

## **Métodos e estratégias de condicionamento para atendimento odontológico ambulatorial de pessoas com transtorno do espectro autista: uma integração da literature**

### **Conditioning methods and strategies for outdoor dental care of people with autistic spectrum disorder: an integration of the literature**

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#### **Rafaela Souza da Costa Ramos**

Pós-Graduanda em Odontologia pela Universidade Ceuma (UNICEUMA)

Instituição: Universidade Ceuma (UNICEUMA)

Endereço: Rua Josué Montello, No. 1, Renascença II, São Luís - MA, CEP: 65075-120

E-mail: rafaelascramos@hotmail.com

#### **Cyrene Piazeria Silva Costa**

Doutorado em odontologia pela Universidade Federal do Maranhão (UFMA)

Instituição: Universidade Ceuma (UNICEUMA)

Endereço: Rua Josué Montello, No. 1, Renascença II, São Luís - MA, CEP: 65075-120

E-mail: cyrene.piazerra@ceuma.br

#### **Barbara Tamires Cruz Aires**

Especialista em Odontologia para Pacientes com Necessidades Especiais

Instituição: Universidade Ceuma (UNICEUMA), Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP)

Endereço: Rua Josué Montello, No. 1, Renascença II, São Luís - MA, CEP: 65075-120

E-mail: babiaires90@gmail.com

#### **Rudys Rodolfo de Jesus Tavares**

Doutorado em Odontologia (Reabilitação oral) pela Universidade de São Paulo (USP)

Instituição: Universidade Ceuma (UNICEUMA)

Endereço: Rua Josué Montello, No. 1, Renascença II, São Luís - MA, CEP: 65075-120

E-mail: rudys.tavarez@ceuma.br

#### **RESUMO**

O objetivo do estudo foi identificar os métodos e estratégias de condicionamento para o atendimento odontológico ambulatorial de pessoas com Transtorno do Espectro Autista. Trata-se de uma revisão integrativa realizada nas bases de dados BVS (Biblioteca Virtual em Saúde), BIREME (Biblioteca Regional de Medicina), LILACS (Literatura Latino-Americana e do Caribe em Ciências da Saúde), IBECs (Índice Bibliográfico Espanhol de Ciências de Saúde), MEDLINE (Medical Literature Analyses and Retrieval System Online), BBO (Biblioteca Brasileira de Odontologia), PubMed, SciELO (Scientific Electronic Library Online), BDTD (Biblioteca Digital Brasileira de Teses e Dissertações) e EBSCOHost. Observou-se que o cirurgião-dentista pode utilizar métodos, estratégias e adaptações que otimizem o tratamento, como Sistema de Comunicação por Intercâmbio de Figuras (PECS) adaptada a Odontologia, modelagem por mídias visuais e Programa

de Treinamento Psicoeducacional (PTP) por meio do TEACCH, a fim de diminuir o estresse, ansiedade e medo ocasionado durante o atendimento.

**Palavras-chave:** Transtorno do Espectro Autista, Odontologia, Métodos, Comportamento.

## **ABSTRACT**

The aim of the study was to identify conditioning methods and strategies for outpatient dental care for people with Autism Spectrum Disorder. This is an integrative review carried out in the databases VHL (Virtual Health Library), BIREME (Regional Library of Medicine), LILACS (Latin American and Caribbean Literature on Health Sciences), IBECs (Spanish Bibliographic Index of Health's Science), MEDLINE (Medical Literature Analyzes and Retrieval System Online), BBO (Brazilian Library of Dentistry), PubMed, SciELO (Scientific Electronic Library Online), BDTD (Brazilian Digital Library of Theses and Dissertations) and EBSCO Host. It was observed that the dentist can use methods, strategies and adaptations that optimize the treatment, such as the Picture Exchange Communication System (PECS) adapted to Dentistry, modeling by visual media and the Psychoeducational Training Program (PTP) through the TEACCH, in order to reduce the stress, anxiety and fear caused during the service.

**Keywords:** Autism Spectrum Disorder, dentistry, methods, behavior.

## **1 INTRODUCTION**

Recent studies show that Autism Spectrum Disorder (ASD) affects 20% of the world population, and 60 out of 10.000 brazilians have this disorder, which is predominantly male <sup>1-3</sup>.

ASD is a global developmental disorder observed before the three years old, conceptualized as a neurological disorder which causes changes in behavior and social interaction <sup>4,5</sup>. Patients with ASD can also present stereotypes of interests, activity and behavior,<sup>6</sup> which can lead to the absence or impairment of speech, hyperactivity, repetitive movements, difficulty in social interaction and adherence to routine <sup>7</sup>.

Regarding dental characteristics, individuals with ASD may present oral self-mutilation, high plaque index and decreased salivary flow due to medication. Such findings contribute to the emergence of caries and periodontal disease <sup>9</sup>, which justifies the need for dental follow-up for this group of people.

However, during outpatient dental care for these patients, there are several barriers, such as: fear of unknown people, great difficulty in communication, lack of knowledge on the part of dentists about ASD and methods to perform a differentiated approach during this servisse <sup>11</sup>; even the office itself have actions that become barriers

during the care of these individuals, such as: light, suction sounds, high and low rotation pens and odors from dental materials.

The dentist during the outpatient dental care of the patient with ASD needs to be aware of the methods, conditioning strategies and adaptations to optimize it<sup>13</sup>. Such a differentiated approach can be used to try to minimize the exposure of these individuals to dental treatment under sedation or general anesthesia, techniques that are known to be safe, but which demand a greater structural and financial need<sup>14</sup>.

The objective of this integrative review was to identify methods, conditioning strategies and adaptations to facilitate outpatient dental care for people with ASD.

## 2 METHODS

A broad search was carried out in the electronic databases: VHL, BIREME, LILACS, IBECs, MEDLINE, BBO, PubMed, SciELO, BDTD and EBSCO Host, using the keywords: autism spectrum disorder and dental care to answer the question: Which the methods, conditioning strategies and adaptations for outpatient dental care of patients with Autism Spectrum Disorder?

Inclusion criteria were: (1) search time (after 2005), (2) population (people with Autism Spectrum Disorder), (3) interventions (methods, conditioning strategies, and adaptations), (4) outcome (outpatient dental care), (5) language (English, Portuguese, Spanish and French), (6) type of study (less literature review of any nature and case reports). Of these, duplicate articles, literature reviews of any nature, case reports, editorials, letters and the like were excluded.

Study selection was performed by two calibrated researchers (Kappa=0.89). Disagreements were resolved by consensus between the evaluators.

The studies included in this integrative review were qualified according to the following items: author(s) and date, objective(s), design, location, participants, variables, measurements, sample size, main results, and conclusion.

## 3 RESULTS

A total of 768 non-repeated articles were selected. In the selection of abstracts, 16 articles were identified fulfilling the inclusion criteria and, after being analyzed in full, 13 were eliminated because they did not fully agree with the theme, totaling 3 articles included in the qualitative synthesis.

#### 4 DISCUSSION

From the results of this review, it was observed that the dentist can use methods, strategies and adaptations during the dental care of patients with ASD, which optimize the treatment, such as: protective stabilization<sup>5</sup>, inhalational and/or drug sedation, general anesthesia<sup>5</sup>, Picture Exchange Communication System (PECS) adapted to dentistry<sup>24, 26</sup>, modeling by visual media<sup>16,19,23</sup> and Psychoeducational Training Program (PTP) through TEACCH<sup>17</sup>.

The lack of dentists' knowledge in relation to the disorder, the need for invasive oral dental treatment and non-collaboration of the autistic individual to dental treatment are the barriers to accessing dental care on an outpatient basis<sup>26,27,28</sup>.

Based on the results of the study by Loo et al.<sup>5</sup>, it was possible to verify that autistic patients are less cooperative than patients with PDD (Pervasive Developmental Disorder). This fact is confirmed by Gadia, Tuchman and Rotta<sup>30</sup>, in which autistic patients present qualitative deficits in social interaction and communication, more severe behavior patterns than those with PDD. According to Loo et al.<sup>5</sup>, the patients most predisposed to care under general anesthesia were autistic patients with poor oral health, non-cooperative and female. Loo<sup>5</sup> also observed the use of protective stabilization in patients with seizures, and according to Klatchoian et al.<sup>31</sup>, its use is contraindicated for patients who cannot be restrained due to associated medical conditions. However, this method of protective stabilization is not well accepted by parents and caregivers, as they see this method as a factor that can lead to greater aversion on the part of the patient to dental treatment.

The PECS method adapted to dentistry<sup>23,25</sup> allows communication between professionals and people with ASD through images of the dental environment, instruments and materials that will be used, because some patients develop verbal language, while others develop non-verbal. Studies carried out by Zink et al.<sup>23,25</sup> found its effectiveness, resulting in faster and more successful dental treatment.

In the study by Zink et al.<sup>23</sup>, patients with ASD were divided into two groups, G1 (with no previous dental experience) and G2 (with dental experience). The variables used were: visual contact and PECS (office, reception room mat, dental chair, dentist, mouth, low-speed pen, triple syringe). There were statistically significant differences in the variables "room rug", "dental surgeon", "mouth" and "triple syringe" and both groups had a similar mean time to establish visual contact with the dentist. G1 patients needed a

smaller number of attempts to accept the following PECS: “floor”, “dentist”, “mouth” and “triple syringe”<sup>23</sup>.

In the second study published by Zink et al.<sup>25</sup>, two strategies for using PECS were compared. G1 used PECS (office, floor, dental chair, dentist, mouth, low-speed pen, triple syringe) in a mobile application using an iPad Mini (iOS operating system; Apple) standardized with female voice, portuguese, no music, and videos and texts available. The images of the triple syringe and low rotation pen also presented a specific sound effect, simulating the real sound of these dental devices. And already on the G2, the same images were shown on a whiteboard designed to fix each plastic poster with a Velcro strip. This application influenced the communication results during the first dental appointment, consequently decreasing the total attempts and the number of appointments needed for dental prophylaxis and evaluation of the caries experience compared to PECS<sup>26</sup>.

Autistic people have a predilection for visual stimuli<sup>15,18,22,33</sup>, Isong et al.<sup>15</sup>, Cagetti et al.<sup>18</sup> and Mah et al.<sup>22</sup> carried out studies in order to determine an innovative strategy in dental care. In Isong et al.<sup>15</sup>, 80 autistic individuals were divided into four groups, in group A (usual treatment); group B (treatment with video modeling on DVD); group C (preferred treatment with video and glasses); and group D (modeling of pairs of videos and glasses). There was a decrease in anxiety and behavior levels in groups C and D, and in groups A and B no significant changes were observed. Suggesting that this result may have been due to watching videos with glasses divert patients' attention, reducing the level of anxiety and uncooperative behavior<sup>15</sup>.

For Cagetti et al.<sup>18</sup>, a total of 83 patients with ASD were divided into four procedural steps (oral examination, oral hygiene, fissure sealing and restorative treatment). The acceptance rate for each stage was associated with verbal fluency, intellectual level and degree of cooperation. This protocol was based on the principles of ABA (Applied Behavior Analysis). The visual protocol tested allowed the most common dental treatments to be performed in children with ASD without the use of sedatives or general anesthesia. Refusals in dental treatment occurred more frequently in non-verbal children, less in non-fluent ones and even less in those with fluent speech<sup>18</sup>.

In the study by Mah et al.<sup>24</sup>, two groups were divided, Talking-Showing-Doing and Talking-Showing-Doing more Visual Pedagogy, in a total of 14 patients. The images were created based on PECS. Preliminary evidence that repeated exposure to weekly dental appointments and the use of images can help children with autism present

satisfying experiences to improve oral care and oral health. A study with a larger sample is necessary in order to verify significant differences between the interventions <sup>24</sup>.

Orellana et al. <sup>16</sup> verified the effectiveness of using a psychoeducational training program (PTP) through TEACCH, also verifying that the improvement in the management of patients with ASD was not influenced by the level of cognitive development, thus indicating that children with autism with high cognitive development and children and adults associated with intellectual disability can benefit from this program. The Frankl scale was used, as in Loo et al. <sup>5</sup>, Stein et al. <sup>17</sup>, Alhumaid et al. <sup>19</sup>, Cermak et al. <sup>20</sup> and Nelson et al. <sup>24</sup>, as the most used scale to assess complications in patients with ASD. Before the intervention, 73.7% of the children and 67.6% of the adults showed reluctant behavior (Frankl: values 1 and 2). After the intervention, 81.6% of the children and 100% of the adults showed positive behavior <sup>16</sup>.

The use of an Adapted Dental Environment (ADE) <sup>20</sup> in patients with ASD, proved to be more effective in relation to the patient's degree of psychological stress when compared to a Regular Dental Environment (RDE), noting the parents' report about the challenges behavior when visiting the dentist. As for the time required to perform dental cleaning, in the ADE in patients with ASD, it took 5 to 7 min longer, which may relate to the patient's cooperation, in which the professional spends more time during the procedure. However, the study was carried out with a small sample, limiting definitive conclusions about its efficacy <sup>20</sup>.

In Nelson et al. <sup>24</sup>, the ability of patients with ASD to tolerate a minimal initial examination through a desensitization program was observed. Only one third of the patients were described as verbal, thus, most received a minimum initial examination within five visits, suggesting an explanation to family members when using alternative means for behavioral management <sup>24</sup>, such as protective stabilization and general anesthesia <sup>5</sup>.

In the study by Alhumaid et al. <sup>19</sup>, they verified the use of a D-TERMINED program. Patients in both groups showed all categories of behavior at the initial dental visit and there was no significant difference in pretreatment behavior between the groups. After treatment, there was a significant improvement in the behavior of the D-TERMINED group compared to the control group. Thirty percent of the children were referred to the operating room and 52% showed improvement in behavior. These results are comparable to the study by Loo et al <sup>5</sup>, which found that 37% of patients with ASD were treated under general anesthesia <sup>5</sup>.

For Chi et al. <sup>21</sup>, comparing the rates of home and preventive oral care for children with ASD and verifying the use of an I-Smile program, children with ASD were less likely to use preventive oral care, however, without significant differences in care mouthpieces at home in the period 2003-2011. In the period 2009-2011, children with ASD were less likely to use preventive dental care than children without ASD. This suggests that children enrolled in Medicaid are less likely to not have oral care at home and also less likely to use preventive oral care in the I-Smile. Findings need to be confirmed through longitudinal studies <sup>21</sup>.

The purpose of management techniques through images, electronic visual media and psychoeducational training was to minimize the devastating impact on patients with limited communication skills, particularly within ASD, which occurs during dental sessions. A good professional-patient relationship can make the treatment safer, preventing the need for protective stabilization <sup>5</sup>, referring these individuals to general anesthesia in a hospital environment <sup>5</sup>, minimizing the stress and costs of the procedure, favoring the social inclusion of these patients and increasing the number of professionals trained to provide outpatient care <sup>23,25</sup>.

## 5 CONCLUSION

It is concluded that conditioning methods, strategies and adaptations such as Picture Exchange Communication (PECS) adapted to dentistry, modeling by visual electronic media and psychoeducational training program can be used for outpatient dental care of patients with ASD, reducing stress, anxiety and fear caused during care. And when it is not possible to control patients with these methods, protective stabilization, inhalational and/or drug sedation, and general anesthesia can be used.

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