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ORIGINAL ARTICLE

Oral Health-Related Quality of Life among Children and Adolescents with Autism Spectrum Disorder: A Cross-Sectional Study

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ABSTRACT

Objective: To assess the oral health-related quality of life (OHRQoL) of children and adolescents with autism spectrum disorder (ASD) through parental/caregiver perceptions. **Material and Methods:** Children and adolescents aged 4–18 years enrolled in an ASD center at Manaus, AM, Brazil, were assessed for dental caries by clinical examination. A trained and calibrated examiner performed all exams. The "Parental-Caregiver Perceptions Questionnaire" (PCP-Q) and the "Family Impact Scale" (FIS) were used to assess OHRQoL. Data analysis was performed using descriptive statistics and the Mann-Whitney U test. **Results:** Fifty-one children/adolescents of both sexes participated in the study. The mean age of patients was ten years (3.0), and most were male (76.5%). Forty-five (88.2%) mothers had more than nine years of schooling, and 28 (54.9%) earned equal to or less than two Brazilian minimum wages. The global PCP-Q score ranged from 0 to 25, with a mean value of 7.41 (6.64). The impact score values were significantly higher in individuals with caries experience in primary dentition ($p<0.05$). No significant differences in OHRQoL scores existed regarding family income and maternal schooling. **Conclusion:** According to parental/caregiver perceptions, children and adolescents with ASD had a higher impact on the PCP-Q functional limitation domain. Caries experience in primary teeth contributed to higher mean scores in all PCP-Q domains.

Keywords: Autism Spectrum Disorder; Oral Health; Dental Caries; Quality of Life; Perception.

Introduction

Autistic Spectrum Disorder (ASD) is a neurological development disorder characterized by qualitative abnormalities in reciprocal social interactions and communication patterns due to restricted, stereotyped, and repetitive interests and activities, manifested at different severity levels [1-4].

An increase in the number of ASD cases has been observed in recent decades [5,6]. According to the World Health Organization, it is estimated that one in every 160 children has ASD [7]. In 2023, the American Center for Disease Control and Prevention established that the prevalence ratio of ASD in 8-year-old children would be 1:36, higher than that found in the previous year in the same age group (1:44), which suggests that its prevalence is increasing [8]. Considering the prevalence ratio published in 2023 by the CDC, if data were extrapolated to the Brazilian population, it would be estimated that there are approximately 6 million individuals with the disorder in Brazil today.

Although it is widely recognized that the etiology of ASD is complex and multifactorial, with multiple associated genes and environmental risk factors, a precise understanding of the exact mechanisms that explain atypical neurodevelopment is lacking [9].

The diagnosis is usually performed during childhood based on the patient's medical and behavioral history. Still, some children usually develop the disease until early childhood and then stop developing skills or lose previously acquired ones [1,10,11]. It is also three to four times more common in boys than in girls, and more than 70% of individuals have associated conditions [12,13].

Concerning the oral cavity, there is controversy in the literature regarding the difference in the incidence of dental caries between children with ASD and the neurotypical pediatric population [2,6,14-16]. Some studies have suggested no significant difference, although worse oral hygiene and gingival/periodontal status have been reported in these children compared to neurotypical ones [3,14,17,18]. It could be expected that the risk of caries is higher in these patients due to the adverse effects of drugs used and difficulties in brushing teeth and flossing [18]. Some of the challenges with ASD individuals can be explained by the lack of manual skills, hypersensitivity sensory, or even refusal when caregivers try to implement daily oral hygiene [1,5,19]. A study has indicated that 24-41% of children with ASD prefer sugary and soft foods, which makes them more prone to dental caries [20]. If not treated, caries can progress to severe clinical conditions, including pulp impairment and tooth loss, negatively affecting patients' quality of life [21].

Although few studies have assessed the prevalence of dental caries in children with ASD [2,6,14], to our knowledge, only one study has estimated the clinical consequences of untreated dental caries in these individuals [22].

Studies have shown that health problems, such as dental caries, can functionally, psychologically, and socially affect patients, causing pain and discomfort in individuals with special needs [15,23,24]. Nevertheless, the quality of life of families of children with ASD seems strongly influenced by the health and severity of the disease, causing several impacts on psychosocial and economic aspects [23]. Oral health-related quality of life (OHRQoL) is a helpful index of parents' adjustment to the needs of their children [25]. It is essential to understand the experiences of children with ASD and their families [15].

However, there is little information regarding the effects of OHRQoL on autistic children and the quality of life of their families [15,23]. Oral examination of autistic children is challenging, which justifies the limited literature available and shows the importance of this work [23].

In children with special health care needs, due to limitations by the deficiency that may prevent any child from expressing oral pain and discomfort, parents or caregivers become the main interlocutors in reporting

their health status and what affects these children [15,26,27]. Furthermore, the perception of parents of children with ASD is an excellent tool for assessing the effect of oral diseases on the quality of life to motivate them to access oral healthcare services periodically [18]. Thus, the perceptions of parents and caregivers are essential and positive when the aim is to evaluate the quality of life in dental research [27].

Therefore, this study aimed to use parental perceptions to assess the OHRQoL of children and adolescents with ASD.

Material and Methods

This study was designed following the guidelines of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) [28].

Ethical Considerations

This study was approved by the Human Research Ethics Committee of the Federal University of Amazonas per the resolution of the National Health Council (CNS) on 12 December 2012 (Protocol number 66358422.0.0000.5020). Parents and caregivers were informed regarding the objectives and importance of the research and signed the Free and Informed Consent Form authorizing their children's participation.

Sample Characteristics and Study Design

A cross-sectional study was carried out at a selected ASD center in Manaus, state of Amazonas, Brazil. The Autism Institute of Amazonas is a non-profit institution for the specialized treatment of people with ASD, aiming at inclusion in all sectors of society. It provides physiotherapy, psychology, speech therapy, and social assistance services. A census was carried out, and parents and caregivers of all individuals with ASD aged 4–18 years assisted at this center were invited to participate in the study, but only those who returned the signed informed consent form could participate.

Study participants were recruited from the ASD center patient register. The registration form contained the name of the ASD patient, the legal guardian's name, the address, the telephone number, and the patient's medical history.

Inclusion criteria were individuals with level-one ASD aged 4–18 years. Level one is the mildest form of autism, in which individuals have difficulties with social communication, but they can have an independent life with some support. They also may have some repetitive behaviors or interests, but they are not severe enough to interfere with daily life [1]. All individuals with ASD whose parents agreed to participate in the study were recruited from January to May 2023. Children and adolescents with ASD whose behavior proved inappropriate for clinical examination, individuals undergoing orthodontic treatment, individuals with other syndromes, and participants who partially completed the questionnaires were excluded.

Data Collection

1. Clinical Data Collection

Clinical examination of all the children with ASD was performed; the child was seated on a regular chair using a plane mouth mirror (Duflex, S.S. White LTDA, Rio de Janeiro, Brazil) and CPI probe (Duflex, S.S. White LTDA, Rio de Janeiro, Brazil). All examinations were performed by a trained and calibrated examiner (MESD) for the diagnosis of decayed, missing, and filled teeth index (dmft for primary teeth/DMFT for permanent teeth) and clinical consequences of the untreated lesions index (pufa for primary teeth/PUFA for permanent teeth) by

an expert examiner (S.A.H.) in the treatment of children with special needs (gold standard), according to recommendations of the specific training manual for these indexes. A series of 50 photographs, which represented all possible classification scores, were used for calibration exercise on two occasions, with a one-week interval between examinations. Intra-examiner Kappa coefficients (0.83) and inter-examiner study examiner x expert (0.81 and 0.80) were calculated for clinical criteria.

Teeth were cleaned and dried with gauze before the clinical exam. Dental caries experience was evaluated using the decayed, missing, and filled index for permanent teeth (DMFT) and the decayed, indicated for extraction, or filled teeth for primary teeth index (dmft) proposed by the World Health Organization [29].

The clinical consequences of untreated dental caries in permanent and primary dentition were assessed using the PUFA/pufa index [30], respectively. This index recorded Pulse Involvement (P/p), Ulcer caused by dislocated tooth fragments (U/u), Fistula (F/f), and Abscess (A/a).

2. Nonclinical Data Collection.

Parents and caregivers answered a questionnaire that included two sections in a waiting room. The first section provided information on their demographic and socioeconomic background: child´s sex, age, mother's and father's age, maternal schooling (categorized as ≤ 9 years and > 9 years), family income (categorized as ≤ 2 and > 2 Brazilian minimum wages), oral health habits and medical history: previous visit to the dentist, daily brushing frequency, and use of fluoridated toothpaste (yes or no), use of drugs (yes or no), and other associated disorders.

The second section comprised a short-form version of the Parental-Caregiver Perception Questionnaire (PCP-Q) and the Family Impact Scale (FIS), which aimed to assess parents' perceptions of their children's OHRQoL and its effect on the family. This instrument has been cross-culturally adapted and validated in several countries, including Brazil [31,32].

Evaluated Outcomes

Outcome and Explanatory Variables

The outcome variable was the impact on OHRQoL obtained with the PCP-Q. The short-form PCP-Q has 13 items distributed into four subscales: oral symptoms (3 questions), functional limitations (4 questions), emotional well-being, and social well-being (6 questions). FIS is included in the PCP-Q and consists of 14 items intended to evaluate the effect of the child's oral orofacial condition on four domains related to parental and family activities (5 questions), parental emotions (4 questions), family conflicts (4 questions) and family finances (1 question). Questions refer only to the frequency of events in the previous three months. The items are scored on a 5-point Likert scale as follows: never = 0, once or twice = 1, sometimes = 2, often = 3, and every day or almost every day = 4. The "I don't know" response was also allowed and was scored as 0. The mean scores for all domains and the overall PCP-Q score were obtained, with high scores denoting that the oral conditions had a negative impact on the children's quality of life [23,30].

The main explanatory variable in our study was dental caries experience. To classify patients based on caries experience, they underwent dental examination under dmft/DMFT indexes. Subjects were categorized based on their caries experience as caries-free when dmft/DMFT = 0 and caries experience when dmft/DMFT≥ 1. Other explanatory variables collected included the patient's sex and age, family income, maternal schooling, and clinical consequences of untreated dental caries. This variable was dichotomized for each individual without

clinical consequences of untreated dental caries (PUFA/pufa=0) and with clinical consequences of untreated dental caries (PUFA/pufa ≥ 1).

Data Analysis

The Statistical Package for the Social Sciences (SPSS for Windows, version 21.0, SPSS Inc., Armonk, NY, USA) was used to analyze the data obtained in this study. Initially, descriptive analyses were performed. The relative frequency (%) of all variables under study was obtained for sample characterization and PCP-Q components. Continuous variables were presented as means and standard deviation, and the outcomes were checked for normal distribution using the Kolmogorov–Smirnov test. Variables that were not normally distributed were analyzed using the non-parametric Mann–Whitney U test. P-value <0.05 was considered statistically significant.

Results

A total of 65 pairs of children and their parents or caregivers were eligible for the study. Eight children (12.31%) were not included in the final sample due to incomplete data from the questionnaire applied to parents/caregivers, and six children (9.23%) presented inappropriate behavior and refused the clinical examination. The study sample consisted of 51 parent/caregiver dyads and their children/adolescents with ASD. The population characterization and clinical data are described in Table 1.

Table 1. Sample characterization and clinical data.

Variables	N	%
Sex		
Male	39	76.5
Female	12	23.5
Age		
Mean (Standard Deviation)	10.0 (± 3.0)	
Number of Siblings		
Only child	21	41.2
≥ 1 sibling	30	58.8
Caregiver Interviewed		
Mother	45	88.2
Father	6	11.8
Family Income		
≤ 2 Brazilian Minimum Wages	37	72.5
> 2 Brazilian Minimum Wages	14	27.5
Maternal Schooling		
≤ 9 years	6	11.8
> 9 years	45	88.2
Other Disorders		
Yes	51	100
No	0	0
Use of Drugs		
Yes	28	54.9
No	23	45.1
A prior Visit to the Dentist		
Yes	40	78.4
No	11	21.6
Daily Toothbrushing Frequency		
≤ 2 times	47	92.2
> 2 times	4	7.8
Who Does the Toothbrushing?		
The child/adolescent	6	11.8

Parents/caregivers	45	88.2
dmft		
dmft = 0	43	84.3
dmft ≥ 1	8	15.7
DMFT		
DMFT = 0	37	72.5
DMFT ≥ 1	14	27.5
PUFA/pufa		
PUFA/pufa = 0	44	86.3
PUFA/pufa ≥ 1	7	13.7

The average age of parents/caregivers was 42.3 (± 7.3) years. Regarding the medical history of participants with ASD, all had at least one comorbidity, with mental impairment (n=51), attention deficit hyperactivity disorder (n=9), epilepsy (n=3), and generalized anxiety disorder (n=1) being the most reported. Regarding drugs, 54.9% used them continuously. Antipsychotics (n=25), anticonvulsants (n=6), antidepressants (n=4), and others (melatonin, antihypertensives, methylphenidate) (n=4) were the most prescribed.

Tables 2 show the answers to the global perception of parents/caregivers regarding the oral health of their children. About 86.1% of respondents considered the oral health of their children/adolescents to range from good to excellent in children with no dental caries experience and 54.5% in those with dental caries experience.

Table 2. Distribution of global perception responses (PCP-Q) regarding oral health, according to the clinical characteristics of children/adolescents with ASD.

Variables	N	Oral Health				
		Excellent N (%)	Very Good N (%)	Good N (%)	Regular N (%)	Poor N (%)
DMFT/dmft=0	29	5 (17.2)	11 (37.9)	9 (31.0)	4 (13.8)	0 (0.0)
DMFT/dmft ≥1	22	2 (9.1)	3 (13.6)	7 (31.8)	9 (40.9)	1(4.5)

Table 3 shows the impact of oral conditions on general well-being regarding the clinical conditions presented by individuals with ASD. Most parents/caregivers (51.0%) reported that oral conditions did not affect their children's general well-being. However, in individuals with dental caries experience, more than half (72.7%) perceived an impact on general well-being, which varied from "mild" to "strong."

Table 3. Distribution of global perception responses (PCP-Q) regarding the impact of oral conditions on general well-being, according to the clinical characteristics of children/adolescents with ASD.

Variables	N	Oral Health				
		No Way N (%)	A Little N (%)	Moderately N (%)	A lot N (%)	Very Much N (%)
DMFT/dmft=0	29	20 (69.0)	7 (24.1)	1 (3.4)	1 (3.4)	0 (0.0)
DMFT/dmft ≥1	22	6 (27.3)	11 (50.0)	4 (18.2)	1 (4.5)	0 (0.0)

Table 4 presents the mean and standard deviation (SD) of the overall PCP-Q and subscale scores according to independent variables. The average PCP-Q score in the study population ranged from 0 to 25, with a mean value of 7.41. For FIS, the mean score was 8.7. Higher scores were observed in subscales related to functional limitation and emotional and social well-being. There are no statistically significant differences in the average OHRQoL scores according to sex, age, family income, maternal schooling, and dental caries experience in permanent teeth of children and adolescents with ASD were found. The impact values were significantly higher than those found for the dmft index in all PCP-Q domains ($p<0.05$; Mann-Whitney test).

Table 4. Mean and subscale scores according to independent variables.

Variables	PCPQ								FIS	
	Overall PCP-Q values	Oral Symptoms	Functional Limitation	Emotional and Social Well-being	Overall PCP-Q values	Oral Symptoms	Functional Limitation	Emotional and Social Well-being		
	Mean (SD)	p-value[1]	Mean (SD)	p-value[1]	Mean (SD)	p-value[1]	Mean (SD)	p-value[1]	Mean (SD)	p-value[1]
Sex										
Male	8.15 (6.89)	0.5	1.67 (1.74)	0.7	3.44 (3.52)	0.5	3.05 (3.68)	0.6	10.36 (10.10)	0.4
Female	6.67 (6.39)		1.50 (1.73)		2.33 (2.02)		2.83 (4.34)		7.00 (7.17)	
Age										
≤ 10 years	7.96 (6.74)	0.3	1.66 (1.74)	0.4	3.24 (2.12)	0.2	3.06 (1.53)	0.3	9.66 (7.07)	0.2
> 10 years	8.04 (6.94)		1.67(1.73)		3.27 (3.20)		3.10 (2.69)		9.46 (9.67)	
Family Income										
≤ 2 BMW	8,00 (7.13)	>0.9	1.57 (1.68)	0.7	3.22 (3.35)	>0.9	3.22 (4.09)	0.7	10.43 (10.02)	0.3
> 2 BMW	7.29 (5.80)		1.79 (1.89)		3.07 (3.05)		2.43 (2.95)		7.29 (8.02)	
Maternal Schooling										
≤ 9 years	6.50 (6.06)	0.7	1.33 (1.51)	0.8	3.00 (2.53)	0.9	2.17 (2.99)	0.6	13.00 (6.81)	0.086
> 9 years	7.98 (6.87)		1.67 (1.76)		3.20 (3.35)		3.11 (3.91)		9.11 (9.81)	
Caries Experience dmft										
dmft = 0	6.67 (6.50)[a]	0.002	1.37 (1.63)[a]	0.014	2.72 (3.03)[a]	0.020	2.58 (3.67)[a]	0.018	9.07 (9.78)	0.15
dmft ≥ 1	13.88 (4.61)[b]		3.00 (1.60)[b]		5.62 (3.46)[b]		5.25 (3.96)[b]		12.25 (8.15)	
Caries Experience MFT										
DMFT = 0	7.57 (6.54)	0.7	1.62 (1.64)	0.9	3.16 (3.32)	0.8	2.78 (3.51)	0.5	9.05 (9.30)	0.6
DMFT ≥ 1	8.43 (7.47)		1.64 (1.98)		3.21 (3.14)		3.57 (4.57)		10.93 (10.37)	
pufa/PUFA										
PUFA/pufa= 0	7.80 (2.63)	0.6	1.63 (1.92)	0.8	3.18 (3.20)	0.5	3.00 (2.69)	0.9	9.57 (2.40)	0.5
PUFA/pufa≥ 1	8.58 (3.51)		1.70 (1.67)		3.44 (2.43)		3.44 (2.43)		10.12 (4.15)	

SD: Standard Deviation; Values in columns with different superscript letters = statistically significant differences at p<0.05; [1]Mann-Whitney test.

Discussion

Few studies have measured the perception of parents and caregivers about OHRQoL in individuals with ASD, especially in Brazil, where the first study was published only in 2019 [23]. To the best of our knowledge, this cross-sectional study is the first to identify dental caries experience and evaluate parents' perceptions of the OHRQoL of children and adolescents with ASD in the state of Amazonas.

Parents/caregivers' perceptions of oral conditions and their impact on the quality of life of children with special needs are essential to highlighting their perceived needs. This enables the planning of adequate treatments and specific oral health promotion programs for each portion of the population [23].

Mothers were the primary respondents of the questionnaires used, a finding similar to that observed in other studies [18,26,33]. This fact can be explained by the fact that mothers are the primary caregivers of their children, especially those with disabilities, reaffirming the educational responsibility in health that is culturally assigned to the maternal figure. The importance of the maternal bond with these individuals is highlighted [18].

Regarding sex, the male-to-female ratio was 3:1, which may reflect the higher prevalence of autism in males, corroborating the findings of studies previously reported in the literature [3,23,34]. This fact can be attributed to unnoticed clinical symptoms in girls and subsequent gender diagnostic bias [35]. However, there was no difference in the average OHRQoL scores between sexes in the present study, corroborating Dias-Caldeira et al. [26]. In a previous study [23], parents and caregivers reported more oral problems in boys with ASD.

In this study, PCP-Q was used to understand the perceptions of parents regarding the OHRQoL of children with ASD. This instrument was also used by other authors to measure the perception of parents/caregivers regarding the impact of oral health on the quality of life of their children [15,18,23,24,26,27]. PCP-Q has become a growing and positive tool used to detect pediatric oral diseases from the point of view of parents and caregivers. The justification for its use as a research tool in patients with special needs is given by the fact that parents and caregivers are primarily responsible for decision-making regarding medical and dental treatment because their children do not have the cognitive capacity to self-evaluate or have a perception of the general or oral health status in which they live [27]. The justification for its use as an investigation tool in patients with special needs is that parents and caregivers are primarily responsible for making medical and dental treatment decisions, as their children do not have the cognitive capacity to self-evaluate and perceive their general or oral health status.

The use of a "proxy" measure, that is, that perceived from the perspective of other people to assess the OHRQoL construct, is a fact that must be taken into account since, in some cases, parents and caregivers may find it challenging to interpret their children's feelings [24]. However, for a population with mental impairment as comorbidity, such as that investigated in this study, the instrument used to assess OHRQoL must be directed to parents and caregivers to minimize inaccurate information from individuals with communication and cognitive disabilities.

Dental caries is considered a predictor factor of worse parental perception of OHRQoL [23,36]. The impact of oral health on OHRQoL observed in the present study was in line with other studies [18,26]. It is probably related to our population's low prevalence of caries, corroborating results from another author [37]. A significant difference was observed in all domains' mean PCP-Q score values between children with caries who experienced it in primary dentition and those without caries. Higher PCP-Q scores reported in this study by parents of ASD children with caries experience in primary dentition can perhaps be explained by the fact that the medical diagnosis of ASD is difficult and usually late. Therefore, the frustration of expectations of an idealized child, associated with the guardians' lack of knowledge about the disorder's characteristics and the absence of social communication specialized therapies in childhood, can lead to a lack of understanding of the desires and needs of younger children, neglecting their oral health care and negatively interfering in the parental perception of ASD's OHRQoL.

Therefore, the frustration of the expectation of an idealized child, associated with the lack of knowledge on the part of parents/caregivers about the characteristics of the disorder and the lack of treatment or specialized therapies aimed at behavior and social communication in childhood, can lead to a lack of understanding of the

wishes and needs of younger children, neglect of oral health care and negatively interfering with caregivers' perception of OHRQoL, who feel powerless in the face of such a situation in their children.

The low prevalence of dental caries observed in this study is likely because most of the individuals treated at the ASD center under investigation are children of employees who provide services there, who perhaps have more knowledge about the characteristics, behavioral management, and communication techniques more suitable for this target audience, favoring the possible management of their behavior for daily activities, including the practice of personal and oral hygiene, monitoring of food intake, limiting sugar consumption, together with efficient supervision during oral hygiene at home [38]. The low prevalence of dental caries observed in this study is likely because most of the individuals treated at the investigated ASD center are children of employees of that center, who perhaps have more knowledge about the characteristics, behavioral management, and communication techniques more suitable for this target audience, favoring the possible management of their behavior for daily activities, including the practice of personal and oral hygiene, monitoring of food intake, limiting sugar consumption, together with efficient supervision during oral hygiene at home [38]. In addition, many low-income families assisted at the Institute were referred to the "Amigo Ruy" Multidisciplinary Care Space for ASD patients, where children received dental care. Other parents reported having access to private dental care in the last two years.

The literature on dental caries experience in individuals with ASD is controversial [6,16]. The heterogeneity of results can be attributed to the different age groups of study participants, evaluated populations, methodological criteria, and sample sizes.

Eslami, Movahed, and Asadi [36] also found a low total PCP-Q mean score. They reported that parents of typical children have more problems related to oral health than those of patients with ASD. It is important to emphasize that the severity of ASD in both studies was mild, which may have contributed to the results of minor problems by parents and caregivers.

The most affected PCP-Q domains were "functional limitations" and "well-being," similar to the results of another study [25], disagreeing with the findings of Alsumait et al. [39], who observed that "well-being" was the most impacted domain, followed by "functional limitations." Slightly lower scores in the "well-being" domain (emotional and social) can be explained by the mental impairment presented by all investigated individuals, which affects the individual self-perception about factors such as aesthetics. In addition, these individuals usually have social relationships restricted to family and the school environment. The family impact measured by FIS in the study can be explained by the numerous problems faced by parents and caregivers of individuals with ASD, such as social discrimination, sleep interruption, work absenteeism, increased financial pressure, and ineffective or insufficient therapy. As a result, parents present an increased risk of developing anxiety and depression, especially mothers of affected children [40].

The global perception questions (oral health and general well-being) of PCP-Q analyze parents' judgment regarding their children's oral health condition. In general, many of them considered their children's oral health good or excellent in our sample, even those whose children had caries. In most cases, the assessment of oral health conditions by parents and caregivers is based on the presence of pain; therefore, in its absence, the opinion of parents/ caregivers does not always reflect the actual situation, which could be even worse.

The lack of knowledge of parents and caregivers regarding the impact of oral health conditions on the general well-being and quality of life of individuals with ASD may also occur due to the impairment of communication and expression of their affected children, which prevents the identification of pain and discomfort. When they do, they often fail to identify the location and cause [15] accurately.

There was no difference in the mean total PCP-Q and FIS scores related to family income and maternal schooling. In the present study, mothers of children with ASD had higher educational levels, as Eslami et al. [36] observed in 70 pairs of parents and children with the autistic spectrum in Iran.

This study's limitations include the fact that it was carried out in only one reference center for the care of individuals with ASD in the state of Amazonas. Therefore, the sample size was small, so the results cannot be extrapolated to the entire population. Another limitation is its cross-sectional design, which does not allow for establishing causality.

Furthermore, it should be highlighted that all patients investigated in our study had mild-severity ASD, which may have influenced the results of the present investigation. In addition, the impact of domains may have been compromised due to the difficulty of parents in interpreting information about the emotional and social interactions of their children with ASD [18], generating many '0' scores and making it difficult to perform specific statistical tests.

Conclusion

According to parental perceptions, children and adolescents with ASD had a higher impact in the PCP-Q functional limitation domain. Dental caries experience in primary teeth contributed to higher mean scores in all PCP-Q domains.

Authors' Contributions

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SAH	https://orcid.org/0000-0002-3415-8557	Formal Analysis, Writing - Original Draft and Writing - Review and Editing.

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

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None.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability

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

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