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Effect of Mindfulness-based Yoga Practices on Anxiety and Attention Level Among High School Children in a Selected High School, Bhubaneswar, Odisha

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Abstract

Background: *In a world filled with endless pressures and expectation, school-aged children often find themselves navigating through a labyrinth of stressors and anxiety. From the moment they wake up, their tiny minds are bombarded with worries about exams, social interaction, etc. Table 6 showsnoted that there was a statistically significant difference between Apgar score and risk factors, overweight/obese, and& history of GDM during pregnancy (P value = 0.000 and& 0.000,) respectively). The study's main goal is to determine how the MSRT influences student's levels of Anxiety and Attention. By comparing the pre-post intervention data. The researchers can evaluate whether the yoga-based relaxation technique has a positive impact on these variables.* ***Materials and Methods:*** *There was use of a quasi-experimental study design. Self-structured socio-demographic Performa and standardized tool that is utilizing the STAI Scale and Mindful Attention Awareness Scale which was used to assess the levels of anxiety, and attention respectively. Data from 80 pupils were gathered using a purposive sampling strategy. In selected high schools in Bhubaneswar, Odisha (40 in each intervention and control group).* ***Result:*** *According to the t-test value at p=0.001, which indicates an extremely high level of statistical significance, the experimental group showed a substantial difference in anxiety and attentiveness pre-and post-testing interval.* ***Conclusion:*** *The outcomes the current investigation suggest that using the Mind sound Resonance Technique has beneficial impact on high school students by enhancing their attention and reducing their anxiety levels. MSRT could be an effective intervention for improving the overall well-being of students in educational setting. However, it is vital to remember that the study only included a small number of participants. Therefore, to strengthen the validity and applicability of these findings, it is recommended that further research be conducted with a larger or more diverse sample. This would allow for a more comprehensive understanding of the potential benefits of MSRT and its generalizability to a wider population.*

Keywords: Anxiety, attention, high school students, MSRT, social interaction

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INTRODUCTION

The stress brought on by these regular occurrences may have long-term effects on

children's health. resulting in worry and other health issues. The children may be better able to handle these stressors and avoid their effects on their future health if they are given coping mechanisms [1, 2].

It is crucial to address these issues and provide support for students experiencing a high level of stress and anxiety. Schools can implement strategies such as stress management programs, counseling services, and creating a supporting and inclusive learning environment. Additionally, parents and educators can play a significant role in promoting healthy coping mechanisms, encouraging open communication, and helping students set realistic goals [3].

It is significant to emphasize that there is a complex and variable link between anxiety and cognitive function. While some students may experience a decline in cognitive abilities due to anxiety, others may be able to maintain their performance or even perform better under pressure [4]. It is essential to consider individual differences and provide appropriate support and strategies to help students manage their anxiety and optimize their cognitive performance [5].

Yoga is known to foster mindfulness, which entails being fully present in the current moment without passing judgement. This practice enables individuals to develop a heightened awareness of their thoughts, emotions and physical sensation, thereby enhancing their ability to cope with stress and anxiety. By cultivating mindfulness, individuals also learn to accept and respond to stressors in a more balanced and adaptive manner, promoting overall well-being [6, 7].

Research has also shown that MSRT can be beneficial for individuals with low-self-esteem by promoting relaxation and a sense of well-being. MSRT helps individuals develop a positive self-image and improve their confidence. This can have a significant impact on their overall mental health [8, 9].

Objectives

1. To evaluate the level of anxiety and attention of the High school students.
2. To examine impact of MSRT on high school pupils' post-intervention levels of anxiety and attention.
3. To determine whether there is a correlation in between high school students' MSRT pre- and post-test results and their degree of focus and anxiety [10, 11].
4. To determine the relationship between the amount of anxiety and attention and specific sociodemographic factors.

MATERIALS AND METHODS

Study Design and Setting

in June 2021, a quasi-experiment design with a pre-post control group was used for this investigation [12, 13]. The sample consisted of High school students from "Utkalmiani Uchha Vidyapitha, Kendupatana Barang and Jaydev Sikhyakendra, Dadha-Patna Barang", Bhubaneswar, Odisha. The researchers used a deliberate sampling technique to choose the participants for the study [14]. They also obtained ethical clearance from the Sikdha O Anusandhan Institutional ethical committee to ensure that the research followed ethical guidelines and protected the rights and well-being of the participants. Additionally, they obtained approval from the principals of the institutions involved in the study [15].

Study Population

The study comprised high school students aged 14–16 years from the previously mentioned institutions. A total of 40 students were assigned to the experimental group, while another 40 students formed the control group. These groups were created based on individuals who met the specified inclusion criteria [16, 17].

Sampling Methodology

The study consisted of three phases. In the first phase, a consent statement was obtained from the participants [18, 19], and their levels of anxiety and attention were measured using specific tools. The

students were then purposively distributed into an experimental group and control group. Demographic data and assessments of anxiety and attention levels were collected [20].

In the second phase, demographic variables such as age, sex, family income, and family type were gathered through questionnaires and interviews. The anxiety and attention level were assessed using the State-Tait Anxiety Inventory scale and the mindful Attention Awareness scale test [21]. Pre-tests were conducted for both groups. During the intervention phase, the experimental group underwent an advanced yoga method called MSRT for 8 weeks, with each session lasting 30 min. The intervention took place at school [22].

In the third phase, a post-test was given to both the intervention and control groups 1 day after the intervention period ended, in order to evaluate the impact of MSRT. The appropriate sample size was determined using a non-probability sampling technique and statistical calculation [23].

These ethical procedures and statistical analyses ensured the validity and reliability of the study's findings [24].

Questionnaires

Following questionnaires were used in the study:

Sociodemographic Background Characteristics

To collect the socio-demographic information of the participants, a self-designed questionnaire with 9 items was used. The items include age, gender, education level family structure, family environment, residential location, monthly income, and socio-economic status [25, 26].

State-Trait Anxiety Inventory Scale

The anxiety level of participants was measured by using a standardized scale with 20 items. The scale asked the participants to rate how they felt at the moment on a 1, 2, 3, 4 scale for each item. A higher score shows a higher anxiety level. Three levels of scores were determined: low (920–37), moderate (38–44), and high ranges (45–80) [27].

MAAS (Mindful Attention Awareness Scale)

The participants completed a 15-items tool that assessed their daily mindfulness experiences. They related how often they had each experience on a 1 to 6 scale. The result was adding together to produce the result of score for mindfulness, with higher values suggesting greater attention. The scores were classified into three levels: Low (15–45), moderate (46–76), and high (77–90) [28].

By having a Cronbach's alpha of 0.76 and a test-retest reliability of 0.69, the scale demonstrated good dependability. Additionally, there were no notable variations in mindfulness scores among male and female students or among students of different ethnicities. Therefore, the Persian version of the MASS can be effectively utilised for clinical and research purpose in Iran.

Statistical Analysis

With the use of both descriptive and inferential, analyses were carried out using SPSS version 22.0. Findings from the examination of participants demographic data were including age, sex, monthly family income, socioeconomic status, and types of family.

Pre- and post-tests were used in the study to evaluate the intervention effect of each variable. An independent paired t-test and an unpaired t-test were applied to the data to analyse it. Additionally, here we used the Karl-Pearson correlation coefficient to determine the correlation between the pretest, post-test scores of MSRT with anxiety and attention level among the participants and to examine the relationship between the level of anxiety and attention with a few socio-demographic factors. The chi-square test was used for the inferential analysis, using a 0.05 significance level [29].

RESULTS

Demographic Characteristics

Demographic information shows that the majority of participants in the experimental group (60%) were between the ages of 15 and 16 years, while 45% in the control group were 16 years old. In terms of gender distribution, both the experimental and control groups had an equal split of 50% boy and 50% girl participants in the experimental; and control group had 57.50% male participants. Among the participants in the experimental group, the majority (52.50%) belonged to the middle socio-economic status. Additionally, 57.50% of the experimental group were in the 10th class, while 77% of the control group were in the 9th class. The vast majority of those taking part in the experiment group (57.50%) came from joint families, whereas 57.50% in the control group came from nuclear families. Furthermore, both groups had a significant proportion of participants from urban areas, with 67.5% in the experiment group and 87.50% in the control group. Majority of the participants in the experimental group (90%) and in control group (82.50%) belongs from the Hindu religion. The majority of participants reported a monthly family income of less than Rs. 10,000, and many of them came from families where the mother was the primary source of support and care.

Table 1. Frequency and percentage distribution of demographic characteristics of both experimental and control group.

Characteristics	Experimental group		Control group	
	Frequency	***P(%)***	***Frequency***	***P(%)***
Age (years)				
14 years	5	12.50%	10	25%
15 years	24	60%	12	30%
16 years	10	25%	18	45%
Gender				
Male	23	57.50%	23	57.50%
Female	17	42.50%	17	42.50%
Socio-Economic status				
High	2	5%	0	0%
Low	17	42.50%	12	30%
Middle	21	52.50%	28	70%
Education				
9th class	17	42.50%	31	77.50%
10th class	23	57.50%	9	22.50%
Types of family				
Joint	23	57.50%	17	42.50%
Nuclear	17	42.50%	23	57.50%
Residential area				
Rural	13	32.50%	5	12.50%
Urban	27	67.50%	35	87.50%
Religion				
Muslim	4	10%	7	17.50%
Hindu	36	90%	33	82.50%
Monthly family income (Rs.)				
20,000–50,000	5	12.50%	18	45%
10,0001–20,000	17	42.50%	3	7.50%
<10,000	18	45%	19	47.50%
Family environment				
Both parents are supportive and caring	31	77.50%	32	80%
Both parents are strict and achievements oriented	5	12.50%	5	20%
Mother only supportive and caring	4	10%		

The study's findings found that MSRT affects anxiety and attention levels among children. Before the intervention, all the children had high anxiety and low attention levels. After the intervention, half of the children had high anxiety, and the other half had low anxiety. The attention level improved for most of the children, with 90% having moderate attention and 2.5% having high attention. The paired test indicates that the intervention led to a significant decrease in the mean anxiety level ($P < 0.01$) and a significant increase in the mean attention level ($P < 0.01$) within the intervention group. The results suggest that MSRT was effective in improving attention and reducing anxiety among children (Tables 1 and 2).

Table 2. Measurement units, SD, to evaluate the impact of the Intervention (MSRT) on anxiety and Attention level paired t value and P value were used (N= 80 (n1=40, n2 =40)).

Criteria	**Mean ± S.D.**		**t-value**	**df**	**p-value**
Anxiety level	***Pre-test***	***Post-test***			
The Experimental Group	58.025±4.52	44.55±4.88	20.47	39	0.01*
Control Group	56.75±5.75	56.15±5.67	3.97	39	0.070
Level of Attention					
Experimental Group	35.65±7.69	55.97±5.44	14.36	39	0.01*
Control Group	35.97±5.88	38.75±5.99	1.94	39	0.060

*$P \leq 0.05$ *(Highly Statistically Significant).*

The study also compared the outcome from the preliminary and final tests on Anxiety and Attention level between the control and experimental groups using unpaired t-tests. Additionally, experimental group exhibited a significantly higher mean attention level ($p<0.00$) in comparison to control group. The findings of the study indicate that the intervention had a beneficial effect on reducing anxiety levels and enhancing attention among the participants. The study also used the Karl-Pearson correlation coefficient to examine the relationship between anxiety and attention level in the intervention group before and after the intervention. The result showed a negative correlation meaning that as anxiety level decreased, attention level increased (Tables 3 and 4).

Based on the inferential analysis conducted at a significance level of 0.05, the results indicated that there was no significant association between the level of anxiety and attention and the selected socio-demographic variables.

This suggests that factors such as age, gender, education level, and other socio-demographic variables did not significantly influence the levels of anxiety and attention among the participants.

Table 3. The mean, standard deviation, unpaired t value, p-value, and pre-test scores of the experimental and control groups were used to analyze the effects of the MSRT on the outcome variables (N=80 (n1=40, n2=40)).

Criteria	**Post-test**				
	Mean ± S.D.	***SE***	***t-value***	***df***	***p-value***
Level of Anxiety					
Experimental Group	44.55±4.88	.77	9.79	39	0.000*
Control Group	56.15±5.67	.89			
Level of Attention					
Experimental Group	55.97±6.44	1.01	12.38	39	0.000*
Control Group	38.75±5.99	.94			

*$P \leq 0.05$ *(Highly Statistically Significant).*

Table 4. Correlation between the MSRT with anxiety and attention pre and post -test scores, among high School Children by using the Karl Pearson Correlation Coefficient (N=80 (n1=40, n2=40)).

Correlation between Karl Pearson's correlation		**Post-Test score**
Coefficient	***Pre-test score***	
Anxiety level with attention level	r=–0.195	r=–0.123

DISCUSSION

The experiment aimed to measure the anxiety level of high school students before and after an intervention. The control group did not experience a significant reduction in anxiety, whereas the experimental group did. In the experimental group, all students (100%) reported high anxiety, before the intervention, but only half of them (52.5%) did so after intervention. Additionally, following the intervention, 40% of the experimental group reported having minimal anxiety. In contrast, in the control group, almost all students (95%) reported high anxiety both before and after the intervention, and only a small fraction (5%) reported moderate anxiety after the intervention.

The present study was supported by the study conducted by Senapati et al., titled 'Effect of Mind Sound Resonance Technique (MSRT) on Working Memory Among High School Children in a Selected High School, Bhubaneswar.' The difference between the two studies involving MSRT lies primarily in their research objectives and the specific variables investigated. One study assesses working memory, while the other assesses attention and anxiety levels. This study involves measuring attention through tasks that require concentration and monitoring anxiety levels through self-reporting measures. It aims to determine whether MSRT has a positive impact on attention and reduces anxiety. The methods measurements and outcomes in each study would be tailored to their respective objectives [30].

The experiment aimed to measure the attention levels of high school children before and after an intervention. The findings indicated that the intervention group experienced a significant improvement in attention levels, while no significant change was observed in control group. This suggests that the MSRT had positive effect on enhancing attention, especially for the participants who received the intervention. In the intervention group, most students (92.5%) reported mild attention before the intervention but only a few (7.5%) reported high attention. In contrast, in the control group, most students (85%) reported mild attention before the intervention and almost the same proportion (83%) did so after the intervention. Only a negligible fraction (7%) reported high attention after the intervention.

CONCLUSION

The study's findings led researchers to the following conclusion: MSRT training may improve high school students' attention spans and lower their anxiety levels. Additionally, regular use of MSRT in class room routine in school may contribute to improving high school students' psychological welfare as well as their cognitive function.

ADDITIONAL INFORMATION

All participants in this study provided their consent or had their consent waived. The research ethics committee at sum nursing college, Siksha O Anusandhan university, approved the study with the reference number SOA/SNC/IRB-252/2020. The research ethics committee (IRB, IEC) has examined the research study proposal and is pleased to grant final ethical approval for the mentioned project. The study did not involve any animals or animal tissues, and all authors confirm this. There are no conflicts of interest among the authors. None of the authors received financial support for the submitted work, and they have declared no current or previous financial relationships with any organization related to the study. Furthermore, the authors have stated that there are no other relationships or activities that could potentially influence the submitted work.

Limitations

The study focuses on students aged 14 to 16 years which may not capture the experiences and perspectives of older or younger students. The findings may not be applicable to students outside of this age group.

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