

MUSIC THERAPY MAKES DIFFERENCES FOR ADHD

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Abstrak:

ADHD atau Attention-Deficit/Hyperactive Disorder adalah suatu gangguan yang mulai muncul di masa anak-anak dan memiliki dua gejala utama, yaitu tidak atentif dan hiperaktif-impulsif. Musik terapi membantu anak ADHD supaya lebih fokus dan perhatian terhadap lingkungannya, serta mengurangi perilaku hiperaktif-impulsifnya.

The meaning of ADHD

It is usual to see children who are active, energetic, and exuberant and easily get bored with tasks that lack intrinsic appeal for them. But when children persistently display some of those activities that do not fit with their age anymore, it becomes something that no longer expressing their childhood's characteristics. It can disturb their Activity Daily Living (ADL). They also can have problems in their social, cognitive, academic, familial, and emotional domains of development and adjustment.

ADHD or Attention-Deficit/Hyperactive Disorder, describes children who display persistent age-inappropriate symptoms of inattention, hyperactivity, and impulsivity that are sufficient to cause impairment in major life activities (American Psychiatric Association (APA), 1994).

Its onset often begins before age 7 years, and it is often to be persistent over development in many cases. Approximately, 3-7% of school-age children are believed to have this disorder. Children with ADHD are at very high risk for a variety of negative outcomes that influence them across childhood and into adolescence and adulthood.

A Brief History of ADHD

ADHD is among us a long, long time ago. William Shakespeare, literally, made reference to a deficit of attention in one of his characters in *King Henry VIII*. In mid-1800s, German physician, Heinrich Hoffman made a poem about a hyperactive child titled "Fidgety Phil".

George Still, an English physician, in 1902, examined a group of 20 children whom he described as aggressive, passionate, lawless, inattentive, impulsive, and overactive.

In 1917-1918, there were great encephalitis epidemics in North America. Children who had survived from these brain infections were noted to have many behavioral problems similar to ADHD. It raised the concept of brain-injured child syndrome. But the concept was not compatible to explain about children with mental retardation who have the same characteristic with ADHD but do not have brain injuries. Then, the diagnostic term was changed to "minimal brain dysfunction" (MDB).

Others became interested to label the condition of ADHD as "hyperkinetic impulse disorder" in the 1950s and 1960s, and attributing it to cortical overstimulation due to

poor thalamic filtering of stimuli entering the brain. This perspective then gave rise to the diagnostic term "hyperactive child syndrome" due to the excessive movements that we seldom see in normal children on the same age.

Then, the second edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-II; American Psychiatric Association, 1968) described all childhood disorders as "reactions"; and hyperactive child syndrome became "hyperkinetic reaction of childhood."

By the 1970s, research was noticing that the importance of this disorder were problems with sustained attention and impulse control and hyperactive. So, in 1980, the researchers titled the disorder into "attention-deficit disorder" (ADD) on the DSM-III. There were two kinds of ADD, with hyperactivity and without it. But finally they found that ADD with hyperactivity was something that different with ADD that now we often use to describe children with a lack of attention only. And then, in 1987, they changed the name again into "attention-deficit/hyperactivity disorder (ADHD) in DSM-III-R. And now, in DSM-IV-TR, the disorder is classified into "Disorders Usually First Diagnosed in infancy, Childhood, or Adolescence" under the subpart "Attention-Deficit and Disruptive Behavior Disorders" together with Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD).

Over the next decade, researchers found that the characteristics of this disorder were inattentive and hyperactive-impulsivity. They could not separate hyperactivity and impulsivity because both of them formed a single dimension of behavior. So, on DSM-IV, there are three kinds of ADHD: the combined type, the one with problems on attention but without any problems of hyperactive-impulsive behavior (ADHD-predominantly inattentive type), and the one with problems on hyperactive-impulsivity but without any problems on attention (ADHD-predominantly hyperactive-impulsive type).

Symptoms of ADHD

ADHD has no distinct physical symptoms that can be seen in an X-ray or a lab test. It can only identified by characteristic behaviors that vary considerably from child to child. Core Symptoms of ADHD based on American Psychiatric Association, 1994 is (1) inattention and (2) hyperactive-impulsive behavior (or disinhibition).

Inattention

In children with ADHD, they usually are not able to sustain attention or responding tasks or play activities as long as others on the same age, and to follow through on rules and instructions as well as others. It also seen that they are more disorganized, easily distracted, and forgetful. Parents and teachers often complain that they do not seem to listen as well as they should for their age, can not concentrate, fail to finish assignments, daydream, and change activities more often without completing them if such completion was necessary. ADHD children have also been noted to be slower to return to an activity once interrupted and even less likely to return to it all than normal children.

Hyperactive-Impulsive Behavior (Disinhibition)

The problems with disinhibition in children with ADHD are manifest in difficulties with fidgetiness, staying seated when required, moving, running, and climbing more than other children. They also often playing noisily, talking excessively, interrupting others' activities, and being less able than others to wait in line or take turns in games. Research objectively documents them to be more active than other children, to be less mature in

controlling motor overflow movements, to have considerable difficulties with stopping an ongoing behavior, to talk more than others, to interrupt others' conversations, to be less able to resist immediate temptations and delay gratification, and to respond too quickly and too often when seen in impulsive errors on continuous performance tests.

Usually, hyperactive-impulsive behavior arises first; approximately arise at 3-4 years old when children enter the formal schooling. And then, inattention is following it, at 5-7 years old by the early to middle elementary school grades or even later. But it still has no prove why hyperactive-impulsive behavior arise earlier than inattention.

Etiology of ADHD

Heredity Factors

Heredity is the most common etiology of ADHD. Most of information about the heritability of ADHD comes from family studies, adoption studies, twin studies and molecular genetic research.

Family Studies: If a trait were genetically inherited, we would expect the rate of occurrence to be higher with the biological family members. For example, brown-eyed people tend to have family members with brown eyes also. Dr. Joseph Biederman (1990) and his colleagues at the Massachusetts General Hospital have studied families of ADHD children. They have learned that ADHD runs in families. They found that over 25% of the first-degree relatives of the families of ADHD children also had ADHD, whereas this rate was only about 5% in each of the control groups. Therefore, if a child has ADHD there is a five-fold increase in the risk to other family members.

Adoption Studies: If a trait is genetic, adopted children should look a like their biological relatives more closely than their adoptive relatives. Studies conducted by psychiatrist Dr. Dennis Cantwell compared adoptive children with hyperactivity to their adoptive and biological parents. Hyperactive children resembled more to their biological parents than their adoptive parents with respect to hyperactivity.

Twin Studies: Another way to determine if there is a genetic basis for a disorder is by studying large groups of identical¹ and non-identical twins². Therefore, if the disorder is genetically inherited, both identical twins should be affected in the same way and the concordance rate the probability of them both being affected should be higher than in non-identical twins. There have been several major twin studies in the past few years that provide strong evidence that ADHD is highly heritable. They have had remarkably consistent results in spite of the fact that they were done by different researchers in different parts of the world. In one such study, Dr. Florence Levy and her colleagues studied 1.938 families with twins and siblings in Australia. They found that ADHD has an exceptionally high heritability as compared to other behavioral disorders. They reported an 82% concordance rate for ADHD in identical twins as compared to a 38% concordance rate for ADHD in non-identical twins.

Molecular Genetic Research: Twins studies support the hypothesis of the important contribution that genes play in causing ADHD, but these studies do not identify specific genes linked to the disorder. Genetic research in ADHD has taken off in the past five years. This research has focused on specific genes that may be involved in the transmission of ADHD. Dopamine genes have been the starting point for investigation. Two dopamine genes, DAT1 and DRD4 have been reported to be associated with ADHD by a number of scientists. Genetic studies revealed promising results, and we should look for more information about this.

Neurobiological Factors

Current research indicates that ADHD can be caused by factors that affect how the brain develops and functions. It stated that the frontal lobe³ and basal ganglia⁴ play a significant role in ADHD. Children with this disorder have a smaller right prefrontal cortex than normal children (Filipek et al., 1997) and show structural abnormalities in several parts of the basal ganglia (Semrud-Clikeman et al., 2000).⁵

Injury to the brain can also result trauma, brain tumor, stroke or disease. These factors can cause problems with inattention and poor regulation of motor activity and impulses. While such circumstances can result in a diagnosis of ADHD, the occurrence of such is atypical.

Food additives and Sugar

Early theories of ADHD that were quite popular in the 1970s were involving the role of food in the development of hyperactivity. In 1973, Feingold proposed that food additives upset the central nervous systems of hyperactive children, and he prescribed a diet free for them. However, the diet, later on it was called the Feingold diet, did not give much effect on ADHD children. In 1982, finally the National Institutes of Health in USA held a scientific consensus conference to discuss this issue. It was found that diet restrictions, like Feingold diet, helped about 5 percent of children with ADHD.

Through the years, popular media continued to discuss the role of food additives and sugar in this disorder. In 1995, the newest study published in the Journal of the American Medical Association concluded, "sugar does not affect the behavior or cognitive performance of children".⁶ Food additives and sugar may give effect to ADHD children but it will be a little difference on one child to others.

Environmental Toxins

Nicotine, especially maternal smoking, is an environmental toxin that may play a role in the development of ADHD. A study found that 22 percent of mothers of children with ADHD reported smoking a pack of cigarettes per day during pregnancy. It affects the fetus because the tobacco in uterus was associated with ADHD symptoms (Linnet, 2003). Several animal studies indicate that chronic exposure to nicotine can increase dopamine release in the brain and cause hyperactivity. Furthermore, withdrawal from nicotine can decrease dopamine release in the brain and cause irritability. So, maternal smoking is affected the dopamine system of the developing fetus, resulting in behavioral disinhibition and ADHD. But, it is important to note that all of evidence shows us a correlation between maternal smoking and ADHD, not a causal relationship. As a conclusion, not all of the children with lead poisoning will have ADHD in the future.

Television Effects

Increased "screen time," time spent watching television or playing video games, has been linked to inactivity, poor nutrition, and obesity. One study, published in 2004, found a link between increased TV viewing and attention problems. However, other researchers have questioned these findings. They point out that children with inattention are often able to watch TV longer than they can stick with other activities. In other words, increased TV viewing could be the result of inattention, rather than the cause. Other studies have found no relationship between TV viewing and ADHD. There is no strong evidence so far that watching a lot of television causes ADHD.

What Does Not Cause ADHD

Long time ago, there were a number of myths about the etiology of ADHD. But the researchers finally proved that hormones, vestibular system and parenting and problem in life were not the cause of ADHD. Hormones: No studies have found any significant connection between problems with hormone functioning and ADHD.

The vestibular system: For a number of years some clinicians have proposed the theory that ADHD and some learning and emotional problems could be the result of problems within the vestibular system of the brain which affects balance. They contend that treatment with anti-motion sickness medicine could correct these problems. This theory is unsupported by scientific research and is inconsistent.

Poor parenting or problems in family life: No studies support the idea that ADHD is the result of poor parenting practices or other family environment variables. While parents of children with ADHD are likely to give more negative commands to their ADHD child and less positive attention, this may be due to the fact that ADHD children are often non-compliant and, therefore, parents are more likely to be more negative in their interaction with them. Furthermore, the interactions of parents of ADHD children whose behavior was not oppositional were no different than they were from non-ADHD children. It is important to note that parents who provide appropriate accommodations and interventions can reduce symptoms of ADHD and the symptoms.

There is no single cause for ADHD. Scientists agree that ADHD is a medical disorder affecting the several areas of the brain with the frontal area likely having the greatest involvement. Those areas involved are responsible for certain executive functions that control the regulation of behavior, working memory, thinking, planning and organizing. Heredity is the most common cause the disorder. Other risk factors for ADHD are the abnormality of the brain development and functioning. Environmental factors, such as toxins, food additives, and sugar also have correlation effects with this disorder.

Music Therapy with Human Beings

Music and human are related to each other. Music is influencing all aspects of human's life so much. Music is an expression of human's cognitive and behavior. It is influencing human's emotions and also influenced by them. Nowadays, people have been recognized music as new a way of therapy. It has been used not as a way to "heal" people, but to "help" people with certain disabilities to deal with their activity in their daily life.

In 1980, the National Association for Music Therapy described music therapy profession in the following way: Music therapy is the use of music in the accomplishment of therapeutic aims: the restoration, maintenance, and improvement of mental and physical health. It is the systematic application of music, as directed by the music therapist in a therapeutic environment, to bring about desirable changes in behavior. Such changes enable the individual undergoing therapy to experience a greater understanding of himself and the world about him, thereby achieving a more appropriate adjustment to society. As a member of the therapeutic team the professional music therapist participates in the analysis of individual problems and in the projection of general treatment aims before planning and carrying out specific music activities. Periodic evaluations are made to determine the effectiveness of the procedures employed.⁷

It is very clear here that music therapy is a therapeutic process that uses music as a media to help client to cope with their problems. It is a long and goal-directed process that

means the therapist designs some long-term goals with certain ways to reach the goals (called objectives) for the client to help him/her to adjust with his/her environment. It is also emphasizing the relationship between therapist and client; they two work together to reach the aim of the therapeutic process.

The therapeutic process also will be successful not only depends on the client's ability to follow the process, but also the therapist's knowledge and experiences. Music therapist is also working in a disciplinary team together with psychologist, parents, teachers, and other therapist.

Music therapy can be referred to a wide variety of people with some disabilities. In the past, music therapists have most frequently worked with those who are mentally ill or mentally retarded. But nowadays, music therapy can helps people with other conditions, such as children with special needs and problems, patients with physical disabilities, elderly populations, teenagers and also adulthood.

Music Therapy and ADHD Children

Music Therapy Treatment Process

Before someone start to do music therapy, he/she has to follow the treatment process. The steps of the process are:

1. Referral

In this step, the therapist has to know why a client is referred to music therapy. The client him/herself, his/her parents, teachers, physicians, the music therapist, other therapists or social workers can do the reference process

Some of the reasons why someone can be referred to music therapy are: (1) when there is strength in auditory learning styles; (2) when there is responsiveness to sound or music; (3) when there is physical inactivity or limited mobility; (4) when there is limited cognitive capacity; (5) when confrontive therapies are inadvisable; (6) when compliance is a problem; (7) when there is difficulty communicating or expressing thoughts, feelings, or ideas; (8) when there is difficulty getting along with others; (9) when there is limited self-awareness; (10) when traditional treatment fail; (11) when the evidence shows that music therapy interventions are successful.

2. Assessment

After the client is referred to the music therapy, we have to assess the client. Assessment is the process whereby a therapist collects and analyzes information about a client for planning and implementing an effective treatment program.

An assessment may lead to hypotheses about the client's diagnostic condition, or even client's personality, problems, needs, and potentials. All of this information helps us as a direction to make an effective treatment for the client.

We can get the assessment by interviewing the client or the family members; observing the client in cognitive, physical, or other tasks; viewing the client's interactions with others; reviewing the client's records; or collecting information from other interdisciplinary team.

There are four types of assessment:

- Selective assessments => we assess the client by collecting data from his/her records.
- Checklist assessments => the assessment is on a checklist form.

- Patient-Specific assessments => we collect the data for assessment by talking and asking the client directly.
- Running assessments => the therapist assess client while do the therapy session.

3. Treatment Plan

Music therapist has to design a treatment plan that based on the client's weakness & limitations. The treatment plan are included the goal and the objectives of the therapy sessions as the therapist's aim for the client's development. Kenneth E. Bruscia tries to explain the definition about the term "goal" in his book *Improvvisational Models of Music Therapy*:

Every therapist has to make goals for helping the client to achieve a state of well-being. A goal describes the overall direction of the therapist's efforts and the desired outcome of those efforts with respect to the client. The direction of the therapist's efforts may be to increase, decrease, improve, maintain, or restore some aspect of the client's being. The outcome may be a specific feeling, attitude, trait, habit, behavior, relation, or state of being.⁸

Objectives are more specific and short-term. It describes an immediate goal, which may be viewed as a small step in the process of attaining a final goal. After designing objectives, we can design the music therapy interventions for the client's needs.

4. Documentation

We need to document all of the session with the client. The documentation are consists of assessment data, treatment plan, progress note for every sessions, and the final report. We also can put photos or videos as our documentation.

5. Evaluations and Termination

Does the client meet our initial goals that were set? Does the client make a progress? Are there any recommendations for further treatment or services? That's all the questions that we have to think again when we evaluate the client.

Evaluation is the process of determining how much progress a client is making towards achieving the goals of therapy. Evaluation is also concerned whether a particular treatment intervention has been effective to change or help client to meet the goal.

And then, we terminate the therapy process. It only can be terminated only when the client has met the objectives, or when the treatment team decides that the client has derived the greatest possible benefit from therapy.

Goals, Objectives and Interventions for ADHD Children

The main goal that music therapist has to design is about the inattentive and hyperactive-impulsive behavior of children with ADHD. The goals are to make the child more attentive and reduce his/her hyperactive-impulsive behavior.

These are some examples of objectives and the music therapy interventions for inattentive behavior in children with ADHD:

- (1) Help the child to be more attentive to the therapeutic process at least for ten minutes during one therapy session.

The music therapy interventions that the therapist can apply for this objective, for example, do the singing activities. Therapist can encourage the child to finish singing the song with a rhythmical beat. And also the therapist has to make sure that the child

completes the assignment task before moving on to another task/ comment.

Therapist can give the lyrics of the song and ask the child to read the lyric and don't forget to observe whether the child can remain seated, listen quietly or talks appropriately (only when we asked).

Reinforce the "in-seat" behavior with musical activities also can increase the child's attention. It relates with one of the learning theory, operant conditioning theory, which is explain that reinforcement or punishment can strengthen or weakened behaviors. The therapist can give the reinforcement occasionally, for example, when the child doing well in the therapy, and so on. Therapist also can arrange some musical tasks to provide attention and completion from the child, such as playing *Boom whackers* with the child has to follow our direction of playing.

- (2) Help the child to maintain the eye contact with the therapist along the therapy session.

Both client and therapist can sing the name of the child in a situational song to maintain eye contact with the child. Therapist can offer our hands before the child's and do a push and pull activity with the child.

- (3) Increase the child's respond to the therapist's instructions and questions or greetings and closings.

Try to say the instruction or question with a situational song that composed by our self. Depend on the research that music psychologists had done, human have the tendency to understand a melody line more rather than talks.

Therapist also can use greetings and good-bye song in the session. Call or put their name in the song. Improvised the song a little. Prompt verbal "Hello" and "Good bye" using appropriate gestures (e.g., shaking hands or waving).

For the hyperactive-impulsive behavior, for example, the objectives and the interventions are:

- (1) Help the child to stop his/her inappropriate behavior (lack of impulsive control), like doing some movements continuously or playing some instruments with a wrong way.

Therapist can give the child other compensation for his/her inappropriate behavior. If the child usually jumps again and again, compensate his/her behavior with another activity, such as doing the "music and movements" activity. So he/she can jump but still have the music as the background for this activity.

- (2) Help the child to be more relaxed and less hyperactive.

Therapist can give some relaxing music in the beginning of the session and make sure that the child listens to quiet. After that, give verbal feedback about their experience when they listen to the music.

- (3) Help the child to not interrupting speech or activity by his/her extraneous talking.

Reinforce task behavior through active participation in a pentatonic ensemble. Use eye contact to communicate when each individual is to start and stop playing his/her instrument.

Why does pentatonic ensemble use for the intervention? Based on Carl Orff

research, he believed that the use of the pentatonic scale at such a young age was appropriate to the child because the nature of the scale meant that it was impossible for the child to make any real harmonic mistakes. The most common instrument in the pentatonic ensemble, for example is xylophones, bells and metallophones that use wooden bars.

Conclusion

Music therapy gives some advantages for ADHD children. Music helps them to be more attentive and to create control of their hyperactivity and impulsiveness. With music therapy, ADHD children could expand their attention more by doing singing activity and some reward inside it. Music also can reduce their hyperactivity by doing "music and movements" activity as a substitute for their inappropriate behavior. Music is just one example of therapies that helps these children to be more related to their environment.

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(Footnotes)

- ¹ Identical twins come from one ovum-cell (ovum) that split itself into two same parts after the fertilization.
- ² Non-identical twins come from two different ovum-cells (ova) that fertilized on the same time.
- ³ Part of the brain that located in the front, which is we are used to think. It is associated with the maturity of someone 's thought.
- ⁴ Basement structures that are associated with attention, executive functions, delayed responding, and response organization.
- ⁵ Eric J. Mash, *Abnormal Child Psychology* (Third Edition; Belmont, California: Thomson Wadsworth, 2005), p. 132.
- ⁶ http://www.ajc.com/health/content/eveningedge/stories/2009/04/02/myths_about_food.html (accessed on 24 of April)
- ⁷ William B. Davis, *An Introduction to Music Therapy Theory and Practice* (Second Edition; USA: McGraw-Hill, 1999), p. 7.
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