

Research Paper

## Effectiveness of Mindfulness on Attention Span and Perceived Stress of School Students - Findings from A Pilot Study

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### ABSTRACT

**Background:** Mindfulness based practices develops a present moment awareness in a non-judgemental manner. Such programs have known to be effective in dealing with day-to-day life stresses in adult population, however its role on child population has not been explored extensively. Present study used tailored MBSR module, to explore its effectiveness on Perceived Stress & Attention span of higher secondary school students in school settings. **Aim:** This study explores the effectiveness of MBSR on Attention Span and Perceived Stress of higher secondary school students in school settings. **Method:** 10 school students of class 12 in Aizawl, Mizoram, India, aged between 16-18 years, selected using purposive sampling and were equally divided into 'Training and Normal Control' group, after screening on DSM-5-TR Self-Rated Level 1 Cross-Cutting Symptom tool. Baseline assessment was done on SLCT and PSS for all participants, thereafter weekly 7 MBSR sessions were demonstrated to 'Training group' participants. After seven weeks, both group participants were re-assessed on same tools and scores were compared. **Results:** Findings indicated significant differences between the compared groups on outcome measures with noticeable improvement in the attention span and lowering of perceived stress experiences in the group, that received MBSR training. **Conclusion:** The study concluded that MBSR training is helpful in improving attention span and decreasing perceived stress experiences, their-by, could facilitate overall learning process for school students.

**Keywords:** Mindfulness, MBSR, Perceived Stress, School Students, Attention Span

Increased stresses of modern-day life style and its demands are not only affecting adults but to childrens as well (Semple & Willard, 2019). Across the world, adolescents were also seen to experience heightened levels of stress which is believed to contribute to the emotional disturbances in this population (Rempel, 2012).

Over the years, there are studies that put forward convincing evidences that suggests that mindfulness practices improve the overall well-being. There is a strong argument for implementing mindfulness practices in to the school curriculum. Training programs based on Mindfulness, are practices that aims to induce focus and attention in the practitioner

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towards the present moment with non-judgmental attitude (Ma & Fang, 2019). Mindfulness Meditation (MM), is an ancient Buddhist meditation practice which, aim at reducing mental anguish (Ramel et al., 2004). Originally developed for chronic pain management by Jon Kabat-Zinn, the Mindfulness based stress reduction (MBSR) training programs have been effectively used for management of anxiety and stress in adults over past 2-3 decade.

The researches related with mindfulness practices, involving children and adolescents is not yet as extensive as with adults, but is growing rapidly. Published literature suggests that when the children are struggling with a mental health condition, it has the potential to inhibit their ability to neglect meaningless stimuli, which increases distractibility, poor organizational skills, and a decreased ability to pay attention on the task at hand (Rempel, 2012). As mindfulness brings changes in the way we relate to ourselves and to our experiences, it can help students by making them more aware of both pleasant and unpleasant experiences that often go unnoticed or unappreciated in our everyday lives. Enhanced awareness of positive experiences can also enhance richness of those experiences. With increased awareness of negative or unpleasant experiences can help the younger ones to respond to themselves and each other with greater understanding and skill. It is a powerful tool to develop social-emotional competencies which includes self-awareness, responsibility, personal initiative, planning and initiation of goal-directed behaviour, inhibition of inappropriate behaviours, conscious decision making, empathic communications, compassion for others, and interpersonal skills in conflict resolution. They lay foundation for self-management of emotions and behaviours throughout life (Semple and Willard, 2019). The existing literature indicates the effectiveness of Mindfulness based intervention on various mental health conditions, however most of the studies were done either on adult population or on clinical conditions in students like anxiety disorders, depression, ADHD, conduct disorder. Studies done in Indian context on students without any mental health issues are limited in number and if present, there is no comparable group in most of them. Therefore, the current study was planned with main objective to study the effectiveness of MBSR program for higher secondary school students on their attention span and levels of perceived stress. For operational purpose we hypothesized that there will be a significant impact of MBSR training in improving attention span and lowering the perceived stress levels of f higher secondary school students.

### **METHODS**

**Sample:** For this pilot study having pre-post with control design, 10 higher secondary school students (N=10) studying in class 12 within age range of 16-18 years, whose gave consent and were not have any significant neuro-psychological/psychiatric or medical illness were selected, mixed of gender using purposive sampling method from regular English medium school located in the Aizawl city of Mizoram state, India.

#### **Inclusion Criteria for Both Groups-**

- Male or Female Regular Students Studying in Class 12.
- Age Between 16-18 Yrs.
- Should Give Written Consent.

#### **Exclusion Criteria of Both Groups-**

- Presence of any significant psychiatric /neurological disorder.
- Presence of any significant medical disorder.
- Students Having Any Substance or drug abuse except Nicotine use

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### **Tools:**

1. Socio-demographic Data Sheet: Essential socio-demographic information was entered in the data sheet, so designed for the purpose.
2. DSM-5-TR Self-Rated Level 1 Cross-Cutting Symptom Measure: This is used for initial screening for presence of any significant psychiatric condition. This tool is a patient-rated measure that assesses mental health domains that are important across psychiatric diagnoses (DSM-5, APA). This child-rated version of the measure consists of 25 questions that assess 12 psychiatric domains, including depression, anger, irritability, mania, anxiety, somatic symptoms, inattention, suicidal ideation/attempt, psychosis, sleep disturbance, repetitive thoughts and behaviours, and substance use. Each item asks the child, to rate how much (or how often) he or she has been bothered by the specific symptom during the past 2 weeks. The measure was found to be clinically useful and had good test-retest reliability in the DSM-5.
3. Six Letter Cancellation Test (SLCT) – This was used to measure attention. It is in the form of test worksheet which specified the six target letters to be cancelled and had a working section which consisted of letters of the alphabet arranged randomly in 22 rows and 14 columns. The participants were required to cancel as many of the six target letters as possible in the specified time of 90 seconds by following from two possible strategies, i.e. either doing all six letters at a time or be selective of any one target letter out of the six. The subject could also follow a horizontal, vertical, or a random path, according to their choice. The total number of cancellations and wrong cancellations were scored and the net scores were calculated by deducting wrong cancellations from the total cancellations attempted. The Six Letter Cancellation test-retest reliability was found to be adequate ( $r = 0.781$ ,  $P = 0.002$ ). This test is directly related to attention measurement (Nagendra & Pradhan, 2008).
4. Perceived Stress Scale (PSS-10)- This scale was developed by Cohen and Williamson (1988) and was used in this study to assess perceived stress. It evaluates the degree to which an individual has perceived life as unpredictable, uncontrollable and overloading over the previous month. It consists of 10 questions, takes 5-10 minutes to complete and is for individual or group administration. The questions ask about feelings and thoughts during the last month. In each case, respondents are asked how often they felt a certain way on a five-point scale from ‘never’ to ‘very often’. Higher scores indicate higher levels of perceived stress. Internal consistency reliability for the PSS-10 total scores was adequate ( $\alpha = 0.82$ ). PSS-10 scores demonstrated good convergent validity. Scores on the PSS-10 were significantly correlated in the expected directions with scores on the GAD-7 and PHQ-9 (Baik et al., 2017).
5. 5.Mindfulness Training- in this study, the Mindfulness training to the school students was provided using MBSR, as developed by Kabat-Zinn (2013), which was tailored as per needs of school children using activities taken from Stress Reduction Workbook for Teens (Biegel, 2017).

The broad outline of the mindfulness-based training used for this study is outlined below:

<b>Session No</b>	<b>Activity</b>
Session 1	Introduction and Mindful Breathing
Session 2	Body-Scan Meditation & Sitting Mindfulness
Session 3	Mindful Yoga & Pleasant Event Calendar
Session 4	STOP Technique & Unpleasant Event Calendar
Session 5	Rail Road Activity & Sitting Mindfulness

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Session No	Activity
Session 6	Mindful Breathing, Unhelpful and Harmful Coping Behaviors & Difficult Communication Calendar
Session 7	Loving Kindness Meditation & Using Self-Care to manage problems & Narrating Experiences

### **Procedure:**

The ethics approval for this present study was obtained from the Institutional Human Ethics Committee of Mizoram University (MZUHEC). For sample collection, few schools were approached and briefed about the purpose of the study. Those school who have given after necessary permission, a meeting was held with students of class 12 with their teachers and study objectives and benefits were explained to all. Those students who signed the informed assent/consent form, were screened on DSM-5-TR Self-Rated Level 1 Cross-Cutting Symptom tool, to screen for the presence of any significant psychiatric condition.

Parents/legal guardians of those screened were also informed about the study and requested for necessary consent. After this, students were allocated in to 'Training group' and 'Normal Control group' using fishbowl method, having 5 participants each. Following group allocation, the socio-demographic details were gathered using socio-demographic data sheet and subsequently baseline assessments were carried out on SLCT, PSS and MAAS-A for all participants of both the groups. Post baseline assessments, 7 mindfulness-based sessions were provided to all the participants of 'Training group' at a frequency of one session per week with session duration of 45 minutes each. These sessions were followed by homework assignments and concerned parents were motivated to co-supervise the homework tasks at home. Whereas the participants of the 'Normal Control group' were not given mindfulness-based training. After completion of 7 weeks' time period (from baselines assessment), participants of both the groups were re-assessed on same psychological tools that were used for baseline assessments. In this manner baseline and post training assessments scores were obtained for all participants of both groups.

Obtained data was analysed using Statistical Package for Social Sciences -29 software (SPSS-29). Both group scores were compared using suitable statistics for various socio-demographic variables and assessment tools scores.

## **RESULT**

The data so obtained after analysis, related with socio-demographic variables of participants of both groups as well as their baseline and post training level assessments were framed in subsequent tables below:

**Table-1: Comparison between Training and Normal Control Group on Age -**

Group	Training Group (N=5)		Normal Control Group (N=5)		Mann-Whitney U Test			
	Mean	SD	Mean	SD	Mean Rank		U	Z
					MBSR Group	Normal Control Group		
Age (Years)	17.40	0.54	17.60	0.54	5	6	10	-0.60 (NS)

*NS= Not Significant*

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Table 1 shows that the mean is  $17.40 \pm 0.54$  and  $17.60 \pm 0.54$  for participants of Training and Normal control group respectively. The data further indicate that both compared groups do not differ significantly on 'Age'.

**Table-2: Comparison between Training and Normal Control Group on various Socio-Demographic Variables -**

Group	Variable	MBSR Group (N=5)	Normal Control Group (N=5)	Fisher's Exact Test
		Frequency/ Percentage	Frequency/ Percentage	
Sex	Male	2 (40)	2 (40)	1 (NS)
	Female	3 (60)	3 (60)	
Education/Standard	XII	5 (100)	5 (100)	-
Religion	Hindu	-	-	-
	Muslim	-	-	
	Christian	5(100)	5 (100)	
	Others	-	-	
Socio-Economic Status	Lower	-	-	-
	Middle	5 (100)	5 (100)	
	Upper	-	-	
Family Type	Joint	2 (40)	1 (20)	1 (NS)
	Nuclear	3 (60)	4 (80)	
Background	Rural	-	-	-
	Urban	5 (100)	5 (100)	
	Sub-urban	-	-	

Table 2 exhibits comparison in terms of various socio-demographic variables between participants of Training and Normal Control Group. The data depicts that 60% of the participants in both groups were of female gender, all of them were hailing from Middle SES, and were Christian. The table further indicate that majority of the participants in both groups were having 'Nuclear' family type (60% for Training group and 80% for Normal control group) and all participants in both groups were residing in urban localities. Finally, the data shows that both compared groups were alike in most of the socio-demographic variables.

**Table 3: Baseline comparison on SLCT and PSS scores for MBSR and Normal Control group**

Group	MBSR Group (n=5)		Normal Control Group (n=5)		Mann-Whitney U Test			
					Mean Rank		U	Z
	Mean	SD	Mean	SD	MBSR	Normal Control		
SLCT	41.80	14.61	43.60	13.08	5.40	5.60	12	-0.10 (NS)
PSS	23.40	5.02	24.40	4.21	4.70	6.30	8.50	-0.84 (NS)

*NS=P value not significant*

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Table 3 shows that the mean is  $23.40 \pm 5.02$  and  $24.40 \pm 4.21$  on PSS scale for the participants of 'Training' and 'Normal Control' group respectively. On SLCT, participants of the 'Training' group exhibits a mean of  $41.80 \pm 14.61$  as against a mean of  $43.60 \pm 13.08$  for 'Normal Control' group. Overall, the presented data exhibits no significant difference between both the groups in their levels of Perceived Stress and Attention.

**Table 4: Post-training Comparison Between Participants of Training and Normal Control Group on SLCT and PSS scores.**

Group	MBSR (N=5)		Normal Control Group (N=5)		Mann-Whitney U Test			
	Post-Test		Post-Test		Mean Rank		U	Z
	Mean	SD	Mean	SD	MBSR Group	Normal Control Group		
SLCT	55	12.90	41.40	4.72	6.60	4.40	7	1.16*
PSS	18.20	5.76	27.40	5.41	3.50	7.50	2.50	2.10*

\*p value significant at 0.05 level

Table 4 shows the comparison between the assessment scores of Training and Normal Control group participants after MBSR training on PSS, SLCT scales. The data indicates a mean of  $18.20 \pm 5.76$  on PSS,  $55 \pm 12.90$  on SLCT scales for participants of 'Training' group as against a mean of  $27.40 \pm 5.41$  on PSS,  $41.40 \pm 4.72$  on SLCT for participants of 'Normal Control' group. Results further indicates that both compared groups differ in the PSS. However, no significant difference was found between both the groups in terms of their Attention levels.

**Table 5: Pre-Post Training Assessment comparison of Training and Normal Control group participants on measures of SLCT and PSS**

Group	Variable	Wilcoxon Sign Rank Test		
		Mean Rank	Sum of Rank	Z-value
Training Group (N=5)	SLCT	3	15	2.02*
	PSS	0	0	2.03*
Normal Control (N=5)	SLCT	2.83	8.50	-0.27 (NS)
	PSS	3	9	-1.47 (NS)

NS= Not Significant; \*p value significant at 0.05 level

Table 5 shows the comparison between Pre and Post training assessment scores for both group participants on PSS and SLCT scales. The results show, significant difference in the Perceived Stress and Attention levels scores in participants of 'Training' group after MBSR training. On the contrary no significant difference was observed among scores on PSS and SLCT scales between pre and post assessment in case of participants of the Normal Control group.

**DISCUSSION**

The current study adopted pre-post with control design to study the effectiveness of MBSR program on the attention span and perceived stress levels of higher secondary school students. The data obtained from pilot phase of the study were discussed here. The findings of Table 1 & 2, depicting comparison between both groups in terms of their 'age' and other

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socio-demographic variables, indicated no significant difference between them in terms of these compared variables, which is indicative of similarity among participants of both studied groups on age, gender, family background, education and related demographic features.

Baseline comparison, between the participants of both groups, on PSS and SLCT scores, indicated no significant difference between them, which is suggestive of similar level of perceived stress, indicating same level of day-to-day stress experiences among participants of both groups. Further, broadly, similar level of attentional span was also observed at pre training assessments in both group participants. Thus, from the outset, participants of both studied groups have performed in the same manner on PSS and SLCT scales. Such similarity in scores at baseline is significant in the sense that helps in attribution, related with any change that may occur, after demonstration of some treatment/training to participants. In this study participants of training group were demonstrated mindfulness-based training sessions.

The re-assessment scores obtained, at the post training level for the participants of training group and after a wait period of 7 weeks for participants of 'Normal Control group' are suggestive of difference in performance of participants of both the compared groups. Significant group differences were observed between post training assessments scores (Table 4) of both the groups on PSS measure. Further, when pre and post training scores (Table 5) of 'Training group' participants were compared, again a significant level of difference (0.05 level) was noticed. This clearly indicates that the participants in 'Training group' have improved upon with regard to their performances on PSS scale after 7-week long mindfulness-based training, as indicated by their mean scores at post training phase assessment. This points towards significant reduction in 'perceived stress' scores among the participants of that group, which received 7 sessions of MBSR training. Our findings were adequately supported by findings by Nur'aini and Patry (2024), who have reported similar findings, suggestive of the positive impact of MBSR program for reducing the stress levels. Hence our hypothesis stating that there will be a significant impact of MBSR program on perceived stress of higher secondary school students holds acceptance. The reduction in perceived stress experiences, in training group participants, after mindfulness training sessions, is also strengthened by the performance of 'Normal Control group' participants after 7 weeks on PSS. As, when the pre-post PSS assessment scores were taken in to consideration for Control group participants, similar level of performance was observed at both levels, indicating towards similar level of perceived stress experiences even after 7 weeks wait period. This finding, strengthen our hypothesis that mindfulness training would be helpful in lowering the perceived stress in the participants. Such changes could be explained in the manner, that after the mindfulness-based training, the person focus more on the ongoing (present) events in life, rather than dwelling upon the past events/memories, which in turn leads to non-accumulation of negative or stressful feeling towards day-to-day experiences. It's a well-accepted, fact that dwelling upon our unwelcomed/unwanted experiences bound to increase our stress perception. With mindfulness-based training, one may develop a tendency to bring focus in the present ongoing events in life.

The study findings further revealed significant difference (0.05 level) between both the group on scores of SLCT and this difference remain consistent even during the comparison of scores at pre and post assessment phase (table 5) for participant of 'Training group'. In other words, these participants differ in their performance at post training phase from their

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pre-training scores. They performed better after receiving mindfulness training sessions for seven consecutive weeks, exhibiting fairer level of attentions span after training sessions. Their improved attentional span is reflected in their improved mean scores at post training assessment phase. This is sharp contrast to the participant of 'Normal Control', which does not exhibit any significant changes, when their pre-post scores were compared on SLCT. They performed almost same, even after 7 weeks' time period after baseline assessment. Similar results were echoed by Suárez-García et al. (2020), where the investigators, examined the effect of mindfulness-based educational intervention, on primary school students and reported lower levels of attentional problems in the intervention groups at the end of the study. Nur'aini and Patry (2024) reported that students experience improvements in concentration and class participation after attending the MBSR program the findings suggested that MBSR training can positively impact student learning behaviour and improvements in mental health can positively impact academic achievement in the long run. Further, reports from students and teachers showed positive changes in learning behaviour. This indicates that the benefits of MBSR training are not only limited to mental health aspects but can also support the learning process. The participants have learnt to be mindfully aware at the present moment, overpowering the distractions from environment and not getting effected by them. Therefore, our hypothesis stating that there will be a significant impact of MBSR program on attention levels of higher secondary school students has been well supported by the findings.

Thus, in both the studied variables, the participants of the 'Training Group; have better scores at post training phase in comparison to their pre training phase scores, this is in sharp contrast with the performance of the participants of 'Normal Control' group at pre and post assessment phases. As both groups were comparable in most of the socio-demographic variables, so, it could be said that mindfulness training have helped participants to bettered their scores on all outcome measures, in perceived stress experiences and in their ability of present moment attention. Therefore, mindfulness-based training program was observed to be helpful in not only bringing improvement in mental health or cognitive abilities of the school students but it was also found to be aiding in the overall learning process, as reported by the parents and teachers during our study. Conclusively, the authors believe that such findings hold implications for school mental health programs in longer run. However, the study was limited with small sample and non-consideration of follow up assessments to see the 'carried over' effect of mindfulness training on participants.

### CONCLUSION

Mindfulness based training is helpful in improving the attention span and decreasing the levels of perceived stress in school students. It helped the school students by reducing their perception of stressful experiences, improving attentional ability and therefore, has the potential for facilitating overall learning process for school students.

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### **Conflict of Interest**

The author(s) declared no conflict of interest.

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