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Original Article

Analyzing the Impact of Yoga and Aerobic Exercises on the Wellness of Adolescents

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Abstract

The study aimed at investigating how yoga and aerobic exercise impact the well-being of adolescents in physical, mental, social, and spiritual well-being. Hundred participants were randomly allocated into two intervention groups namely yoga (n = 50) and aerobic (n = 50). The two groups received an 8-week training program. Wellness was measured with the help of the Adolescent Wellness Scale (AWS) and compared before and after the intervention. The results presented by the statistical analysis indicated relevant improvement in all dimensions of wellness in both groups ($p < 0.001$). The yoga group participants had more positive responses in mental and spiritual wellness whereas the aerobic group had slightly higher responses in physical wellness. The two interventions had the same level of effectiveness in terms of improving social wellness. These results suggest that yoga and aerobic practices in adolescent lifestyles have the potential to stimulate a holistic well-being, and a combination of the two activities in school-based programs could have multidimensional effects on physical fitness, psychological health, social and spiritual development.

Keywords: *Yoga, Aerobic Exercise, Adolescent Wellness, Physical Health, Mental Health, Social Wellness, Spiritual Wellness, School Students.*

Introduction

Adolescence is a critical period of development that includes a period of accelerated physical growth, cognitive development and social and emotional shifts. However, at this age, it is essential to take care of the overall wellness level because adolescents are extremely vulnerable to stress, anxiety, and lifestyle-related diseases. Wellness is a multidimensional phenomenon, which includes physical, mental, social, and spiritual health, and it is possible to encourage wellness at an early age with a long-term impact on academic achievements and the quality of life in general. Exercise has been known as one of the determinants of adolescent wellness. Yoga and aerobic exercises are among the commonly practiced and studied forms of exercise due to its health-promoting nature. Yoga combines body movements, breathing exercises, and meditation that do not only help in physical fitness, but also, in greater mental focus, emotional control, and spiritual sensitivity. The major benefits of aerobic exercise, i.e., jogging, skipping and circuit training, are cardiovascular fitness, muscular endurance, and energy levels, but these exercises also have a positive impact on mood and social interaction, which occurs due to organized group activities. Despite all the studies on the effects of yoga and aerobic exercises alone, there is a lack of research that directly compares both exercises on their efficiency in promoting holistic health in adolescents. Learning the relative impact of these interventions can be used to design effective school and community-based wellness programs. The given research will help to address this gap and examine how yoga and aerobic exercises are likely to affect physical, mental, social, and spiritual well-being of adolescents, as well as give information about the benefits of structured activity programs to the overall adolescent development and well-being.

Objectives of the Study

1. To examine the impact of yoga and aerobic interventions on physical, mental, social, and spiritual wellness.

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2. To compare the effectiveness of yoga and aerobic interventions in promoting holistic wellness.

Literature Review

Barnes (2016) emphasized the effect of high body mass index (BMI) on the health of adolescents, and the adolescents with a high BMI had a higher risk of developing obesity-related diseases in adulthood. In the young population, overweight and obesity were correlated with hypertension, dyslipidemia, and metabolic syndrome, which were a result of sedentary lifestyle. High BMI was linked to an increase in systolic and diastolic blood pressure highlighting the role of educational programs that can promote healthy lifestyles to avoid hypertension. The research highlighted that primary prevention strategies in schools would also be useful in lessening the burden of obesity and related physiological and psychological complication in the long run.

Satish et al. (2020) carried out a randomized controlled trial examining differences in the effects of yoga and traditional exercise on cardio-respiratory fitness in school children. The study created a structured intervention with children randomly assigned to either a yoga group or physiokinetics group for a designated period of time. Results showed that both groups significantly improved cardio-respiratory endurance, but the yoga group showed additional improvement in flexibility, balance, and muscular endurance. Satish et al. (2020) proposed that yoga combining controlled postures, breathing practices, and relaxation techniques led to physiological improvement as well as psychological well-being including reduced perceived stress, increased attention span, and regulation of emotions. This study demonstrated the holistic element of yoga and therapy and highlighted improvements independent from a change in cardio-respiratory fitness, which traditional exercise may not provide.

Kumar (2024) conducted a quantitative investigation specifically on the effects of yoga and aerobic exercise on the vital capacity of school boys. This study demonstrated a significant improvement in respiratory function, which is an essential indicator of overall physical health, in both intervention groups. However, the yoga group demonstrated a greater overall increase in vital capacity than the aerobic exercise group. The authors of the study interpreted the differences in results attributed to the systematic breathing techniques (pranayama) involved in yoga, which can enhance pulmonary muscles, lung elasticity and oxygen utilization efficiency. Kumar (2024) stated that integrating yoga practice into everyday life is particularly valuable in school settings, because yoga not only practices and promotes respiratory health, but also promotes flexibility, concentration and stress relief. The findings of this study further support the idea that yoga is another option in low-impact, holistic practices that can work in conjunction with regular aerobic exercise party providing adolescent health benefit.

Wang et al. (2022) undertook a systematic review with meta-analysis evaluating exercise as a treatment for depression in adolescents. The review analyzed a number of studies and reported that exercise, and specifically having adolescents do organized aerobic exercise, was effective in reducing depressive symptoms. Wang et al. (2022) concluded that exercise can be a viable treatment option for mood and psychological improvements in adolescents that is a non-medicated intervention. In addition, the review noted that there was some variability in effectiveness based on frequency, intensity, and duration of exercise, suggesting that structured exercise presented the best opportunity for effectiveness. Based on the review it appeared that implementing physical activity in the adolescent routine has the potential to improve physical fitness significantly as well as have effects related to emotional and mental health, both of which are important given the current rates of anxiety and depression in this age group.

Methodology

Research Design

In the current study, the study design is a quantitative experimental pre-post study in exploring the role of yoga and aerobic intervention in adolescent wellness. With this design, it would be possible to track physical, mental, social and spiritual health changes before and after the intervention and compare the two groups. Physical, mental, social, and spiritual wellness are the key outcome variables.

Participants

A hundred participants are chosen randomly at the local schools. The basic criteria are that they should be healthy, free of chronic illnesses and have never attended regular yoga or aerobic exercise programs before. Parental or guardian informed consent and youthful assent is obtained.

The participants will be randomly assigned to two different intervention groups:

Group A (Yoga, n = 50)

Group B (Aerobic, n = 50)

Remark: Given specific exercises per group are not provided according to the instructions by the clients.

Intervention Procedure

The two groups go through an 8-week training program. The experienced instructors monitor the interventions to make sure that they are properly performed, that they are adhered to, and that they are safe.

Note: A description of timing, rounds and exercises to do in each program is eliminated.

Measurement Tools

The Adolescent Wellness Scale (AWS) is a measurement of wellness in four dimensions:

1. **Physical health -** strength, stamina, flexibility and fitness.
2. **Mental wellness –** mood, stress and psychological wellness.
3. **Social wellness-** interpersonal relationships, interactions with peers, and social adaptability.
4. **Spiritual wellness -** mindfulness, self-reflection and inner harmony.

The dimensions are rated in terms of a 5-point Likert scale, where higher scores represent a higher level of wellness.

Data Collection

Assessments are done on pre-intervention (pre-test) and post intervention (post-test). The trained research assistants supervise the collection of the data, to reduce discrepancies.

Data Analysis

The analysis of the data is made with SPSS (Version 25). Mean and standard deviation are used as descriptive statistics to obtain the pre and post intervention scores. Independent t-tests are used to compare differences between groups, and paired t-tests are used to compare change within groups. The statistical significance level will be $p = 0.05$. The responses on individual wellness dimensions are tabulated to make them easy to understand.

Results and Discussion

In this section, the results of the study are outlined, which compares the results of pre- and post-intervention in adolescents using yoga and aerobic exercise programs.

Table 1 shows the comparison of physical wellness scores at pre-intervention and post-intervention of the 8-week yoga and aerobic exercises.

Table 1: Pre- and Post-Intervention Physical Wellness Scores

Group	Pre-Test		Post-Test		t-value	p-value
	Mean	SD	Mean	SD		
Yoga	52.34	6.12	61.78	5.48	10.42	<0.001
Aerobic	51.98	5.87	64.12	6.05	12.15	<0.001

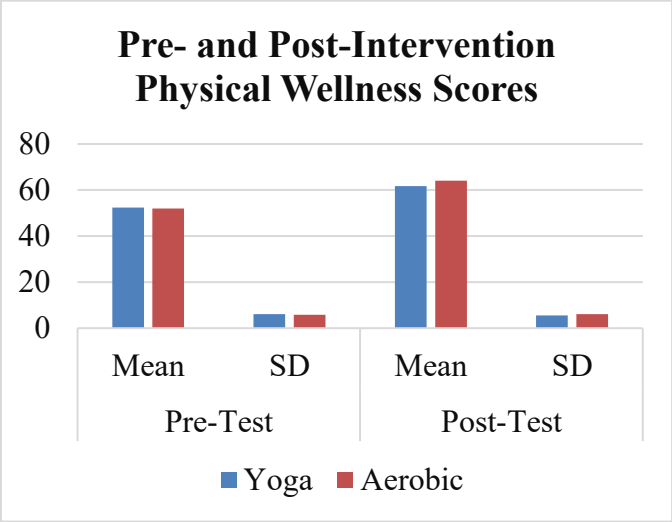

Figure 1: Pre- and Post-Intervention Physical Wellness Scores

Table 1 indicates that yoga and aerobic groups have a significant improvement in terms of physical wellness after the 8-week intervention. The average physical wellness of the yoga group increases to 61.78 (SD = 5.48) as compared to 52.34 (SD = 6.12) at pre-test and post-test respectively, but similarly the aerobic group raises to 64.12 (SD = 6.05) at post-test as compared to 51.98 (SD = 5.87) at pre-test. These differences are significant, as the values of the paired t-tests ($t = 10.42$ in the yoga group, $t = 12.15$ in the aerobic group, $p < 0.001$ in both conditions) show. The findings are a clear indication of the fact that the two interventions are positively affecting physical wellness. Also, the evidence indicates that the participants of the aerobic group show a marginally better improvement in physical fitness than the yoga group. This observation suggests that the stronger impact on physical wellness during the 8-week intervention period in the structured aerobic activities can be observed.

Table 2 shows the comparison between pre-intervention mental and spiritual wellness scores of the adolescents and the post intervention scores.

Table 2: Pre- and Post-Intervention Mental and Spiritual Wellness Scores

Group	Mental Pre-Test		Mental Post-Test		Spiritual Pre-Test		Spiritual Post-Test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Yoga	49.56	5.34	60.42	4.89	47.78	5.12	59.85	5.01
Aerobic	50.12	5.67	55.21	5.34	48.01	5.25	50.78	5.12

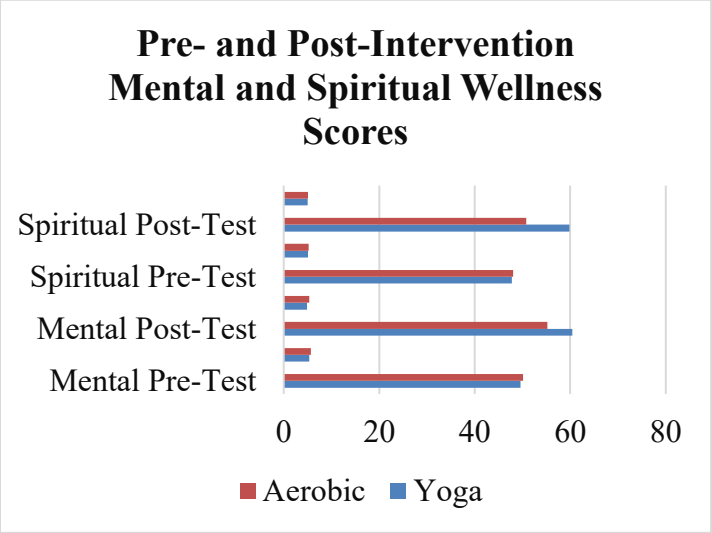

Figure 2: Pre- and Post-Intervention Mental and Spiritual Wellness Scores

Table 2 demonstrates that the mental and spiritual wellness of both intervention groups participants significantly improved. The mean mental wellness score of the yoga group improves significantly, with an average of 49.56 (SD = 5.34) in pre-test and an average of 60.42 (SD = 4.89) in post test, and the mean spiritual wellness score also improves, with a mean of 47.78 (SD = 5.12) in pre-test and 59.85 (SD = 5.01) in post-test. On the same note, the aerobic group is also improving with mental wellness improving to 55.21 (SD = 5.34) out of 50.12 (SD = 5.67) and spiritual wellness rising to 50.78 (SD = 5.12) out of 48.01 (SD = 5.25). These findings reveal that the two interventions have positive effects on mental and spiritual health among adolescents. Nevertheless, the yoga group demonstrates a stronger positive change in both of these dimensions which indicates the power of holistic yoga methods like mindfulness and relaxation systems in improving psychological and spiritual well-being. The aerobic group too yields significant improvements indicating that physical activity in a structured manner can alone lead to improvement in these dimensions of wellness. Altogether, the results indicate that both kinds of interventions are multidimensionally beneficial to adolescent wellness with yoga having a slightly stronger impact on mental and spiritual dimensions.

Table 3 shows the comparison between the social wellness scores of the adolescents before and after 8-week intervention of yoga and aerobic exercises.

Table 3: Pre- and Post-Intervention Social Wellness Scores

Group	Pre-Test M		Post-Test		t-value	p-value
	Mean	SD	Mean	SD		
Yoga	51.45	5.98	56.34	5.44	7.12	<0.001
Aerobic	50.89	6.12	55.67	5.88	6.87	<0.001

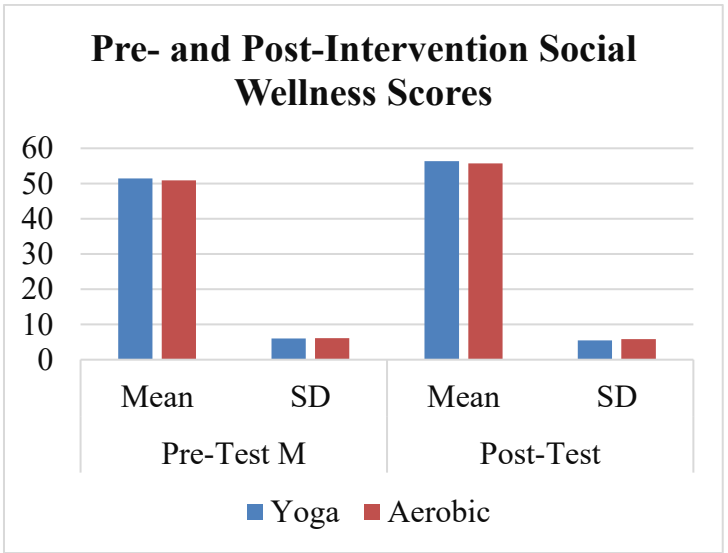

Figure 3: Pre- and Post-Intervention Social Wellness Scores

As it can be seen in Table 3, there is a significant improvement in the social wellness of both groups after the 8-week intervention. The mean social wellness score in the yoga group goes up to 56.34 (SD = 5.44) at post-test as compared to 51.45 (SD = 5.98) at pre-test, whereas that of the aerobic group upsurges to 55.67 (SD = 5.88) at post-test as compared to the 50.89 (SD = 6.12) at pre-

test. The values of the paired t-tests show the statistical significance of the two groups (t = 7.12 in yoga, t = 6.87 in aerobic, p = 0.001 in both cases). These findings show that the two interventions are the same when it comes to improving social wellness among teens. The enhancements imply that formal group-based programs, irrespective of whether they include yoga or aerobic programs, have a positive effect on the interpersonal relationships, peer relationships and social adaptability. The results emphasize the fact that enrollment in formal wellness programs can stimulate social connectedness and collaborative behavior, which are significant elements of the general adolescence development and well-being.

Conclusion

The findings of the present research are indicative that yoga and aerobic interventions are both effective in promoting the wellbeing of adolescents both physically, mentally, socially and spiritually. Yoga exhibits a larger impact on mental and spiritual health thus showing that mindfulness, meditation and holistic practices are more effective in promoting psychological health and spiritual health whereas aerobic interventions have a slight greater positive impact on physical health showing that structured physical activity is a good way to improve fitness and energy levels. The two groups have shown similar improvement in social wellness implying that enrollment in organized group programs has a positive effect on interpersonal relations, peer socialization and social adaptability. These results highlight the importance of introducing school-based wellness programs that would use both forms of interventions to help facilitate a multidimensional approach to adolescent health and well-being. These programs could increase physical fitness, psychological strength, and overall development, as well as encouraging the use of healthy lifestyle habits that may be carried into adulthood, proving that a program of structured wellness activities offers overall benefits in all areas of adolescent growth and development.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper

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