

EFFECTIVENESS OF AUDIO MUROTTAL INTERVENTIONS FOR CHILDREN WITH AUTISM SPECTRUM DISORDER

Hernita¹, Syarifah Rauzatul Jannah² and Teuku Tahlil³

¹*Master Program of Nursing Science, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, 23111*

²*Department of Psychiatry and Mental Health Nursing, Universitas Syiah Kuala, Banda Aceh, 23111*

³*Department of Community Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, 23111*

Abstract: Autism Spectrum Disorder (ASD) is a developmental disorder that affects communication and behavior. Children with ASD have difficulties with social communication and interaction, restricted interests, and repetitive behaviors. These behavior disorders can inhibit the development of ASD children. Behavioral disorders in ASD children need intervention to reduce the symptoms and improve the behavior of autistic children. The study aimed to assess the effectiveness of Audio Murottal Intervention (AMI) to improve behavior in children with Autism Syndrome Disorder (ASD). A quasi-experimental with pretest posttest control group design was used in this study. Findings show that there was a significant difference between the behavior of children with autism before and after murottal audio intervention ($p=0.006$). Murottal audio interventions improve the level of behavior of school-aged children with autism.

Keywords: Audio Interventions, Children, Autism Spectrum Disorder.

I. INTRODUCTION

Autism Spectrum Disease (ASD) is defined in the Diagnostic and Statistics of Mental Disorders V (DSM V) as a group of developmental disorders which have a basic cause of brain developmental disorders (neurodevelopmental). ASD children have deficiencies in social and emotional communication skills, limited behavior, repetitive behavior patterns and have abnormal and hyperactive interest in sensory input and interest in sensory aspects of the environment (American Psychiatric Association, 2013).

Corresponding author :

Teuku Tahlil. Department of Community Health Nursing, Faculty of Nursing, Universitas Syiah Kuala, Banda Aceh, Indonesia, 23111.

Email: ttahlil@unsyiah.ac.id

ASD children have different abilities and characteristics from each other, so it determines how they interact with themselves and the environment and makes ASD children as unique individuals. Someone said to suffer from ASD when experiencing one or more of the characteristics such as difficulty in socially interacting qualitatively, communicating qualitatively, showing repetitive behavior, difficulty in expressing feelings or emotions, talking monotonous and rigid, repetitive movements, hyperactivity in preschool children and abnormal in play. In reality the case of ASD is very important to anticipate because it can only be handled through therapy or intensive treatment (Mangunsong, 2009). According to WHO in 2017, about 1 in 160 children worldwide has ASD. While the Centers of Disease Control (CDC) data for the past 12 years, the prevalence of ASD increased by 289.5%. Based on data reported from 11 communities across the United States in 2018, the prevalence of ASD is 16.8 per 1,000 (1: 59) children aged 8 years, this figure tends to increase compared to the prevalence of ASD in 2014 (1: 68). The cases of ASD in the surveillance period during 2000–2018, increased from 6.7 to 16.8 per 1,000 children aged 8 years (Centers of Disease Control and Prevention, 2018).

In Indonesia, no accurate data has been found regarding the actual number of ASD children. Ten years ago, the number of ASD children was estimated at one per 5000 children, while in 2015 there were estimated to be approximately 134,000 children with ASD in Indonesia (Cahya, 2016). In Aceh Province the number of children with ASD increases each year starting from 32.3% of children in 2010 to 41.5% in 2017 (Aceh Autism Service Center, 2017).

Autistic behavior is classified into two types namely excessive behavior (excessive) and deficit behavior (deficient) which includes extensive behavior is hyperactivity and tantrum (raging) in the form of screaming, biting, clawing, hitting and so on. And sometimes children also often hurt themselves (self-abused). While deficit behavior can be characterized by speech disorders, social behavior is less appropriate, sensory deficits so that they are deaf, play improper and inappropriate emotions, for example laughing without cause, crying without cause, and daydreaming (Azwandi, 2015). This behavior disorder can inhibit the development of ASD children and can inhibit the giving and implementation of interventions against ASD children.

Behavioral disorders in ASD children need intervention to reduce the symptoms exhibited and improve the behavior of children with autism (Mayrani & Hartati, 2013). Nurses have an important role in overcoming problems in ASD children by providing innovation in nursing interventions. The role of nurses providing comprehensive nursing care through nursing interventions can support positive development in ASD children. The interventions given aim to reduce the symptoms of behavioral disorders in ASD children (Veskariyanti, 2012).

Audio therapy is one of the effective therapies in improving the development of ASD children. Giving audio therapy to ASD children can increase attention, and develop body awareness, self-concept, verbal and non-verbal communication,

improve and change behavior, and reduce anxiety, anger levels, and hyperactivity (Djohan, 2009). Audio can have a therapeutic effect on the mind and body and influence the physiology of the body in the activation of the sensory cortex with secondary activation in the neocortex, and in turn into the limbic system, hypothalamus, and autonomic nervous system. This therapy is also cheap and does not cause side effects (Djohan, 2009). Therapy with the strains of reading the Qur'an or called murottal Al-Qur'an can be used as an alternative therapy. The stimulant of the Qur'an can cause delta waves of 63.11% (Abdurrachman, Perdana & Andhika, 2008). The current study was intended to assess the effectiveness of Audio Murottal Intervention (AMI) as a sound therapy for children with Autism Syndrome Disorder (ASD).

II. METHODS

Study Design and Participants

This quasi experiment used a pretest and posttest without control group design. The study involved autistic children aged between 6 and 12 years and their mothers. The participants were selected using purposive sampling, consisted of 11 participants with the inclusion criteria as follows: (a) Muslim students aged 6 to 12 years; (b) Normal hearing; (c) Children with mild to moderate autism, and; (d) Children who get permission from their mothers. The exclusion criteria were (a) autistic children with severe degrees of autism; (b) under 6 years of age or over 12 years; (c) non-Muslims; (d) deaf, and; (e) not permitted by their mothers.

Program Intervention

The Audio Murottal Interventions (AMI) consisted of 6 sessions and provided to participants in the intervention group for 2 weeks with the duration of 11 minutes 19 seconds per session. Participants received the AMI in the morning at 08.00 WIB from laptop equipped with sound speakers sung by Muhammad Taha Al Junayd, with music pressure of 60 dB (measured by Sound Level Meter). AMI was given in slow rhythm with a pitch of 440 Hz and a tempo of 79.8 beats per minute (bpm).

Measurements

Emotional levels of ASD children were measured using the Autism Treatment Evaluation Checklist (ATEC) from the Autism Research Institute. The ATEC is designed to be filled in by mothers, teachers or caregivers. The ATEC is a simple but effective tool for assessing the severity, symptoms and development of ASD. The ATEC contains 77 items, covering four main areas of ASD disorders including communication (0–28), sociability (0–40), sensory-cognitive awareness (0–36), and physical-behavioral health (0–75 items).

The ATEC questionnaire was tested for face validity, which is a simple form of validity by applying shallow and subjective assessments of research instruments in measuring what should be measured (Stephanie, 2015). Face validity in this study was conducted on 10 parents of ASD children. Translation process goes through the back-translation process.

For Sections 1–3 (Communication, outreach, and sensory-cognitive awareness), parents are asked to read the statement in each item and indicate whether it is “N (not true/descriptive)”, “S (somewhat true/ descriptive)”, or “V (very true/descriptive)” of their child. Part 4 asks parents to indicate whether the statement describes something that “N (Not a problem)”, “MI (Minor problem)”, “MO (Moderate problem)”, or “S (serious problem)” for their child.

The total score in the ATEC range is from 0–180 and is calculated by summing the scores of each subscale. In general, higher scores indicate smaller levels of symptoms. Responses to each question are given a numerical value and then added together. Furthermore, it is categorized as: a) Low: 20–49; b) Medium: 50–79; and c) High: ≥ 80 (Mahapatra et al., 2018).

Procedures

At pretest, the mothers of ASD children were asked to fill in ATEC questionnaires. All autistic children at the study site were also assessed for their degree of autism using the ATEC questionnaire. Children were included in the study if their ATEC scores between 20–49 (mild level) and 50–79 (moderate level). Children with scores over 79 (severe category) were not included in the study. The AMI was provided to the selected children. At posttest, parents of ASD children were asked again to fill out the ATEC questionnaire.

Parental consent, in form of written consent, was required for this study. Ethical approval was provided by the Ethical Committee of Nursing Faculty, Universitas Syiah Kuala.

Data Analysis

Differences in ASD children’s behavior between pretest and posttest were assessed by t-test.

III. RESULTS

Characteristic of Respondents

Characteristic of respondents are shown in Table 1. Table 1 showed that the majority of parents aged between 30–35 years (63.6%), identified as male (72.7%), had less than three children (63.7%), high school level (63.6%), worked as housewives (81.8%), monthly income less than IDR 1.000.000 (55.4%).

Table 12.1 Demographic Characteristic of Participants

<i>Demographic Characteristics</i>	<i>f(%)</i>
Aged of Parents	
30–35	7(63.6)
36–41	4(36.4)
Gender	
Male	8(72.7)
Female	3(27.3)
Number of children	
One	2(18.2)
Two	5(45.5)
Three	2(18.2)
Four	2(18.2)
Education level	
High school	7(63.6)
College	4(36.4)
Occupation	
Housewife	9(81.8)
Government employees	2(18.2)
Private employees	0
Monthly income (IDR)	
> 2.000.000	3(27.3)
1.000.000–2.000.000	3(27.3)
< 1.000.000	5(45.5)

Effects of Audio Murottal Intervention (AMI) on ASD Children behavior

Effects of the Audio Murottal Intervention (AMI) on children behaviors are described in Table 2 as follows:

Table 12.2 Mean Differences in the ATEC Scores at Pretest and Posttest (N=11)

	<i>N</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>SD</i>	<i>p value</i>
Pretest	11	42	76	63,54	14,08	0,006
Posttest	11	39	75	57,72	13,52	

Table 2 shows that there was a significant difference in the mean of ATEC scores of children with autism before and after the Audio Murottal Intervention completion ($p=0.006$).

IV. DISCUSSION

The study was intended to assess the effectiveness of Audio Murottal Intervention (AMI) on children with Autism Syndrome Disorder (ASD). The findings indicate that there was a significant effect of the intervention on children. This finding is in line with the results of research conducted by Abdullah & Omar (2011), which shows that the reciting of the Al-Qur'an can increase the alpha electroencephalogram wave (EEG), even though respondents cannot read or understand the Koran. This means that the Al-Qur'an is not only useful as a guide and the main source of Islamic sharia but its miracles can also be experienced by listening to the readings. A research by Astuti, et al (2017) shows that murottal Al-Qur'an audio therapy (Surah Ar-Rahman), which is given every morning for 2 weeks in 6 treatments, is effective for developing the behavior of children with autism at the age of five (1–5 years). Mayrani and Hartati (2013) found a decrease in behavior disorders of school-aged children with autism (6–12 years) in aspects of social interaction, behavior, and emotions after getting audio therapy with murottal surah Ar-Rahman.

Wahyudi (2012, as cited by Pratiwi, Hasneli, & Ernawaty, 2015) stated that the Qur'an as a healer has been done and proven, people who read the Qur'an or listen will provide changes in electrical current in the muscles, changes in circulation blood, changes in heart rate and changes in blood levels on the skin. Alkahel (2011) suggests that reading or listening to the Qur'an provides a relaxing effect, so that the arteries and heart rate decrease. Al-Qur'an reading therapy when played on a person or patient will carry sound waves and encourage the brain to produce chemicals called neuropeptides. This molecule will affect the receptors in the body so that the body feels comfortable. Sound can have a therapeutic effect on the mind and body and influence the physiology of the body in the activation of the sensory cortex with secondary activation in the neocortex, and in turn into the limbic system, hypothalamus, and autonomic nervous system.

V. CONCLUSIONS

This research showed that murottal surah Ar-Rahman audio interventions can reduce the level of behavior of school-aged children with autism. Researchers suggest that parents can provide special time at home to apply audio therapy with murottal surah Ar-Rahman which has been proven to be able to reduce autistic child behavior disorders and to the school can apply as companion therapy for example one session in one week.

REFERENCES

1. Abdurrahman, A., Perdana, S., & Andhika, S. (2008). *Murottal Al-Qur'an: Alternatif Terapi Suara Baru*. Presented in Seminar Nasional Sains dan Teknologi-II. Lampung: Universitas Lampung

2. Abdullah, A. A., & Omar, Z. (2011). The effect of temporal EEG signals while listening to Quran recitation. *International Journal on Advanced Science, Engineering and Information Technology*, 1(4), 372–375
3. Aceh Autism Service Center. (2017). *Children with ASD in Aceh Province*. Banda Aceh: Aceh Province
4. Alkahel, A. (2011). *Al-Quran's The Healing*. Jakarta: Tarbawi Press
5. American Psychiatric Association, (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. Retrieved from <https://www.psychiatry.org/psychiatrists/practice/dsm> on June 20th, 2019.
6. Autism Research Institute. (2016). *Autism Treatment Evaluation Checklist (ATEC)*. Retrieved from <https://www.autism.org/autism-treatment-evaluation-checklist/> on November 4th, 2018.
7. Astuti, A., Suryono, S., Widyawati M. N., Suwondo, A., & Mardiyono. (2017). Effect of Audio Therapy using Al Qur'an Murrotal on Behavior Development of Children with Autism. *Belitung Nursing Journal*, 3(5), 470–477
8. Azwandi, Y. (2015). *Mengenal dan membantu Penyandang Autis*. Jakarta: Departemen Pendidikan Nasional
9. Cahya, Y. (2016). *Jumlah Penyandang Autis di Indonesia*. Retrieved from <https://www.rumahautis.org/artikel/jumlah-penyandang-autis-di-indonesia> on May 3rd, 2019.
10. Central for Disease Control and Prevention. (2018). *Data & Statistics on Autism Spectrum Disorder*. Retrieved from <https://www.cdc.gov/ncbddd/autism/data.html> on January 7th, 2019.
11. Djohan. (2009). *Terapi Musik, Teori dan Aplikasi, cetakan kedua*. Yogyakarta: Galangpress
12. Geretseger, Monika & Holck, Ulla & Gold, Christian. (2012). Randomised controlled Trial of Improvisational Music therapy's Effectiveness for children with Autism spectrum disorders (TIME-A): study protocol. *BMC pediatrics*. 12(2).
13. Mahapatra, S., Khokhlovich, E., Martinez, S., Kannel, B., Edelson, S. M., & Vyshedskiy, A. (2018). Longitudinal Epidemiological Study of Autism Subgroups Using Autism Treatment Evaluation Checklist (ATEC) Score. *Journal of Autism and Developmental Disorders*, 0(0), 0
14. Mangunsong, F. 2009. *Psikologi dan Pendidikan Anak Berkebutuhan Khusus Jilid I*. Jakarta: Lembaga Pengembangan Sarana Pengukuran dan Pendidikan Psikologi (LPSP3)
15. Mayrani, E. D., & Hartati, E. (2013). Intervensi Terapi Audio Dengan Murottal Surah Ar-Rahman Terhadap Perilaku Anak Autis. *The Soedirman Journal of Nursing*, 8(2), 69–76
16. Pratiwi, L., Hasneli, Y., & Ernawaty, J. (2015). Pengaruh Teknik Relaksasi Bensondan Murottal Al-Qur'an Terhadap Tekanan Darah Pada Penderita Hipertensi Primer. *JOM*, 2(2)
17. Stephanie. (2015). *Face Validity: Definition and Examples*. Retrieved from <https://www.statisticshowto.datasciencecentral.com/face-validity/> on July 14th 2019.
18. Veskariyanti, G. (2012). *Terapi Autis Paling Efektif*. Yogyakarta: Pustaka Anggrek.
19. WHO. 2017. Autism spectrum disorders. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/autism-spectrum-disorders> on January 7th, 2019.