
PROCEDURE TO OVERCOME DENTAL ANXIETY IN CHILDREN WITH AUTISM SPECTRUM DISORDER: A SCOPING REVIEW

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KEYWORDS

Autism Spectrum Disorder, dental anxiety, procedure

ABSTRACT

Introduction: Dental anxiety in children with Autism Spectrum Disorder (ASD) is challenging for dentists and dental staff. Children with autism usually show negative behaviour toward dental treatment due to their limitations in social interaction, language, and communication. Consequently, the necessary dental procedure could not perform. Some procedures could be conducted to overcome dental anxiety. The purpose of this review is to report the relevant studies about the procedure to overcome dental anxiety in children with Autism Spectrum disorder. **Main body.** Relevant articles during 2010-March 2020 were identified and retrieved from three internet databases, PubMed and Cochrane. Through removing duplicates, title and abstract screening, inclusion criteria and exclusion criteria were applied to the journal results to find eligible studies. Nine articles were eligible to recommend the procedure that reduces dental anxiety for children with ASD. **Conclusion:** It can be concluded that the structural and visual approach and long-term follow-up of children with autism is the recommended approach to overcome dental anxiety.

INTRODUCTION

Autism spectrum disorder is a long life disorder that affects neurodevelopmental to individual.¹ Child with Autism Spectrum Disorder (ASD) has limitations in social interaction, communication, and language. Some of them have a unique characteristic such as hypersensitive to sensory such as sound, light, or pain. It leads to anxiety or fear of the surrounding.²

Dental treatment for oral care in dental clinics is challenging for children especially for those who suffered from ASD. The instrument and a noise that produced could be a scare stimulus for them. It contributes to uncooperative behaviour to a dental

procedure that leads to unmet dental treatment or makes the dentist or parents feel reluctant to conduct the treatment.³

The common procedure that used to overcome dental procedure from the literature:⁴

1. Pharmacology approach

The drug can be used for children with anxiety when facing dental treatment through sedation, general anesthesia, oral or parenteral. However, it might induce interaction or adverse effects of drugs, such as xerostomia, drooling, glossitis and dysphagia, lung problem, allergy, heart attack, and strokes.

2. Non-pharmacology approach.

a. Behaviour approach.

The dentist will do a behaviour approach through psychological education.

b. Medical restraint

Emergency cases might need this technique. However, it might cause psychological trauma, physical trauma, stretches, abrasion, and bruises

There are some standard procedures to overcome dental fear or anxiety to dental treatment such as Tell-Show-Do (TSD), desensitization, hand and over-mouth approach. However, this strategy might not be implemented for children with ASD in a dental clinic. Therefore, some behaviour strategies that used for children with ASD. Many studies reported the implementation of a psychology approach in a dental clinic or oral care to children with ASD to overcome dental anxiety.^{5,6,7}

The objective of this study is to report the relevant studies about the procedure to overcome dental anxiety in children with Autism Spectrum Disorder.

MATERIAL AND METHODS

Search criteria

The literature was searched using the PubMed and Cochrane databases on April 2020 with the following keywords: (((((((("Dental Anxiety"[MeSH Terms] OR "stress"[All Fields]) OR "dental fear"[All

Fields]) AND ("Dental Care for Disabled"[MeSH Terms]) OR ("Dental Care for Children"[MeSH Terms]) OR ("dental treatment"[All Fields]) OR "mouth care"[All Fields]) OR ("dental treatment"[All Fields]) AND ("Autism Spectrum Disorder"[MeSH Terms]) OR "autism OR "autis*")

To be included in the present review, the articles had to be written in English language and published between 2010 and April 2020.

Screening procedure

The first or initial selection were removing the duplicate papers between two databases. The second screening is selection through title and abstracts. The third selection was reading based on the full text to assess the eligibility of the studies.

The inclusion criteria:

Population: Children 6 to 18-years-old.

Intervention: behaviour strategy or training children with ASD to a dental procedure or oral health care.

Comparison: common behaviour strategy that applied to normal children.

Outcome: cooperative attitude.

Exclusion criteria:

Information based on the basic science of autism/ disease, sedation/ pharmacology as intervention, dental service, dental education to dental staff/ parents, diagnostic test, oral/ general health assessment (epidemiology study), specific clinical dentistry (prosthetic, orthodontic, surgery and periodontal

treatment), emergency treatment, Disability in the general case, Review Article, Full text are not available, not explain the behaviour strategy in dental treatment, qualitative study, low significance, descriptive study, Case report.

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The initial search yielded a total of 71 papers (69 and 2 hits, respectively, of which 1 duplicates). Seventy papers were excluded according to the title and/ or the abstract and 48 were excluded based on the full text. The remaining 22 papers were scored of which 9 papers were considered of high quality and presented in this review. The retrieved articles explain the procedure to reduce the anxiety will be explained in this article.

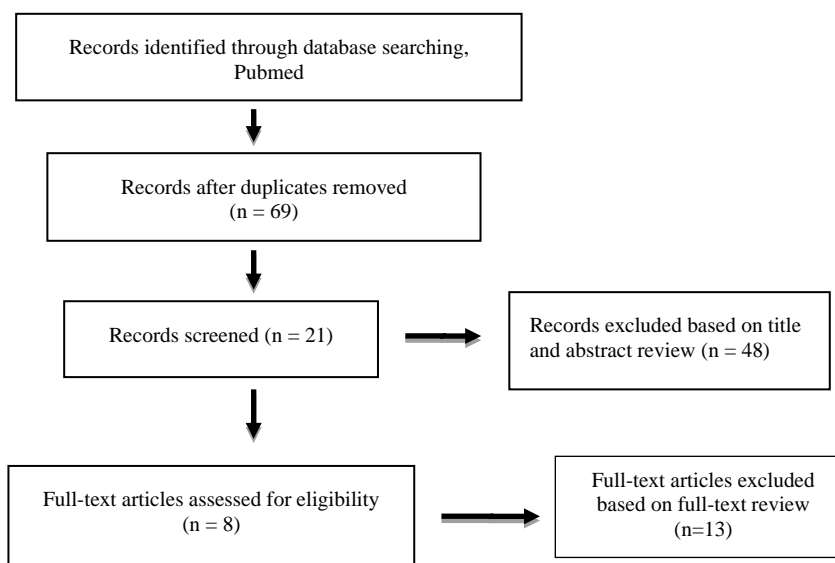


Figure 1. Flowchart of the study search and inclusion in the review.

Table 1. Eligible papers about the procedure to overcome dental anxiety in children with autism

Author, year	Title	Journal	Study	Subject	Control	Age	Country	Outcome	interventions
Zink et al., 2018	Communication Application for Use During the First Dental Visit for Children and Adolescents with Autism Spectrum Disorders	Journal Pediatric Dentistry	RCT	20	20	15-40 y.o	Brazil	Mobile app more significant than PECS in communication patient-dentist	PECS
Nilchian et al., 2017	Evaluation of Visual Pedagogy in Dental Check-ups and Preventive Practices Among 6-12-Year-Old Children with Autism	Journal of Autism and Developmental Disorders	RCT	20	20	6-12 y.o	Iran	Visual pedagogy is effective in fluoride therapy	Visual
Zink et al., 2016	Use of a Picture Exchange Communication System for preventive procedures in individuals with autism spectrum disorder: a pilot study	Special Care in Dentistry	RCT	13	13	5-19	Brazil	number of times required for acquiring the skill proposed in each PECS. There were statistically significant differences in the PECS variables "ground," "dentist," "mouth," and "triple" ($p < .05$) between the two group	Visual/ PECS
Mah et al., 2016	Visual Schedule System in Dental Care for Patients with Autism: A Pilot Study	Journal of Clinical Pediatric Dentistry	RCT	14	14	3-8 y.p	Canada	The number of dental visit attempt, the completion of dental procedure, child behavioural distress	Visual
Al Humaid et al., 2016	Effectiveness of the D-TERMINED Program of Repetitive tasking for children with an autism spectrum disorder	Journal of Dentistry for Children	RCT	22	22	5-18 y.o	USA	D-TERMINED program may have a positive impact on the behaviour of children with ASD compared to SBT's used (TSD, Voice control. Etc)	D-TERMINED /ABA
Cagetti et al., 2015	Dental care protocol based on visual supports for children with autism spectrum disorders	Medicina Oral, Patologia Oral y CirugiaBucal	experiment	83	-	6-12 y.o	Italian	the acceptance rate at dental stage and gender, intellectual level, verbal fluency, and cooperation grade after ABA intervention	Visual
Nelson et al., 2017	Predicting successful dental examinations for children with an autism spectrum disorder in the context of a dental desensitization program.	Journal of the American Dental Association	cohort	168	-	4-18 y.o	USA	The ability to receive minimal threshold examination (MTE)	Desensitization
Marion et al., 2016	Dental stories for children with autism	Special Care in Dentistry	Pre-post test	40	-	1-18 y.o	USA	a history of preparatory story use and a child's preference for home media serve as useful indicators of future dental story preferences.	Visual

DISCUSSION

Many procedures recommended overcoming anxiety in the dental clinic. Retrieved studies investigated the techniques below that widely use:

Desensitization also has been a component of behavioural packages to train individuals with intellectual disabilities to be compliant with dental procedures. Desensitization makes the children feel comfortable to the exposure of steps or stimuli that were given step by step in the skill of training. Desensitization is also effective in achieving minimal threshold examination in children.^{8,9}

Visual pedagogy is a way of introducing dentistry to children with autism that effective to explain the activity interestingly¹⁰ Many studies that utilize pictures have been carried out to train children with ASD since they are visual learners. Photographs have been used to teach children with low-functioning autism to explain a sequence activity in the dental clinic.^{11,12} Mah stated that the visual approach could be complete more steps of dental care, a quicker rate, and exhibit lower levels of behavioural distress progress compared with Tell-Show-Do as part of the standard care.^{13,14}

Applied Behaviour Analysis (ABA) is one of the psychological approaches that could modify behaviour through analysis of the relationship then achieve the desired effect. ABA is also an evidence base of approach and could teach patients with ASD new skills

or lessons by emphasizing, rewarding, and reinforcing. The study about ABA involved some disciplines of science such as the development of children, psychology, nursing, and pain management. Shaping behaviour as the dentist expected is conducted through successive approximations, and the child is reinforced to accept the behaviour by himself eventually with his intention.^{15,16}

Three strategies are the most approaches that widely use to coupe children in dental clinics. However, approaches that are structurally used such as Treatment and Education of Autistic and related Communication-handicapped Children (TEACCH). This technique arises psychoeducational training program that also uses visual, Tell-show-Do Feel-Do, and modelling. The visual approach seems more effective when implemented in children with autism.^{17,18}

CONCLUSION

It can be concluded that the structural-visual approach and long-term follow-up of children with autism is the best strategy for reducing dental anxiety.

REFERENCES

1. Green D, Flanagan D. Understanding the autistic dental patient. *Gen Dent.* 2008;56(2):167–71.
2. Pilebro C, Bäckman B. Teaching oral hygiene to children with autism. *Int J Paediatr Dent.* 2005;15(1):1–9.

3. Baron-cohen S, Ashwin E, Ashwin C, Tavassoli T. Talent in autism: hyper-systemizing, hyper-attention to detail and sensory hypersensitivity. 2009;1377–83.
4. Elmore JL, Bruhn AM, Bobzien JL. Interventions for the Reduction of Dental Anxiety and Corresponding Behavioral Deficits in Children with Autism Spectrum Disorder. *J Dent Hyg JDH*. 2016;90(2):111–20.
5. Stein LI, Lane CJ, Williams ME, Dawson ME, Polido JC, Cermak SA. Physiological and behavioral stress and anxiety in children with autism spectrum disorders during routine oral care. *Biomed Res Int*; 2014
6. Luscre DM, Center DB. Procedures for reducing dental fear in children with autism. *J Autism Dev Disord*. 1996;
7. Luscre DM, Center DB. Procedures for reducing dental fear in children with autism. *J Autism Dev Disord*. 1996;
8. Nelson T, Chim A, Sheller BL, McKinney CM, Scott JM. Predicting successful dental examinations for children with an autism spectrum disorder in the context of a dental desensitization program. *J Am Dent Assoc [Internet]*. Elsevier; 2017 Jul;148(7):485–92. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/28433195>
9. Yost Q, Nelson T, Sheller B, McKinney CM, Tressel W, Chim AN. Children with Autism Spectrum Disorder Are Able to Maintain Dental Skills: A Two-Year Case Review of Desensitization Treatment. *Pediatr Dent [Internet]*. United States; 2019 Sep 15;41(5):397–403. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/31648672>
10. Mah JW, Tsang P. Visual Schedule System in Dental Care for Patients with Autism: A Pilot Study. *J Clin Pediatr Dent*. 2016;40(5):393–9.
11. Zink AG, Diniz MB, Rodrigues Dos Santos MTB, Guaré RO. Use of a Picture Exchange Communication System for preventive procedures in individuals with autism spectrum disorder: a pilot study. *Spec Care Dentist [Internet]*. 2016/04/05. United States; 2016 Sep;36(5):254–9. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27059442>
12. Marion IW, Nelson TM, Sheller B, McKinney CM, Scott JAM. Dental stories for children with autism. *Spec Care Dent*. 2016;36(4):181–6.
13. Mah JWT, Tsang P. Visual Schedule System in Dental Care for Patients with Autism: A Pilot Study. *J Clin Pediatr Dent [Internet]*. 2016;40(5):393–9. Available from: <http://jocpd.org/doi/10.17796/1053-4628-40.5.393>
14. Nilchian F, Shakibaei F, Jarah ZT. Evaluation of Visual Pedagogy in Dental Check-ups and Preventive Practices Among 6–12-Year-Old Children with Autism. *J Autism Dev Disord [Internet]*. 2017 Mar;47(3):858–64. Available from: <http://link.springer.com/10.1007/s10803-016-2998-8>
15. AlHumaid J, Tesini D, Finkelman M, Loo CY. Effectiveness of the D-TERMINED Program of Repetitive Tasking for Children with Autism Spectrum Disorder. *J Dent Child (Chic) [Internet]*. United States; 2016;83(1):16–21. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/27098716>
16. Hernandez P, Ikkanda Z. Applied behaviour analysis: behaviour management of children with autism spectrum disorders in dental environments. *J Am Dent Assoc [Internet]*. England; 2011 Mar;142(3):281–7. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21357862>
17. Mesibov G, Shea V, Schopler E. *The Teacch Approach to Autism spectrum disorders*. 1st ed. New York: Springer; 2004.
18. Orellana LM, Martínez-Sanchis S, Silvestre FJ. Training adults and children with an autism spectrum disorder to be compliant with a clinical dental assessment using a TEACCH-based approach. *J Autism Dev Disord*; 2014.