Influence of Literacy in Oral Health among Parents and Caregivers and their Participation in Oral Health Programs on Clinical Decision-Making in Pediatric Dental Care: A Cross-Sectional Study

Influência do Alfabetismo em Saúde Bucal de Pais e Cuidadores e sua Participação em Programas de Saúde Bucal na Tomada de Decisões Clínicas no Atendimento Odontopediátrico: Estudo Transversal

Influencia de la Alfabetización en Salud Bucal de Padres y Cuidadores y su Participación en Programas de Salud Bucal en la Toma de Decisiones Clínicas en la Atención Odontopediátrica: Estudio Transversal

RESUMO

Introdução: O alfabetismo em saúde bucal (ASB) auxilia o indivíduo a compreender e implementar boas práticas de saúde bucal, influenciando diretamente a saúde do próprio paciente como também a de seus filhos. Além disso, o nível ASB dos pais ou cuidadores pode estar relacionado com a escolha do tratamento clínico adotado na consulta odontopediátrica. **Objetivo:** O presente estudo visou avaliar o nível de ASB de pais e cuidadores atendidos em programas de saúde e o reflexo deste sobre o procedimento clínico odontopediátrico a ser escolhido. **Material e método:** Trata-se de um estudo analítico e transversal, que avaliou 423 pais/cuidadores os quais os filhos eram atendidos em clínica escola odontopediátrica no período de 2022 a 2023. Esses foram avaliados frente a três instrumentos, sendo eles questionário de perfil sociodemográfico, o BREALD-30 e o instrumento de escolha de imagens de tratamento (IETs). **Resultados:** A análise sociodemográfica indica que 76% dos participantes eram do sexo feminino e pertenciam a classe C ou inferior. Os resultados gerais obtidos pelo questionário BREALD-30 e IETS revelam que 58% dos indivíduos optaram por tratamentos invasivos, sendo essa escolha diretamente relacionada a indivíduos com baixo nível de ASB. **Conclusão:** Os programas de saúde bucal aumentaram significativamente o nível de alfabetismo em saúde bucal, refletindo na melhora dos comportamentos de saúde bucal dos pais/cuidadores e suas crianças. Assim como na tomada de decisão em relação aos tratamentos disponíveis para os dentes decíduos com lesões cariosas.
DESCRITORES: Promoção da saúde. letramento em saúde. saúde bucal.

ABSTRACT

Introduction: Oral health literacy (OHL) helps individuals understand and implement good oral health practices, directly influencing the health of the patient as well as their children. Furthermore, the OHL level of parents or caregivers may be related to the choice of pediatric dental treatment. **Objective:** This study aimed to evaluate the OHL level of parents and caregivers participating in health programs and its impact on the selection of pediatric dental procedures. **Material and Methods:** This is an analytical and cross-sectional study that assessed 423 parents/caregivers whose children were treated at a pediatric dental school clinic from 2022 to 2023. The evaluation was conducted using three instruments: a sociodemographic profile questionnaire, the BREALD-30, and a treatment image selection tool (IETs). **Results:** Sociodemographic analysis indicates that 76% of the participants were female and belonged to socioeconomic class C or lower. The overall results obtained through the BREALD-30 questionnaire and the IETs revealed that 58% of individuals opted for invasive treatments. The preference for invasive treatments was associated with low OHL levels. **Conclusion:** Oral health programs significantly increased the level of oral health literacy, reflecting better oral health behaviors among parents/caregivers and their children, as well as more informed decision-making regarding the available treatments for primary teeth with carious lesions.
DESCRIPTORS: Health promotion. health literacy. oral health.

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RESUMEN

Introducción: El alfabetismo en salud bucal (ASB) ayuda al individuo a comprender e implementar buenas prácticas de salud bucal, influyendo directamente en la salud del propio paciente, así como en la de sus hijos. Además, el nivel de ASB de los padres o cuidadores puede estar relacionado con la elección del tratamiento clínico odontopediátrico. **Objetivo**: En este contexto, el presente estudio tuvo como objetivo evaluar el nivel de ASB de padres y cuidadores atendidos en programas de salud y su impacto en la elección de procedimientos clínicos odontopediátricos. **Material y método:** Se trata de un estudio analítico y transversal que evaluó a 423 padres/cuidadores cuyos hijos eran atendidos en una clínica escuela odontopediátrica durante el período de 2022 a 2023. Estos fueron evaluados mediante tres instrumentos: un cuestionario de perfil sociodemográfico, el BREALD-30 y un instrumento de selección de imágenes de tratamiento (IETs). **Resultados:** El análisis sociodemográfico indica que el 76% de los participantes eran mujeres y pertenecían a la clase C o inferior. Los resultados generales obtenidos mediante el cuestionario BREALD-30 y el IETs revelaron que el 58% de los individuos optaron por tratamientos invasivos, relacionándose esta elección con un bajo nivel de ASB. **Conclusión:** Los programas de salud bucal aumentaron significativamente el nivel de alfabetismo en salud bucal, reflejándose en una mejora de los comportamientos de salud bucal de los padres/cuidadores y sus hijos, así como en la toma de decisiones relacionadas con los tratamientos disponibles para dientes primarios con lesiones cariosas.

DESCRIPTORES: promoción de la salud. alfabetización en salud. salud bucal.

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INTRODUCTION

Health literacy is recognized as a relevant topic in the global public health scenario, transcending the reductionist concept that it is only the ability of individuals to read and understand information about their health. In addition to its multidimensionality, health literacy involves the ability of individuals to use this information to build their own health and transmit healthy habits to their descendants. [1,2]

Scientific evidence shows that understanding the determinants and implications of health literacy is essential in the formulation of health education and promotion strategies, leading to beneficial results for individuals and their families, which extend to society as a whole.[3,4]

With regard to dentistry, studies have revealed a connection between the HLA of parents and/or caregivers and the oral health status of their children, indicating that as the level of literacy of parents and/or caregivers decreases, the likelihood of developing poor oral hygiene habits and oral pathologies increases. [5,6]

Educational and preventive programs, especially those aimed at oral health, include among their purposes the identification of access or lack of access to dental services and the assessment of a population's treatment needs. [7,8] In addition, they seek to educate individuals to incorporate behavioral changes so that they gain autonomy over their own general and oral health care. [9,10]

Studies have shown that it is possible to associate low levels of ASB among parents and caregivers, low parental education, and low family income with oral health problems in their offspring, which are predisposing factors particularly for caries lesions. [11–13]

Furthermore, recent research clearly shows that these factors interfere with the choice of therapeutic options available for the curative treatment of children when parents and/or caregivers act as active participants in clinical decision-making together with pediatric dentists.[14]

However, to date, there are no studies in the dental literature that aim to evaluate, reflect on, and interpret the level of ASB and the participation of parents and/or caregivers in health programs and the impact of these actions on the choice of clinical procedures in pediatric dental practice when interventions are needed for their children, which is the primary objective of this study.

MATERIAL AND METHOD

ETHICAL ASPECTS

The study was approved by the Ethics and Research Committee of the INTA-UNINTA University Center, opinion 5.479.633/2022, under CAAE 59400722.0.0000-8133, in accordance with the ethical and fundamental requirements of Resolution 466/2012 of the National Health Council (Standards for research involving human subjects). All study participants signed a Free and Informed Consent Form (FICF).

LOCATION, SAMPLE, STUDY DESIGN, AND INSTRUMENTS USED

The study was conducted at the INTA-UNINTA University Center Teaching Clinic, located in the city of Sobral (CE – Brazil), from August 2022 to May 2023. This is a leading university center for higher education and preventive and curative care for children. The study design is a cross-sectional analytical study, using parents and/or caregivers who seek dental services for their children. A total of 423 parents and/or caregivers participated in the study, with the eligibility criteria being that they were responsible for children aged 3 to 12 years old treated at the pediatric dentistry clinic, resided in the same household, and agreed to sign the informed consent form. Parents and/or caregivers with visual or hearing impairments, whose native language was not Portuguese, or who showed signs or symptoms of cognitive impairment, drug use, or alcoholism were excluded.

Three instruments were used in the study, starting with a questionnaire about the sociodemographic profile and oral health of the family unit. The second instrument applied was the BREALD-30,[3] followed by a construct validated by clinical images indicating treatment needs (IETs).[14]

SOCIO-DEMOGRAPHIC PROFILE INSTRUMENT

The demographic characteristics were the degree of kinship of the guardian, the age and sex of the guardian and the child. Socioeconomic data included the guardian's education level (incomplete elementary school, complete elementary school, incomplete middle school, complete middle school, incomplete high school, complete high school), the child's education level (preschool II, III, IV, and V and elementary school grades 1 through 7), and the number of hours per day the guardian spends with the child. Economic classification was based on the criteria of the Brazilian Association of Research Companies, which is a standardized socioeconomic classification based on households, and individuals are categorized into classes according to purchasing power. Points are assigned on a checklist, including the head of household's education level, ownership of assets (car, dishwasher, refrigerator, freezer, washing machine, home internet, microwave oven, motorcycle, clothes dryer), whether the street where the individual lives is paved, and connection to the home's sewage system. Each item is assigned a score, and individuals are categorized into five economic classes: A (45 to 100 points), B1 (38 to 44

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points), B2 (29 to 37 points), C1 (23 to 28 points), C2 (17 to 22 points), and D/E (0 to 16 points).

BREALD-30 INSTRUMENT

This instrument, previously translated and validated into Portuguese, includes 30 words from the dental context arranged in ascending order of difficulty. Subjects were asked to read the words aloud in order to measure their level of literacy, i.e., oral health literacy, noting errors and difficulties in pronunciation. For each word read aloud, a score of 1 (one) was assigned for correct pronunciation and 0 (zero) for incorrect pronunciation, with a score ranging from 0 (zero) to 30 (thirty). The higher the score, the higher the level of oral health literacy.

IMAGE SELECTION TOOL (IETs)

In order to assess the research subjects' understanding of the various treatment options, the IET was used, which consists of photographs representing clinical cases, indicating caries lesions in deciduous teeth, in stages ranging from active white spots progressing in severity to cavitated caries lesions with dentin exposure based on the International Caries Detection and Assessment System (ICDAS II) index. [15]

For each IET presented, there were three treatment alternatives: 1) conservative treatment, 2) moderate treatment, and 3) invasive treatment. IET I presented upper incisors with active white spot lesions with an ICDAS score of 2, IET II presented caries lesions in the interproximal region of the upper incisors with an ICDAS score of 3, and IET III presented caries lesions on the occlusal surface of the deciduous molar with an ICDAS score of 4. In IETs I, II, and III, the treatment options were: (a) hygiene control, diet, and fluoride application; (b) scraping the stain with a manual instrument (curette); (c) using a small motor to polish (IET I) and remove the caries with the small motor (IETs II and III).

IET IV had a caries lesion with an ICDAS score of 5 in the second lower molar and the other molars with an ICDAS score of 6. IET V had an ICDAS score of 6 on the occlusal surface of the lower molar with painful symptoms. In IETs IV and V, the treatment options were: (a) remove the caries with a "small motor"; (b) treat the canal; (c) extract the tooth.

It should be noted that for each IET, a brief report of the clinical case and its possible manifestations (thermal sensitivity or painful symptoms) was provided for the better understanding of the parents and/or caregivers.

PROCEDURES

All instruments were applied systematically to each parent and/or caregiver at a single time and in the respective sequence by previously calibrated researchers and annotators. They were applied in a private room on the premises of the educational institution at times previously scheduled for the children's dental appointments.

It should be noted that the research participants were instructed to understand that the choice of treatments proposed in the IETs would be reproduced in their children, if necessary. In order to reduce the Hawthorne effect[16], the research subjects were instructed that there were no right or wrong answers.

RESULTS

A total of 416 individuals participated in this study. Seven individuals did not participate in the study because they were illiterate or did not have their glasses at the time of the interview.

Table 1 shows the demographic and socioeconomic characteristics of the sample. Of the parents and/or caregivers who were interviewed on the day of the child's appointment, 340 (81.7%) were the father or mother, 317 (76.2%) were female, the mean age was 36.79 (SD=9.55), and spent an average of 6.54 (SD=2.78) hours/day with the child. Most participants had more than eight years of schooling (%) and belonged to economic class C or lower (76.5%). The average age of the child was 7.38 (SD=2.63), with 237 (57%) being female and 44.2% attending preschool.

Table 2 shows the descriptive analysis of the understanding of parents and/or caregivers regarding dental treatment and BREALD-30.

In the clinical case in Image I (upper deciduous incisors with initial active white spot lesion in the cervical region, ICDAS 2), the respondents (46.2%) opted for more conservative treatments (hygiene control, diet, and fluoride application).

In the clinical case in Image II (moderate lesion in the interproximal region of the upper deciduous incisors, ICDAS 3) and Image III (moderate lesion in the occlusal region of the lower deciduous molar, ICDAS 4 with painful symptoms when exposed to cold/heat), the respondents, respectively (62.7% and 71.9%), opted for more invasive treatments (removing the caries with a "small motor").

Of the clinical cases in Image IV (ICDAS 5 lesion in blackened lower second deciduous molar) and Image V (ICDAS 6 lesion in the occlusal surface of the lower deciduous molar with continuous pain), the respondents, respectively (50.7% and 71.4%), opted for more invasive treatments (tooth extraction). The mean BREALD-30 score was 19.36% (SD=6.94).

Table 3 presents the descriptive analysis of the general and oral health of parents and/or caregivers and children. Of the parents and/or caregivers who were interviewed, 224 (53.8%) reported having participated in a general health education program at some

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point in their lives, and 237 (57%) reported participating in preventive oral health programs. Regarding oral health behaviors, the time since the last visit to the dentist for parents/fathers and/or caregivers was 16.6 months, and for children, it was 9.5 months. The daily frequency of tooth brushing was 2.75 times (SD=0.75) for parents/fathers and/or caregivers and 2.45 times (SD=0.72) for children.

Table 4 shows the comparative analysis of the variables of interest in relation to the participation of parents and/or caregivers in the oral health program. The Breald-30 shows asymptotic significance with participation in oral health programs, with the higher the BREALD-30 score of the guardian, the greater the probability of participation in oral health programs.

Table 5 presents a comparative analysis of the characteristics of guardians in relation to participation in oral health programs. The age of the guardian shows asymptotic significance with participation in oral health programs, with older guardians being less likely to participate in oral health programs. Level of education shows asymptotic significance with participation in the oral health program, with higher levels of education among guardians increasing the probability of participation in oral health programs. The ABEP social stratum shows asymptotic significance with program participation, with higher social classes increasing the probability of participation in oral health programs.

Table 6 shows a comparative analysis of the participation of parents and/or caregivers in the oral health program in relation to their understanding of dental treatment. The choice of treatment for EIT 4 shows asymptotic significance with participation in oral health programs, with the more invasive the treatment chosen (mean score 241.30), the lower the probability of participation in oral health programs (169). The choice of treatment for EIT 5 shows asymptotic significance with participation in oral health programs, such that the more invasive the treatment chosen (mean score 224.03), the lower the probability of participation in oral health programs (179).

Table 7 shows the correlation between the understanding of parents and/or caregivers regarding dental treatment, BREALD-30, and participation in health programs.

In the correlation analysis between participation in oral health programs and BREALD-30, we found a positive correlation of moderate magnitude and highly significant ($p<0.01$). Regarding the choice of images, there are negative correlations of weak magnitude and highly significant ($p<0.01$) with images 4 and 5. In the correlation analysis between participation in general health programs and BREALD-30, we found a positive correlation of weak magnitude and highly significant ($p<0.01$). Regarding image selection, there were weak but highly significant negative correlations ($p<0.01$) with images 4 and 5, and significant correlations ($p<0.05$) with image 1. In the correlation analysis between participation in oral/general health programs and BREALD-30, we found a positive correlation of weak magnitude and highly significant ($p<0.01$). Regarding the choice of images, it shows negative correlations of weak magnitude and highly significant ($p<0.01$) with images 4 and 5.

Table 8 shows the correlation analysis between the variables of interest and participation in oral health programs. In the correlation analysis between the age of the guardian and participation in oral health programs, there was a weak but highly significant positive correlation ($p<0.05$). The correlation analysis between economic level (ABEP) and participation in oral health programs showed a positive correlation of weak magnitude and high significance ($p<0.01$).

Table 9 presents a comparative analysis of the number needed to treat (NTT) according to BREALD-30, showing that for every 4 parents and/or caregivers included in the oral health program, 1 shows an improvement in their categorized BREALD-30 score, that is, of every 100 individuals who responded to the BREALD-30, 25% who participated in some preventive oral health program achieved a high score on the BREALD-30.

DISCUSSION

The family unit is a social space that, from a theoretical perspective, promotes physical and emotional well-being for all its members. Parents, as members of this family, play important roles in disease prevention and control through affective, cognitive, and behavioral actions directed at their offspring. [17]Oral hygiene habits and healthy food preferences are typical examples of the family's influence on children's oral health.[18] However, a considerable number of studies suggest that parents and/or caregivers are unaware of the concept of oral health promotion for their children or are not informed about oral diseases and the therapies indicated for preventive or curative treatment.[17,19]

In any case, clinical decision-making by the dentist and the choices made by parents and/or caregivers are complex processes guided by clinical, non-clinical, and biopsychosocial factors.[8] Thus, it is understandable that defining a "right" or "wrong" choice by parents and/or caregivers is not a simple and easy task.[20] This limitation in the knowledge of parents and/or caregivers alone fully

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justifies the construction of this research, whose essential scope is to discuss how ASB and oral health programs can act as a pedagogical tool, supporting parents and/or caregivers in making treatment choices that are more appropriate to the clinical conditions of their children.

At first, the results point to a descriptive analysis of the understanding of parents and/or caregivers regarding treatment options and the BREALD-30 instrument, which shows that the lower the level of ASB, the more prevalent the choice of invasive interventions. When evaluating the analysis of the variables of interest, our results reveal that the higher the BREALD-30 score, the greater the likelihood of parents and/or caregivers participating in health programs.

Although the literature does not present studies with a design and objectives similar to the present research, which weakens comparative analyses, it is reasonable to mention that our results are tangentially related to other studies.

In the late 1990s, the WHO created GLOBAL SCHOOL HEALTH, with the aim of transforming school environments into places for educational programs promoting oral health.[23] This program, in turn, inspired the creation of others, highlighting that parents and/or caregivers act as role models for their children in acquiring healthy oral health habits.[19,24,25]

Thus, the results are consistent with those who believe that parents can create a favorable environment for oral health in the home by monitoring the frequency of tooth brushing, limiting sugar consumption, encouraging their children to visit the dentist, and involving their children in discussions about the importance of oral health. [17,19,26]

We emphasize that the data support these statements and sustain a strong association between these parental behaviors and ASB and the choice of clinical treatments offered to their children. Notably, parents who did not participate or participated infrequently in educational programs expressed a positive opinion of more invasive clinical interventions.

Another relevant finding in our records, which may be a stimulus for the creation of educational programs aimed exclusively at parents and/or caregivers, is that for every 100 subjects participating in the study who were involved in educational programs, 25% of them achieved a high score on the BREALD-30 and opted for non-invasive or moderate treatments.

Regarding habits and behaviors, the present study points out that the frequency of tooth brushing by parents and/or caregivers was similar to that of their children, values that are similar to other studies. [27,28]The participation of parents and/or caregivers in educational activities had a very significant influence on the frequency of tooth brushing by their children. These data are consistent with other studies, confirming that children tend to repeat the behavior of their parents and/or caregivers with a positive impact on their health.[29–31]

We emphasize that in the population studied, the return to dental appointments by parents and/or caregivers was eight times longer than that of their children. In some way, this marked difference is due to the fact that children undergoing treatment at the teaching clinic were automatically scheduled for return and follow-up appointments. However, the dental literature has reported that parents and/or caregivers who visit dentists periodically every six months return to appointments more frequently than those who visit annually.[27,32] This may be associated with a higher number of caries-free children in the first group of parents and/or caregivers.[33,34]

On the other hand, research has not found a strong association between the last visit to the dentist and ASB, hypothetically explained by a reflection of ineffective professional-patient communication or the dentist's inability to persuade parents and/or caregivers. [34,35]

That said, it is a fact that parents and/or caregivers cannot do without health knowledge, attitudes, and practical skills, a high level of ASB, which are virtues acquired through public oral health programs. Therefore, the individual education of parents and/or caregivers, combined with educational programs, certainly changes behavior and, consequently, translates into better health outcomes for parents and children, which is demonstrated in our research.

In general, parents and/or caregivers who participated in oral health programs chose less invasive treatments for their children, according to the IETs presented, which was significant for IET IV and IET V. Based on the results, we found that parents and/or caregivers who had previously participated in some educational-preventive or educational-interventionist approach opted not to extract the teeth in question, even if the tooth was symptomatic (IET V) or not (IET IV). We can infer that the implementation of these educational activities may explain a conservative approach to care and the importance of keeping the deciduous tooth in the mouth until its complete exfoliation.

Our study also showed that social determinants, education, and socioeconomic status of the family influenced the attitudes of parents and/or caregivers toward participation in oral health programs, which also seem to influence health behaviors, such as the frequency of brushing and visits to the dentist. Furthermore, in most low- and middle-income families in the , family investment in oral health is low. This association between low education and low income may result in restricted access to dental care and low knowledge about oral health.

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The lack of a prospective study and the cross-sectional design, which makes causal inference impossible, can be seen as a limitation of the research. In addition, the study was implemented in a higher education institution in dentistry, and in view of this, the available results should be examined with the necessary caution for other groups of parents and/or caregivers, considering the specificity and methodology employed. Nevertheless, the methodological measures instituted compensated for these limitations. In addition to the novelty of the subject, the rigorous adherence to the methodology in obtaining the questionnaire responses increased the power of inference and analysis of the results.

CONCLUSION

It can be concluded that oral health programs not only improved the oral health behaviors of parents and/or caregivers and their children, such as the frequency of brushing and dental visits, but also resulted in a significant increase in the level of oral health literacy. In addition, these programs contributed to better decision-making regarding the treatments available for deciduous teeth with carious lesions.

We emphasize that parents and/or caregivers should play a decisive role in their children's oral health education, providing guidance, lasting support, and continuous reinforcement of healthy habits. These attributes provide long-term effectiveness, and the expansion of educational programs for parents and/or caregivers should be permanently observed with the purpose of alleviating oral health problems in their descendants .

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