The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 9, Issue 4, October- December, 2021
DIP: 18.01.004.20210904, DOI: 10.25215/0904.004
http://www.ijip.in

Research Paper

Music: Impact on Memorisation and Anxiety Among Children

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ABSTRACT

Music is a form of art that each and every individual enjoy. It is a habit for few and an addiction for few. Music has powerful effects on the mind. Various styles of music can have a significant effect on a person's mood very quickly, and it can help them experience and process a wide range of emotions such as happiness, excitement, sadness, calmness and thoughtfulness. Music produces pleasing tones with melody, rhythm and harmony. It helps an individual to express untold emotions. Music also helps is remembering things. Memorization is done as a part of learning so as the learner will be able to remember particular events. Music effects the amount of stress hormones that the body releases and reducing these hormones can help relieve symptoms of anxiety. Hence music has an impact on reducing anxiety. This study deals with the impact of music on memorization and anxiety on children with various researches including concepts of how music training improves verbal memory, effect of music while studying, relation between music and memory. The present study analyses the available research on the similar topic, which discuss the relationship between music and its impact on memorization. The study also explores how music can help to reduce the level of anxiety amongst children.

Keywords: *Impact, Music, Memorisation, Verbal Memory, Anxiety, Stress Hormones*

Music is a form of arranging sounds having melody, rhythm and harmony. Music is performed with the help of instruments and techniques such as singing and rapping. Ancient Greek and Indian Philosophers defined music in two parts: melodies, as tones ordered horizontally and harmonies, as tones ordered vertically. The definition of music varies according to culture and social context. Throughout history, some new forms or styles of music have been criticized as "not being music".

Music may be classified as a performing art, a fine art or an auditory art. Music may be played or sung and heard live at a rock concert or orchestra performance, heard live as part of a dramatic work or it may be recorded and listened to on a radio, CD player, smartphone or TV show. In many cultures, music is an important part of people's way of life, as it plays

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Received: August 08, 2021; Revision Received: October 04, 2021; Accepted: October 23, 2021

a key role in religious rituals, rite of passage ceremonies, social activities and cultural activities. People may make music as a hobby or work as a professional musician or singer.

Memorization

According to American Psychological Association, memorization or memory is the ability to retain information or a representation of past experience, based on the mental processes of learning or encoding, retention across some interval of time and retrieval ore reactivation of memory. Children slowly begin to show signs of memory which improves in their adolescent years. The types of memory include short term memory, long term memory, working memory etc. Memorization can be improved through rehearsal. However, longer rehearsal obtains deeper understanding of the information. With rehearsal being one way of improving memory, the other way is by using chunking. In chunking, person categorizes the information into groups for better memory of the content. Music and memory have a positive relation in terms were listening or performing music can activates different brain areas which are associated with memory, reasoning, speech etc.

One older study found that listening to music allowed test takers to complete more questions in the time allotted and get more answers right. More recent research suggests that whether or not music improves cognitive function depends on whether the music first improves a person's emotional state. Researchers at the music and neuro-imaging laboratory at Harvard-affiliated Beth Israel Deaconess Medical Center have shown that singing lyrics can be especially helpful to people who are recovering from a stroke or brain injury that has damaged the region responsible for speech.

Anxiety

Anxiety is the body's natural response to stress. It has many definitions. According to American Psychological Association, anxiety is an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure. Anxiety is a normal condition which can be seen in every individual in situation such as taking a test, speaking in public. When the feelings are excessive, anxiety is the indicator of underlying disease. The causes of anxiety can be either internal or external such as work stress, relationship issues, medical side effects. Along with these, a combination of factors which include genetic, environmental also play a role. Researchers believe that the areas of brain responsible for controlling fear might be affected. In children, anxiety can be diagnosed due to fears or worries that they interfere with school, home or play activities.

Any illness can be managed or controlled. Hence anxiety can also be managed through exercise, medication, mindfulness techniques, understanding the causes of anxiety, diet maintenance and building self-esteem. Listening to music have effects such as relaxation and reducing anxiety. Music reduces the amount of cortisol and adrenaline which are the stress hormones released by the body and therefore helps relieve symptoms of anxiety.

This review examines the effect of music on memorization and levels of anxiety among children. It contains empirical data that brings out contrasting result in both the domains. The researcher has inclined to select the studies about music relating to memorization and anxiety because memory has a fundamental role in life and hence storing and retrieving information is also an important aspect of living. Anxiety is a negative emotion which gives stress and a relaxing aspect like music can have a positive role in reducing anxiety.

METHODOLGY

The review aimed on studying the following objectives:

Objective 1 - To study the effect of music on memorization.
Research Question - How does memorization get affected by music?

Objective 2 - To study the impact of music in reducing anxiety
Research Question - Can the level of anxiety in children be reduced through music?
The present study analyzing the impact of music on memorization and anxiety among children.

A total of six peer reviewed empirical papers were selected for the study. They are broadly from India, America, Iran, Australia and Brazil all published in English language.

Inclusion criteria: There are certain criterions upon which the papers were selected such as the specific focus on the memory through music training, change in anxiety levels in children undergoing medical treatments.

Exclusion criteria: The literature review does not include the extremities in the psychological disorder spectrum.

RESULTS

The following reviews provide a brief description of the papers examined with supporting data. These reviews are showing there is some effect of music on memorization and anxiety. Children The findings showed that children who had trained in music for couple of days to years have improved the mathematical thinking ability and verbal memory. Also, listening to music during medical treatment has reduced the effect of anxiety in children to a great extent.

Effect of music on memorization

Chan et al. (2003) studied the memory of individuals who have undertaken music training by examining the effect of cognitive functions with neuroanatomical model. Studies with brain damage patients showed that left temporal lobe is concerned with verbal memory while right temporal region is related to visual memory. He conducted the study on 90 male participants aged 6-15 out of which 45 participants had musical training of 2-5 years and the rest had no musical training. For verbal memory, the HKLLT-Form one verbal memory test was used where the subjects were asked to recall as many words as possible in three trials with 10 min and 30 min delayed recall. For the visual memory, The Brief Visuospatial memory test was used which followed the same procedure as test for verbal memory. Children with music training had better verbal memory and not visual memory than non-music participants. Results suggested that music training had a beneficial effect on verbal memory. More the music training in childhood, better was the verbal memory.

Stacey Pye (2008) discussed a casual link between music and memory. If there was a link, there could be significant implications, practice and promotion of music in early childhood education. The study focused on materials such as books and articles related to music and identified that music had a transfer effect of later aspects of learning. Some research indicated that music had a positive effect on intelligence and general cognitive functioning. Sheppard (2oo5) cited a study which found that kindergarten children were able to retain textbook knowledge better when it was in the form of a song. Blythe (2005) notes that

children are more receptive to learning through music between ages of 4-7. It was identified that learning songs through games and repetition is more appropriate for children as long-term memory is formed during a period of weeks to months.

Edel Sanders (2012) conducted a test to investigate if musical training would improve mathematical thinking. The participants of age 7-8 were chosen from five schools. Out of five, six groups were selected and all children received music lessons with eleven songs from same teacher for a week. Nine of eleven songs were same for all groups and other two songs differed based on the emphasis of group. The words and music of song were frequently showed on whiteboard and two weeks before the concert the students were allowed to take notes along and memorize the lyrics. At the concert, students sang all eleven songs and head teachers noted that memorization of lyrics have improved participants cognitive development that mathematical questions which requires practice might have improved. Though it was difficult to identify to what degree music and memorization had an influence, but particular questions benefited from memory were noted. Hence, mathematical thinking of the students has improved through music training. Evidences showed that memory development was an additional benefit of music training.

Swathi Swaminathan (2013) examined the second language English abilities of musically trained and untrained school children. Participants were administered Malin's Intelligence Scale for Indian Children (MISIC) and an English word-reading test. The musically trained participants performed better on tests of comprehension and vocabulary. When the scores of participants with Indian classical music training were compared with scores of untrained groups, the advantage of comprehension and vocabulary persisted. The result viewed that music and language shared resources due to which learning took place.

Impact of music in reducing anxiety levels among children

N Marwah (2005) conducted a study to find out if music distraction was an effective means of managing anxiety in pediatric dental patients. Forty children aged between 4 and 8 were selected and assessment of anxiety was done using Venhams's picture test, Venham's anxiety rating scale, pulse rate and oxygen saturation during different treatment visits. The values were statistically analyzed and it was concluded that audio distraction did decrease the anxiety level in pediatric dental patients but not to a very significant level.

Shida Kazemi et al. (2012) evaluated the role of music therapy on level of anxiety in children aged 9-12 years. 60 hospitalized patients with 30 each in control and experimental group were selected. The data was gathered through Spielberger Trait Anxiety Inventory for children (STAIC) and the questionnaire was filled. The experimental group was presented with soothing music for 2 days, 20 minutes through a tape recorder equipped with headphone. Later, the questionnaires were refilled by each patient. The control group did not receive any intervention. From the results of study, it was seen that both the groups had no difference in the level of anxiety before application of music. However, a difference was observed in anxiety levels in the experimental group. The final results showed that music therapy reduced anxiety level in hospitalized children.

Andrew Kesselman (2016) assessed the influence of music during pediatric ultrasound to reduce anxiety measured by heart rate. A total of 44 patients were selected in which 21 were controls and 23 were experimental and were randomized to either music or no music (control). Pulse oximeters were used to monitor the heart rate for 1 minute at interval of 15 seconds. Total scan time was determined by the technologist from the initial image until the

last image saved was recorded. The technologist was asked to rate the ease of performance on a scale of 1-10. When music was used during the ultrasound examinations, the study demonstrated decreased heart rate which suggested lower level of anxiety. Despite differences in group size, heart rate in the beginning was higher in music group than the control group. However, the variability in heart rate had consistently decreased over different time periods in the music group.

Twishaka (2020) evaluated the impact of music on anxiety in children during dental care. 40 children of age 5 to 11 years were selected and were randomized into two equal groups; experimental (music) and control (no music) groups. The oxygen saturation, heart rate and levels of Corah anxiety scale and pain scale were measured. The results for heart rate were evaluated by ANOVA. The Kruskal Wallis test was used to evaluate the oxygen saturation and the Wilcoxon test for Corah anxiety and pain scores. There was a significant decrease in the heart rate in children who listened to music during dental treatment. The heart rate remained unchanged throughout the care for the group without music. There was no difference in the oxygen saturation or Corah anxiety and pain scores in children who listened to music during dental care. It was concluded that music is a non-pharmacological alternative that reduces anxiety in children during dental treatment.

CONCLUSION

Music activates both the left and right brain at the same time and the activation of both hemispheres can maximize learning and improve memory. Music relaxes the mind and soothes the mood. In many cases, students find that listening to music is helpful in memorization by creating a positive mood which directly boosts memory formation. Also, exposing children to music during early development helps them learn the sounds and meanings of words better, ultimately increasing the memory. It helps them improve in cognitive development and directs thinking to better memory which helps in reasoning, problem-solving. Studies have suggested that children who listened to music while performing various tasks have increased ability to memorize the information better.

The studies reviewed concluded that music has a positive effect on children in improving their memory. The findings also showed that music can enhance the mathematical thinking. There is an increase in the verbal memory of children who had musical training for over a period of time. Prolonged training in music is seen to have a major role in increasing the memory. In all the ways, music helped to increase the memory of children.

Music also helps to cope up with anxiety. Music can help reduce anxiety levels by up to 65%. Soft and soothing music gives positivity and optimism and helps relieve anxiety. In case of children, musical training can lower anxiety and help with emotional control. The researches thus reviewed focused on the medical anxieties experienced by children. The results suggest that presenting the children with music during the pre- and post-operative periods reduced the level of anxiety.

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Acknowledgement

The author appreciates all the researchers who have put in their efforts to conduct the above studies.

Conflict of Interest

The author(s) declared no conflict of interest.

How to cite this article: Roy Choudhury N. & Dharani N. (2021). Music: Impact on Memorisation and Anxiety Among Children. *International Journal of Indian Psychology*, *9*(4), 29-34. DIP:18.01.004.20210904, DOI:10.25215/0904.004