Research article

Brain gym exercises: an approach in improving the psychological perception in graduate students

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ABSTRACT

Brain Gym is an academic kinesiological program that is promoted and applied with a consistent learning purpose that aims at enhancing performance such as memory, psychological perception and cognitive skills. The technique requires the participant to communicate with a series of activities that help the body to understand the primary behaviour and learn how to coordinate the brain and entire body. 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. By ways of balancing both the side of brain, behavioural difficulties, social and intellectual burdens are expected to be reduced. This study aims to improve the psychological perception and decrease depression in the undergraduate physiotherapy students. Here's an idea we suggest to check the psychological perception with brain gym intervention and the duration for practices comprises of three days a week session, duration of 25 minutes, which is completed in one hour. The study design is of pre- post type with simple randomized sampling. Before the treatment the mean stress showed a mean score of 33.87, anxiety showed a mean score of 32.43, depression showed a mean score of 32.34; an improvement was seen after the treatment where the mean score was 18.42, 17.26, 19.46. The final mean difference was 43.49±17.33 and t-value 30.42 (p=0.0001,S). The data analysis shows that after the Brain Gym Activity intervention there was marked reduction in the score of DASS. The participants involved in the study showed significant improvement in their psychological perceptions.

Keywords: Psychological perception, Depression, Stress, Anxiety, DASS-21, Brain gym.

INTRODUCTION

It is an interventional type with before-after study design which focuses on the evaluation of the psychological perception after intervention of brain gym exercise. Brain Gym was developed in 1970 as an educational and psychological training system developed and enforced with a specific learning intent. 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 [1][2].

Brain Gym is an instructional curriculum intended to improve social, mental, emotional and physical efficiency and use 26 moves [3]. According to Brain Gym literature, the abstract framework on which brain activity is conceptualised is generally simplified and defined along dimensions: laterality, attention and centring. 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, centring, the top and bottom brain parts organized as necessary to combine rational thought with emotion [4]. Brain gym 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. As per the founders, the daily practice of brain gymnastics leads to activation and development of various sections of the brain, particularly the cortex which allows for smoother and more organized communication between the two sides of the brain for high-level thinking.

Many recent experiments have been carried out to determine the efforts required to enhance and stimulate the psychological perception of brain [5]. Perception is defined as a essentially relational process in which visual stimuli is translated progressively into projections which serve as the basis for action [6]. Students nowadays are under stress from waking up to not having proper sleep in addition to all the pressure of appraisals and examinations [7]. This undoubtedly...
influences the attitude of the student towards leaning and academic success [8].

Kulkarni et al have done a project to detect the effects of brain gym exercise on the attention span of the young students and concluded that the mechanism of reading, recoding and comprehension has been improved. Also, the effect of these exercises demonstrated an improvement in eye power and hand control, as well as helping to focus on the same focal point while reading and writing concurrently. Keith J. Hyatt in year 2007, conducted a study on school students and finished with a segment explaining Brain Gym exercises to encourage literacy ability, oral reading comprehension, communication skills, pronunciation and learning, self-esteem, memory, analytical thought, imaginative thinking [9].

This research explores the impact on the psychometric characteristics of undergraduate students in the exercise program called as brain gym. Especially because it seems to be a accurate and easy-to-administer scale, the Depression Scale, Anxiety, and Stress-21 are chosen. The DASS-21 consist of three self-report measures used to assess depression, anxiety, and emotional tension [10]. Thanch Duc Tran, Jane Fisher performed a study on the Efficacy of DASS-21 in a cohort of Northern Vietnamese people in rural communities as a screening tool and the study concluded that it can useful in clinical practice and the components such as depression, and stress levels are determined by summing the ratings for the elements in question [11].

METHODOLOGY

The research was conducted in Ravi Nair Physiotherapy College, Datta Meghe Institute of Medical Sciences, Deemed to be University, Sawangi (Meghe). The study design is of pre- post type with purposive sampling. It is a interventional study type, with 220 sample size. The study duration is 6 months. Inclusion criteria includes age group between 18 to 23 years physiotherapy undergraduate students, who falls under the moderate range of stress, anxiety and depression as per the DASS-21 scale. Exclusion criteria contain the participants not willing to do, student with migraine headache or diagnosed with psychological condition or having a history of neurosurgery or cognitive damage. Outcome measures are Depression, anxiety and stress scale (DASS-21). The DASS-21 is with reliability for depression = 0.81, anxiety = 0.89, stress = 0.78 respectively.

Procedure

The Institutional Ethics Committee (IEC) Clearance was be obtained prior. Students was selected as per the inclusion criteria that has been mentioned. The participants was oriented about the aim of the research and will get informed consent. Pre and post interventional assessment using DASS-21 scale was done, reading was recorded and the exercise intervention was given for a month. After the intervention of brain gym exercise, data collection was done and statistical analysis was obtained.

Brain gym exercises treatment protocol

The intervention of brain gym exercise starts with Marching as a warm up exercise, in which subjects stand straight and lift both the legs continuously slight above for time duration of 1 minute. A Cross Crawl is performed to enhance the coordination between both the sides of the brain, it is done for time duration of 2 minute (5 sets of 8 repetition). Subject is instructed to stand straight and lift up the leg up to the chest and touch the knee with opposite elbow [9].

Positive Points helps to improves memory and reduce stress levels. The subject is instructed to breathe deeply and gently press the eyeballs with eyes closed for time duration of 1 min (10 repetitions). It helps to stimulate the lateral and side to side coordination. A Step Touch is done and it is performed in standing position and the subject is instructed to simultaneously move right legs toward left and left towards right, should be done for duration of 5 minutes (30 repetitions). A Neck Circles exercise helps to reduce stress on the neck muscle, head movement coordination and move the neck in circular motion for a time frame of 2 minutes (20 repetitions). A Cook’s Hook-Up helps it stimulates the neurons and enhances the balance between hand and brain, where subject is instructed to extend and cross both the hands and fix the fingers together and internally rotate the hands for a time duration: 5 minutes (repetition).

A Brain Button- This exercise is performed and helps to improve the flow of electromagnetic energy and, helps in relaxation. The subject is instructed to palpate belly button with one hand and other hand over the collarbone and perform circular motion with finger for time duration of 2 minutes (10 repetitions). The Thinking Cap helps to enhance learning speed and mood, increase attention span, and improve memory. The subject is instructed to press the top of ear and
the bottom continuously duration: 1 minute (15 repetitions).

A Lazy Eight helps in boosting eye muscle control, balance, and concentration. The subject is instructed to extend the hand and make the figure of Eight horizontally in front. Duration: 1 minute (5 repetition). A Trace X helps to increase attention span and improve focus. Where the subject to close eyes and imagine a figure of “X” and do eyeball movement the duration is 2 minutes (10 repetition).

RESULTS

Table 1. Distribution of patients according to their age in year

<table>
<thead>
<tr>
<th>Age in years</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-20 years</td>
<td>53</td>
<td>36.05%</td>
</tr>
<tr>
<td>21-23 years</td>
<td>93</td>
<td>63.27%</td>
</tr>
<tr>
<td>&gt;23 years</td>
<td>1</td>
<td>0.68%</td>
</tr>
<tr>
<td>Total</td>
<td>147</td>
<td>100%</td>
</tr>
</tbody>
</table>

When recruiting the subjects for the study, after taking into consideration the inclusion criteria, 53, 93 and 1 patients fell into the age groups of 18-20 years, 21-23 years, >23 years respectively, which constituted of 36.05%, 63.27%, and 0.68% of the total patients respectively (Table 1, Figure 1).

Table 2. Comparison of total score pre and post treatment Student’s paired t test

<table>
<thead>
<tr>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
<th>Mean Difference</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre t/t</td>
<td>98.65</td>
<td>147</td>
<td>10.42</td>
<td>0.85</td>
<td>43.49±17.33</td>
<td>30.42</td>
</tr>
<tr>
<td>Post t/t</td>
<td>55.15</td>
<td>147</td>
<td>13.27</td>
<td>1.09</td>
<td>0.68%</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

The study protocol aimed to evaluate the psychological perception in undergraduate students by using the DASS-21 scale. We hypothesised that there will be improved ability to concentrate and improved focus. The research was meant to predicate the effectiveness of brain gym exercises on stressed student and help with strategies to decrease stress and anxiety. The DASS-21 was chosen as the scale addresses the challenges faced by the current generation i.e. stress, anxiety and depression, and it entirely evaluates the mental status of a person.

In this study, 149 students who fell into the inclusion criteria were chosen. They were instructed to do the brain gym exercises: marching, cross crawl, positive points, step touch, neck circle, hook up, brain button, thinking cap, lazy eight, trace X for 30 minutes per day for 1 month. Some days, it took more than 30 minutes because a few students were not able to focus, and needed prior counselling. 15 additional days were required to complete the study. The treatment sessions were supervised by the therapist. The DASS-21 scale was used to determine the pre-treatment and post-treatment results. Many difficulties were faced by the participants such as not being able to perform the exercises in proper posture and form.

Similarly, Cancela carral et. al observed the efficacy of Brain Gym Training on the Cognitive Performance and Fitness Level of Active Older Adults and concluded that the on the cognitive performance and fitness level of community-dwelling older individuals are similar to those obtained after the practice of a traditional exercise program. Secondly, Kulkarni, Khandale et. al in 2019 conducted a study on effect of brain gym exercises on the young adults. The study found a significant improvement in attention span, as well as the fact that brain gym can aid with focus and memory, as well as combating hyperactivity and excessive dreaming.

In this case, the outcome of the analysis has proven that interventional programs are beneficial in reducing depression, anxiety and emotional stress in undergraduate students. The participants involved in the study showed significant improvement in their psychological perceptions. Before the treatment the mean stress showed a mean score of 33.87, anxiety showed a mean score of 32.43, depression showed a mean score of 32.34; an improvement was seen after the treatment where the mean score was 18.42, 17.26,19.46. The final mean difference was 43.49±17.33 and t-value 30.42 (p=0.0001,S).

CONCLUSION

The results of this study indicates the effects of brain gym exercise on the psychological perception of the under graduated
A marked reduction in the stress, anxiety and depression is seen, on DASS-21 scale. Brain exercise has been shown to be effective in attention improvement, is useful in enhancing concentration, attention, and memory as well as helping to relieve stress.

**Limitations**

Regarding the above mentioned methodology, certain limitations related to treatment time, inappropriate exercise form and posture, which were not tested for validity must be acknowledged so as to interpret the results with caution.

**ETHICAL CLEARANCE**

Institutional Ethics Committee (IEC) of Datta Meghe Institute of Medical Sciences, Deemed to be University, Sawangi (Meghe).

**CONFLICT OF INTEREST**

None

**REFERENCES**


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