

Effect of family cohesion on oral health predictors in children and adolescents: A systematic review

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Objective: The family environment influences oral health conditions and the utilization of dental services. The emotional link between the family members and the degree to which they are resilient and close to each other is represented as family cohesion and adaptability. This systematic review critically appraises and synthesizes existing evidence on the effect of family cohesion on oral health predictors in children and adolescents. **Methods:** The protocol was registered in PROSPERO (CRD42023453608). Databases such as PubMed, Embase, and Scopus were electronically searched in September 2023. No restriction of time frame was allowed. Risk of bias was assessed using the Agency for Healthcare Research and Quality tool. **Results:** Initially, 272 records were identified from PubMed (133), Embase (122) and Scopus (10) databases and other sources, finally leading to 12 cross-sectional studies to be included. Eleven studies were carried out in Brazil and one in USA. Only one study reported moderate risk, whereas the others all reported low risk of bias. The studies were carried out from 2013–2023. The frequency of dental visits, oral health literacy, and self-perceived need for dental treatment were reported to be higher in families with the better cohesive ties. An inconsistent direct association was reported between dental caries and family cohesion. **Conclusions:** Family dynamics are important in shaping oral health behaviors and outcomes during a pivotal phase of development. Further exploration through longitudinal studies in this field can elucidate causal pathways and potential moderators.

Keywords: Family Cohesion, Children, Adolescents

Introduction

Oral health plays a fundamental role, influencing not only physical comfort but also psychological and social aspects of life. The child and adolescent phases form critical points in development, often serving as the juncture at which lifelong oral habits are established. Behavioral characteristics of children and adolescents encompass a wide range of traits and tendencies that shape their interactions, development, and overall well-being. These behaviors are influenced by environmental factors, social interactions, and individual experiences. The behavioral characteristics in this group are diverse and multifaceted, influenced by a complex interplay of factors. During these stages of children and adolescence, behaviors and choices can set the trajectory for an individual's oral health into adulthood.

Amidst the interplay of various factors that form an integral part of and shape the oral health journey, the family forms the central pillar. As family dynamics evolve and adapt to societal changes, it is necessary to comprehend the ways in which these changes might reverberate through child and adolescent oral health practices. The family environment influences oral health conditions and the utilization of dental services (Moura *et al.*, 2012, Neves *et al.*, 2023). The emotional link between the family members and the degree to which they are resilient and close to each other is represented by the concepts of family cohesion and adaptability (Falcato *et al.*, 2000). In simple terms, family cohesion has been defined as the emotional bonding that family members have towards one another (Olson *et al.*, 1982).

Previous studies have assessed the association between family cohesion and oral health predictors like frequency of dental visits, dental caries, oral health literacy, and the need for dental treatment (Finlayson *et al.*, 2018, de Moura *et al.*, 2021, Dutra *et al.*, 2020, Lopes *et al.*, 2021, de Moura *et al.*, 2022, Neves *et al.*, 2022, Ferreira *et al.*, 2013, Prata *et al.*, 2021, Paula *et al.*, 2022, Lopes *et al.*, 2020) and many been carried in Brazil. The studies, however, have reported contrasting findings with no association, direct association, or indirect association with different outcome measures. By examining the existing body of research systematically, we hope to illuminate the nuanced links between family cohesion and various dimensions of adolescent oral health. This review investigates the intricate interplay between family cohesion and the oral health of adolescents to unravel the multifaceted connections that underlie this dynamic relationship.

This systematic review aims at a comprehensive synthesis of the available literature, encompassing studies from diverse cultural and socio-economic contexts. By critically appraising and synthesizing existing evidence to determine how family cohesion influences oral health in children and adolescents. The study may provide valuable insights to inform research agendas and practical interventions aimed at promoting oral health.

Method

The protocol was registered in PROSPERO (CRD42023453608) and the review was conducted according to PRISMA (Preferred reporting items for systematic review and meta-analysis) guidelines.

Based on the Population, Exposure and Outcome (PEO) criteria, the following research question was formulated: “What is the effect of family cohesion on the oral health predictors in children and adolescents?” The review also analyzes how variations in family cohesion levels may impact the frequency of dental visits, oral health literacy, the need for dental treatment, dental services, and other oral health-related outcomes among children and adolescents. The inclusion criteria were descriptive, analytical, and experimental studies without any restriction of language assessing the relationship between family cohesion (or related constructs) and oral health outcomes in children and adolescents. Case reports, case series, conference abstracts, editorials, commentaries, and narrative reviews were excluded.

Databases such as PubMed, Embase, and Scopus were electronically searched in September 2023. No restriction on the time frame was allowed. Google Scholar, grey literature, and references to the relevant articles were also searched to extract studies relevant to the review. Boolean operators were combined with the Medical Subject Heading (MeSH), keywords and terms related to PEO for the search strategy (Full search available at: https://www.aiims.edu/images/pdf/Departments_Centers/CDER/Search%20Strategy.pdf).

Two authors (USB and AB) screened possible sources independently based on their titles and abstracts. Duplicates were removed manually. This was followed by evaluating the full texts and extracting data. Additional data were retrieved by contacting report authors where necessary. Discrepancies were resolved by discussing with the third author (BP). Reliability for the title/abstract and full text reviews was evaluated using Cohen’s Kappa and was reported to be 0.88 and 0.85, respectively.

Author BP collected the information from the included studies, which were independently cross-checked by HP. Inconsistencies were discussed and resolved between the authors. The following data were extracted: Authors, Year, Country, Study Design, Sample Size, Age Group, Assessment of Family Cohesion, Outcome, and Conclusion.

All the studies included in the review were cross-sectional. Risk of bias (ROB) was assessed using the Agency for Healthcare Research and Quality tool. This tool recommends 11 items; with each item scored ‘1’ if the study quality is in accordance with the methodological standard. A total score for each source is awarded as a sum of the item scores. An score of 0 to 4 indicates high ROB, 5 to 7 indicates moderate ROB, and 8 to 11 indicates a low ROB (Mamikutty *et al.*, 2021).

The heterogeneity in interpretations of study outcomes led to the narrative synthesis of the study results to organize and analyze the trends and variations in the relationship between family cohesion and oral health.

Results

Initially, 272 records were identified from PubMed (133), Embase (122) and Scopus (10) databases and other sources. 27 records were found to be duplicates and were removed. After screening the titles and abstracts, 210 articles were excluded. No unpublished paper was identified. The full text of the remaining 35 articles was assessed for eligibility. Of which, 23 were excluded as

they either reported family functioning and social cohesion, carers and family perspective, quality of life and behavioral characteristics, were systematic reviews on family relationships, or were carried out in the elderly. Finally, 12 articles were included (Figure 1).

The 12 studies were conducted between 2013 and 2023. Eleven were conducted in Brazil and one (de Moura *et al.*, 2021) in the USA (Table 2). All the studies were cross-sectional and had samples ranging from 142 to 769. Participants were aged 0–19 years. One study was reported in Portuguese. Family adaptability and cohesion scores (FACES III Questionnaire) were used in 10 of the 12 studies to assess family cohesion. Frequency of dental visits, dental caries, oral health factors, oral health literacy, need for dental treatment, and dental utilization were the outcomes in the primary studies.

Eleven studies had low risk of bias and one had moderate risk. Several with low risk did not report assessment of confounding or excluded some participants from analysis. The study with moderate risk did not describe representation of participants, blinding or assessments undertaken for quality assurance.

Table 1 reports the results extracted from different studies. Dental visits were more frequent in adolescents from families with greater cohesive ties when compared with disengaged or detached families (de Moura *et al.*, 2022). This indicates the importance of family ties in utilization of dental services. However, a study reported no association between family cohesion and dental service utilization (Finlayson *et al.*, 2018).

This review establishes a direct link between family cohesion and oral health literacy. Enmeshed families had higher oral health literacy scores than families with disengaged family cohesion (Lopes *et al.*, 2020).

Of the four studies directly assessing dental caries or the number of cavitated dental lesions as an outcome, one reported no association between family cohesion and caries experience (de Moura *et al.*, 2021). Another study showed an indirect association between the two (Neves *et al.*, 2023). The remaining two studies reported that a higher level of family cohesion led to a lower prevalence of dental caries and cavitated lesions in children and adolescents (Paula *et al.*, 2022, Dutra *et al.*, 2020). Oral health factors and family cohesion was assessed in a study which showed more untreated carious lesions in adolescents with low family cohesion (Ferreira *et al.*, 2013).

Adolescents with low family cohesion had more behaviors harmful to health, whereas adolescents with high family cohesion demonstrated lower exposure to smoking habits (Ferreira *et al.*, 2013). High family cohesion was associated with a greater self-perceived need for dental treatment (Prata *et al.*, 2021).

Discussion

This review synthesized evidence from studies on a diverse array of oral health spectrum by understanding the intricate relationship between family cohesion and the oral health of children and adolescents. Taking into consideration the limited geographical variations, this review highlights and strengthens the evidence that family cohesion may shape oral health behaviors and outcomes.

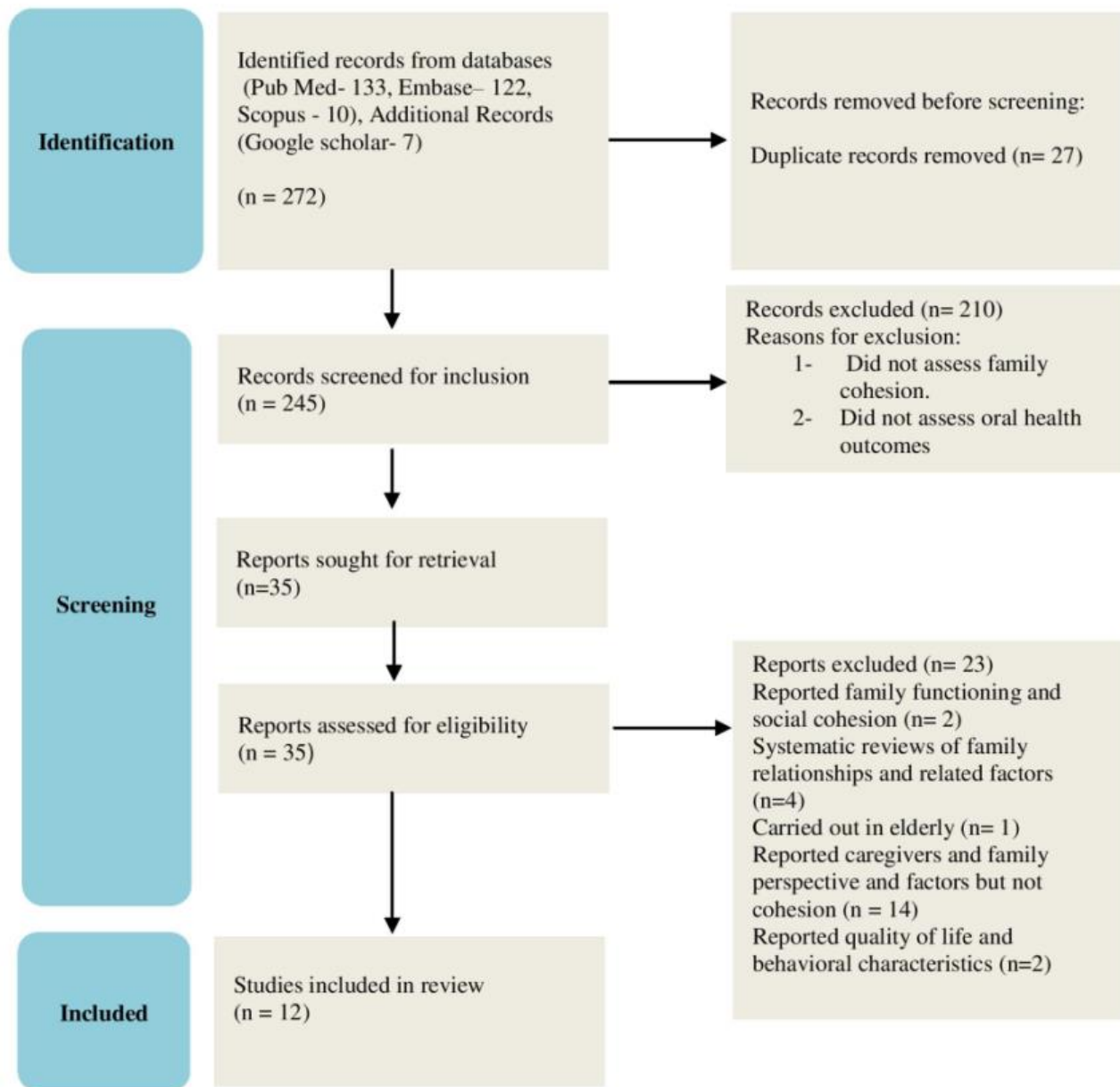


Figure 1. Flowchart of records screening through review process.

From the exuberance of play to the introspection of identity formation, the behaviors of children and adolescents encompass a spectrum of emotions, actions, and interactions with the world around them. Young individuals demonstrate curiosity, resilience, and a natural inclination to explore and learn. They navigate social dynamics, forge friendships, and grapple with challenges as they navigate the complexities of growing up. Their behaviors are influenced by genetics, environment, and social interactions, shape their evolving personalities and lay the foundation for their future trajectories.

Findings from the studies reported a consistent positive association between higher levels of family cohesion and better oral health. These findings are consistent with the previous studies that emphasize the role family dynamics play in different health-related behaviors (Yang *et al.*, 2022, Brown *et al.*, 2018, Park *et al.*, 2018). Children and adolescents with stronger familial ties were more likely to have a greater frequency of dental visits, better dental service utilization, better oral health literacy,

a greater perceived need for dental treatment, and lower exposure to smoking habits. This consistency across a range of studies suggests that family cohesion plays a pivotal role in shaping oral health practices during this critical developmental period.

Dental caries and the number of cavitated lesions were the only clinical outcomes assessed in the included studies. The association between dental caries and the degree of family cohesion revealed inconsistent results, with direct relationships in some and indirect relationships in others. The reason could be attributed to the multifactorial aetiology of dental caries showing different associations with different factors.

The association between family cohesion and oral health could be attributed to several mechanisms. Strong family bonds facilitate open and supportive communication, creating an environment where oral health knowledge and practices can be exchanged. Adolescents who perceive their families as cohesive are more likely to internalize positive oral health values and engage in

Table 1. Included studies.

<i>Author, Year</i>	<i>Country</i>	<i>n.</i>	<i>Age (y)</i>	<i>Assessment of Family Cohesion</i>	<i>Outcome</i>	<i>Results</i>
De Moura, 2022	Brazil	448	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Frequency of Dental Visits	The prevalence of having visited a dentist some was more among adolescents with enmeshed (PR = 1.08; 95% CI: 1.01-1.15) and connected (PR = 1.06; 95% CI: 1.01-1.13) families.
De Moura, 2021	Brazil	448	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Dental Caries	Adolescents with more symptoms of ADHD (RR: 1.73; 95% CI: 1.31-2.28), those with lower OHL (RR: 1.59; 95% CI: 1.01-2.51), those with a lower family income (RR: 1.38; 95% CI: 1.03-1.83), and those from homes with more residents (RR: 1.18; 95% CI: 1.06-1.31) had more caries experience.
Dutra, 2020	Brazil	746	15-19	Family adaptability and Cohesion Scales (FACES III Questionnaire)	No. cavitated caries lesions	Disengaged (RR: 6.30; 95% CI: 1.24–31.88; p = 0.028), separated (RR: 4.80; 95% CI: 1.03–22.35; p = 0.046) and connected (RR: 5.23; 95% CI: 1.27–21.59; p = 0.024) family cohesion, and high social class (RR: 0.55; 95% CI: 0.39–0.76; p = 0.001) associated with the no. lesions
Ferreira, 2013	Brazil	524	15	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Oral Health Factors	Adolescents with low family cohesion were more likely than those with medium family cohesion to have low income (OR 2,28 95% CI 1,14- 4,55), caries (OR 2,23 95% CI 1,21-4,09), less than two daily brushings (OR 1,91 95% CI 1,03-3,54).
Lopes, 2021	Brazil	740	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Oral Health Literacy	Higher oral health literacy was associated with connected type of family cohesion (RR=1.12; 95%CI: 1.05-1.20) as well as rigid (RR=1.14; 95%CI: 1.04-1.25) and structured (RR=1.11; 95%CI: 1.04-1.20) types of family adaptability.
De Moura, 2022	Brazil	448	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Oral Health Literacy	Greater OHL in adolescents with higher family cohesion scores (rate ratio [RR], 1.02; 95% CI 1.01–1.03). Higher family adaptability (RR, 0.99; 95% CI, 0.98–0.99) and more signs of ADHD (RR, 0.95; 95% CI, 0.91–0.99) associated with lower OHL.
Neves, 2023	Brazil	740	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Dental Caries	Family cohesion and socioeconomic status exerted an indirect effect on caries incidence.
Neves, 2021	Brazil	740	12	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Frequency of dental visits	Family cohesion classified as enmeshed (PR = 1.55; 95% CI: 1.19-2.02) and connected (PR = 1.22; 95% CI: 1.02-1.44), and the absence of toothache (PR = 1.18; 95% CI: 1.01-1.38) associated with having visited a dentist.
Prata, 2021	Brazil	746	15-19	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Self Perceived Need for Dental Treatment	Enmeshed family cohesion type (OR = 10.23; IC 95%: 3.96–26.4) associated with perceived need for dental treatment.
De Paula, 2022	Brazil	247	5	Questionnaire	Dental Caries	The chances of the absence of dental caries experience (dmft = 0) were in greater number in those who lived in an environment of high family cohesion (OR = 3.66 [95%CI: 1.19–11.29]).
Lopes, 2020	Brazil	769	15-19	Family adaptability and Cohesion Scales (FACES III Questionnaire)	Oral Health Literacy	Higher oral health literacy associated with connected family cohesion (RR=1.12; 95%CI: 1.05-1.20), rigid (RR=1.14; 95%CI: 1.04-1.25) and structured (RR=1.11; 95%CI: 1.04-1.20) family adaptability.
Finlayson, 2018	USA	142	0-17	Family Functioning Cohesion subscale	Dental Utilization	1- Uninsured children were less likely to have a past year dental visit compared to insured children (OR) = 0.23, 95% CI 0.06-0.96). 2-Children whose caregivers visited the dentist were 4.29 times more likely to visit the dentist in the past year (CI=1.36-13.61). 3- Higher caregiver education was associated with child dental utilization (OR=4.50, CI=1.50-13.55).

Table 2. Risk of Bias for Cross Sectional Studies.

	<i>De Moura et al. 2022</i>	<i>De Moura et al. 2021</i>	<i>Dutra et al. 2020</i>	<i>Ferreira et al. 2013</i>	<i>Lopes et al. 2021</i>	<i>De Moura et al. 2022</i>	<i>Neves et al. 2023</i>	<i>Neves et al. 2021</i>	<i>Prata et al. 2021</i>	<i>De Paula et al. 2022</i>	<i>Lopes et al. 2020</i>	<i>Finlayson et al. 2018</i>
Source of information	1	1	1	1	1	1	1	1	1	1	1	1
Inclusion & exclusion criteria	1	1	1	1	1	1	1	1	1	1	1	1
Subject consecutive & representative	1	1	1	1	1	1	1	1	1	1	1	-
Time period for subject identification	1	1	1	-	1	1	1	1	1	1	1	1
Evaluators masked & professional	1	1	1	1	1	1	1	1	1	1	1	-
Standard examination method	1	1	1	1	1	1	1	1	1	1	1	1
Assessments for quality assurance	1	1	1	1	1	1	1	1	1	1	1	-
Clear and standard assessments	-	1	1	1	-	-	1	1	1	1	-	-
Exclusions from analysis	-	-	-	-	-	-	-	-	-	-	-	1
Assessment of confounding	-	-	1	-	1	-	-	-	-	-	-	-
Response rates and completeness	1	1	1	1	1	1	1	1	1	1	1	1
Total	8	9	10	8	9	8	9	9	9	9	8	6

behaviors that align with family norms. Furthermore, the emotional support provided within cohesive families may mitigate oral health-related stressors, thereby reducing the likelihood of detrimental behaviors like excessive sugary snack consumption. Adolescents in cohesive families might have a sense of accountability to their families, motivating them to prioritize oral hygiene practices and maintain regular dental visits. These qualitative insights complement the quantitative findings, offering a holistic understanding of the multifaceted ways in which family cohesion influences oral health behaviors.

The implications of these findings extend to both research endeavours and practical interventions. The consistent positive association between family cohesion and adolescent oral health calls for further exploration through longitudinal studies in this field that can elucidate causal pathways and potential moderators. Public health campaigns and educational programs can leverage the positive influence of family cohesion by promoting effective communication strategies within families. Encouraging joint family activities related to oral health could foster a sense of collective responsibility and improve oral health practices.

While the systematic review offers valuable insights, certain limitations warrant consideration. The inclusion of studies primarily from Brazil might limit the generalizability of the study findings and draw definitive conclusion from a global perspective. Additionally, all the included studies were cross sectional and thus the future research should aim to address these limitations in longitudinal designs, incorporating objective measures of oral health, assessing other clinical outcomes, and exploring the interplay between family cohesion and

other psychosocial factors. Analysis of the risk of bias from this review recommends assessment of confounding and assessment as per standardized guidelines and tools in future studies.

In conclusion, this systematic review contributes to the growing body of knowledge regarding the influence of family cohesion on children and adolescent oral health. The consistent positive associations underscore the importance of family dynamics in shaping oral health behaviors and outcomes during a pivotal phase of development. By recognizing the pivotal role of the family unit and understanding the mechanisms at play, researchers and practitioners alike can work collaboratively to design interventions that promote healthier oral health practices among children and adolescents, setting the stage for a lifetime of improved oral health and overall well-being.

References

- Brown, C.A. and Weisman de Mamani, A. (2018): The mediating effect of family cohesion in reducing patient symptoms and family distress in a culturally informed family therapy for schizophrenia: A parallel-process latent-growth model. *Journal of Consulting and Clinical Psychology* **86**, 1-14.
- de Moura, M.F.L., Neves, É.T.B., Firmino, R.T., Costa, E.M.M.B., Ferreira, F.M. and Granville-Garcia, A.F. (2021): Attention-deficit/hyperactivity disorder and oral health literacy exert an influence on the occurrence of dental caries in early adolescence. *International Journal of Paediatric Dentistry* **31**, 691-698.
- de Moura, M.F.L., Firmino, R.T., Neves, É.T.B., Costa, E.M.M.B., Paiva, S.M., Ferreira, F.M. and Granville-Garcia, A.F. (2022): Attention-deficit Disorder, Family Factors, and Oral Health Literacy. *International Dental Journal* **72**, 565-571.

- Dutra, L.D.C., Neves, É.T.B., Lima, L.C.M., Gomes, M.C., Forte, F.D.S., Paiva, S.M., Abreu, M.H.N.G., Ferreira, F.M. and Granville-Garcia, A.F. (2020): Degree of family cohesion and social class are associated with the number of cavitated dental caries in adolescents. *Brazilian Oral Research* **34**, e037.
- Falceto, O.G., Busnello, E.D. and Bozzetti, M.C. (2000): Validation of diagnostic scales of family functioning for use in primary health care services. *Revista Panamericana de Salud Pública* **7**, 255-263.
- Ferreira, L.L., Brandão, G.A., Garcia, G., Batista, M.J., Costa, L.S., Ambrosano, G.M. and Possobon, R.D.F. (2013): Coesão familiar associada à saúde bucal, fatores socioeconômicos e comportamento em saúde [Family cohesion associated with oral health, socioeconomic factors, and health behavior]. *Ciencia e Saude Coletiva* **18**, 2461-2473.
- Finlayson, T.L., Asgari, P., Dougherty, E., Tadese, B.K., Stamm, N. and Nunez-Alvarez, A. (2018): Child, caregiver, and family factors associated with child dental utilization among Mexican migrant families in California. *Community Dental Health* **35**, 89-94.
- Lopes, R.T., Neves, É.T.B., Dutra, L.D.C., Gomes, M.C., Paiva, S.M., Abreu, M.H.N.G., Ferreira, F.M. and Granville-Garcia, A.F. (2020): Socioeconomic status and family functioning influence oral health literacy among adolescents. *Revista de Saúde Pública* **54**, 30.
- Lopes, R.T., Neves, É.T.B., Dutra, L.D.C., Gomes, M.C., Paiva, S.M., Abreu, M.H.N.G., Ferreira, F.M. and Granville-Garcia, A.F. (2021): Family structure, sociodemographic factors, and type of dental service associated with oral health literacy in early adolescence. *Ciencia e Saude Coletiva* **26**, 5241-5250.
- Mamikutty, R., Aly, A.S. and Marhazinda, J. (2021): Selecting Risk of Bias Tools for Observational Studies for a Systematic Review of Anthropometric Measurements and Dental Caries among Children. *International Journal of Environmental Research and Public Health* **18**, 8623.
- Moura, M.D.F.L.D., Firmino, R.T., Neves, É.T.B., Paiva, S.M., Ferreira, F.M. and Granville-Garcia, A.F. (2022): Family cohesion and attention deficit exert an influence on visits to the dentist in early adolescence. *Community Dentistry Oral Epidemiology* **50**, 164-170.
- Neves, É.T.B., da Costa Dutra, L. and de Lima, L.C.M. (2023): Structuring of the effects of oral health literacy on dental caries in 12-year-old adolescents. *Community Dentistry Oral Epidemiology* **51**, 864-871.
- Neves, É.T.B., Lima, L.C.M., Dutra, L.D.C., Gomes, M.C., Siqueira, M.B.L.D., Paiva, S.M., Ferreira, F.M. and Granville-Garcia, A.F. (2021): Oral health literacy, sociodemographic, family, and clinical predictors of dental visits among Brazilian early adolescents. *International Journal of Paediatric Dentistry* **31**, 204-211.
- Olson, D.H., Russell, C.S. and Sprenkle, D.H. (1982): The circumplex model of marital and family systems, VI: Theoretical update. *Family Process* **22**, 69-83.
- Park, Y.Y., Jeong, Y.J., Lee, J., Moon, N., Bang, I., Kim, H., Yun, K.S., Kim, Y.I. and Jeon, T.H. (2018): The influence of family adaptability and cohesion on anxiety and depression of terminally ill cancer patients. *Supportive Care in Cancer* **26**, 313-321.
- Paula, J.S., Rodrigues, P.A., Mattos, F.F., Abreu, M.H.N.G. and Chalub, L.L.F.H. (2022): Mother's education and family relations protect children from dental caries experience: a salutogenic approach. *Brazilian Oral Research* **36**, e111.
- Prata, I.M.L.F., Granville-Garcia, A.F., Neves, É.T.B., Lima, L.C.M., Dutra, L.C., Perazzo, M.F., Ferreira, F.M. and Paiva, S.M. (2021): Family Cohesion Is Associated with the Self-Perceived Need for Dental Treatment among Adolescents. *BioMed Research International* 4504030.
- Yang, Y., Pan, W., Farag, S.S. and Von Ah, D. (2022): Effect of family cohesion on symptom distress during hematopoietic stem cell transplantation. *Supportive Care in Cancer* **30**, 1731-1737.