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Management Interventions to Improve Emotional Regulation in Children With Autism Spectrum Disorders: A Scoping Review

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Abstract. *Introduction: Autism Spectrum Disorder (ASD) presents significant challenges in emotional regulation, often leading to behavioral difficulties such as anger outbursts, tantrums, and depression, particularly in early childhood development. Recognizing the need for effective interventions. Objective: To explore management interventions to improve emotion regulation for children with ASD. Methods: We conducted a review of interventions to improve emotion regulation for children with ASD. The search process uses appropriate populations, concepts, and contexts. The search was carried out through the PubMed, Science direct, ProQuest, and SAGE Journal databases published between 2011 - 2021. The selection process was carried out using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method. Critical assessment using The Joanna Briggs Institute checklist. Results: Of 4,157 articles, 7 articles were selected for this review. Several interventions to improve emotional regulation that can be used include Cognitive behavior therapy (CBT), Physical Activity, Stress and Anger Management Program (STAMP), and Stress and Anger Management Program (STAMP). In general, this intervention can be used to improve emotional regulation in children with ASD aged 4-17 years. Conclusion: All interventions can be used to improve emotional regulation in children with ASD*

Keywords: *Management, emotional regulation, Autism spectrum disorder*.

INTRODUCTION

Autism Spectrum Disorder (ASD), commonly referred to as autism, is a neurodevelopmental condition typically observed during early childhood development (Xu et al., 2019). The main characteristics of ASD disorders are impaired social, emotional, child communication functioning, repetitive behavior, and lack of interest (Morales-Hidalgo et al. 2018). Bruggink et al. (2016) it was determined that there were no discernible variances in emotional adjustment strategies between children with autism and those without autism. Nevertheless, the nature of these strategies exhibits fundamental disparities, with notably higher levels of depression and anxiety observed in children with autism compared to those without. The capacity to perceive emotions in an individual plays a crucial role in influencing one's actions (Nugraha & Patriyani, 2017).

Centers for Disease Control and Prevention (CDC) (2021) It is approximated that around 1 out of every 44 8-year-old children has been diagnosed with Autism Spectrum Disorder (ASD), equivalent to a prevalence rate of 23.0 per 1,000 8-year-old children.

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According to research conducted by Bruggink et al. (2016) estimated that 1.55% of preschool children and 1.00% of school-aged children suffer from ASD in Spain. In Asia, including Indonesia, there is an increase in cases of autistic disorders. In 2011, the number of autistic sufferers in Indonesia was 1 in 1000, which was a higher figure than ten years earlier (Ministry of Health, 2019).

Children with ASD generally have problems with emotional regulation and usually have angry behavior, tantrums, physical aggression, depression and anxiety and even excessive excitement (Conner et al., 2019; Scarpa et al., 2013). Emotion regulation is a process in which individuals adopt various strategies to control themselves from inappropriate actions, manage themselves so as not to be affected by mood changes, calm themselves when strong emotions arise, and focus on the situation when emotions arise (Gross & Jazaieri, 2014; Fiona & Indianti, 2018).

Effective regulation of emotions in children diagnosed with ASD holds significant importance as it underpins crucial aspects of their development, impacting their interactions within the social and physical environment (Berkovits et al., 2017). Inadequate emotional regulation can lead to challenges such as impaired problem-solving abilities, diminished responsiveness, difficulty in recognizing others' emotions, and social constraints (White et al., 2014). Moreover, deficiencies in regulatory skills may contribute to various future difficulties (Conner et al., 2019). Furthermore, children with ASD often encounter obstacles in formulating adaptive strategies and display a higher frequency of maladaptive behaviors (Cai et al., 2018).

Interventions to improve emotional regulation for children with ASD may be beneficial in reducing emotional and behavioral difficulties. This can be done by teaching children with ASD how to apply more adaptive emotion regulation strategies and to reduce their emotional lability (Tajik-Parvinchi et al., 2020). According to one study conducted by Danial & Wood (2013), cognitive behavioral therapy (CBT) is recognized as a treatment that can be used for emotional difficulties in children with and without ASD.

Research conducted by Sarol & Çimen (2015) also states that physical activity can improve social, physical and emotional functioning which can affect the quality of life of children with ASD. However, there is still not much research regarding interventions that can be carried out to improve emotional regulation for children with ASD, so the author

needs to conduct a literature study aimed at exploring intervention management to improve emotional regulation for children with ASD.

MATERIAL AND METHOD

This section describes the relevant theories behind the research topic and provides a review of relevant prior studies. It also serves as a reference and justification for conducting this research. If there is a hypothesis, it may be communicated implicitly, and is not required to be posed as a question. The search process in this review refers to predefined clinical questions, namely PCC [population (P), concept (C), and context (C)]. The population in this study is children with ASD, and the concept of this research is interventions to improve emotional regulation, while the context is studies conducted in clinics, schools, or communities.

The initial search was conducted from April 2nd to April 10th, 2024, through 3 databases: (1) PubMed, (2) SAGE Journal, and (3) Science Direct. Keywords used were children AND Autism spectrum disorder AND improvement regulation emotion AND Clinical OR School OR Community. Various search terms were utilized, including Boolean operators (And /Or) and MeSH (Medical Subject Heading). Studies included in this review are those discussing interventions to enhance emotional regulation for children with ASD in English.

Inclusion criteria for this study were (1) articles from 2011-2021; (2) articles focusing on children with ASD as subjects; (3) articles describing methods to improve emotional regulation in children with ASD; (4) original research articles or research papers; and (5) articles in English. Meanwhile, exclusion criteria were (1) Subjects aged >19 years, (2) having other types of disabilities, and (3) interventions targeted solely at parents of children with ASD.

The researcher thoroughly read 7 selected articles, assessed critically using the Joanna Briggs Institute (JBI) checklist for RCTs and quasi-experiments. This method employs several criteria to evaluate the quality of articles to decide whether they can proceed to the synthesis stage or not. These criteria include the sample and subjects of the study, the validity and reliability of measurement tools, confounding factors, and statistical analysis. No studies were excluded based on this quality assessment.

In this stage, data extraction was carried out on the 7 articles obtained in the previous stage. Data grouping can be done based on several pieces of information

suggested by Peters et al. (2015): (1) Author(s), (2) Year of publication, (3) Source/country of origin, (4) Aim/objective, (5) Study population and sample size, (6) How outcomes were measured, and (7) Key findings related to the review question.

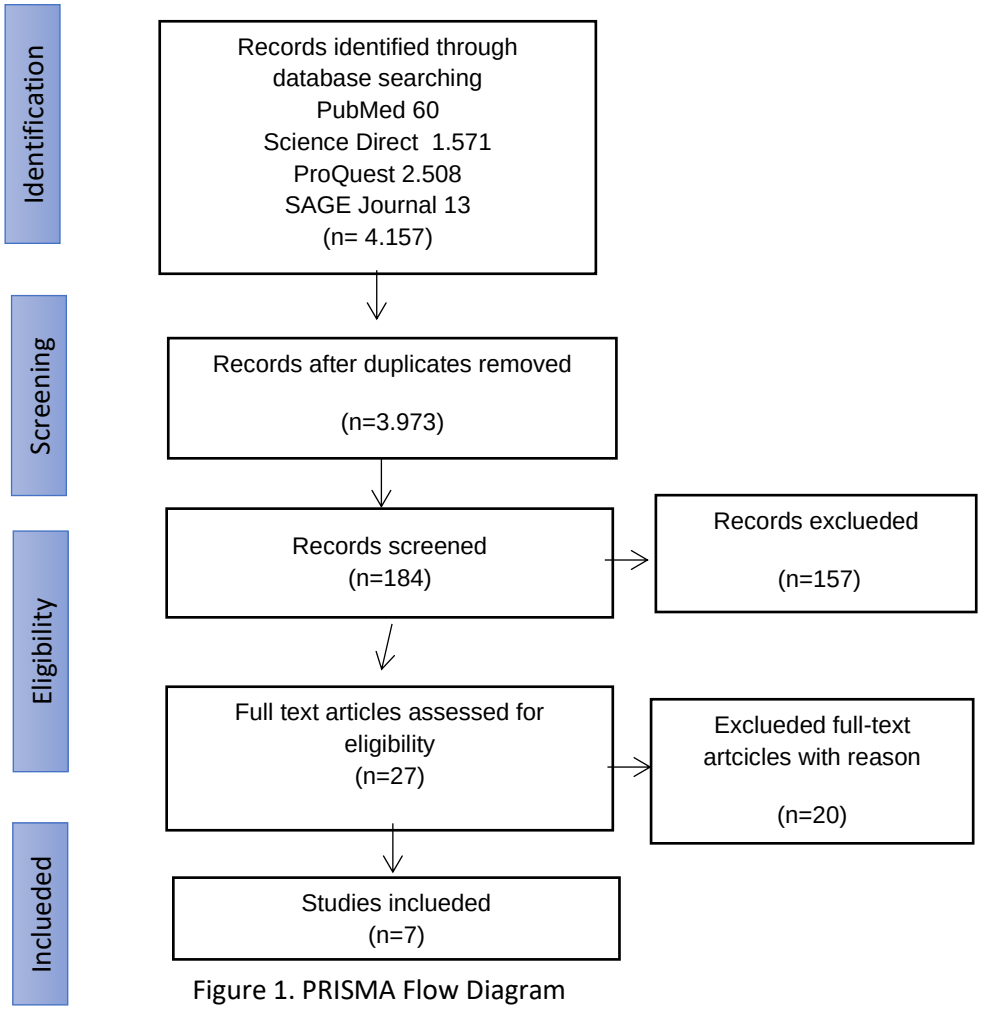

Figure 1. PRISMA Flow Diagram

RESULTS

We generated 4,157 articles consisting of PubMed 60, Science Direct 1,571, ProQuest 2,508 and SAGE Journal 13. There were 3,973 duplicate articles, leaving 184 articles. Then a screening process was carried out with inclusion and exclusion criteria in the title and abstract of the articles, and only 27 articles met the criteria. In the final stage, 7 articles were included for this research (Figure 1).

The seven selected articles were recently published, from 2011 to 2021. The studies were conducted in several countries such as Canada, China, Australia, America (Table 1). Respondents in this study ranged from 4 to 17 years old who received intervention to improve emotional regulation in children with ASD. In general, the study aimed to

explore management interventions to improve emotion regulation for children with ASD (Table 2).

From the seven articles synthesized, there are four interventions that can be used to improve emotional regulation for children with ASD, namely: Cognitive behavior therapy (CBT), Physical Activity, Emotion Awareness and Skills Enhancement Program (EASE), and Stress and Anger Management Program (STAMP) (Table 2).

Tabel 1 Country information from 7 included studies

No.	Penulis, Tahun Publikasi	Design	Negara	Benua
1.	Weiss et al. (2018)	RCT	Canada	Amerika
2.	Tse (2020)	RCT	China	Asia
3.	Tanksale et al. (2021)	RCT	Australia	Australia
4.	Tajik-Parvinchi et al. (2020)	RCT	Canada	Amerika
5.	Conner et al. (2019)	RCT	Amerika	Amerika
6.	Factor et al. (2019)	RCT	Amerika	Amerika
7.	Scarpa & Reyes (2011)	Quasy Eksperimen	Amerika	Amerika

Tabel 2 Extracting the Authenticity of Emotion Regulation Intervention Data

No.	Author, Year of Publication	Objective	Sample			Intervation	Result
			n	location	age		
1.	Weiss et al. (2018)	Knowing the effect of CBT on improving emotional regulation and mental health in autistic children	68 children	Community	8–12	Cognitive behavior therapy (CBT)	In the intervention group there was an increase in emotional regulation (emotions, ability to regulate emotions with social skills) and aspects of psychopathology (internalization and externalization symptoms, and adaptive behavior) compared to the control group
2.	Tse (2020)	To determine the effect of physical activity (moderate-vigorous intensity jogging) on the emotional function and behavior of children with ASD	27 children	School	8-12	Aktivitas Fisik (jogging 12 minggu)	In the intervention group there was an increase in emotional regulation and reduced behavioral problems
3.	Tanksale et al. (2021)	Knowing the benefits of yoga therapy with CBT to improve cognitive, emotional, behavioral control and awareness in children with ASD	67 children	School	8-12	Yoga dan cognitive behavioral therapy (CBT)	Children can control executive functions, improve sleep quality, reduce anxiety, and emotional awareness.
4.	Tajik-Parvinchi et al. (2020)	To determine the effect of CBT for 10 weeks on autistic children aged 8-12 years	55 children and parents	School	8-12	Cognitive behavioral therapy (CBT)	CBT therapy is associated with adaptive regulation, namely children with ASD show improved verbal reasoning, social communication skills, social motivation, and lower levels of parental anxiety.
5.	Conner et al. (2019)	To determine the effect of the Emotion Awareness and Skills Enhancement Program (EASE) on improving emotional regulation in children with ASD	20 children	Clinic	12-17	Emotion Awareness and Skills Enhancement Program (EASE)	The Emotion Awareness and Skills Enhancement Program (EASE) can improve emotional regulation and reduce anxiety in children with ASD
6.	Factor et al. (2019)	Evaluating the effects of the Stress and Anger Management Program (STAMP) on children's L/N, ER, and parental	23 children and parents	School	4-7	Stress and Anger Management Program (STAMP)	The child's lability/negative affect (L/N) decreased, regulation did not change significantly, and parental beliefs regarding the child's ability to manage anger and

		confidence in children 4 to 7 years old with ASD					anxiety increased from before to after treatment.
7.	Scarpa & Reyes (2011)	To determine the effects of developmentally modified CBT therapy for young children with Autism Spectrum Disorders (ASD)	11 children	School	5-7	Cognitive behavioral therapy (CBT)	CBT can be useful for children with ASD, namely it can improve emotional regulation, reduce anger and anxiety, and parent training can increase parent self-efficacy.

DUSCUSSION

a. Cognitive behavior therapy (CBT)

This review identified four articles that applied Cognitive Behavioral Therapy (CBT) to improve emotion regulation in children with ASD (Table 2). CBT is a form of therapy that aims to change a person's mindset or perception of the problems they face. The basis of the CBT approach is the belief that the behavior shown is influenced by cognitive processes, so that by using CBT, it does not only focus on changing behavior, but can also be used to intervene in cognitive processes that influence emotions and behavior (Beck, 2011).

Several studies implemented CBT for an average of around 6-14 weeks (Weiss et al., 2018; Tajik-Parvinchi et al., 2020; Scarpa & Reyes, 2011; Tanksale et al., 2021). The implementation of CBT includes understanding positive emotions, understanding negative emotions of anxiety and anger, teaching relaxation and teaching how to think (Scarpa & Reyes, 2011). CBT protocols for children with ASD require a high level of parental involvement both in terms of weekly session participation, as well as parental support outside of therapy sessions (Tajik-Parvinchi et al., 2020).

CBT can be useful for children with ASD, namely it can improve emotional regulation, reduce anger and anxiety, reduce internalization and externalization symptoms and parent training can increase self-efficacy and reduce parental anxiety (Weiss et al., 2018; Scarpa & Reyes, 2011). This is in line with research conducted by Kuroda et al. (2013) which states that CBT therapy is effective for improving emotional regulation in patients with ASD.

b. Physical Activity

This review identified two articles that used physical activity to improve emotion regulation in children with ASD (Table 2). Physical activity is any body movement

produced by skeletal muscles that requires energy expenditure. Physical activity can be done by walking, cycling, exercising and playing (WHO, 2021). Research conducted by Tse (2020) provided an intervention in the form of 12 weeks of jogging consisting of 48 sessions (four sessions per week for 30 minutes per session). While Tanksale et al. (2021) provides yoga exercise therapy which is carried out for six sessions every week for 60 minutes. Both interventions can improve emotional regulation, reduce behavioral problems, and improve sleep quality.

This is in line with research conducted by Bahmani et al. (2020) explained that physical activity such as doing resistance training and coordination training has a beneficial effect on several aspects of emotional regulation and social cognition such as empathy and emotional control. Several neurotransmitters are associated with physical activity, including neurotransmitters that fall into the monoamine category (norepinephrine, serotonin, and dopamine). Norepinephrine has a role in improving mood, intrinsic motivation, self-confidence, and improving self-perception. (Permono & Kusristanti, 2020).

Meanwhile, serotonin has a role in regulating mood, controlling impulses, increasing self-confidence, fighting the negative effects of high levels of stress hormones, and improving learning processes at the cellular level. Regular exercise can also increase the production of enzymes that produce dopamine, as well as affect the function of dopamine in the postsynaptic membrane. Physical exercise tends to increase levels of glucose, serotonin, epinephrine, and dopamine (neurotransmitters that influence behavior) (Permono & Kusristanti, 2020).

c. Emotion Awareness and Skills Enhancement Program (EASE)

This review identified one article that used the Emotion Awareness and Skills Enhancement Program (EASE) to improve emotion regulation in children with ASD (Table 2). EASE was developed to reduce emotional regulation disorders and improve behavioral disorders, through mindfulness. Improving Emotional Awareness and Skills consists of a 16-week individual therapy treatment targeting impaired emotional regulation among individuals with ASD. EASE refers to CBT, MBCT, and MBSR, EASE was developed based on emotion regulation research specifically for ASD (Conner et al., 2019).

Conner et al. (2019) in their research stated that EASE can improve emotional regulation and reduce worries in children with ASD. Another study conducted by Mazefsky (2021) using the EASE intervention showed that EASE can reduce the use of psychotropic drugs, improve quality of life, and reduce family stress. This research was conducted on 80 children aged 14-21 years with ASD without intellectual disabilities and evaluated after 3 months. However, there are not many studies that have conducted EASE interventions to improve emotional regulation in children with ASD.

d. Stress and Anger Management Program (STAMP)

This review identified one article that used the Stress and Anger Management Program (STAMP) to improve emotion regulation in children with ASD (Table 2). The Stress and Anger Management Program (STAMP) adapted CBT for young children with ASD ages 4–7 years and added an active parent training component (Factor et al., 2019).

The focus of STAMP is to teach children self-regulation strategies to help manage emotions, solve problems, reduce distress, avoid punishment or injury, and increase friendships. In addition, STAMP views parents as important cofacilitators in helping children to generalize their self-regulation of skills (Hassenfeldt et al., 2015).

Research conducted by Kazemi et al. (2020) found that teaching the STAMP method on emotional regulation issues was beneficial in reducing anxiety and angry behavior in children. In research by Factor et al. (2019) also found that children's Lability/negative affect (L/N) decreased, regulation did not change significantly, and parents' beliefs about their children's ability to manage anger and anxiety increased from before to after treatment.

CONCLUSION

Several management interventions to improve emotional regulation that can be used in children with ASD include Cognitive behavior therapy (CBT), Physical Activity, Stress and Anger Management Program (STAMP), and Stress and Anger Management Program (STAMP). In general, according to evidence based, management interventions are effective in improving emotional regulation in children with ASD. Nurses can apply one of these methods to improve emotional regulation, this is because children with ASD have emotional problems. In addition, poor emotional regulation can result in poor

problem solving, lower responsiveness, inability to recognize other people's emotions, and social limitations, so it is hoped that with this intervention the problems in children with ASD, especially emotional, anxiety and behavioral problems can be reduced resolved.

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