

A Study to Assess the Effectiveness of Mindfulness Based Stress Reduction Therapy in Reducing Stress among the Adolescent Students in Selected Schools at Bhopal

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ABSTRACT

Background: Adolescence is a stage of human development that occurs in between childhood and adulthood. Behavioural and emotional pattern experienced across adolescence can spiral into positive or negative outcome processes. **Objectives:** To assess the pre-test and post-test level of stress and find out the effectiveness of mindfulness-based stress reduction therapy, and to associate the post-test stress score with their selected demographic variables. **Methods and materials:** A pre-experimental design was chosen. Non probability purposive sampling technique used to select the sample of 90 school students. Perceived stress scale was used to assess the stress level. **Results:** effectiveness of the study point was estimate of 18.57% and interval estimate was 16.40% to 20.72%. Mean difference with 95% CI. **Discussion:** Dawn Bazarko et al (2013) explained that the mindfulness was decreased the stress level ($p < 0.001$). This was supported to my study. So, mindfulness had significant to reduce stress level among the adolescent students. **Conclusion:** Statistical significance was calculated by using chi square test and student independent t-test. So, mindfulness-based stress reduction therapy had significant impact on reducing stress among the adolescent students. Mindfulness therapy is safer and more effective intervention in all settings.

KEYWORDS: Stress, adolescence students, mindfulness

INTRODUCTION

Adolescence is a stage of human development that occurs in between childhood and adulthood. Adolescence is generally viewed as the age running between 10 to 19 years (UNICEF 2013). During this period, they attain physical and mental growth. The brain had undergone various developments in early adolescence and it affects physical and emotional skills including mental abilities. When they grow, they take additional responsibilities and they experiment with new way of doing things, finally push for independence. So, this is the time in which value and skills are developed, that have great impact on the well-being.

Nikola Balvin (UNICEF- “Evidence from neuroscience”, 2017) is the innovative editor and he explained about the importance of support in early

developmental stage, initiate changes in policies as well as intervention for adolescents. From that poverty, violence, stress, technology may lead positive and negative impact on brain development. But with the help of the interventions like socio emotional learning, stress management, nutrition and counselling may create positive relationship and will be able to cope with the changes.

Ron Dahl (UNICEF 2016) explained about the adolescence brain with particular impact on neural circuits involved in processing emotions, risks, rewards and social relationship. Behavioural and emotional pattern experience across adolescence can spiral into positive or negative outcome as a result of complex interaction of social, emotional, psychological, behavioural and neural development

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processes. Much of the neural related scientific evidence is developed in the global north and more information is needed to reflect the various experiences of adolescents including the harsh situation, conflict, chronic stress and malnutrition. Interdisciplinary activities were needed to fill knowledge gap and make comfortable life. It's a crucial period of life to intervene design. The appropriate matched interventions need, which are cost - efficient, scalable and sustainable, can improve adolescence" well-being for the rest of their lives.

Stress is defined as the adverse relation of the people to excessive pressure or other types of demand placed on them. Stress is a condition or feeling experienced by a person perceives that "the demands exceed the personal and social resources of the individual is able to mobilize". When environmental demands strain an organism's adaptive capacity, it results in both psychological as well as biological changes that could place a person at risk for illness. Stress occurs when pressure exceeds his or her perceived ability to cope. Problems begin when ordinary stress becomes too much, it results in both psychological and biological changes and could place a person at a risk of illness.

It is agreed upon that the mindfulness is one of the meditation practices, in which „moment to moment awareness is intentionally non-reactive and non-judgmental. " The practitioner attends to the full range of whatever is present in the field of heretic experiences in a non-judgmental way. So, the practitioner fully engages with whatever he experiences. If someone is not practicing mindfulness they may catch up in past mistake and may feel anxious or worried about the future. Intensive training of the mindfulness and its application in day-to-day life will help in coping with stress, pain, illness, reduce the emotional symptoms and alleviate the suffering as well as it is an effective therapy for various mental illnesses. Mindfulness contributes directly to the development of cognitive, performance skills and executive function. School going adolescent students were beneficial with mindfulness for their improvement in attention, concentration, memory, problem solving, reasoning and multi-tasking.

Need of the study:

The pressure of modern life, the multiple tasks for the adolescence reduce the physical and emotional stamina, irritability, tension, emotional exhaustion, family conflict, transition period of life and further consequences these are the most important cause for the adolescence" stresses. This unresolved stress leads to inadequate attention, lack of concentration which leads to depression, eating disorder,

eliminating disorder, substance abusing and the most important problem of suicide. Identification of adolescence stresses and helping them to overcome those stress and stressor is the important task for us to save our assets of kids.

GLOBAL SCENARIO

Worldwide total population of 7.7 billion and the adolescents aged between 10 to 19 years make up 16 percent of the total population.

As per **UNICEF** (June 2018), it was estimated that 1.2 billion adolescents were present in the world. More than half of all adolescents globally live in Asia. As per **WHO** (Sep 2018), one in six people are aged 10 to 19 years. Mental health maturity start by 14 years and improper development may account for 16% of the global burden of diseases. Depression is one of the leading causes of illnesses and disability among adolescence. Suicidal is the second leading cause of death in 15 to 19 years old children. Consequences of mental ill condition of adolescence extending to adulthood, limiting the opportunity to fulfill the lives as adults, which impair physical and mental health. **WHO** gives suggestions to prevent and promote activities which are one to one, group delivered activities school-based interventions etc.

Ratna Shila Banstola (2017) conducted a descriptive cross-sectional study on psychosocial problem among school-going adolescents in Pokhara, Western Nepal. Non-probability purposive sampling technique were used, 360 number of samples were selected from public school of Pokhara Lekhnath Metropolitan city in Western Nepal. Tools were used such as socio demographic questionnaires, questions regarding family and school related factors and standardized tool for measuring psychosocial problems (Paediatric Symptoms Checklist – Youth Report). Among the 360 participant 65.4% were 14 – 16 years, females were slightly higher 56.1%, adolescents facing physical and verbal abuse (OR=13.54, P=0.000), facing poor home environment (OR=5.01, P=0.000), high academic and school related stress (OR=5.304, p=0.000) and hardly sufficient income (p=0.000, OR=3.29). This study pointed that the school and family combined together for prevention of psychosocial problems.

PROBLEM STATEMENT:

"A study to assess the effectiveness of mindfulness-based stress reduction therapy in reducing stress among the adolescent students in selected schools at Bhopal."

OBJECTIVES:

- To assess the pre-test level of stress among the adolescent students in selected school.

- To evaluate the effectiveness of mindfulness-based stress reduction therapy on stress reduction among the adolescent students (post-test).
- To compare the pre and post test score of stress among the adolescent students.
- To find association between the post-tests level of stress among adolescents with the selected demographic variables.

HYPOTHESIS:

H₁- There will be significant difference between the pre-test score and the post test score of stress among the adolescent students.

H₂: - There will be significant association between the adolescent students post stress test score with their selected demographic variables.

OPERATIONAL DEFINITIONS:

Effectiveness- In this study it refers to effectiveness is the measure of the ability of mindfulness-based stress reduction therapy to reduce stress that can be quantitatively measured.

Mindful based stress reduction therapy- In this study it refers to Mindful based stress reduction therapy is the techniques to create stimulate and maintain an optimum state of physical, emotional, mental, and spiritual health among the adolescents by using six steps of mindful breathing, mindful observation, mindful awareness, mindful listening, mindful immersion and mindful appreciation.

Adolescence- In this study it refers to adolescence is a period marked by changes in the way individuals view themselves and in their capacity to function independently. In this study the age group runs from 14 – 15 years of age.

Stress- In this study it refers to stress is a condition or feeling experienced when a person perceives that "demands exceed the personal and social resources the individual is not able to mobilize."

School - In this study it refers to school is an administrative unit dedicated to and designed to impart skills and knowledge to students.

MATERIAL AND METHODS:

Research approach: Quantitative research approach

Research design: *pre-experimental one group pre-test post-test design.*

Variables:

Independent variables: an intervention for stress reduction, it was known as mindfulness-based stress reduction therapy which includes the six steps of mindful breathing, mindful observation mindful awareness, mindful listening, mindful immersion and mindful appreciation.

Dependent variables: The stress among the adolescent students was considered as the dependent variable.

Demographic Variable

In this present study, demographic variables were age, sex, type of the family, education of the parents, income, residential area, BMI, academic scoring, parental status, any previous exposure to relaxation exercise and no of siblings.

Population:

Target Population- Adolescent students at the age of 14 to 15 years.

Accessible population – The population of the study comprises the adolescent students who were studying in the girl's higher secondary school, Bhopal.

Sample: Samples of the students were studying in 9th standard and those who fulfil the inclusion criteria from Girls Higher Secondary School, Bhopal.

Sample size: 90 students.

Setting of the study: In this present study consist of 90 students were selected from the government girls' higher school who met with inclusion criteria.

Sample techniques:

Non probability – purposive sampling was used for the present study.

Criteria for sample selection:

Inclusion criteria:

- Adolescent students who were attending in a selected school Bhopal.
- Adolescent students between the age group of 14 -15 years.
- Adolescent students who had moderate and high level of perceived stress as per perceived stress scale.

Exclusion criteria:

- Adolescent students below 14 years and above 15 years.
- Adolescent students who were not willing to participate in the study.
- Adolescent students who were not available at the time of the study.
- Adolescent students who were taking medications.
- Adolescent students who was not able to cope with the mindfulness practices.
- Adolescents who participated the other study during the same time.
- Adolescent students who had low level of stress as per perceived stress scale.

Tool and method of data collection:

DEVELOPMENT OF TOOL

➤ In this study, the following tools were used by the investigator, that were demographic questions and perceived stress scale. Extensive review of literature was done from various sources in order to select the most appropriate tool for this study. The construction of tool was started with obtained content validity and opinion from nursing experts, clinical psychologist and psychiatrist. During the pilot study, direct assessment was done among the adolescent students.

DESCRIPTION OF THE TOOL

In this study the tool consists of two parts

Section-A: The demographic variables involve age of the adolescent students, sex, type of the family, education of the parents, income of the parents, residential area, Body Mass Index, academic scoring, parental status, any previous exposure to relaxation exercise and no of siblings.

Section-B: The perceived stress scale was developed by Mr. Sheldon Cohen for measuring the perception of stress. It also helps to measure the degree of one's life situation is appraised as stressful. The scale was designed to find the stressful item of unpredictable, uncontrollable and overload respondents in their lives. It includes the direct questions which deal with current experience of stress level. In this, the questionnaires were general in nature, easy to understand, ask about the feelings and thoughts during the last month.

SCORING INTERPRETATION

The scale has 10 questions. In that, answers consist of following options and its scoring are 0=Never, 1=Almost Never, 2=Sometime s, 3=Fairly Often, 4=Very Often (1, 2, 3, 6, 9, 10). The scoring obtained by reversing response like 0=4, 1=3, 2=2, 3=1 and 4=0 (Items 4, 5, 7 and 8). The individual scores on Perceived Stress Scale range from 0 to 40.

Description of scoring key perceived stress scale

S. No	Range	Level
1.	0-13	Low
2.	14-26	Moderate
3.	27-40	High

Reliability of tool: The reliability of the tool was determined by Cron-Bach alpha method. Stress score reliability correlation coefficient value is **0.83**. This correlation coefficient is very high and it is a good tool to assess the effectiveness of Mindful Based Stress Reduction Therapy. Hence the tool was found to be reliable to conduct the study

Data collection procedure:-

- The formal permission was obtained from The Institutional Ethics committee for conducting the pilot study and the main study.
- The subjects were selected according to the inclusion criteria as per purposive sampling techniques.
- The initial task was obtained permission, for that meet the principal and self-introduced by the investigator, explained the procedure of the data collection and the study.
- Investigator obtained the timing schedule for the students of 9th standard. As per vice principal guideline investigator took the students with the time schedule. Introduce herself to the students, next clearly explained about the purpose of the study, got informed consent and ensured confidentiality.
- Explained the students that they had rights to withdraw from the study at any time and assured that the details of their profile will be maintained confidentiality.
- The data collection started after accommodated the students comfortably, collected demographic data and assessed the stress level by using pretest questions.
- As per inclusion criteria 100 students were included, after the drop out and error 90 adolescent students were divided into 4 groups among themselves for convenient of the students as well as the investigator. First two days were taken for conducting the pre-test.
- The next day onwards intervention of mindfulness-based stress reduction therapy along with six steps of mindful breathing, mindful observation, mindful awareness, mindful listening, mindful immersion, mindful appreciation was implemented with lecturer cum demonstration method along with pamphlet and encouraged the students to do the six-step s.
- Each step explained and demonstrated up to two to three minutes after establishing the rapport. The students were participated with interest and demonstrated in enthusiastic manner. The next session was started with established rapport, asked about the previous day experiences, cleared the doubts and encouraged the students demonstrated the same steps. Finally, explained about application mindful practices in day-to-day life.
- The post test was conducted with same questionnaire. The investigator observed the scoring stress level regarding the impact of the

intervention. The data collection procedure was terminated by thanking the students as well as the principal.

Plan for data analysis:

The plan for data analysis includes-

- Both descriptive and inferential statistics were used in this study. In descriptive statistics frequency and percentage distribution, mean and standard deviation were used. In inferential statistics paired „t“ – test, chi square test and Mc.Nemer test were used to test the rese arch hypothesis.

- Stress score were given mean and standard deviation. Difference between pre-test and post - test were analysed by using student paired“ test and generalized Mc. Nemer test.
- Associations between levels of stress score with demographic variables were analysed by using chi square test. Difference between pre-test and post-test on effectiveness of mindfulness-based stress reduction therapy were analysed by using mean difference with 95% of CI, $p < 0.001$ was considered statistically significant.

RESULTS:

Table – 1: Demographic Profile of the adolescent students

Demographic Profile		No. of Students	%
Age	14 years	59	65.56%
	15 years	31	34.44%
Gender	Boys	0	0.00%
	Girls	90	100.00%
Type of Family	Nuclear family	54	60.00%
	Joint family	27	30.00%
	Extended family	9	10.00%
Occupation of the Head Score	Legislators, Senior Officials, man	0	0.00%
	Professionals	0	0.00%
	Technicians and Associate Prof	0	0.00%
	Clerks	9	10.00%
	Skilled Workers and Shop	23	25.56%
	Skilled Agricultural & Fishery	15	16.67%
	Craft & Related Trade Workers	9	10.00%
	Plant & Machine Operators, asst	15	16.67%
	Elementary Occupation	17	18.89%
	Unemployed	2	2.22%
Education of the Head Score	Profession or Honors	0	0.00%
	Graduate	8	8.89%
	Intermediate or diploma	10	11.11%
	High school certificate	31	34.44%
	Middle school certificate	23	25.56%
	Primary school certificate	12	13.33%
	Illiterate	6	6.67%
Monthly Family Income	>Rs.126, 360	0	0.00%
	Rs.63182-126,356	0	0.00%
	Rs.47, 266-63178	0	0.00%
	Rs.31, 591-47262	5	5.56%
	Rs.18, 953-31589	15	16.67%
	Rs.6327-18949	34	37.78%
	≤ Rs.6323	36	40.00%
Area of residence	Urban	90	100.00%
	Rural	0	0.00%
Medium of education	English	90	100.00%
	Tamil	0	0.00%
Weight	40-50 Kg	56	62.22%
	51-60 Kg	32	35.56%
	>60 Kg	2	2.22%

Height	140-145 cm	31	34.44%
	146-155 cm	43	47.78%
	156-160 cm	10	11.11%
	>160 cm	6	6.67%
BMI	Below 18.5 kg/m ²	15	16.67%
	18.5 – 24.9 kg/m ²	71	78.89%
	25 – 29.9 kg/m ²	4	4.44%
	> 30.0 kg/m ²	0	0.00%
Parental status	Both are alive and together	63	70.00%
	Both are alive living and separate	19	21.11%
	Single parent	8	8.89%
	Both are not alive	0	0.00%
No of siblings	Nil	22	24.44%
	One	55	61.11%
	Two	9	10.00%
	> Two	4	4.44%
Previous exposure to any relaxation techniques	No	48	53.33%
	Yes	42	46.67%
Academic performances	<50 %	18	20.00%
	50 to 70 %	29	32.22%
	>70 %	43	47.78%

S. No	Question	Maximum score	Mean score	Sd	% of mean score
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	4	2.00	1.10	50.00%
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	4	2.36	1.08	59.00%
3.	In the last month, how often have you felt nervous and stressed?	4	2.02	1.18	50.50%
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	4	1.79	1.22	44.75%
5.	In the last month, how often have you felt that things were going your way?	4	2.29	.91	57.25%
6.	In the last month, how often have you found that you could not cope with? All the things that you had to do?	4	2.06	1.12	51.50%

Table - 2: Each question wise pre-test percentage of perceived stress score

S. No	Question	Maximum score	Mean score	Sd	% of mean score
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	4	2.00	1.10	50.00%
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	4	2.36	1.08	59.00%
3.	In the last month, how often have you felt nervous and	4	2.02	1.18	50.50%

	stressed?				
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	4	1.79	1.22	44.75%
5.	In the last month, how often have you felt that things were going your way?	4	2.29	.91	57.25%
6.	In the last month, how often have you found that you could not cope with? All the things that you had to do?	4	2.06	1.12	51.50%
7.	In the last month, how often have you been able to control irritations in your life?	4	1.98	1.24	49.50%
8.	In the last month, how often have you felt that you were on top of things?	4	1.93	1.11	48.25%
9.	In the last month, how often have you been angered because of things that happened that been outside of your control?	4	2.31	1.21	57.75%
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	4	2.31	1.20	57.75%
	Total	40	21.04	3.42	52.60%

Table - 3: Pre-test level of perceived stress score

	No. of students	%
Low stress	0	0.0%
Moderate stress	83	92.2%
High perceived stress	7	7.8%
Total	90	100.0%

In general, none of the students has low level of stress, 92.2% of them having moderate level of stress and 7.8% having high level of stress.

Stress scoring interpretation 0=Never, 1=Almost Never, 2=Sometimes, 3=Fairly Often, 4=Very Often. Minimum is 0, maximum is 4, total questions are 10, and maximum marks are 40.

Table - 4: Each question wise post-test level of perceived stress score among adolescent students

S. No	Question	Never	Almost Never	Some times	Fairly often	Very Often
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	23	41	19	6	1
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	21	38	20	9	2
3.	In the last month, how often have you felt nervous and stressed?	25	31	24	9	1
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	18	20	36	13	3
5.	In the last month, how often have you felt that things were going your way?	12	22	41	12	3
6.	In the last month, how often have you found that you could not cope with? All the things that you had to do?	13	22	42	11	2
7.	In the last month, how often have you been able to control irritations in your life?	29	16	30	10	5
	often have you felt that you were on top of things?	27	16	26	12	9
9.	In the last month, how often have you been angered because of things that happened	36	29	13	7	5

	that been outside of your control?					
10.	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	28	36	19	5	2

Table - 5: Each question wise post-test percentage of perceived stress score

S. No	Question	Maximum score	Mean score	SD	% of mean score
1.	In the last month, how often have you been upset because of something that happened unexpectedly?	4	1.12	0.91	28.00%
2.	In the last month, how often have you felt that you were unable to control the important things in your life?	4	1.26	1.00	31.50%
3.	In the last month, how often have you felt nervous and stressed?	4	1.22	1.00	30.50%
4.	In the last month, how often have you felt confident about your ability to handle your personal problems?	4	1.59	1.07	39.75%
5.	In the last month, how often have you felt that things were going your way?	4	1.69	.98	42.25%
6.	In the last month, how often have you found that you could not cope with? All the things that you had to do?	4	1.63	.95	40.75%
7.	In the last month, how often have you been able to control irritations in your life?	4	1.40	1.21	35.00%
8.	In the last month, how often have you felt that you were on top of things?	4	1.56	1.32	39.00%
9.	In the last month, how often have you been angered because of things that happened that been outside of your control?	4	1.07	1.17	26.75%
10.	In the last month, how often				

have you felt difficulties were piling up so high that you could not overcome them?	4	1.08	.97	27.00%
Total	40	13.61	3.94	34.03%

Table - 6: Post-test Level of Perceived Stress Score

	No. of students	%
Low stress	49	54.4%
Moderate stress	41	45.6%
High perceived stress	0	0.0%
Total	90	100.0%

From that 54.4% of the adolescent students had low stress level score, 45,6% of the adolescent students had moderate stress score and none of the adolescent students had high perceived stress score.

ASSESSMENT THE EFFECTIVENESS OF MINDFULNESS BASED STRESS REDUCTION THERAPY

Table-7: Each question wise comparison of Pre-test and Post Test Score

S. No	Domains	Pre-test		Post-test		Mean Difference	Student's paired t-test
		Mean	SD	Mean	SD		
1	In the last month, how often have you been upset because of something that happened unexpectedly?	2.00	1.10	1.12	0.91	0.88	t=7.36 P=0.001 *** DF= 89 , Significant
2	In the last month, how often have you felt that you were unable to control the	2.36	1.08	1.26	1.00	1.1	t=8.14 P=0.001 *** DF= 89 ,

	important things in your life?						Significant
3	In the last month, how often have you felt nervous and stressed?	2.02	1.18	1.22	1.00	0.8	t=5.08 P=0.001 *** DF= 89 , Significant
4	In the last month, how often have you felt confident about your ability to handle your personal problems?	1.79	1.22	1.59	1.07	0.2	t=1.96 P=0.05* DF= 89 , Significant
5	In the last month, how often have you felt that things were going your way?	2.29	0.91	1.69	0.98	0.6	t=3.90 P=0.001 *** DF= 89 , Significant
6	In the last month, how often have you found that you could not cope with? All the things that you had to do?	2.06	1.12	1.63	0.95	0.43	t=3.31 P=0.001 *** DF= 89 , Significant
7	In the last month, how						t=3.25

	often have you been able to control irritations in your life?	1.98	1.24	1.40	1.21	0.58	P=0.001 *** DF= 89 , Significant
8	In the last month, how often have you felt that you were on top of things?	1.93	1.11	1.56	1.32	0.37	t=2.42 P=0.001 *** DF= 89 , Significant
9	In the last month, how often have you been angered because of things that happened that been outside of your control?	2.31	1.21	1.07	1.17	1.24	t=8.15 P=0.001 *** DF= 89 , Significant
10	In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	2.31	1.20	1.08	.97	1.23	t=8.89 P=0.001 *** DF= 89 , Significant
	Overall	21.04	3.42	13.61	3.94	7.43	t=17.09 P=0.001 *** DF= 89 , Significant

*** very high significant at $P \leq 0.001$, DF= Degrees of Freedom.

Table 7 shows the comparison of pre-test and post-test stress regarding:

In the last month, how often have you been upset because of something that happened unexpectedly? In the pre-test score students had score 2.00 and post test score 1.12. Difference is 0.88. this difference is large and it is statistically significant difference.

In the last month, how often have you felt that you were unable to control the important things in your life? In the pre-test score students had score 2.36 and post test score 1.26. Difference is 1.1, this difference is large and it is statistically significant difference.

In the last month, how often have you felt nervous and stressed? In the pre-test score students had score 2.02 and post test score 1.22. Difference is 0.8, this difference is large and it is statistically significant difference.

In the last month, how often have you felt confident about your ability to handle your personal problems? In the pre test score students had score 1.79 and post test score 1.59. Difference is 0.2 this difference is large and it is statistically significant difference.

Table-8: Comparison Of Overall Stress Score Before And After Mindfulness Based Stress Therapy

	No of school students	Pre test mean ± SD	Post test mean± SD	Mean difference	Paired „t“ test
Overall Stress score	90	21.04 ± 3.42	13.61± 3.94	7.43	t=17.09 P=0.001 *** DF= 89 , Significant

Very high significant at $P \leq 0.001$

Table no 8- Shown the comparison of overall stress before and after administration of mindfulness on stress among the adolescent students in selected school at Chennai.

On an average, school students were reduced their stress from 21.04 to 13.61 after the administration of mindfulness therapy. Difference was 7.43. This difference is statistically significant. Statistical significance was calculated by using student’s paired „t“ test.

Table 9: Comparison of Pre test and Post test Level of Stress Score

Level of Stress	Pretest		Posttest		Extended McNemar’s test
	N	%	n	%	
Low stress	0	0.0%	49	54.4%	$\chi^2=72.00$ $P=0.001***(S)$
Moderate stress	83	92.2%	41	45.6%	
High perceived stress	7	7.8%	0	0.0%	
Total	90	100.0%	90	100.0%	

*significant at $p < 0.05$ level

Table no 9-shows the pretest and post -test level of stress among students.

Before the mindfulness therapy, none of the adolescent students had low level of stress score, 92.2% of them had moderate level of stress and 7.8% of them had high level of stress.

After mindfulness based stress reduction therapy, adolescent students had 54.4% low level of stress, 45.6% of them had moderate level of stress and none of them having high level of stress.

Level of stress reduction score between pre test and post test was calculated by using generalized Mc Nemer's, chi -square test.

Table-10: Effectiveness in Generalization mindfulness based Stress Reduction Thereapy

	Max score	Mean score	Mean Difference of stress reduction score with 95% Confidence interval	Percentage of stress reduction score with 95% Confidence interval
Pretest	40	12.68	7.43(6.56 – 8.29)	18.57%
Posttest	40	24.10		(16.40% –20.72%)

Table no 10: shows the effectiveness of mindfulness based stress reduction therapy in reducing stress among the adolescent students.

On an average, in post test after the mindfulness therapy the stress among adolescent students was reduced to 18.57% reduced stress score than pre test score.

Difference and generalization of stress reduction score between pre and post test score was calculated by using mean difference with 95% CI and proportion with 95% CI .

In this, effectiveness of the study point estimated of 18.57% and interval estimate is 16.40% to 20.72%. It means in this similar setup of the study, who ever conducted with 95% CI, we can assure the effectiveness of study will lies between 16.40 to 20.72% stress score reduction.

Table-II: Association between the stress reduction score and demographic variables

Demographic variables		Stress reduction score						N	One way ANOVA F-test/t-test
		Pretest		Posttest		Reduce scorePre-post			
		Mean	SD	Mean	SD	Mean	SD		
Age	14 years	20.85	3.82	14.24	4.14	6.61	4.19	59	t=2.00 P=0.05*(S)
	15 years	21.42	2.51	12.98	3.58	8.44	3.99	31	
Gender	Boys	0.00	0.00	0.00	0.00	0.00	0.00	0	t=0.00 P=1.00(NS)
	Girls	21.04	3.42	13.61	3.94	7.43	4.12	90	
Family type	Nuclear family	21.22	3.42	12.53	3.89	8.69	4.10	54	F=3.18 P=0.05*(S)
	Joint family	20.59	3.19	13.52	4.38	7.07	4.32	27	
	Ext. family	21.33	4.30	15.93	3.00	5.40	3.71	9	

Occupation	Legislators, Senior Officials & Managers	0.00	0.00	0.00	0.00	0.00	0.00	0	F=2.10 P=0.07(NS)
	Professionals	0.00	0.00	0.00	0.00	0.00	0.00	0	
	Tech.&Asso.Prof.	0.00	0.00	0.00	0.00	0.00	0.00	0	
	Clerk	21.22	4.24	13.22	3.73	8.00	3.81	9	
	Skill. Work & Shop &	20.96	3.46	15.09	4.48	5.87	4.36	23	
	Agri & Fish. Workers	20.27	3.51	14.33	4.64	5.93	3.63	15	
	Craft & Rel. Trade	22.11	3.69	13.11	2.03	9.00	3.67	9	
	Plant & Mach. Operat	20.20	2.76	12.73	3.41	7.47	4.34	15	
	Elementary occup	21.47	2.87	12.35	3.79	9.12	3.24	17	
	Unemployed	25.00	7.07	12.50	.71	12.50	6.36	2	
Education of the Head Score	Profession or Honors	0.00	0.00	0.00	0.00	0.00	0.00	0	F=1.35 P=0.24(NS)
	Graduate	21.13	3.52	12.38	4.75	8.75	5.26	8	
	Inter or diploma	19.90	2.69	12.70	3.59	7.20	2.70	10	
	High school certificate	21.03	4.00	13.97	4.36	7.06	4.49	31	
	Middle sch.cert.	20.57	3.33	14.39	4.36	6.17	4.18	23	
	Primary sch. Certificate	22.75	3.11	13.42	2.23	9.33	3.45	12	
	Illiterate	21.33	1.03	12.33	1.86	9.00	2.00	6	

Demographic variables		Stress reduction score						N	One way ANOVA F-test/t-test
		Pretest		Posttest		Reduce scorePre-post			
		Mean	SD	Mean	SD	Mean	SD		
Monthly Family Income	>Rs.126, 360	0.00	0.00	0.00	0.00	0.00	0.00	0	F=2.09 P=0.11(NS)
	Rs.63182-126,356	0.00	0.00	0.00	0.00	0.00	0.00	0	
	Rs.47, 266-63178	0.00	0.00	0.00	0.00	0.00	0.00	0	
	Rs.31, 591-47262	23.00	2.45	12.00	3.46	11.00	5.29	5	
	Rs.18, 953-31589	21.00	3.85	14.93	5.04	6.07	3.58	15	
	Rs.6327-18949	20.79	3.03	12.91	3.12	7.88	3.54	34	
	≤ Rs.6323	21.03	3.72	13.94	4.14	7.08	4.49	36	
Area of residence	Urban	21.04	3.42	13.61	3.94	7.43	4.12	90	t=0.00 P=1.00(NS)
	Rural	0.00	0.00	0.00	0.00	0.00	0.00	0	
Medium of education	English	21.04	3.42	13.61	3.94	7.43	4.12	90	t=0.00 P=1.00(NS)
	Tamil	0.00	0.00	0.00	0.00	0.00	0.00	0	

Demographic variables		Stress reduction score						n	One way ANOVA F-test/t-test
		Pretest		Posttest		Reduction score=Pre-post			
		Mean	SD	Mean	SD	Mean	SD		
Weight	40-50 Kg	21.25	3.47	13.71	3.98	7.54	4.35	56	F=1.46 P=0.23 (NS)
	51-60 Kg	20.44	3.13	13.47	4.03	6.97	3.66	32	
	>60 Kg	25.00	5.66	13.00	2.83	12.00	2.83	2	
Height	140-145 cm	20.16	3.24	13.68	4.36	6.48	3.85	31	F=1.38 P=0.25 (NS)
	146-155 cm	21.70	3.02	13.67	4.02	8.02	4.31	43	
	156-160 cm	19.30	3.47	13.40	3.72	5.90	2.60	10	

	>160 cm	23.83	4.83	15.17	1.33	8.67	4.41	6	
BMI	Below 18.5 kg/m ²	22.73	4.03	13.33	2.72	9.40	4.29	15	F=2.38 P=0.10 (NS)
	18.5 – 24.9 kg/m ²	20.70	3.23	13.75	4.15	6.96	4.04	71	
	25 – 29.9 kg/m ²	20.75	3.30	12.25	4.65	8.50	3.42	4	
	> 30.0 kg/m ²	0.00	0.00	0.00	0.00	0.00	0.00	0	
Parental status	Both are alive and living together	20.78	3.34	13.95	4.07	6.83	4.10	63	F=2.35 P=0.10 (NS)
	Both are alive living and separate place	21.63	3.34	12.79	3.34	8.84	3.44	19	
	Single parent	21.75	4.37	12.88	4.32	8.88	5.08	8	
	Both are not alive	0.00	0.00	0.00	0.00	0.00	0.00	0	
No of siblings	Nil	21.27	2.90	12.41	2.72	8.86	3.58	22	F=2.34 P=0.08 (NS)
	One	20.69	3.67	13.75	3.96	6.95	4.26	55	
	Two	21.22	2.99	12.78	4.02	8.44	3.97	9	
	> Two	24.25	2.50	20.25	3.40	4.00	2.94	4	

NS=Not Significant, S= Significant, P> 0.05 Not Significant, *P≤0.05 Significant.

Table no 11: Shows the association between students stresses reduction score and their demographic variables. 15 years adolescence, Nuclear family adolescence were reduced more stress score than the others.

Previous exposure to any relaxation techniques and adolescents with >70% Academic performances had more stress reduction score than the others.

Statistical significance was calculated by using one way analysis of variance, F-test and student independent t-test.

DISCUSSION:

To evaluate the effectiveness of mindfulness-based stress reduction therapy on stress reduction among the adolescent students (post-test).

This study showed, that 54.4% of adolescent students had low stress level score, 45.6% of the adolescent students had moderate stress score and none of the

adolescent students had high perceived stress score. This was supported by the following studies. **From this, the research hypothesis H1 there will be significant difference between the pre test score and the post test score of stress among adolescent students was accepted.**

A systematic review and meta-analysis was done by **Yang Yang (2015)** on Effectiveness of mindfulness-based stress reduction and mindfulness-based cognitive therapies on people living with HIV. Decreased feelings of stress after 8 weeks ($p = 0.03$) of MBT, decreased feelings of depression after 8 weeks ($p = 0.04$) and after 6 months ($p = 0.02$) was recorded. Additionally, patients receiving MBCT showed improved CD4 counts at 8 weeks and 6 months, respectively.

CONCLUSION

The study proved that there was an association between post test level of stress score and demographical variables. 15 years adolescents, Nuclear family adolescent students are reduced more stress score than others, adolescents who had previous exposure to any relaxation techniques and adolescents who had >70% academic performances had more stress reduction score reduction than others. Statistical significance was calculated using one way analysis of variance F -test and student independent t-test. So mindfulness therapy has significant impacts in the reductions of stress level among the adolescence students were significant. The findings of the study were consistent with the literature and have support from studies conducted throughout the world and our India.

Recommendations:

- The similar can be conducted for a longer group in different setting like cancer unit, for nurses, working women, especially single parents, transgender etc
- Similar study may be conducted by using quasi-experimental design.
- Similar study can be conducted by using different steps or methods.

- Comparative study can be done along with this mindfulness therapy.

Conflict of interest: No

Financial support: Self

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