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EFFECT OF AEROBIC EXERCISE VS YOGA TRAINING ON DEPRESSION AMONG ADOLESCENTS - A PILOT STUDY

Dr. Niharika Soni	Department Of Physiotherapy, USB College of Physiotherapy, Aburoad (Rajasthan), India
Dr. Suruchi Karn	Department Of Physiotherapy, USB College of Physiotherapy, Aburoad (Rajasthan), India
Dr. Mayuri Sharma*	Department Of Physiotherapy, USB College of Physiotherapy, Aburoad (Rajasthan), India *Corresponding Author

ABSTRACT **OBJECTIVE:** Depression is a major mental health concern. There is an established relationship between physical activity and depression, where greater levels of physical activity are related to lower depression status.

AIMS: The objective of the current study was to compare the Effect of Aerobic Exercise and Yoga Training on Depressed Adolescents.

METHOD: subjects were divided into two groups i.e. aerobic exercise (group A)and yoga training (group Y) on random basis consisting 30 subjects in each group. The training was done for 10 consecutive days, aerobic exercise for 45minute and yoga training for 55minute duration. Depression was measured by Beck Depression Inventory II (BDI- II) scale and data were analyzed by SPSS-17 software package and paired T-tests.

RESULTS: pre and post training within the group data showed significant improvement but between group comparisons were not much significant.

CONCLUSION: Both aerobic exercise and yoga training for short-period had shown to be beneficial for depressed adolescent.

KEYWORDS : Depression, adolescent, yoga, aerobic

INTRODUCTION

Students lifestyle have a significant impact on increasing depression (sadock 2009) and is associated with low academics engagement, struggle with school related experiments (eccleset et al 2008); significant frustration in self-esteem (Baldwin and Hoffman 2002), mood(Buchanan et al 1992), some adolescent also experience a drop in self-competence belief, academic motivation, achievement, inactivity, social withdrawal and in worst possible scenario suicide(1). As per NMHS (2015-2016) in India; one in 20 people over 18 years of age have ever suffered (at least once in their lifetime) from depression amounting to total of over 45million persons with depression in 2015.The over all prevalence rate of depression among 13-17 years old is 0.8%(NMHS2015-2016). Although the prevalence of adolescent depression is high it is significantly under diagnosed and under treated (2); therefore it is essential to determine whether reduction in depressive symptoms can be accomplished with the non medication treatment (1).

Physical activity is one of such non medication intervention for adolescence showed improvement in many residual symptoms of depression (1). Aerobic activity is not only related to lower depression but is also comparable to antidepressants in treatment for depression (Blumenthal et al 2007); further research has indicated that individuals who attain a high level of cardiovascular fitness exhibit fewer signs of depression (riewald 2007). There is also an emerging research from both narrative and systematic reviews that school based physical activity intervention may enhance academic performance and fluid intelligence (rabeery et al 2011). Relatively it has also been examined the effect of yoga training on depression in adolescent. Two recent systemic reviews of yoga for pediatric population concluded that majority of studies report benefits from yoga (3, 4). Additional studies of school based yoga intervention also suggest positive effects of these programs on several factors such as concentration; attention, anxiety, stress, mood, resilience, emotional arousal; self esteem and coping frequency (bothe et al 2014). Based on evidences all the recent studies concluded that both aerobic and yoga has positive effect on mood states, depressive symptoms and anxiety; but there is lack of comparative study between aerobics and yoga and therefore aim of the present study is to evaluate the effectiveness of aerobic against yoga in improving depressive symptom among adolescent.

MATERIALS AND METHODOLGY:

60 adolescents having BDI-II scale score >15 were included in this prospective randomized trial, based on inclusion and exclusion criteria.

Inclusion criteria:-

- Adolescent of age 15-18 years
- Subjects who scored more than 15 on BDI-II scale and non-trained school students.

Exclusion criteria:-

- Hospitalization and surgery in past month
- Regular yoga or exercise practice longer than 1 month within past 5 years.

Each of them was explained about the study and its benefits and written consent was obtained from every adolescent. Depression was assessed using BDI-II (beck depression inventory-II) scale. The subjects were then randomly divided in 2 groups:
Group A- aerobics exercise
Group B- yoga training

Subjects from group A completed aerobic exercise for 10 consecutive days (under observation) each training session consisted 45minutes of aerobic training. Aerobic exercises were taken under 3 session i.e. warm up session(5-10 minutes), aerobic exercise(30 minutes) and cool down session(5 minutes). And subjects from group B completed yoga training for 10 consecutive days (under observation) each training session consisted of 55minutes of yoga training. Session started with 10minutes of loosening practice, 30 minutes of yogasana i.e. Hatha yoga (suryanamaskar), Baddha konasana (bound angle pose), Setu bandha sarvangasana (bridge pose), Paschimottanasana (seated forward pose), Urdhvamukhashvanasana (upward facing dog pose) followed by breathing technique (pranayama)and the session ended with 5minutes of relaxation(savasana).

All the outcomes were checked again and data was statistically analyzed.

- **STATISTICALANALYSIS:**

After the collection of data according to BDI-II scores, data was analyzed by SPSS-17 software package. The mean value between pre and post training and inventory scale test were compared by using paired T-test. The level of significance was set at 0.05%.

RESULT:

All students completed the session without interruption and no training

related complication were observed during the study.

Table 1: The Mean values of Group A and Group B according to pre and post training tests:

Group	Pre/post training test	Mean	No	Std Deviation
Group A	Pre training test	24.3667	30	7.30840
	Post training test	13.3000	30	11.36586
Group B	Pre training test	27.7333	30	7.06098
	Post training test	13.5667	30	8.06732

N: Number, PRE: pre training test, POST: post training test

Table 2: The pre and post values of within group comparison showing: Average improvement, T-value and P-value

Group	Pre/post training comparison	Average improvement	T-value	P-value	Result
Group A	Pre-post	11.06667	8.951	0.000	P<0.05 SIG
Group B	Pre-post	14.16667	9.657	0.000	P<0.05 SIG

According to the information of Table 2; After pre and post training of both the group, within group comparison showed significant improvement i.e. P<0.05

Table 3: The pre and post values of between group comparison showing: Average improvement, T-value and P-value

Group	Pre/post training comparison	Average improvement	P-value	T-value	Result
Group A	Pre-post	11.0667	1.616	0.112	P>0.05 NOT SIG
Group B	Pre-post	14.1667	1.616	0.112	P>0.05 NOT SIG

Contrary to expectation pre and post training comparison between group was not significant i.e. P>0.05

However statistically results were not much significant but clinically we observed that throughout the training session of both the groups; interest in participation was increased i.e. they became more active, positive effects were also seen on several other factors such as mood, self-esteem, self-belief and self-acceptance.

DISCUSSION:

Recent reports have shown that, during the adolescent age teenagers are often at risk of depression as a result of stressful events that take place personally, socially and academically. Research indicates that the children who experience a disruption in the developing brain which may later contribute to problems with learning, behavior and overall physical and mental well-being across the life span. (National scientific council on developing child, 2004)

The present study was aimed to test the effect of aerobic exercise and yoga training among depressed adolescents. The main findings of our result showed that, there was significant reduction in BDI score level. During the intervention phase, all the participants were motivated. In one of the earlier comparative study between yoga intervention and dance group with orphanage children having trauma related distress, the participants showed significant improvement in symptoms after participation in a 8-week program (5).

Subjects participating in aerobic dance showed improvement in BDI-II score. One of the recent findings also support that, dance intervention for adolescent girls with internalizing problems gave increased self-rated health, decrease somatic symptoms, emotional distress and use of medication, increase feeling of self trust and were considered cost-effective (6). In present study we preferred moderate intensity exercise protocol of 45 minutes, which showed reduction in BDI-II score. Legrand and heuze confirmed that intense and moderate aerobic exercises appear to have greater impact on decreasing depression compared with exercise undertaken at mild intensity. (7)
Possible mechanism behind these findings could be:-

I) The social interaction and a support of a group which met at regular session.
II) The extra attention and special interest of a health professional received by the subjects.
III) A structured programme of activity which may be important in counteracting the lack of motivation and lethargy that is characteristically found in depression.
IV) The reduction in muscle tension which may contribute to the reduction in trait anxiety. (8)
V) Highlighting enjoyment rather than performance has been shown to be important for increasing physical activity participation among adolescents.(6)

Relatively, subjects in yoga group also showed improvement in depression level; apart from this, yoga is widely used in the adolescent population in many health related conditions and one study with irritable bowel syndrome found 4 weeks of yoga practice reduces anxiety, depression, pain and functional disability.(9)

Possible mechanism behind the findings could be that yoga improves autonomic functions through influencing neuro-hormonal mechanism that suppress sympathetic activity through down-regulation of the hypothalamic-pituitary-adrenal axis (10). Reduced sympathetic activity leads to enhanced physical and mental relaxation. This may help in reducing anxiety, depression and improved self-esteem. It has been reported that active participation in practice and increase physical activity may improve self-esteem (11). By improving perceived physical competence This study was conducted to know which treatment was better (aerobic or yoga). Yoga is a static form of exercise and aerobic is dynamic one, both of them proved to be equally beneficial based on within group comparison on BDI score. As this was a pilot study and subject size was small, between groups comparison was not much significant.

• LIMITATIONS AND SUGGESSTIONS:

There were limitations in this study due to the small sample size. The focus of the study was to compare the effects of yoga and aerobic exercise on depression among adolescent. However if the study was implemented over a longer period of time, data of between group comparison reports may have strengthened the validity of the intervention and conclusion of the study.

It is suggested that future research involve a larger sample size by replicating similar studies at various schools within inner city school districts. Future researchers might also conduct a longitudinal study for longer period of time i.e. more than 6weeks and tracking students throughout different grade levels.

CONCLUSION:

Based on this pilot study, both aerobic exercise and yoga training for short-period had shown to be beneficial for depressed adolescents.

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