Short Communication

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Importance of Brain gym as exercise in physiotherapy and rehabilitation

Vaishnavi V Siroya[1], Waqar M Naqvi*[2], Chaitanya A Kulkarni[2]

[1]Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha- 442001, Maharashtra, India
[2]Department of Community Health Physiotherapy, Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Wardha- 442001, Maharashtra, India

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Abstract

This is not unprecedented that a whole industry, effectively promoted, has grown to promote the notion of 'brain-based' learning among other ideas. Much attention has been put on connecting advances in neuroscience research with educational approaches to boost learning. Brain Gym is a curriculum basically focused on theories of neuroscience and educational kinesiology. Intervention of brain gym consists of integrated, cross-lateral, balance-requiring movements that mechanically activate both hemispheres of the brain through the motor and sensory cortexes. The study describes the importance of brain gym exercise in physiotherapy. Exercise can stimulate the brain in such a way that neurons are often in a condition to handle the different data from outside and are capable of responding to a "corporate member" of their duty in compliance with parts of brain activity by means of the principle of "brain-body link". Brain Gym is a great source of personal development, enabling individuals to obtain rapid transformations and also improve quality of life in different age group.

*Corresponding Author

Name: Waqar M Naqvi
Phone:
Email: waqar.naqvi@dmimsu.edu.in

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INTRODUCTION

Brain Gym is an academic kinesiological program that is promoted and applied with a consistent learning purpose and is invented by Paul and Gail Dennison, in the 1970s. Brain Gym activities includes of 26 basic motions, which are believed to improve perception and stimulates brain hemisphere by neural re-modelling to facilitate whole brain learning (Spaulding *et al.*, 2010). The neural mechanism and white matter connectivity of the brain is influence by the intervention of the exercise (Gujral *et al.*, 2017). According to Brain Gym literature, the abstract framework on which brain activity is conceptualized is generally simplified and defined along dimensions: laterality, attention and centering. Laterality, the synchronization between the brain's right and left hemispheres, which is considered important for reading, writing, hearing, communicating and being able to walk and think. Focusing, the ability to process information in the brain, which is connected to perception and lack in attention/hyperactivity. The final section, centering, the top and bottom brain parts organized as necessary to combine rational thought with emotion (Chen *et al.*, 2019).

As per the founders, routine performance of brain gymnastics results in the activation and development of various parts of the brain, especially the corpus callosum, which allows contact between the two sides of the brain smoothly and in a more opti-

mized way for high-level thinking (Hyatt, 2007). The brain is a complex organ which focuses on motion and according to Hannaford, "activity is necessary for learning" (Weslake and Christian, 2015). Brain training is very important in neuro rehabilitation it reduces atrophy, decrease white matter lesion burden, and improve cognitive function. It is effective treatment for depressed older adults, since its neural benefits enhanced for age-related atrophy aggravated by neuropathology (Li, 2017). Neuroimaging work has suggested that motor learning and skill transfer require activation of perceptual processing regions and more motor cortex activity. Changes within the nervous system are required for the effective transfer of learned motor mechanics in sports (Grooms *et al.*, 2018).

Physical therapy intervention aims at the optimization of activity, social participation, and quality of life, as well as the health condition of people with acute and chronic disabilities. The most effective way to activate brain is to integrate the right and left-brain functions by combining kinesthetic and tactile learning, strategies with visual and auditory exercises. Brain exercise leads to sensory integrity, motor learning and brain-body connection. Brain-inspired learning has recently gained additional interest in solving control and decision-making tasks (Chen *et al.*, 2019). A motion in the mental workout has been shown to have increased blood circulation and stability, good oxygen levels and healthy metabolism (Doewes, 2009). Diabetic peripheral neuropathy including perception impairment is known to contribute to compromised equilibrium, abnormal gait habits and increased risk of accidents. According to the studies there is significant improvement in balance and reduced risk of fall after Brain Gym exercises in patients with diabetic neuropathy. This exercise is useful in treating hypertensive patients as it reduces stress, relieves anxiety, promotes circulation of blood and boots brain development (Panse *et al.*, 2018).

Many studies show that brain gym is the non-pharmacological treatment for mental health especially in geriatrics. The ageing process is characterized by the loss of progressive physiological integrity, which causes impaired function and this damage leads to various diseases, such as cancer, diabetes, cardiovascular disorders, and neurodegenerative disease (Efffendy *et al.*, 2019). José María Cancela et al. conducted a study which represents the efficacy of brain gym training on cognitive performance and fitness level in elderly patient and suggested that Brain Gym can be considered as a useful physical therapy strategy for older adults, since it can have a positive impact on brain functioning. Finally, it has been suggested that a higher level of fitness through increased physical activity might have a positive effect on neuropathologic substrates as well as it might lead to a decreased whole-brain and medial temporal lobe atrophy in older adults (Cancela *et al.*, 2015). Intervention of physiotherapy in elderly patients leads to improve sleep, quality of life and reduce depression and stress and it has an significant effects on the cognition and psychological perception (Deslandes *et al.*, 2009).

Brain gym plays an important role in pediatric treatment with neural dysfunction such as autism, attention deficit hyperactive disorder, dyspraxia, dyslexia (Cortese, 2013). Children with Autism Spectrum Disorder experience problems such as behavioral impairments in social interaction and weak communication skills. Intervention of brain gym in ASD children is effective in enhancing memory and concentration power and also improves quality of life. It also has a significant effect on the student with depression and stress. Andrea Watson and Ginger L. Kelso in 2014 found the effect of brain gym on academic engagement for children with developmental disabilities and claims that wide areas of educational functioning such as concentration and emphasis are strengthened, and more specific areas such as learning, writing, mathematics and studying. Although some work has already started in these areas, researchers will systematically assess performance improvements in each field. For the development of brain in mentally effects children brain gym exercises are found to be very efficient and convenient (Watson and Kelso, 2014).

As per the research conducted by Dustin R. Grooms et al. in 2018 in order to clarify the adaptive mechanisms of neuromotor learning this study offers early information leading to the neuronal developmental processes of risk of serious injury – decreasing movement process transition to sports. This improving occipital cortex output could strengthen the learning process of motor coordination habits exercised during practicing and promote the transferring of these patterns to many other sport-specific practices. Such novels describe the possible neuronal pathways of transmitting adjustment to sport through neuronal exercise. It comprehensive integrative evaluation of neuromotor regulation from the cognitive mechanisms to the neurological performance will help potential initiatives to minimize injury risk-limiting treatments by specifically targeting neuronal processes that enhance the transition of procedure adjustments to the sport experience (Grooms *et al.*, 2018). This show that brain training is very effective in sports physiotherapy as

it enhances the cortex for learning the motor patterns.

And many studies have successfully proved that with the help of brain gym activities intervention there is significant effects as various fields (Deslandes *et al.*, 2009). In school systems around the world, Brain Gym is used to help students in accomplishing great things faster. In the technology industry, Brain Gym is often used to help staff at all ability levels to do their job comfortably and conveniently. Brain Gym is also used in athletics, promoting leadership skills as well as team contact. Brain Gym is a great resource for personal development, encouraging people to make massive improvements in places where they might have previously felt "locked." (Montgomery *et al.*, 2004). Brain gym training enhances the effectiveness of development in children through its systematic perspective and is commonly used for polite and clam behavior. It reflects development in mental capacity, motivation, behavior, perception and awareness, concentration, eye-hand coordination, cognitive skills, obeying commands, calculations and computing, ability to read and write, and self-confidence (Hyatt, 2007).

Physiotherapy includes rehabilitation, injury prevention, and health and fitness. However, aerobic exercise aims at improving fitness, increasing muscle strength and endurance whereas brain gym boots brain performance. Brain Gym is a great source of personal development, enabling individuals to obtain rapid transformations and also improve quality of life in different age group (Gujral *et al.*, 2017). Proper functioning of brain is very important to deal with daily life problems. Practicing brain gym exercise is prove to be very important in physiotherapy as it focus on the mental and physical health and have no negative effects, and can be done very easily. Performing brain gym enhances the neural pathways which provides effective relearning of the movement, reduces stress and depression, improve cognitive perception, adaption of motion patterns and biomechanics of the body. Most importantly brain gym enhance quality of life which is the most focused aspect of the physiotherapy (Efffendy *et al.*, 2019).

CONCLUSION

From this short communication we can conclude that Brain Gym is a great source of personal development, enabling individuals to obtain rapid transformations and also improve quality of life in different age group. Brain gym exercise is very important for elderly patients as it allows for sufficient supply of blood between the brain and body, decreases anxiety, stimulates the vestibular system for equilibrium, beneficial effects on mental health and decrease the fight or flight mechanism.

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Conflict of Interest

The authors declare that there is no conflict of interest for this study.

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