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ORIGINAL ARTICLE

Impact of Parents' Positive Attitude on the Pacifier Sucking Habit Duration and Occurrence of Anterior Open Bite in Children: A Cross-Sectional Survey

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ABSTRACT

Objective: To investigate the influence of the parents´ attitude on the duration of the pacifier sucking habit and the occurrence of anterior open bite (AOB) in children. **Material and Methods:** A population-based cross-sectional study was conducted in Ribeirão das Neves, Brazil, including 497 children aged 4-6 years. The pacifier use was reported by the parents and categorized as "never used", "used up to 24 months" and "used more than 24 months". Perceived parental positive attitude was measured by two self-reported questions "I have enough energy to do what has to be done" and "I have self-discipline". Socioeconomic variables were collected. Children were examined by two examiners to the diagnosis of AOB according to Forster and Hamilton criteria. Adjusted logistic and multinomial regressions were performed ($p<0.05$). **Results:** Children who used pacifiers more than 24 months were 6.21 times more likely to have AOB than those who did not use pacifier (95%CI: 2.98–12.92). Children who discontinued pacifier use within 24 months had parents with higher energy than those who keep the habit for more than 24 months (OR:1.22; 95%CI: 1.01–1.47). Parents from children who never used or used pacifier for less than 24 months were more self-disciplined than those who used for more than 24 months (OR: 1.18; 95%CI: 1.01–1.37; OR: 1.29; 95%CI: 1.06–1.56). **Conclusion:** High energy and self-discipline of parents were active factors in the discontinuation of pacifier sucking habit in less than 24 months.

Keywords: Malocclusion; Pacifiers; Child.

Introduction

Malocclusion is defined as a change in the growth and development process, resulting in variability of tooth position [1]. It is commonly caused by an interaction of etiological factors such as a vertical growth pattern, congenital or acquired pathologies, mouth breathing, atypical phonation, and swallowing [2]. In addition, it is associated with deleterious and parafunctional oral habits and can be related to non-nutritive sucking habits, which contribute to the installation and aggravation of this condition [3,4].

Amongst the different types of malocclusions, stands out the anterior open bite (AOB), which is the malocclusion characterized by an absence of contact between the anterior teeth while the posterior teeth are in occlusion [5]. The main habits associated with this condition are nail biting, bruxism, mouth breathing, tongue interposition, digital or pacifier sucking, and bottle-fed use [6]. The severity of problems arising from these habits depends, in addition to individual predisposition, on the duration, frequency and intensity of use (Graber's Triad) [7].

The literature has shown a direct relation between pacifier uses and AOB [8,9]. The spread use of pacifiers is due to a cultural habit based on psychological compensation due to its soothing effect against emotional distress [10]. The American Association of Pediatric Dentistry also recommends pacifier use as a possible prevention strategy against sudden infant death syndrome [11].

Malocclusions resulting from non-nutritive sucking habits present a self-corrective potential if the usage is discontinued before the child is two years old, based on the body's ability to resolve this phenotype during regular growth [12,13], this self-correction may also occur if the habit persists until the child is four years old [14]. Although, after that, more attention is required due to a higher tendency and probability of permanent malocclusion, needing orthodontics intervention [12], especially if there is a concomitant factor [14]. The challenges during the first year of the infant, the cultural aspect, and the potential of calmness may be related to non-nutritive sucking habits and the difficulty of discontinuing them [15].

Infants in their first years require a full-day monitoring and care of an adult, usually the mother. Parents/caregivers are supposed to give all their physical and mental attention and energy to supply the infant's needs, which can result in an extensive workload on them and some psychological distress and exhaustion. This can signalise the first symptom of parental burnout, namely, overwhelming fatigue related to one's parental role [16]. Exhausted parents become less involved in parenting, besides making their relationship and interaction with their children superficial [16].

Studying how parents/caregivers help preschool children quit pacifiers is crucial. Patient Report Outcome Measures (PROMs) and Patient Report Experience Measures (PREMs) are just as vital as clinical data in any research undertaken to explore this link [17,18]. Additionally, it is possible to determine how they are involved in the process of health care, improving communication, providing better dialogues, and elevating the quality of the relationship between professional and patient, thus, boosting the quality of the care provided to them [19]. It is a characteristic of patient-centred care, a holistic view of the patient focusing on better health outcomes.

To the best of our knowledge, there is no research on how parental attitude towards burnout affects dental outcomes and there is no suitable questionnaire to it. Thus, this study aims to evaluate the influence of the parents´ positive attitude on the duration of the pacifier sucking habit and the occurrence of AOB in preschool children, based on the lack of energy caused by the workload in parental life. The study hypotheses were twofold: that parents'/caregivers' positive attitude to do what is necessary influences an early discontinuation of the pacifier habit in children and that preschool children who used pacifiers had more prevalence of AOB.

Material and Methods

The present study conforms to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE statement) [20].

Study Design, Sample Selection and Eligibility Criteria

This cross-sectional study was conducted in Ribeirão das Neves, Brazil, with 4-to-6-year-old preschool children from private and public schools. Ribeirão das Neves is in the metropolitan region of Belo Horizonte, in the state of Minas Gerais, and it is the seventh most populous municipality in the state, gathering 331.045 inhabitants [21]. It is distributed in three administrative districts: Justinópolis, Centro and Veneza, in a territorial area of 155,454 Km² [21]

To guarantee the representativeness of the study sample, the stratified and randomised selection of schools and preschool children was carried out in a double stage (Table 1). The sample was stratified according to the proportion of preschool children enrolled in public and private schools in the three administrative districts. First, the distribution of preschool children in each administrative district was measured, and then, the number of preschool children in public and private schools in each region. The randomisation was carried out in two steps. The first step was a random drawing of public and private preschools in each administrative district, and then, in each of the selected preschools, a classroom was selected, and all children were invited to participate.

Table 1. Distribution of the number of preschool children enrolled in each region and distribution of the number of preschoolers who participated in the research in Ribeirão das Neves.

Administrative Districts	Distribution by Administrative District		Preschool Types	Distribution by Preschools			
	N (%)	N (%)		N	(%)	N	%
Veneza	1959 (23.4)	104 (23.4)	Public	1459	74.5	102	86.8
			Private	500	25.5	27	13.2
Centro	2358 (28.2)	126 (28.2)	Public	2092	88.7	122	79.1
			Private	266	11.3	17	20.9
Justinópolis	4043 (48.4)	216 (48.4)	Public	3607	89.2	198	87.1
			Private	436	10.8	30	12.9

Preschool children aged four-to-six years old of both sexes and regularly enrolled on public or private preschools from Ribeirão das Neves were included. Preschool children absent, with some health problem on the days scheduled for clinical examination, or with disabilities, were excluded. The data collection was performed from August 2018 to March 2019.

Ethical Requirements

The study was carried out in accordance with the Declaration of Helsinki and received approval from the Human Research Ethics Committee of the Universidade Federal de Minas Gerais (Approval Report No. 2725377). First, a letter explaining the purpose, importance, and methods of the study was sent to parents/caregivers. Then, parents/caregivers signed a statement of informed consent authorising their children's participation by the ethical requirements for human research stipulated by the Resolution 466/12 of the Brazilian National Health Council. Finally, preschool children who agreed to participate in the study also signed a statement of informed assent.

Training and Calibration Exercise

The calibration of the two examiners was performed in two steps. Both steps were coordinated by an expert in paediatric dentistry, who was considered the gold standard. First, a theoretical training exercise was conducted with malocclusions photographs using Foster and Hamilton criteria. Subsequently, a practical calibration involving 17 preschool children (not included in the main study sample) was carried out. Each examiner independently assessed the children to ascertain the level of agreement between the examiners. After a week, the same preschool children were re-examined to calculate the intra-examiner agreement. The kappa values were 0.79 for inter-examiner agreement (between the two examiners) and 0.76 / 0.86 for intra-examiner agreement. The inter-examiner agreement was 0.78 and 0.81 between each examiner and the gold standard.

Pilot Study

The pilot study was conducted with 53 preschool children who did not participate in the main study, to test the study methods and prepare the examiners. Certain adjustments were necessary to conduct the main study, including enhancing the letter provided to parents/caregivers detailing the study's objective. Additionally, modifications were made to the phrasing of questions in the socioeconomic questionnaire to ensure clearer comprehension among parents/caregivers.

Non-Clinical Data Collection

Data on pacifier use by preschool children were obtained through a self-administered questionnaire to parents/caregivers through the following questions: "Does your child use or used a pacifier?" and "For how long?". The variable was categorised into never used, up to 24 months, and more than 24 months.

Despite the absence of a specific instrument to measure the parents' attitudes, two questions were used to assess the perceived parental's attitude leading to burnout. The following items were used: "I have enough energy to do what must be done" and "I have self-discipline". These items were used as quantitative variables in the statistical analyses. A higher value indicates a greater positive attitude.

Family income (up to 2 Brazilian minimum wage and more than 2 Brazilian minimum wages) and parents' years of schooling (up to eight years and more than eight years) were obtained through a socioeconomic questionnaire self-administered to parents/caregivers.

Clinical Data Collection

A clinical examination was performed at the school where the preschool children were enrolled, during class hours, in a private room. The clinical procedures were performed under artificial light (Head Lamp, Petzl ZOOM Lamp, Petzl American, Clearfield, USA), with the use of a sterile mouth mirror (Duflex Flat Nº 05, SS WHITE, Juiz de Fora, Brazil) and millimetre probe. AOB was diagnosed according to Forster and Hamilton criteria and dichotomised in the absence or presence of AOB [22].

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics for Windows, Version 22.0 (IBM Corp., Armonk, NY, USA) Descriptive analyses were performed to understand the distribution of the variables in the sample. Unadjusted and adjusted logistic regression was performed to verify the association between pacifier use (predictor variable) and AOB (outcome variable). Otherwise, unadjusted and adjusted multinomial regression was performed to analyse the association between parents/caregivers' attitudes (predictor variable) and pacifier use (outcome variable). The significance level was 5%.

The OpenEpi (version 3.0, The OpeEpi Project, Atlanta, Ga., USA) software was used to calculate the power of the sample. The sample was calculated considering the prevalence of AOB in preschool children who used pacifiers (17.6%) and those who never used one (6.9%), with a level of confidence of 95%.

Results

The present study involved 497 four-to-six-year-old preschool children from Ribeirão das Neves, Brazil. The calculated power of the sample was 0.86. Most participants were girls (50.9%), of which 40.4% made us of a pacifier, and 23.7% used it until twenty-four months old. A total of 11.9% of the sample presented AOB. Parents/caregivers, in majority, studied for more than eight years (19.7%), and 75.1% have a family income of up to two Brazilian minimum wage (Table 2).

Table 2. Descriptive analysis for socioeconomic data, pacifier use, and anterior open bite.

Variables	N (%)
Children's Sex	
Female	253 (50.9)
Male	244 (49.1)
Children's Age (Years)	
4	181 (36.4)
5	249 (50.1)
6	67 (13.5)
Pacifier Use	
Never	296 (59.6)
Up to 24 months	118 (23.7)
More than 24 months	83 (16.7)
Anterior open bite	
No	304 (88.1)
Yes	41 (11.9)
Family Income*	
> 2 Brazilian minimum wage	124 (24.9)
≤ 2 Brazilian minimum wage	373 (75.1)
Parents' years of schooling	
More than 8 years	396 (79.7)
Up to 8 years	101 (20.3)

*Brazilian Minimum Wage: US$ 292,64.

AOB was used as the outcome variable and the result from the unadjusted analysis evidenced that pacifier use was statistically associated with the occurrence of AOB ($p<0.001$). However, family income, parents/caregivers' educational level and sex of the children were not associated with AOB in preschool children ($p>0.05$) (Table 3). The adjusted model demonstrated that preschool children who used pacifiers beyond 24 months had a 6.21 more chance to acquire AOB (95% CI: 2.98–12.92; $p<0.001$) than preschool children that had never used pacifiers (Table 3).

Table 3. Bivariate and multiple regression analyses of association between independent variables and anterior open bite.

Variables	Anterior Open Bite			
	Unadjusted OR (95%CI)	p-value	Adjusted OR (95%CI)	p-value
Family Income				
> 2 Brazilian minimum wage	1.00*		1.00*	
≤ 2 Brazilian minimum wage	1.31 (0.60–2.87)	0.494	1.31 (0.57–3.01)	0.530
Parents' Years of Schooling				
More than 8 years	1.00*		1.00*	
Up to 8 years	0.85 (0.36–2.02)	0.721	0.92 (0.37–2.32)	0.863

Pacifiers' Use				
Never used	1.00*		1.00*	
Up to 24 months	0.46 (0.13–1.63)	0.228	0.45 (0.13–1.60)	0.215
More than 24 months	6.31 (3.04–13.08)	<0.001	6.21 (2.98–12.92)	<0.001
Children's Sex				
Male	1.00*			
Female	1.06 (0.55–2.03)	0.870	-	-

OR=Odds Ratio; CI=Confidence Interval; *Reference; Model adjustment based on the Hosmer–Lemeshow test (non-significant value denotes that the proposed model has an adequate adjustment, p>0.05). Hosmer-Lemeshow test p=0.907.

The adjusted analysis supported the unadjusted results. Parents/caregivers with higher energy were 1.22 times more likely to help the children to interrupt the use of the pacifier before 24 months (95% CI: 1.01-1.47), compared to parents who have not helped interrupting it before that age. However, no difference was found between the energy from parents/caregivers of children who never used from that of who used pacifiers more than 24 months of age (p=0.277).

Furthermore, parents/caregivers who have higher self-discipline presented a 1.18 more chance to have children who never used a pacifier (95% CI: 1.01–1.37) and 1.29 to have children who discontinued the habit before 24 months (95% CI: 1.06–1.56). These results are in comparison with parents/caregivers who have not discontinued the habit until 24 months (Table 4).

Table 4. Bivariate and multiple regression analyses of association between energy to do what have to do, and self-discipline, as independent variables and pacifier use as outcome variable.

Variables	Pacifier Use					
	Never Used		Up to 24 Months		More than 24 Months	
	Unadjusted OR (95%CI)	Adjusted OR (95%CI)	Unadjusted OR (95%CI)	Adjusted OR (95%CI)	Unadjusted OR (95%CI)	Adjusted OR (95%CI)
Energy to do what have to do	1.08 (0.93–1.25)	1.09 (0.94–1.26)	1.23 (1.02–1.48)	1.22 (1.01–1.47)	1.00*	1.00*
p-value	0.314	0.277	0.032#	0.034#		
Self-discipline	1.16 (0.99-1.35)	1.18 (1.01-1.37)	1.28 (1.06-1.55)	1.29 (1.06-1.56)	1.00*	1.00*
p-value	0.054	0.037#	0.010#	0.009#		

Bivariate and Multinomial Regression; Adjusted by educational level and Family income; OR: Odds Ratio; CI: Confidence Interval; *Reference; #Statistically Significant; Model adjustment based on goodness-of-fit tests: Pearson Chi-square and deviance chi-square values (non-significant values denote that the proposed models have adequate adjustment, p>0.05). Energy to do what have to do (Pearson Chi-square p=0.544; deviance chi-square p=0.474) and Self-discipline (Pearson Chi-square p=0.387; deviance chi-square p=0.368).

Discussion

This study advances in the existent literature presenting a novel approach and reinforcing what has already been found. These results corroborate the hypothesis that a more positive attitude from parents/caregivers to do what is necessary and self-discipline impact the cessation of the habit of pacifier use for up to 24 months. To the best of our knowledge, there are no studies about parental's attitude towards burnout and dental outcomes, thus, the use of these two questions may suggest a suitable research approach in the future. Moreover, a higher prevalence of AOB in children who used pacifier is in accordance with other studies [4,12].

Parental burnout encompasses three factors, two of which are presented in this study: the lack of energy and loss of parental efficacy [23]. This approach is in line with patient-centred care, an important resource on clinical research to promote more patient involvement in decision-making, focusing on the success of the process. Furthermore, it can be implemented through tools that capture information that might not be directly observable to the researcher, known as PROMs (Patient-Reported Outcome Measures) [18]. This evidence can be used as

guidance for clinical practice [17]. Parents play a pivotal role in breaking the habit of pacifier sucking. Therefore, evaluating their perspectives, anticipations, and willingness regarding the process is of utmost importance.

The use of pacifiers is related to the infant's sucking needs and has a calming potential. The first months of an infant's life are a learning experience for parents, full of challenging moments, in which the pacifier sometimes is used to help parents to deal with moments of tension and anxiety [15]. Parental support is essential for the early elimination of the pacifier habit. If they are not prepared to act favourably to it, the habit can persist for a longer time [24]. This has been shown by the differences in the attitude to do what is necessary, and self-discipline from parents/caregivers from those who quitted the habit before 24 months to those who did not quit it up to this age. In this way, the presence of higher levels of energy to do what needs to be done and self-discipline may represent parents with a more positive attitude in front of challenging processes.

Higher energy levels might be essential for parents/caregivers to effectively help on the cessation of the child's pacifier habit. However, there was no difference between the energy to do what needs to be done of parents/caregivers of children who never used pacifiers and children who have used them for more than 24 months. After 24 months of use, the pacifier becomes an unconscious attitude, establishing a habit that complicates its elimination. In fact, children may exhibit behaviours such as frustration, anguish, stress, and regression [15], which intensifies the challenge for parents/caregivers. When experiencing signs of parental burnout, caregivers might lose the enjoyment of parenting and occasionally struggle with their responsibilities [23,25]. They wake up with their physical and emotional energy drained and become less involved with their children's needs [25].

Nowadays, some mothers return to work immediately after their maternity leave ends. Moreover, exclusive breastfeeding can be interrupted mainly in countries where maternity leave does not conform to the six months of exclusive breastfeeding recommended by the World Health Organization [26]. The individual needs of each family may influence the presence of the pacifier habit, as well as the cultural factor, which puts the pacifier in the infant's layette [15,27]. This way, some facets of patient-centred care can straighten the relationship between professionals and parents to make better decisions in the process. The professional must understand the patient's social context and avoid placing blame or a moralistic speech [19]. Numerous mothers experience elevated stress levels, which is linked with maternal burnout [28]. Therefore, understanding it may allow the professional to identify families that are psychological and contextual vulnerable for the parental exhaustion and help them through this, using the appropriate therapeutic strategy [28].

The second aim of this study was to verify the association between pacifier use and AOB prevalence. This study showed that preschool children who use pacifiers over 24 months have more chance of developing AOB than those that have never used pacifiers. These results correspond with previous hypotheses and agree with previous studies [4,12,29,30]. Pacifier use interferes with the stomatognathic balance through dysfunctional stimuli, causing changes in maxillomandibular growth pattern [4]. In some cases, discontinuing the habit within 24 months of use excludes possible secondary habits like tong interposition associated with craniofacial growth, which may act on self-correcting for this malocclusion [12].

The use of pacifiers is controversial based on its possible injuries, mainly related to malocclusion, the establishment of breastfeeding, and early interruption of breastfeeding [4,11,30,31]. The World Health Organization (WHO) discourages pacifiers to prevent the disruption of breastfeeding [32], whereas other organizations suggest their use in children placed to sleep to avoid sudden infant death syndrome, like the American Association of Pediatrics Dentistry [11].

Medical and personal motives may exert an influence on the necessity of the pacifier use, despite all the deleterious effects. The pacifier is used as a stimulus for children with disabilities that need to develop their suction, swallowing and breathing process. The act of suction reduces the pain in some procedures. Additionally, sometimes the pacifier is used for children who do not breastfeed [15]. For this reason, the professional needs to engage in open communication with the parents/caregivers, discussing all potential options. Our objective is to gather information, elucidate the obligations, risks, and advantages associated with pacifier use, and promote the appropriate treatment when necessary.

The present study cannot presume causality. Although, the representativeness of the sample was allowed throw the stratified and randomized selection of the sample and, the proportion of children in each type of school and district was respected. These steps guaranteed that the results can indeed be extrapolated for the target population. Nevertheless, it is crucial to propose a hypothesis that contributes to new studies and aids paediatric professionals in advising families about pacifier use, grounded in substantial evidence. Being aware of the cultural role and other factors associated with pacifier use, the paediatric professional can develop a personalised and friendly strategy to assist the family in gently and appropriately discontinuing the habit. This ensures that the process does not negatively affect the occlusion and has no psychological impact [24].

These results may be a start to thinking out of the box on the process of pacifier use. Mental health outcomes, like parental burnout, matter, and health professionals must consider the family as a unique element and try to correspond to all family expectations. Unfortunately, there is no appropriate instrument to measure burnout in dentistry, so this study is a first step in thinking about it and planning how it might be possible to assess this within the field of dentistry. It is our responsibility as health professionals to see the need for an interdisciplinary approach to give our patients not only holistic care but the best care they deserve. Research on parental burnout may guide on risks that may occur when parents are exhausted, and even if this exhaustion impacts their children [23].

Conclusion

The cessation of pacifier use within 24 months is associated with higher energy from the parents/caregivers to do what must be done besides self-discipline. It was also found that preschool children who had used pacifiers for more than 24 months were more prone to have an anterior open bite.

Authors' Contributions

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All authors declare that they contributed to critical review of intellectual content and approval of the final version to be published.

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Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

The data used to support the findings of this study can be made available upon request to the corresponding author.

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References

[1] Leoncio LL, Furtado KKFA, Chacon LD, Nóbrega CBC, Costa LED, Queiroz FS. Prevalence of malocclusion among five-year-old children in Patos, PB, Brazil. Arq Odontol 2015; 51(1):25-31.

[2] Rijpstra C, Lisson JA. Etiology of anterior open bite: A review. J Orofac Orthop 2016; 77(4):281-286. https://doi.org/10.1007/s00056-016-0029-1

[3] Lima GN, Cordeiro CM, Justo JS, Rodrigues LCB. Anterior open bite and oral habits in children. Rev Soc Bras Fonoaudiol 2010; 15(3):369-375.

[4] Ling HTB, Sum FHKMH, Zhang L, Yeung CPW, Li KY, Wong HM, et al. The association between nutritive, non-nutritive sucking habits and primary dental occlusion. BMC Oral Health 2018; 18(1):145. https://doi.org/10.1186/s12903-018-0610-7.

[5] Almeida RR. Etiologia das má oclusões. In: Almeida RR. Ortodontia preventiva e interceptora: Mito ou realidade? Maringá: Dental Press, 2013. [In Portuguese].

[6] Medeiros PKM, Cavalcanti AL, Bezerra PM, Moura C. Malocclusion, breast feeding and deleterious buccal habits in preschool children – An association study. Pesqui Bras Odontopediatria Clín Integr 2005; 5(3):267-274.

[7] Graber TM. Orthodontics; principles and practice. 2nd ed. Philadelphia: WB Saunders Co; 1966. 953p.

[8] Corrêa-Faria P, Ramos-Jorge ML, Martins-Júnior PA, Vieira-Andrade RG, Marques LS. Malocclusion in preschool children: prevalence and determinant factors. Eur Arch Paediatr Dent 2014; 15(2):89-96. https://doi.org/10.1007/s40368-013-0069-9

[9] Nihi VS, Maciel SM, Jarrus ME, Nihi FM, Salles CLF, Pascotto RC, et al. Pacifier-sucking habit duration and frequency on occlusal and myofunctional alterations in preschool children. Braz Oral Res 2015; 29:1-7. https://doi.org/10.1590/1807-3107BOR-2015.vol29.0013

[10] Carvalho CM, Carvalho LFPC, Forte FDS, Aragão MS, Costa LJ. Prevalence of Anterior open bite among the children aged 3 to 5 years in Cabedelo, PB, Brazil, and its relationship with deleterious oral habits. Pesqui Bras Odontopediatria Clín Integr 2009; 9(2):205-210. https://doi.org/10.4034/1519.0501.2009.0092.0012

[11] American Academy of Pediatric Dentistry. Policy on Pacifiers. Reference Manual of Pediatric Dentistry. 2022-2023. Available from: https://www.aapd.org/globalassets/media/policies_guidelines/p_pacifiers.pdf. [Accessed on March 26, 2024].

[12] Góis EG, Ribeiro-Júnior HC, Vale MP, Paiva SM, Serra-Negra JM, Ramos-Jorge ML. Influence of nonnutritive sucking habits, breathing pattern and adenoid size on the development of malocclusion. Angle Orthod 2008; 78(4):647-654.

[13] Moraes RB, Knorst JK, Pfeifer ABR, Vargas-Ferreira F, Ardenghi TM. Pathways to anterior open bite after changing of pacifier sucking habit in preschool children: A cohort study. Int J Paediatr Dent 2021; 31(2):278-284. https://doi.org/10.1111/ipd.12725

[14] Adriano LZ, Derech CD, Massignan C, Flores-Mir C, Porporatti AL, Canto GL, et al. Self-correction of anterior open bite after cessation of non-nutritive sucking habits: A systematic review. Eur J Orthod 2023; 45(3):235-243. https://doi.org/10.1093/ejo/cjac054

[15] Castilho SD, Rocha MAM. Pacifier habit: history and multidisciplinary view. J Pediatr 2009; 85(6):480-489. https://doi.org/10.1590/S0021-75572009000600003

[16] Roskam I, Brianda ME, Mikolajczak M. A step forward in the conceptualization and measurement of parental burnout: The Parental Burnout Assessment (PBA). Front Psychol 2018; 6(9):758. https://doi.org/10.3389/fpsyg.2018.00758

[17] Davidson M, Keating J. Patient-reported outcome measures (PROMs): How should I interpret reports of measurement properties? A practical guide for clinicians and researchers who are not biostatisticians. Br J Sports Med 2014; 48(9):792-796. https://doi.org/10.1136/bjsports-2012-091704

[18] Perazzo MF, Serra-Negra JM, Firmino RT, Pordeus IS, Martins-Júnior PA, Paiva SM. Patient-centered assessments: How can they be used in dental clinical trials? Braz Oral Res 2020; 34:e075. https://doi.org/10.1590/1807-3107bor-2020.vol34.0075

[19] Bedos C, Loignon C. Patient-centered approaches: New models for new challenges. J Can Dent Assoc 2011; 77:b88.

[20] Malta M, Cardoso LO, Bastos FI, Magnanini MM, Silva CM. STROBE initiative: Guidelines on reporting observational studies. Rev Saude Publica 2010; 44(3):559-565. https://doi.org/10.1590/S0034-89102010000300021

[21] Instituto Brasileiro de Geografia e Estatística (IBGE). Censo Demográfico 2010 [website]. Available from: https://cidades.ibge.gov.br/bras il/mg/ribeirao-das-neves/panorama. [Accessed on April 12, 2022].

[22] Foster TD, Hamilton MC. Occlusion in the primary dentition. Study of children at 2 and one-half to 3 years of age. Br Dent J 1969; 126(2):76-79.

[23] Mikolajczak M, Roskam I. Parental burnout: Moving the focus from children to parents. New Dir Child Adolesc Dev 2020; 2020(174):7-13. https://doi.org/10.1002/cad.20376
[24] Muzulan CF, Gonçalves MIR. O lúdico na remoção de hábitos de sucção de dedo e chupeta. J Soc Bras Fonoudiol 2011; 23(1):66-71. https://doi.org/10.1590/S2179-64912011000100014
[25] Polizzi C, Giordano G, Burgio S, Lavanco G, Alesi M. Maternal competence, maternal burnout and personality traits in Italian mothers after the first COVID-19 lockdown. Int J Environ Res Public Health 2022; 19(16):9791. https://doi.org/10.3390/ijerph19169791
[26] Navarro-Rosenblatt D, Garmendia ML. Maternity leave and its impact on breastfeeding: A review of the literature. Breastfeed Med 2018; 13(9):589-597. https://doi.org/10.1089/bfm.2018.0132
[27] Góes MPS, Araújo CMT, Góes PSA, Jamelli SR. Non-nutritive sucking habits persistence: Prevalence and associated factors. Rev Bras Saúde Matern Infant 2013; 13(3):247-257. https://doi.org/10.1590/S1519-38292013000300006
[28] Lebert-Charron A, Dorard G, Boujut E, Wendland J. Maternal burnout syndrome: Contextual and psychological associated factors. Front Psychol 2018; 9:885. https://doi.org/10.3389/fpsyg.2018.00885
[29] Wagner Y, Heinrich-Weltzien R. Occlusal characteristics in 3-year-old children: Results of a birth cohort study. Oral Health 2015; 15:94. https://doi.org/10.1186/s12903-015-0080-0
[30] Schmid KM, Kugler R, Nalabothu P, Bosch C, Verna C. The effect of pacifier sucking on orofacial structures: A systematic literature review. Prog Orthod 2018; 19(1):8. https://doi.org/10.1186/s40510-018-0206-4
[31] Buccini GDS, Pérez-Escamilla R, Paulino LM, Araújo CL, Venancio SI. Pacifier use and interruption of exclusive breastfeeding: Systematic review and meta-analysis. Matern Child Nutr 2017; 13(3):e12384. https://doi.org/10.1111/mcn.12384
[32] World Health Organization. Report of the expert consultation on the optimal duration of exclusive breastfeeding: Conclusions and recommendations. Geneva, 2001. Available from: https://www.who.int/publications/i/item/WHO-NHD-01.09. [Accessed on March 26, 2024].