dentist about it. This within-subject gap was statistically significant (McNemar's exact test on the discordant pairs, $\chi^2 = 10.0$, $p = 6.9 \times 10^{-9}$), confirming that parents were considerably more likely to attempt informal management than to seek professional dental input.

Table 2: Chi-square test of association between parental occupation and nominal (Yes/No/Don't-know) items (n = 111^a)

Item	Test	χ^2	df	p-value
Has an idea about oral habits (Q2)	Chi-square	2.94	2	0.230
Believes habits affect teeth (Q5)	Chi-square (Monte Carlo)	7.79	4	0.100
Believes habits can be prevented (Q8)	Chi-square (Monte Carlo)	10.73	4	0.027*
Tried to help child stop habit (Q9)	Chi-square (Monte Carlo)	4.63	4	0.332
Noticed improvement after habit stopped (Q13)	Chi-square (Monte Carlo)	3.16	4	0.548
Ever consulted dentist (Q16)	Chi-square	1.68	2	0.432
Believes treatment differs by age (Q17)	Chi-square (Monte Carlo)	9.02	4	0.063
Habit stopped after consulting dentist (Q18)	Chi-square	3.27	2	0.195

^a Restricted to the three adequately sized occupation groups; the single business and student respondents were excluded from this comparison. * $p < 0.05$. Where $>20\%$ of expected cell counts were <5 , the p-value shown is a Monte Carlo exact p-value based on 20,000 resamples.

Only one item showed a statistically significant association with parental occupation: belief that oral habits can be prevented (Q8; $\chi^2 = 10.73$, $df = 4$, Monte Carlo $p = 0.027$). Unemployed parents were more likely to answer “Don't

know” (33.3%) and less likely to answer “Yes” (48.1%) than governmental (77.8% “Yes”) or private employees (77.1% “Yes”). No other nominal item differed significantly by occupation (all $p > 0.06$).

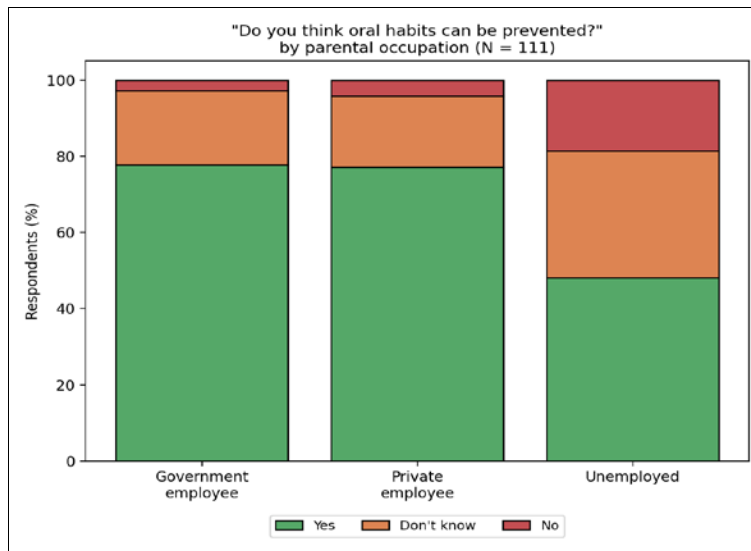


Fig 2: Response to “Do you think oral habits can be prevented?” by parental occupation — the only item showing a significant association (n = 111).

Table 3: Kruskal-Wallis H test of association between parental occupation and ordinal frequency/importance items (n = 111)

Item	H statistic	df	p-value
Frequency of observing poor oral habits (Q3)	1.31	2	0.521
Age until which habits considered normal (Q7)	0.05	2	0.975
Frequency of discussing impact with child (Q11)	0.75	2	0.687
Frequency of actively seeking knowledge (Q12)	0.26	2	0.879
Perceived importance of parental education (Q14)	1.67	2	0.434
Frequency of taking child to dentist (Q15)	0.96	2	0.619

None of the six ordinal knowledge/practice items differed significantly by parental occupation (all $p > 0.43$), indicating that how often parents observe, discuss, seek

knowledge about, or act on their child's oral habits was broadly similar across occupation groups.

Table 4: McNemar's exact test comparing parents who tried to help their child stop the habit with those who ever consulted a dentist about it (N = 113)

Response pattern (tried to help / consulted dentist)	n
Tried to help, and consulted dentist (Yes/Yes)	31
Tried to help, but never consulted dentist (Yes/No)	56
Did not try to help ^b , but consulted dentist (No/Yes)	10
Did not try to help ^b , and never consulted dentist (No/No)	16

^b Combines respondents who answered “No” to trying to help and those whose child does not have a habit, for the purpose of this 2×2 comparison. McNemar's exact test on the 56 vs 10 discordant pairs: $\chi^2 = 10.0$ (continuity-corrected), exact $p = 6.9 \times 10^{-9}$.

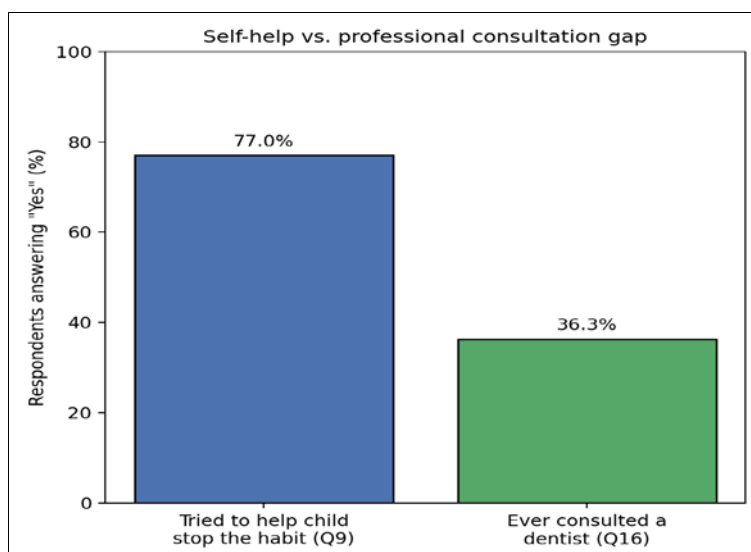
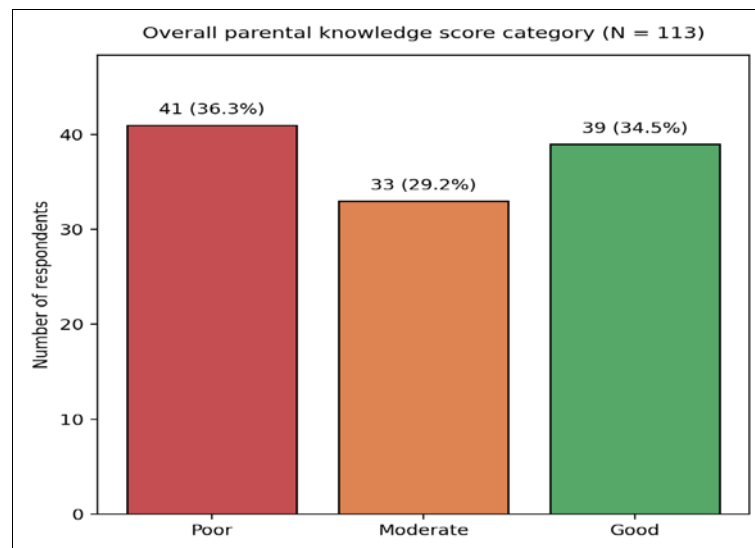


Fig 3: Parents who tried to help their child stop the habit versus those who ever consulted a dentist about it, expressed as % answering “Yes” (N = 113).

Table 5: Distribution of the composite parental knowledge score (range 0–4) and knowledge category (N = 113)

Knowledge category (Bloom's cut-off) ^a	n	%
Poor (<60%, score 0–2)	41	36.3
Moderate (60–80%, score 3)	33	29.2
Good (>80%, score 4)	39	34.5

^a Composite score derived from four core knowledge/attitude items and expressed as a percentage of the maximum possible score. Median composite score = 3 (IQR 2–4); mean $\pm$ SD = 2.73 $\pm$ 1.24.

**Fig 4:** Distribution of respondents by overall parental knowledge category (N = 113).

Discussion

The present study found that parents in coastal Karnataka generally recognized deleterious oral habits and their potential effects on dental development. Thumb sucking was the most commonly reported habit (33.6%), followed by nail biting (29.2%) and mouth breathing (15.9%). Malocclusion (33.6%) and dental cavities (27.4%) were the most commonly perceived consequences. Persistent oral habits can exert abnormal forces on the developing dentition and disturb the balance between the tongue, lips, cheeks, and other orofacial muscles. Thumb sucking and prolonged pacifier use may contribute to increased overjet, anterior open bite and altered arch form, while tongue thrusting and mouth breathing may be associated with altered tooth position, open bite, crossbite and changes in orofacial muscle posture^[7, 9, 10].

Although 78.8% of parents had an idea about oral habits and 69.9% believed that they could affect the teeth, only 36.3% had consulted a dentist. In contrast, 77.0% had attempted to help their child stop the habit, demonstrating an important awareness-to-consultation gap. This finding is consistent with AlMugairin *et al.*, who reported that 92.9% of Saudi mothers had never consulted a dentist regarding their child's persistent oral habit^[3]. Similar gaps between parental knowledge and practice have been reported by Zhang *et al.*^[4], while Demircan and Demir found associations between parental knowledge and sociodemographic characteristics^[2]. The present finding differed from Khattab *et al.*, who reported nail biting as the most prevalent habit, whereas thumb sucking predominated in our study^[6]. Such differences may reflect variations in age, cultural practices, and sampling characteristics. In the present study, parental occupation was associated with only one item, belief in the preventability of oral habits ($p = 0.027$), while no significant association was observed for the other knowledge, awareness, or practice measures. Moreover, this association

would not remain significant after Bonferroni correction, and therefore should be interpreted cautiously.

The study had strengths including complete responses from all 113 participants, use of statistical tests appropriate to the type of data, and direct comparison of informal parental action with professional consultation. However, the electronic convenience sample may introduce selection bias, and the absence of information on parental age, education and socioeconomic status limited assessment of other potentially important determinants. The questionnaire's formal validity and reliability were also not established for the analyzed dataset. Parent-reported, cross-sectional data may additionally be affected by recall and social-desirability bias, and clinical verification of habits was not possible.

Overall, the findings indicate that parental awareness of deleterious oral habits was reasonably good, but awareness did not consistently translate into professional dental consultation. Parental education should therefore emphasise not only recognition of these habits and their effects on teeth and orofacial musculature, but also the importance of timely professional assessment.

Strengths of the Study

- Complete data all 113 respondents answered every item, so no data were lost to missingness and the full achieved sample exceeded the pre-calculated minimum of 111.
- Statistical methods were matched to each item's measurement level — chi-square (with Monte Carlo correction where expected cell counts were low) for nominal items and Kruskal-Wallis H for ordinal frequency/importance items — rather than a single test applied uniformly across all items.
- The paired McNemar comparison of informal action against professional consultation directly quantified a clinically actionable gap within the same respondents,

rather than relying on two separate, unlinked proportions.

- Triangulation across descriptive frequencies, inferential group comparisons, and a composite knowledge score provided a multi-layered and internally consistent picture of parental perception.

Limitations of the Study

- The sample was recruited via a self-administered electronic form rather than a formal random sampling frame, so a response rate cannot be calculated and selection/self-selection bias cannot be excluded; findings may not generalise beyond parents who chose to complete an online survey.
- All data were parent-reported and cross-sectional, so responses are subject to recall and social-desirability bias, and no independent or clinical verification of the child's oral habits, or of whether a dental consultation actually took place, was possible.

Conclusion

Parents in this sample generally recognised the existence of deleterious oral habits in their children and their potential dental consequences, and most reported taking informal steps chiefly verbal reminders — to help their child stop the habit. However, only around a third had ever consulted a dentist about it, a statistically significant awareness-to-practice gap that echoes findings from several other parental-awareness studies in paediatric dentistry ^[2–6]. Parental occupation showed, at most, a weak and isolated association with one belief item (preventability of oral habits) and did not meaningfully explain differences in the frequency of observing, discussing, or acting on oral habits. These findings suggest that educational interventions aimed at closing the awareness-to-consultation gap should be broadly targeted at all parents rather than tailored by occupation, with particular emphasis on encouraging earlier professional dental consultation once a persistent oral habit is noticed. Larger, methodologically validated studies using a defined sampling frame and a fuller set of sociodemographic variables are needed to confirm these findings and to better characterise which factors most strongly predict the translation of parental awareness into dental care-seeking behaviour.

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