

## Music Therapy in Children with Autism Spectrum Disorder: What and How

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Submitted 2 March 2020 Accepted 23 April 2021 Published 27 June 2022

**Abstract.** Until now, music therapy is still widely used to help children with autism. In this literature study, various music therapy research will be explained and explicitly given to help children with an autism spectrum disorder. This literature study using two academic electronic search engines: Taylor Francis Online dan EBSCOhost Academic Research Database. For this literature study, researcher using five research studies from abroad, and three research studies from Indonesia. Besides, this literature study is expected to help parents with autistic children, children with needs precisely, as well as music therapists, to get information about the types of therapy and to get therapy music choices that fit the goals to be achieved.

**Keywords:** autism spectrum disorder; music therapy; special needs

### Introduction

Autism spectrum disorder is a neurodevelopmental disorder that is signified by the difficulty to interact and communicate with other people, lack of interests, and indication of repetitive behavior that affect individual life in society, workplace, or other important areas (American Psychiatric Association, 2013). In Indonesia, there is no accurate data that represent autism disorder prevalence. Globally, the number of autism spectrum disorder tends to increase. Data (Centers for Disease Control and Prevention [CDC], 2018) shows prevalence of autism spectrum disorder of 1 per 59 population in 2014. From that data, Indonesia, with its 267.7 million population with growth rate of 1.14%, has estimated number of 5 million people with autism spectrum disorder.

Various kinds of interventions developed based on various approaches are developed to help kids with autism spectrum disorder. These interventions aim to increase their physiological and cognitive aspects, social skills, language, and communication skills (Autism Intervention Research Trust, 2006; Rossignol, 2009; Wheeler et al., 2008). One of the interventions that used to help kids with autism spectrum disorder is music therapy. This intervention using music that has been clinically conducted based on the existing study to achieve individual purpose (American Music Therapy Association, 2010). In conducting therapy, music has a role as the medium in fulfilling physical, emotional, cognitive, and social needs of the individual. Studies related to music therapy find that

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music therapy is effective in many aspects, such as: physical rehabilitation, increase in motivation to get involved in the intervention, emotional support for individuals and families, and as a medium to express their feelings (American Music Therapy Association, 2010).

Music therapy also offers experience related to their clients' interests and expressions (Carpente, 2016; Kim et al., 2008; Mössler et al., 2013). A systematic review that discusses music therapy finds that music therapy is highly effective in increasing developmental aspect as social interaction, verbal and non-verbal communication skills (Rossignol, 2009; Wheeler et al., 2008). Besides, a study by Chiang (2008) states that music therapy may have specific purposes like motor development, communication and language development, social development, emotional development, and cognitive development. Furthermore, music therapy can help develop fine motor skills and gross motor skills as well as physical coordination (Boxill & Chase, 2007). In language and communication development, study by Oldfield (2006) shows that when used in therapy, music has vital effects in improving language skills. Other than language skills, music can also affect social skills by generating self awareness on kids before entering social interaction (Adamek & Darrow, 2005). In emotional development, music can be used as the medium to express feelings and emotions, which encourage self-expression (Boxill & Chase, 2007). Meanwhile, in cognitive development, literature shows that music therapy can generate cognitive development along with communication development (Adamek & Darrow, 2005).

Many benefits of music therapy found in previous studies brought out main issue for discussion, which is the effects of music therapy on children with autism spectrum disorder (Amaral et al., 2008). Based on its characteristics, children with autism spectrum disorder often show relatively high interest and positive response toward music stimulation (Hairston, 1990). Besides, children with autism spectrum disorder tend to remember simple sound patterns with high accuracy (Ricks & Wing, 1975). A study by Kolko et al. (1980) also shows that it is easier for most kids with autism spectrum disorder to respond to auditory stimulus rather than visual stimulus, especially when the auditory stimulus is musical. This is supported by Kolko et al. (1980) who states that children with autism spectrum disorder have good auditory stimulation preference when presented in the form of music.

Furthermore, music is also known to help develop curiosity and exploration interest on children with autism, and as a motivator to participate in activities with the aim to reach the purpose of therapy (Nelson et al., 1984). Based on the previous facts, music therapy becomes more important in children with autism spectrum disorder care because it helps developing verbal and non-verbal communication skills through musical experience (Hillecke, 2005; Kim et al., 2008; Palac & Grimshaw, 2006). Musical activity itself involves different expressive qualities as well as dynamic shapes and dialogs. Musical activity also represents the opportunity to build alternative ways to communicate and help children to interact with and connect to other people (Goldstein, 2002; Møller et al., 2002; Thaut, 2005). The studies above show the potential of music therapy for the development of children with autism spectrum disorder.

With the studies above that related to the potential of music therapy for the development of children with autism spectrum disorder, these music therapies can be categorized in several types based on the purpose and the procedures. Based on the purpose, music therapy for children with

autism spectrum disorder has seven broad purposes: communication, social, emotional development, motor skills, daily activities, and academic skills. The level of disorder that the children experience is related to the purpose of intervention plan for children with autism spectrum disorder. Children with mild autism spectrum disorder will have result-oriented purposes on behavior, social, and learning. Meanwhile, children with severe disorder will have purposes on communication and physical domain (Thompson, 2012).

Music therapy itself is categorized in various types, such as: embedded music therapy interventions, improvisational music therapy, family-centered music therapy, and relational music therapy. Every type of music therapy has different purposes and procedures. Every type of therapy is used based on the level of disorder experienced by the kids and the consideration by the experts (psychiatrist/psychologist/therapist). Based on the number of people involved, music therapy is categorized into two groups: individual music therapy and group music therapy. Meanwhile based on the roles of music in therapy, Strobel and Huppman (1997) categorizes music therapy in two groups: active (productive) and passive (receptive). In individual music therapy, client and music therapist conduct face-to-face session. Active individual music therapy focuses on interaction with music prepared by the therapist and from this interaction, client will create creative and collective products. Meanwhile in passive (receptive) music therapy, therapist prepares specific music and through that music the therapist is expected to make psychological change on clients (McFerran et al., 2015).

As seen from music therapy's potential for children with autism spectrum disorder through previous studies, this literature review aims to collect the results of both quantitative and qualitative studies on music therapy, specifically for children with autism spectrum disorder. Furthermore, this literature review aims to obtain the ideas about types of music therapy conducted to children with autism spectrum disorder, such as: purposes, developed aspects, implementation, and used approaches. The objectives of this literature review are to help parents with children with autism spectrum disorder, special-needs children practitioners, music therapists and to gain information on the types of therapy and their purposes. With such knowledge, parents can choose music therapy that their children will take and consider the characteristics of each therapy based on the condition and the purpose. Generally, this literature review answers the following question: "What is music therapy and how is it used for children with autism spectrum disorder?"

## Methods

This study is a literature review using previous studies to find the ideas of music therapy for children with autism spectrum disorder. Included in this literature review are the studies on music therapy for children with autism spectrum disorder. Music therapy chosen is the music therapy that is used and developed within the last thirteen years. This study is conducted through two steps. First step is to search studies on music therapies on children with autism spectrum disorder conducted outside Indonesia, and the second step to search studies with the same topic conducted in Indonesia. Criteria of music therapy that are used and developed since 2006 - 2019 or within the last thirteen years

are chosen to maintain the relevance with today's contexts and conditions. Besides, the studies chosen are the ones that give insight on therapy itself, like its stages and purposes, so based on that insight, readers can see the difference between each therapy and its use.

#### *Search Procedures*

Systematic search is conducted on electronic search engines Taylor Francis Online and EBSCOhost Academic Research Database. The search is conducted on articles that are published in January 2006 to September 2019. In all electronic search engines, the search is limited to full texts, English, and scholarly peer reviewed articles with references available. The selection process to decide whether a study is eliminated or included consists of screening, reading and title identification or study abstracts from two database. The keywords used in the search on the Taylor Francis Online database are: (a) ('music therapy' AND autism); and (b) ('music intervention' AND 'autism'). From the first process (a), the researcher found 11 scientific studies before conducting further selection related to keywords. From the second process (b), the researcher found 2 studies related to keywords. In addition, a search through the EBSCOhost Academic Research Database used the following keywords: (a) ('music therapy' AND autism); and (b) ('music intervention' AND 'autism'). From the first process (a) the researcher found 28 studies related to the keywords used. From the second process (b) the researcher found 32 scientific studies before conducting further selection related to keywords.

#### *Data Extraction*

Based on the results of a systematic search conducted in two electronic databases, 38 articles were obtained. The articles were then filtered and only included articles that provide a complete picture (e.g.: stages, goals, parties involved) regarding the type of music therapy given to children with autism spectrum disorders. In searching the first database, the number of selected study articles is 3 studies which are a combination of qualitative and quantitative studies. Meanwhile in the second database, the number of selected study articles is 2 studies. Elimination of research articles was conducted on articles that were outside the context of the search, such as: unrelated studies with the same keywords were excluded from the search.

## **Discussion**

Based on an article search conducted on two electronic academic databases, namely Taylor Francis Online and the EBSCOhost Academic Research Database using a variety of predetermined keywords, 38 studies related to music therapy and autism spectrum disorders were found. The results of this search are not relevant to the topic discussed, namely music therapy for children with autism spectrum disorders. Irrelevant research found that generally discusses the assessment of children with autism spectrum disorders who use music as the media. In addition, there is also research which is a review of scientific literature that discusses the advantages and disadvantages of a form of music therapy. There are also studies that discuss music therapy for children with special needs in general

(special needs student), and there are also studies that discuss music therapy for children with autism based on a neuroscientific approach. This form of research is not included in the discussion of this scientific literature review. After searching for articles, synthesizing articles that match the specified criteria, namely research articles that provide a complete picture (e.g.: stages, objectives, parties involved) regarding a type of music therapy, found five articles that matched which were research articles since 2006 until 2018. The following is an overview of the five studies that will be used in this scientific literature review.

**Table 1**  
*Overview of Research Studies*

No	Researcher	Title of the Study	Age (years)	Number of participants (n)	Types of research
1.	Kern and Aldridge (2006)	Using embedded music therapy interventions to support outdoor play of young children with autism in an inclusive community-based childcare program	3 – 5	4	Case study
2.	Salomon-Gimmon and Elefant (2018)	Development of vocal communication in children with autism spectrum disorder during improvisational music therapy	4 – 5	4	Case study
3.	Thompson (2012) (2012)	Family-centered music therapy in the home environment: promoting interpersonal engagement between children with autism spectrum disorder and their parents	4 – 6	6	Case study
4.	Kim et al. (2008) (2008)	The effects of improvisational music therapy on joint attention behaviors in autistic children: a randomized controlled study	3 – 5	15	Experiment: Randomized Control Study
5.	Gattino et al. (2011)	Effects of relational music therapy on communication of children with autism: a randomized controlled study	7 – 12	24	Experiment: Randomized Control Study

**Table 1 (Continued)**

*Overview of Research Studies*

6.	Mafulatun and Mariyam (2014)	The Effect of Javanese Classical Music Therapy on the Creativity of Autistic Children at SLB Negeri Semarang	6 – 12	34	Quasi Experimental
7.	Wahyuningrum (2017)	The Effect of Mozart's Music Therapy on the Changes in the Creative Potential of Autistic Children Aged 5 – 6 Years at the Speech Therapy Clinic Fastabikul Khoirot Bedali Lawang	5 – 6	8	Experimental one group pre-post test design
8.	Asri (2013)	The Effect of Classical Music Therapy on Language Skills in Autistic Children at Harapan Training Park Makassar	2 – 7	30	Experimental one group pre-post test design

Based on the search for the study articles above, in this literature review what will be discussed are four music therapy studies conducted outside Indonesia, namely: embedded music therapy, improvisational music therapy, family-centered music therapy, and relational music therapy. Another discussion regarding music therapy in children with autism spectrum disorders conducted in Indonesia. Basically, each form of music therapy has its own characteristics and goals, which will be described in the following discussion.

#### *Embedded Music Therapy*

In this literature review, research that discusses embedded music therapy was conducted by Kern and Aldridge (2006). This type of therapy recommends clear management of the physical environment including children's play areas, comprehensive visual information, predictable and routine scheduling, individualized and structured teaching, and the use of integration therapy. The meaning embedded in this type of therapy is a form of intervention that is 'embedded' in ongoing classroom routines (Marcus et al., 2001). The research conducted regarding the type of music therapy embedded music therapy is a case study research conducted on four participants who are children with autism spectrum disorders. This study itself aims to evaluate the effects of musical adaptation conducted in children's playgrounds. Music therapy can increase the interaction of children with autism spectrum disorders with their peers in the playground. Based on this explanation, it can be seen that the purpose of this type of music therapy tends towards social goals, namely, to increase the interaction of children with autism spectrum disorders with their environment.

In this study, the parties involved were not only children with autism spectrum disorders but their classmates who had been selected and obtained permission from their parents who in this study were referred to as peer buddies and there are three main teachers and three assistant teachers who are also involved in the music therapy intervention. Involved teachers will receive direction from the research team regarding the problem to be solved, the objectives of the intervention, intervention plans, and discuss how the intervention can take place effectively and be embedded in children's play activities. Meanwhile, for peer buddies the researchers taught songs that were created for each participant that would be used in the intervention process.

This therapy has a clear arrangement from the environment to the establishment of a routine and predictable schedule. In this study, the environmental setting chosen was outdoor playtime in the morning, namely in the children's playground. The playground already has a large climbing area, three sandboxes, a wooden playhouse, a tricycle track, a green playing field, two large and two small trees surrounded by wooden benches, three flowers, and a garden bed. Specifically in this study, researchers placed an outdoor music center in the form of Music Hut which was placed in the middle of the largest sandbox. Music Hut consists of several musical instruments, such as: Chinese Lion Wind Gong, Tubano, Drum, Bongo, High Head, Cabasa, Sound Tubes, Marching Drum, Ocean Drum Plexiglass wall. In addition, the researchers also created unique songs that were taught to each participant. The themes of the created songs supported the growth of participants by incorporating their strengths and individual educational goals in the song material, such as queuing in turn, making proper body



contact, which the songs had identified prior to the study by the interdisciplinary intervention team.

Another thing that has been prepared beforehand in this research is the design of the situation that will be faced by the parties involved and how to handle and overcome the situation. In general, the situation design is divided into four groups, namely: basic conditions, adaptation to the playground, teacher-mediated intervention, and peer-mediated intervention. In the first situation (basic conditions), no musical adaptation process has been conducted. All participants are welcome to enter the playground. Teachers are not given the opportunity to interact with children unless needed. The purpose of this situation is to evaluate a natural, unstructured, and unsupported situation with peer interaction and child involvement that occurs on the playground. The second situation is adaptation to the playground, the teacher brings the child to the Music Hut, gives him a musical instrument to play, and asks the child to play in the Music Hut. In the third situation (teacher-mediated intervention), the teacher enters the Music Hut with one of the peer buddy, invites the two children to play, sings a unique song that has been made previously, plays in the Music Hut for 10 minutes, and the teacher asks the peer buddy to perform the same thing he had done. When the peer buddy does the same, this situation is part of a peer-mediated intervention.

The results of this study show that the first situation (basic condition) reflects the general characteristics of children with autism spectrum disorders and complements the findings of previous studies which showed that children with special needs were less involved in meaningful play and peer interaction on the playground compared to their peers (Fujiki et al., 2001). The second finding was that participants were interested in the sound produced in the Music Hut area and explored musical instruments for a short time. The third discovery was a unique song created for each participant by combining specific therapeutic goals, producing the desired outcome. The results of this study are consistent with previous research which found that songs can be used to help children with autism spectrum disorders to improve their social skills (Pasiali, 2004). In addition, this study also found that individual interventions based on the principles of music therapy can be instilled by teachers in children's playing routines. Children's playgrounds can be seen as important and appropriate for implementing music therapy interventions to facilitate learning and development for children with special needs.

This study has limitations related to the small number of samples and uses a single case method with an experimental design. In addition, other limitations are the absence of (follow up) results and generalization of this study. Therefore, further research is expected to be able to see the generalization of skills of children with autism spectrum disorders in different environments.

#### *Improvisational Music Therapy*

In this literature review, research that discusses improvisational music therapy includes research conducted by Kim et al. (2008) and research conducted by Salomon-Gimmon and Elefant (2018). These two studies have different objectives but have the same type of form and will be described in the discussion. This type of improvisational music therapy has many advantages when performed on children with autism spectrum disorders (Møller et al., 2002; Schmid, 2013). During the therapy

process, the music therapist identifies the musical elements in a child’s musical or non-musical behavior (such as tempo, timbre, pitch, rhythmic patterns, and melody lines), and then provides an empathetic and supportive musical structure to engage and engage the child (Møller et al., 2002). The main principle in this type of music therapy with a population of children with autism spectrum disorders is to facilitate the harmony of music and emotions, scaffolding interactions with music, and leveraging shared experiences for musical interactions between children and therapists (Geretsegger et al., 2015). This type of music therapy is also potential for children with autism spectrum disorders because this therapy connects clear structures that provide security, great flexibility that can help children with autism spectrum disorders learn to deal with a less structured, less expected and less clear world (Wigram & Elefant, 2009).

Two studies using this type of therapy have different aims and research designs. In the first study conducted by Kim et al. (2008), the aim of the study was to investigate the effects of improvisational music therapy on attentional behavior in preschool children with autism spectrum disorders. Seeing this aim, this form of music therapy tends to achieve goals in activities of daily living and social goals. This research was conducted because the researcher assumes that the ability to pay attention together (attention to the same thing with others) has an important role in the early developmental stages because with this ability, it will affect higher functions such as communication, social interaction, and language.

In this study, involved thirteen men and two women aged three to five years and diagnosed with autism spectrum disorder. This participant had no previous experience with music therapy. This study compared the effects of music therapy and play therapy. Participants were grouped into two groups. Participants were grouped into two groups. Each group will perform music therapy and play therapy in a different order. The first group will do music therapy in the first session and followed by play therapy in the next session. While the second group did the two therapies in a different order. In practice, this study involved two music therapists, one playing therapist, and three music therapy students who were part of the research team. This study has a manual that is semi-flexible. In addition, this study uses several tools during the implementation of music therapy and play therapy which are summarized in table 2.

**Table 2**  
*Equipment in Music and Play Therapy*

Instruments in Music Therapy Sessions	Game in Play Therapy Session
Upright Piano	Doll house set
Cymbals	Big garbage truck
20-inch tympanic drum	Bulldozer
Xylophone Alto	Lego set
Chroma Harp	A pair of mid-size balls
Three different color tone bars	Spinning tops

**Table 2 (Continued)***Equipment in Music and Play Therapy*

Four different colored toy bells	Five different colored play dough
Pair of Drum Paddles	A pair of small balls
Guiro	Fruits and vegetables
Egg shaker	Puzzle
Finger Cymbal	Transformable robot
Horns, whistle	Various shapes and sizes of small cars

The results of this study generally look at the target behavior related to the behavior of mutual attention in children, namely eye contact and taking turns. Eye contact is seen through the state when the child looks at the therapist while playing, manipulates, holds, touches a toy or instrument and engages with the therapist in any way. Turn-taking behavior is seen through the situation when there is a situation to alternate during play between the therapist and the child. Based on research conducted, both improvisational music therapy and play therapy have an effect on increasing joint attention behavior in children with autism spectrum disorders. The difference is that with the use improvisational music therapy there is an increase in children's communicative behavior in mutual attention behavior, especially in eye contact. This study has a limitation, namely the number of samples is small. Therefore, the suggestion from this study is that there should be further research that uses a large number of samples so that the results can be generalized to situations outside of similar research.

The second research related to improvisational music therapy was conducted by Salomon-Gimmon and Elefant (2018). The purpose of this study was to observe the development of vocal communication in children with autism spectrum disorders during improvisational music therapy. In addition, another objective of this study is to identify and categorize the vocal interventions used by music therapy when providing therapy and to examine various aspects related to their use. Research analysis was conducted through in-depth video microanalysis of the music therapy sessions conducted. This study involved four participants aged four to five years and diagnosed with autism spectrum disorders.

In practice, this music therapy session lasts for 30 minutes and is carried out by an academically trained music therapist. The therapy sessions were videotaped, and this video became the main data source analyzed to answer the research questions. In this video, researchers will assess children's vocal communication based on the VQR Scale (vocal pre-speech quality of relationship) developed by Schumacher and Calvet (2007). This scale shows aspects related to the communicative quality of vocal expressions, namely the child's ability to tolerate and engage in communicative interactions at the vocal level. In this study, the most frequently used vocal intervention was vocal resonance with things. In this intervention, the therapist reacts with his voice to the client's vocalizations and repeats the musical and non-musical characteristics of the client's vocalizations but changes some characteristics. For example, the therapist responds to the vocal sounds produced by the child interactively, expanding and developing the tone, melody, rhythm, and intensity of the children's vocals.

The hypothesis of this study is that children with autism spectrum disorders require more sedation and regulation of sound use in conjunction with individual investigations toward their own voices. This hypothesis develops from the fact that children with autism spectrum disorders know that these vocals are their own and that they are aware that they can create it. This raises the question of whether children with autism spectrum disorders can talk to others using their voices in a more communicative way or share their experiences and feelings. This study found that three out of four cases in this study showed an increase in the number of client vocalizations made during five months of music therapy. This increase is not too big, but according to research, it must be emphasized that for children with autism spectrum disorders, every change even the smallest is also very important for children and their families. The developments in communication found in this study are not one-dimensional but have a complex and interesting developmental pattern. In addition, the list of vocal interventions compiled during the study can provide therapeutically relevant ideas relevant to the different ways in which sound can be used in therapy and thus contribute to the work of the clinical field.

#### *Family-Centered Music Therapy*

In this literature review, the research that discusses family-centered music therapy is the research conducted by Thompson (2012). This type of music therapy is a therapy that emphasizes the important feature of its provision in natural settings such as the home environment. ECI (Early Child Intervention) found that children are actively engaged and learn when their learning is part of their daily routine, emphasizing the need to embed learning strategies into natural environments such as home, parenting, and preschool (Rantala et al., 2009; Roper & Dunst, 2003). Dunst et al. (2007) found that the use of this type of therapy is related with increased parental self-efficacy which will also have a positive effect to children development. In family-centered music, the therapists along with families are trying to work together with an emphasis on developing the family capacity (Dunst & Trivette, 2009). This study describes a model for applying the practice of family-centered music therapy which is discussed through reflection on practice and case examples. This study used six case studies with participants aged four to six years. Based on this explanation, it can be seen that this type of therapy has goals in communication, social and daily live activities.

The stages in music therapy generally consist of nine stages. The first stage called as family-centered practice, is the stage where the therapist provides an overview to the family about the cooperation that will be carried out. The therapist also share knowledge to families about the process and roles carried out by each party involved in this therapy. At this stage, also occur communication between the music therapist and parents to together determine the specific goals to be achieved in the music therapy conducted. The second stage is paying attention to the child's mood and behavior and following the situation. At this stage, the therapist builds a rapport with the child following the interests and skills demonstrated in the session (Carpente, 2009). Meanwhile, at this stage, parents observe what practitioners do. The third stage is to attract children with motivating activities. Children with autism spectrum disorders have problems in adequate communication and repetitive behavior,

so they may have a limited repertoire and interest in playing (Rogers et al., 2003). Therefore, this stage it will be meaningful if the therapist invites children to do activities and introduce them to new things so that they get an experience. The fourth stage is giving a positive influence, acceptance and shows affection to the child. Children with autism spectrum disorders will be difficult to see emotionally even with people who know them very well. Families also often feel rejected or disliked by their children and children choose to be alone and do not show social interaction with their families. By demonstrating positive influence, acceptance and affection to the child, the therapist and family can reassess the child's behavior towards a more positive interpretation.

The fifth stage in this study is the therapist show himself as a playmate. This stage is sustainable with the sixth stage in which the therapist must create a don't worry environment for the child and sensitive to the child's needs. In this stage the therapist can provide support to parents to build creative interactions with the child based on their desire and interests (time - establishing the social connection: A Program to develop the communication skills of children with autism, 2002). The seventh and eighth stages are continuous stages where the therapist looks at the child's ability in music and relates it to the theory of development of social communication. The last stage is the child shows attachment. At this stage the child is expected to be able to show interest to other people by trying to attract someone's interest in something or keeping the interaction going. This study found that with this type of music therapy, the therapist is not only focus on the results to be achieved but also focus on how to achieve those goals. The challenge found in this type of therapy is that when collaborating with families in a participatory manner, knowledge and skills are needed for the family so as to increase the development opportunities of children with autism spectrum disorders in their natural environment, that is in their home environment (Roper & Dunst, 2003). The active involvement of the family in music therapy sessions provides the possibility for positive result in children's development.

#### *Relational Music Therapy*

In this literature study, the research that discusses relational music therapy used is the research conducted by Gattino et al. (2011). This type of music therapy itself was created by Gallardo (2004) and has the aim of helping individuals develop their capacities (e.g.: motor, communication, social, cognitive, and emotional) in accordance with the interactions that occur in the therapy process. In this therapy, the focus is the participant. Music therapists will take an indirect approach by observing participants in each session. Relational music therapy itself does not have a structured protocol for intervention. In therapy sessions only basic guidelines are prepared to lead the therapy process (Cabrera & Caniglia, 2008). The purpose of this study is to examine the effect of verbal, nonverbal, and social communication on children with autism spectrum disorders. When viewed from the general purpose of music therapy according to (Reschke-Hernandez, 2011) this research has general goals in communication and social. The hypothesis of this study is that participants who take relational music therapy will improve their communication skills compared to participants who follow standard procedures (clinically).

The sessions this relational music therapy consist of several stages. First, the music therapist

provides several variations of musical instruments placed on the floor or on a table so that the child can choose one or several musical instruments. After that the therapist will make observations to see the interactions the child has with the instrument (Gallardo, 1998). This interaction occurs through experiences such as singing, composing, improvising, and playing musical instruments. After that, the music therapist enters into this interaction. If the child shows disinterest in the instrument, then a music therapist can encourage the child to try again a few times. If the child is still not interested, the music therapist should accommodate their wish. Another important thing in implementing this therapy is the participation of parents in the therapy process (Cabrera, 2000). Parents should be involved in several meetings so that the music therapist can understand, through musical activities, how the child shows his or her difficulties and potential to the family and how the family interacts and helps the child. Music therapists do not always invite parents in every session, because children need independence in showing their wishes during the music therapy process.

This study was conducted on children aged seven to twelve years, consisting of twenty-four participants. All participants had no previous experience in music therapy. Participants were divided into two groups randomly. The first group received a music therapy assessment consisting of thirty minutes per session during the sixteen weeks of the intervention. The second group did not receive music therapy and only engaged in weekly routine clinical activities during the study period. The following is a list of equipment used in music therapy.

**Table 3**  
*Equipment Used in Music Therapy*

Audio (Hyundai)	Acoustic guitar (Jerez)
Keyboard 4 octave (Yamaha)	Small traditional drum
A pair of small metal rattles (Izzo)	A pair of large metal rattles (Izzo)
little stick	A pair of drumsticks
Tambourine (Luen)	Little wooden guiro
Tambourine (Show)	A pair of cabasas (musical)
Cowbell (Liverpool)	Wood claves (Izzo)

Based on the measurements made in the three aspects, namely verbal communication, nonverbal communication, and social communication, it was found that the measurement results were not fixed. Changes were only seen in the first group who took music therapy, namely in increasing nonverbal communication skills. Things that may be obstacles in this study are the use of inappropriate musical instruments to measure the results and also the potential difficulties caused by the physical setting of the music therapy intervention. Hospitals may be a great place for music therapy interventions. But this is not in accordance with the situation of children because children with autism spectrum disorders often fight and oppose when they are in the hospital because they are worried about facing pain (Nader et al., 2004).

*Javanese Classical Music Therapy*

In a study conducted on children with autism spectrum disorders at SLB Negeri Semarang, researchers used Javanese classical music as a therapeutic medium with the aim of increasing the creativity of children with autism spectrum disorders. This study is an experimental study in which there are two groups, namely the control group (who did not receive treatment) and the intervention group (the group that received treatment).

The research was conducted with several instruments, namely Javanese classical music cassettes and tape recorders. At the initial stage, participants were given six topic questions with a set time and followed by taking the Circle Test Torrance to see the participants' verbal creativity. Furthermore, in the intervention group Javanese classical music was listened to with gamelan cassettes (Javanese langgam) which contained several songs played with a tape recorder for 30 minutes every day for 14 days and while listening to music the participants sat down and observed by researchers to see their creativity.

In this study, the results of the bivariate analysis showed that classical Javanese music therapy had an effect on the creativity of children with autism spectrum disorders. In the intervention group there was a change in the average creativity test score from 50.47 to 75.47. Meanwhile in the control group there was a decrease in the average creativity test results from 42.59 to 38.53. This is in accordance with research conducted by Tabrani (2007) which states that children with autism spectrum disorders have sensitivity to audio-visuals stimulated by the environment and daily events.

*Mozart's Music Therapy*

In this study, researchers looked at the effect of music therapy on changes in creativity potential in children with autism spectrum disorders aged 5 – 6 years at the WFKB Lawang Therapy Clinic. This study uses a tape recorder instrument in the playing room with a size of 7 x 10 m<sup>2</sup>. Therapy is carried out in several stages. First, respondents were given the task of drawing people. The score of the task depends on the details of the person drawn. Furthermore, an assessment is carried out to determine low, medium, or high creative potential. The implementation of this stage is based on research conducted by Stegemoller (2014) which suggests that the creative character in children can be seen from the imagination in accordance with the orders which are then poured into writing. Second, for 30 minutes, the respondent was played with Mozart's song. This process was carried out for two weeks and then tabulated the data. Third, respondents were given the same task as in the first stage.

The results of this study indicate that Mozart's music therapy has an effect on changes in creativity potential in children with autism spectrum disorders aged 5 – 6 years at the WFKB Lawang Therapy Clinic. The research data shows the classification of creative potential as follows: 3 respondents (38%) high, 4 respondents (49%) moderate, and 1 respondent (13%) low.

*Classical Music Therapy*

In this study, the aim of the researcher was to see the effect of classical music therapy on language skills in children with autism spectrum disorders. Therapy is carried out in several stages. First, respondents were given an ability test measurement consisting of several parts, namely: expressing themselves

when talking, understanding other people's speech, repeating words spoken by others, recognizing the names of objects around them, and reading. Second, respondents were listened to classical music while doing activities such as labeling, articulation, and others. Third, respondents were given a test as in the first stage but equipped with reinforcing data in the form of observations before and after the implementation of classical music therapy.

The results of this study indicate that there is a significant difference in the language skills of the respondents before and after music therapy. Before being given therapy, children's active language skills were 7 respondents (23.3%) and after being given therapy increased to 22 respondents (73.3%). While in passive language skills before being given classical music therapy there were 23 respondents (76.7%) and after being given classical music therapy it decreased to 8 participants (26.7%). Based on the results of this study, it was concluded that the respondents' language skills had increased after being given classical music therapy. Respondents who initially showed less expressiveness, slow reactions, less communicative, less able to make eye contact when talking, less able to repeat words spoken by others, less able to recognize the names of objects around them after being given music therapy experienced an increase in ability.



**Table 4**  
*Research Summary*

No	Study	Methodology	Primary Findings	Participants	Purpose of Therapy
1.	Using embedded music therapy interventions to support outdoor play of young children with autism in an inclusive community-based childcare program; Kern and Aldridge (2006)	Experimental design – multiple baseline design across participants	Music adaptation facilitates the activities of children with autism spectrum and their engagement with peer buddies through interest in sounds and the chance to use musical instruments	Children with autism spectrum disorder, peer buddies, class teachers	Social; Daily activities
2.	Development of vocal communication in children with autism spectrum disorder during improvisational music therapy; Salomon-Gimmon and Elefant (2018)	In-depth video microanalysis of music therapy sessions	Children vocal communications develop during music therapy sessions. Development pattern is not linear, instead marked by complex development patterns.	Children with autism spectrum disorder, therapist.	Communication; Daily activities; Social
3.	Family-centered music therapy in the home environment: promoting interpersonal engagement between children with autism spectrum disorder and their parents; Thompson (2012)	Case study	Increasing social interactions at home and in society and the relationship of parents and children, but not within language skills and social responses in general.	Children with autism spectrum disorder, therapist, parents.	Social (at home); Daily activities
4.	The effects of improvisational music therapy on joint attention behaviors in autistic children: a randomized controlled study; Kim et al. (2008)	Repeated comparison design (between condition and within subjects)	Overall result shows that improvisational music therapy is more effective in producing joint attention and non-verbal social communication skills in children compared to play therapy.	Children with autism spectrum disorder, therapist	Daily activities; Communication; Social;
5.	Effects of relational music therapy on communication of children with autism: a randomized controlled study; Gattino et al. (2011)	Randomized Controlled Trial (RCT)	Positive and significant changes in non-verbal communication skills in children with autism	Children with autism spectrum disorder, therapist, parents (only a few sessions).	Daily activities; Communication;

**Table 4 (Continued)**  
*Research Summary*

6.	Pengaruh Pengaruh Terapi Musik Klasik Jawa Terhadap Kreativitas Anak Autis di SLB Negeri Semarang; Mafulatum and Mariyam (2014)	Quasi Experimental	Javanese classical music therapy increases creative skills in children with autism spectrum disorder at SLB Negeri Semarang	Children with autism spectrum disorder, researcher	Creativity
7.	Pengaruh Terapi Musik Mozart Terhadap Perubahan Potensi Kreativitas Anak Autis Usia 5 – 6 Tahun Di Klinik Terapi Wicara Fastabikul Khoirot Bedali Lawang; Wahyuningrum (2017)	Experimental one group pre-post test design	Mozart therapy creates creative potential changes to children with autism spectrum disorder at Klinik Terapi WFTKB Lawang	Children with autism spectrum disorder, researcher	Creativity
8.	Pengaruh Pemberian Terapi Musik Klasik Terhadap Kemampuan Berbahasa Pada Anak Autis Di Taman Pelatihan Harapan Makassar; Asri (2013)	Experimental one group pre-post test design	Classical music therapy increases language skills on children with autism at TPH Makassar	Children with autism spectrum disorder, researcher.	Communication

## Conclusion

Based on this literature review, it was found that each music therapy has different characteristics ranging from the implementation procedure, the parties involved, to the goals to be achieved. For example, there is music therapy that only involves the therapist, there is music therapy that involves the child's environment such as teachers, peers, and parents. A summary of the research results can be seen in table 4. Each of these types of music therapy has its advantages and disadvantages. There is music therapy which only has the aim of achieving an increase in communication skills, there is also music therapy which has the goal of achieving an increase in social skills, and so on. Given the various characteristics of music therapy, this needs to be a concern for parents, schools, music therapists to determine the type of music therapy performed on children. The following is an overview related to the summary of research results used in this literature review.

When compared between the implementation of music therapy carried out outside Indonesia and music therapy carried out in Indonesia, there are several important points that need attention. In research in Indonesia, the process of music therapy still only involves researchers or therapists, while research conducted outside the music therapy process is also supported by the presence of other people in the environment (family and close friends).

In addition, in studies conducted in Indonesia, there has been no form of variation in music therapy given. The therapy given is still in an experimental form to test whether there is an effect of the therapy on improving the ability of children with autism spectrum disorders. In research conducted outside, the forms of music therapy that have been developed have varied (embedded music, improvisational music, family-centered, relational music) so that when someone is going to do music therapy, he or she can compare the advantages and disadvantages of each given form of therapy.

### *Recommendation*

The discussion obtained from this literature review is the need for further research on music therapy conducted in Indonesia related to its effect on children with autism spectrum disorders. Suggestions for further research can also discuss music therapy in Indonesia by considering the cultural context of its role in children with autism spectrum disorders. This research was conducted to expand the reference for forms of therapy that can be used to improve the abilities of children with autism spectrum disorders in Indonesia.

## Acknowledgment

The authors would like to express enormous appreciation to all who have supported the publication of this paper.

### *Funding*

This research was funded by the author's own funds.

### *Authors Contribution*


IC managed the data collection, writing most part of the manuscripts. FK helped in the research conceptualization and wrote some parts in the manuscripts.

*Conflict of Interest Statement*

The authors declare that there is no conflict of interest in this research.

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