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Research article

MANTRA, MUSIC AND REACTION TIMES: A STUDY OF ITS APPLIED ASPECTS

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ABSTRACT

Aims &Objectives: The mechanism of the effects of music is still under scientific study and needs to be understood in a better way. We designed this study to see how music affects reaction time and concentration. The aim of our study was to study the effect of Gayatri mantra on reaction time. **Material and Methods**: 30 healthy subjects were selected for the study. Baseline record of Visual online Reaction time test was taken**.** Online visual reaction time was measured during listening to Gayatri Mantra was taken. **Results:**The reaction times decreased significantly $p<0.001$. **Conclusion:** Listening to music at work area reduces distractions, helps increase concentration and delays fatigue. It can be used to heal tinnitus, as an educational tool to develop children with special needs, Alzheimers disease, to improve motor skills in Parkinsonism and help alleviate pain after surgery.

Keywords: Mantra, Chanting, Music, Reaction Times, Concentration

INTRODUCTION

Music therapy probably began when the earliest humans stomped or clapped to involve healing spirits or to exercise a sick person's demons. Greek myths contain metaphors for the healing power of music, and musical cures were part of many ancient cultures and religions. The healing effects of music on all aspects of mind/body function are universally accepted but not scientifically understood. Music is the universal language of the soul's devotion. [1]

Music that is saturated with soul force is the real universal music, understood by all hearts. Chants bring ineffable joy, and are proof that God has answered. Popular songs are usually inspired through sentiment or passing interest. These songs are like wet matches that do not produce any spark of divine realizations[1] But the Gayatri mantra born out of depths of true devotion to God, brings boundless joy and is a spiritualized song (mantra, chant). Such songs like live matches produce the fire of God awareness, whenever they are struck at the foundation of devotion. There has been considerable interest in how background sounds may influence an individual's performance on various cognitive and work tasks[2]. In a study by Smallwood and Schooler[3] (2006), they discover mind wandering occurs when the executive components of attention appear to shift away from the primary task, leading to failures in task performance and superficial representations of the external environment. This study provided the framework for future studies on cognitive distraction. With the framework in place it is possible to branch out into other interesting studies that focus on musical influence on cognition involving distractions and reaction times. Is it possible classical music can increase productivity and cause one to focus, besides boosting cognitive recall for students studying? Does music really help students boost their cognitive functioning?

Reaction speed is the ability to quick motor response to definite stimulus, while the time that elapses

between the sensory stimulation and the motor reaction time is called reaction time. [4]. This is the time that elapses between a stimulus and response it. This process consists of sensory and perceptual process. After a stimulus is perceived by our receptors (in our eyes, and ears), identification and recognition in the central nervous system begin. If we recognize a certain stimulus to be significant for us, we respond, in the opposite case we ignore and do not respond. The speed of identifying the stimulus is an essential factor in this process. The last stage of the response to the stimulus is a motor reaction which involves clicking the computer mouse[5]. How music effects the brain is still not clear. The mechanism of the effects of music is still under scientific study and needs to be understood in a better way. We designed this study to see how music affects reaction time and concentration.

MATERIAL AND METHODS

This was a cross-sectional study done in Santosh medical college Ghaziabad. Ethical approval of the research committee was taken before starting the study. 30 healthy subjects were selected for the study. Baseline record of Visual Reaction time test was taken using a computer online Windows 7. The Online Reaction Time Test [6] consists of a traffic light signal of red, yellow and green. The subject is instructed to click on a button to begin when ready, to wait for the stoplight to turn green, and click when it turns green quickly. The average of five responses in seconds is taken as reading. Online visual reaction time was measured during listening to Gayatri Mantra was taken. Gayatri mantra means 'We meditate on the worshipable power and glory of Him who has created the earth, the nether world and the heavens (i.e. the universe), and who directs our understanding".

The duration of study was three months. Sound of music kept low (audible). Healthy students with normal hearing and Hindu religion were included in the study. Students who had hearing problems as tested by whispered voice test, complaints of tinnitus, ear pain and students of a different religious faith who did not want to hear the Gayatri mantra were excluded. The mantra was listened early morning. Our hypothesis is that stimulating music, such as Gayatri mantra will shorten the reaction time to visual stimuli, while without music, the reaction time will be longer.

RESULTS

Results were analysed by paired t test using SPSS version 17.0.

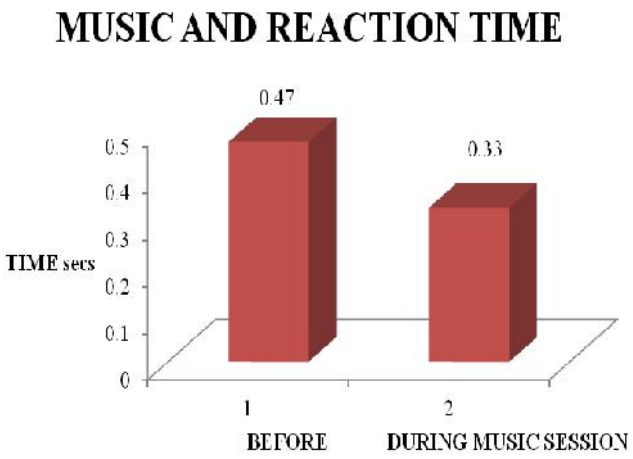

Fig 1: showing the online reaction time before and during the Gayatri mantra session (p<0.001)

DISCUSSION

They are several factors that influence the reaction time, such as age, gender, left handedness vs right, practice, exercise, type of personality, the use of stimulant drugs, hypothyroidism and hyperthyroidism, brain injury and illness[7]. Music helps promote brain development[8, 9] It is well known that music is used to manage organic disorders such as pain, and for rehabilitation after a stroke or a serious accident. It helps improve coordination and alleviates perception of pain by stimulating an increase in endorphins especially in polio patients. The aged and patients with Parkinson's disease, improve coordination and learn to walk with a steadier gait by exercising to music. Singing or playing certain musical instruments may contribute to improved lung function. Singing is also used to overcome speech disorders[10].

Psychotherapy: Music and rhythm are used to improve physical and psychological functioning and provide an alternative means of communication for persons who are unable to put their feelings and thoughts into words. It is especially beneficial in treating autistic and emotionally disturbed children[10]. Music may also be used to calm agitated or aggressive behavior; in some cases it also provides a means of self-expression[10,25]. Music therapies and

dance help children to improve their coordination, build muscle tone and strength, and gain self confidence[10,18,22,24,].

Special Education : Music helps improve the coordination of children with neurological disabilities, such as cerebral palsy, as well as those who are blind or deaf. When incorporated into group activities, it also contributes to socialization[10]. Regular exposure to music is likely to be part of the special education program for a hyperactive child because of its calming effects. Parents can ask a qualified music therapist to suggest kinds of music to be played at home. Also, makes child music, on his own may help him to expand his attention span[10.]

Art, dance and music therapies when instituted at an early age help retarded children overcome physical and social handicaps. These and play therapy can help the child to express feelings of frustration and anger[10]. Listening to music is a time honoured method of relaxation[19,20,21]. To alleviate anxiety, music therapists recommend soothing classical music rather than loud, percussive types [11,12,13,16,]. Music associated with a happy event or time period can also be beneficial[10,14,15].

How it works: Old songs often spark remarkable responses from Alzheimer's patients. Some researchers believe that music activates a flow of stored memory that is otherwise inaccessible. Even when verbal memory fades, the ability to remember and recognize music remains intact. Music therapists find that playing songs popular during a patient's youth, or music associated with a particular time and place, jogs other memories and helps in retrieving past experiences[10,17]. Research studies suggest that musical experience may also trigger the production of endorphins, brain chemicals that are natural painkillers. Studies by anaesthologists indicate that playing music during surgery reduces the need for anaesthesia. Dentists have observed that their patients don't need as much pain killer when music is being played[10,15].

In Canada, accredited music therapists must have completed courses at Wilfrid Laurier University, home to the Canadian Music Therapy Association. Similar courses are being offered at SVYASA, Banglore, India. To emotionally disturb or developmentally handicapped drama, used as therapy (an outgrowth of music therapy), is a valuable method in healing method. Playing background music is useful to mask tinnitus. If headphones are used, the volume should be loud enough to mask the noise in the ears, but not loud enough to cause further damage[10].

Sound or vibration is the most powerful force in the universe. Music is a divine act, to be used not only for pleasure but as a path to God realization. Vibrations resulting from devoted singing lead to attunement with the cosmic vibration or Aum[1,26,27,28]**.** Many men and women testified to the God perception and the healing of the body, mind and soul that has taken place at a cosmic chant of " O God Beautiful " that was sung for hours in USA[1]

Lacunae and Future Studies: Measuring the cortisol levels and endorphins would help explain the effect of music on neuroendocrine system. It would also play an important role in understanding the underlying physiology of the relaxation music on decreasing reaction times and helping maintain the alert, awake, aroused state. Duration of music and therapy in various diseases needs to also be scientifically studied.

CONCLUSION

Listening to Gayatri mantra decreases reaction time. Listening to music at work area reduces distractions, helps increase concentration and delays fatigue. It can be used to heal tinnitus, as an educational tool to develop children with special needs, Alzheimers disease, to improve motor skills in Parkinsonism and help alleviate pain after surgery.

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Conflict of interest: Nil

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