Pilot Study

Mindfulness Based Stress Reduction Intervention on College Students

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ABSTRACT

Mindfulness Based Stress Reduction (MBSR) was used as a pilot study that focused on young female adults in the age group of 18-22 years. Sample size of this study was 40 female college students. Out of which 20 were in experimental group and the other 20 as control group. Screening of the subjects was done using Demographic Questionnaire. The study will measure the effect of MBSR intervention of 8-weeks on individual to be more mindful and its effect on its attention and perception of stress using the task stroop, change detection and KIMS and perceived stress scale.

Keywords: Mindfulness, Stress, College Students

Stress as a term has been misunderstood for following reasons: it is either perceived as damaging or it's considered only a psychological effect and not physiological or it is believed that stress does not affect adolescents. Any external factors that changes a person's reaction as well as compounds his/her understanding of a given situation can be categorized as stress. (Fahimeh Sehhatie., et al 2013). It is the initial tolerance and the predisposition factor that determines susceptibility to stress hormones and neurotransmitters have a major role in that. Anticipating the future outcome of a stressor experienced is the one that makes an individual prone to panic attacks/anxiety. Many times, we create our own stress because of faulty perceptions, which we can learn to correct.

The issue of stress among college and university students has been in focus for several years. (Scott, 2009). Despite the fact that the news broadcast college preparatory high schools are the main sources of pressure and stress, more studies are needed as not many experimental studies have been conducted with students in these settings. (Conner et al.2010). Students believe that they would practice an improved way of life if these challenges were removed.

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Babar et al 2004, found out that the most dominant stressors were that of academics and examinations.

Through the synthesis of current research into time management deficits in individuals with executive functioning difficulties and mood disorders, strategies for time management tracking and self-reflection are posited. Broadly, executive functioning relates to the mind's ability to organize, prioritize, and manage details that aid in daily functioning (Barkley, 2012). While motivation and impulsivity are a critical component of academic performance, self-regulation and perceptions of self-efficacy are the larger drivers of many of the factors teachers often consider when grading student performance.

Results of an Indian study revealed that factors associated with curriculum and workloads combined with economic deprivation are accountable for academic stress. Low academic achievement of some students can be a consequence of improper time management, economic hardships, lack of sleep, and societal engagements. Psychological distress refers to co-occurring symptoms of anxiety, depression, and somatic discomfort (e.g., sleeplessness, trembling hands, headaches), indicating a general state of emotional arousal or upset (Payton 2009).

What is Mindfulness?

Mindfulness is a way of being and it's a way of bringing awareness to the present moment experiences that includes how you're feeling or experiencing something and how you're feeling about it. According to Jon Kabat-Zinn, "mindfulness means paying attention in a particular way; on purpose, in the present moment, and non-judgmentally."

We often tend to be mindless/operate on autopilot, whether by categorizing; performing mechanically, or by simply not paying attention.

Mindfulness Based Stress Reduction:

The 8-week structured program of MBSR has three major components. The 3 components are mindfulness meditation, yoga and mind-body connection. It trains the participants in developing mindfulness practice of purposeful non-judgmental attention to everything happening at the present moment. Also group meetings, home practice encouragement and group discussion enables participants in problem solving as well as effective practice. Thus, effective prevention of unnecessary rumination and worries generally observed in individuals are kept limited.

RESEARCH METHODOLOGY

Objective:

The objective of this study was to explore how MBSR intervention of 8-weeks can help an individual be more mindful and its effect on its attention and perception of stress using the task stroop, change detection and KIMS and perceived stress scale.

Hypothesis:

Two groups experimental (with MBSR) and control (without MBSR), where we expect MBSR group to regulate their attentional processes, maintain their focused attention and are able to regulate their thoughts. Measures used to prove this were attention tasks (stroop and change detection) and questionnaires including KIMS and PSS.

Variables:

In the study the major variables are as following:

Variable no	Types of variable	Level	Name of the Level
1	Subjects	Independent	• MBSR • Control
2	Stroop test	Dependent and Indepedent	• Reaction time congruent • Reaction time Incongruent
3	Change Detection	Dependent and Independent	• Proportion Correct Flicker • Proportion Correct Non-Flicker • Reaction time Flicker • Reaction time Non-Flicker
4	KIMS	Dependent	• Observing • Describing • Acting with awareness • Acting without judgement

Sample:

This study focuses on young female adults in the age group of 18-22 years. Sample size of this study was 40 female college students. Out of which 20 were in experimental group and the other 20 as control group. Screening of the subjects was done using Demographic Questionnaire including: Age, weight, height, non-meditators, no active substance dependence, psychological and medical issues (with permission from primary health provider), and complete commitment using a consent form.

Tools used

MBSR intervention: Will consists of 8-weeks comprising of two sessions per week; per session 1 hour and 3 sessions for home practice.
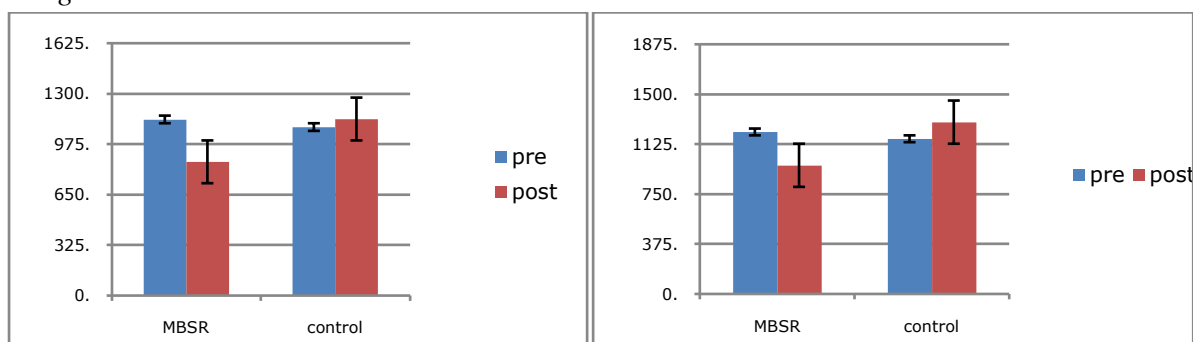
Pre-post measures:

Questionnaires: Perceived stress scale (PSS)- Perception of stress, Kentucky inventory mindfulness skills (KIMS)- Observing, Describing, Acting with awareness, Accept without judgement

Cognitive tests: Stroop Test and Change Detection.

RESULTS AND DISCUSSION

Stroop test

Congruent:

	Congruent				Incongruent			
	MBSR		**Control**		**MBSR**		**Control**	
	mean	**Std.dev**	**mean**	**Std. dev**	**mean**	**Std.dev**	**Mean**	**Std.dev**
Pre	1133.55	339.6459	1084.363	381.1512	1215.397	390.4952	1164.327	461.5954
Post	860.4667	236.5635	1136.303	226.1934	965.2683	241.0587	1289.128	189.7433

On the stroop task there was a significant decrease between MBSR pre and MBSR post task on speed of reaction time in relation to week 1 to week 8 (t. stat= 4.288427, t critical one tail= 1.729133), p<.05, showed that of congruent. There was no significant decrease between control pre and post task on speed of reaction time in relation to week 1 to week 8 (t.Stat= 0.808196, t critical one tail= 1.72913), showed that of congruent. There was a significant decrease between MBSR pre and MBSR post task on speed of reaction time in relation to week 1 to week 8 (t. stat= 3.23016, t critical one tail= 1.729133), p<.05, showed that of congruent. There was no significant decrease between control pre and post task on speed of reaction time in relation to week 1 to week 8 (t.Stat= 1.293686, t critical one tail= 1.729133), showed that of congruent.

Change detection
Proportion correct: (Flicker) (Non-flicker)
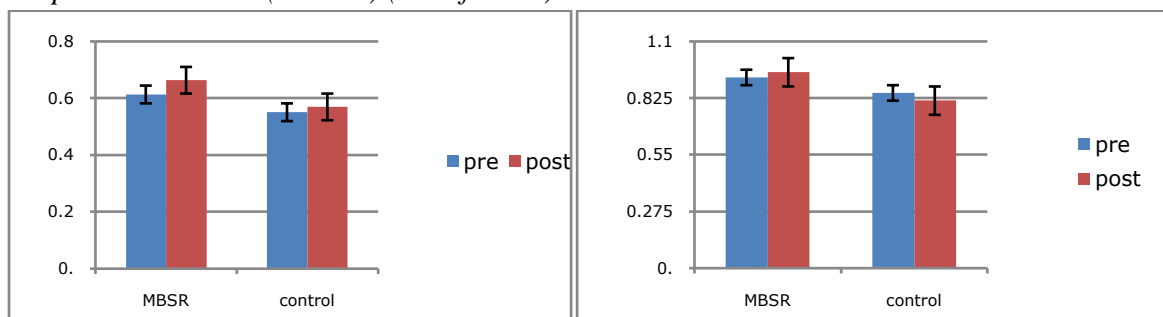
	Flicker				Non-flicker			
	MBSR		Control		MBSR		Control	
	mean	Std.dev	mean	Std. dev	mean	Std.dev	Mean	Std.dev
Pre	0.6125	0.145661	0.55	0.179088	0.925	0.08507	0.85	0.197017
Post	0.6625	0.177241	0.56875	0.172539	0.95	0.110322	0.8125	0.172539

On the Change detection task there was an increase but no significant increase between MBSR pre and MBSR post task on proportion correct in relation to week 1 to week 8 (t. stat= 1.19187, t critical one tail= 1.729133), showed that of flicker. There was an increase but no significant increase between MBSR pre and MBSR post task on proportion correct in relation to week 1 to week 8 (t. stat= 0.889757, t critical one tail= 1.729133), showed that of non-flicker. There was an increase but no significant increase between control pre and post task on speed of reaction time in relation to week 1 to week 8 (t.Stat= 0.51549, t critical one tail= 1.72913), showed that of flicker. There was a decrease between control pre and post task on proportion correct in relation to week 1 to week 8 (t.Stat= 0.233327, t critical one tail= 1.729133), showed that of non-flicker.

Reaction time: flicker non-flicker
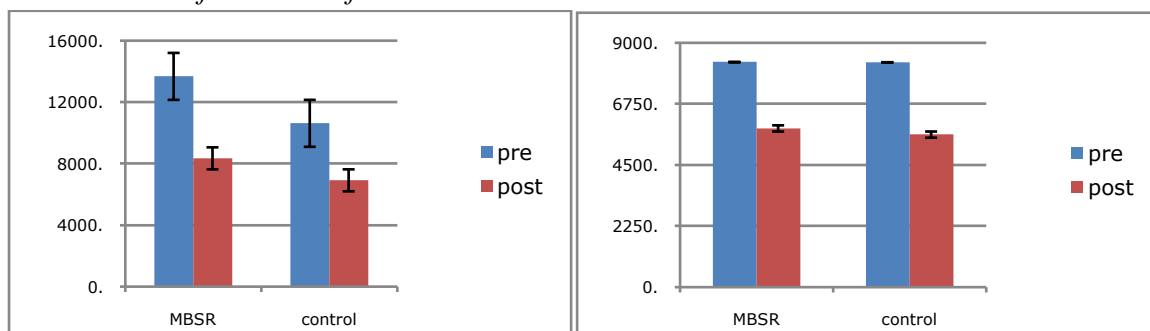
	Flicker				Non-flicker			
	MBSR		Control		MBSR		Control	
	mean	Std.dev	mean	Std. dev	mean	Std.dev	Mean	Std.dev
Pre	13686.97	6946.148	10635.46	8222.725	8288.206	4103.051	8278.459	5837.933
Post	8359.679	3983.269	6929.9	4072.983	5843.597	2371.293	5615.324	1953.637

On the Change detection task there was a significant decrease between MBSR pre and MBSR post task on speed of reaction time in relation to week 1 to week 8 (t. stat= 4.123417, t critical one tail= 1.729133), showed that of flicker. There was a significant decrease between MBSR pre and MBSR post task on speed of reaction time in relation to week 1 to week 8 (t. stat= 2.767079, t critical one tail= 1.729133), showed that of non-flicker. There was a significant decrease between control pre and post task on speed of reaction time in relation to week 1 to week 8 (t.Stat= 1.805302404, t critical one tail= 1.72913), showed that of flicker. There was no significant decrease between control pre and post task on speed of reaction time in relation to week 1 to week 8 (t.Stat= 2.346061989, t critical one tail= 1.729133), showed that of non-flicker.

KIMS:
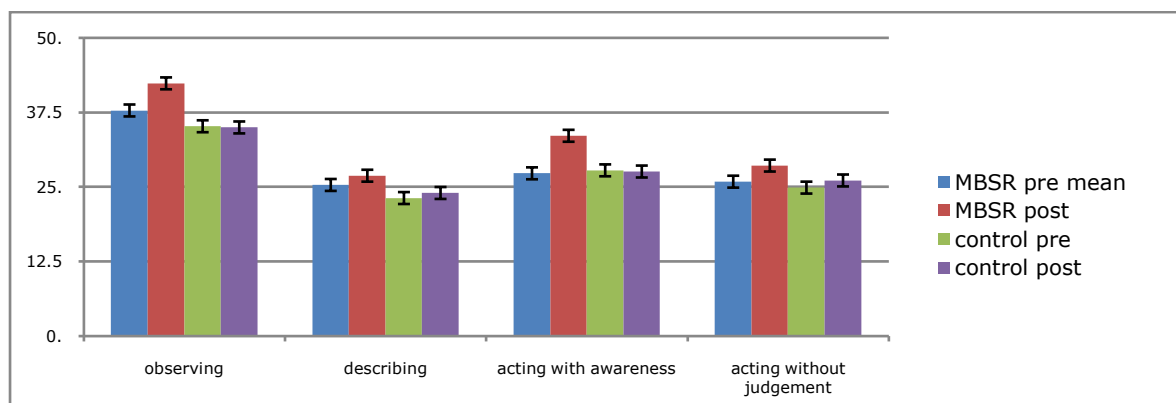
	Pre				Post			
	MBSR		Control		MBSR		Control	
	mean	Std.dev	mean	Std. dev	mean	Std.dev	Mean	Std.dev
observing	37.85	6.152235	35.2	5.932959	42.4	6.511528	35	5.91608
describing	25.35	5.034878	23.15	4.811445	26.9	5.186521	24	4.898979
acting with awareness	27.3	5.22494	27.8	5.272571	33.6	5.796551	27.6	5.25357
acting without judgement	25.9	5.089204	24.9	4.98999	28.6	5.347897	26.1	5.108816

There were statically significant interactions observed between (i) scores on KIMS week 1 and week 8 in the MBSR group conditions F (7, 152) = 19.58976, p < .05 and in the control group F(7,152)= 8.377772. There was a significant increase between MBSR pre and MBSR post task on observing scale in KIMS in relation to week 1 to week 8 (t. stat= 2.879264, t critical one tail= 1.729133), p< .05. There was no significant increase between MBSR pre and MBSR post task on describing scale in KIMS in relation to week 1 to week 8 (t. stat= 1.432412, t critical one tail= 1.729133). There was a significant increase between MBSR pre and MBSR post task on acting with awareness scale in KIMS in relation to week 1 to week 8 (t. stat= 5.853388, t critical one tail= 1.729133), p< .05. There was a significant increase between MBSR pre and MBSR post task on acting without judgement scale in KIMS in relation to week 1 to week 8 (t. stat= 1.942443, t critical one tail= 1.729133), p< .05. There was no significant increase between control pre and control post task on observing scale (t. stat= 0.129727, t critical one tail= 1.729133), describing scale (t. stat= 1.175915, t critical one tail= 1.729133), acting with awareness scale (t. stat= 0.228468, t critical one tail= 1.729133) and acting without judgement scale (t. stat= 1.03664, t critical one tail= 1.729133) in KIMS in relation to week 1 to week 8.

Perceived Stress Scale:
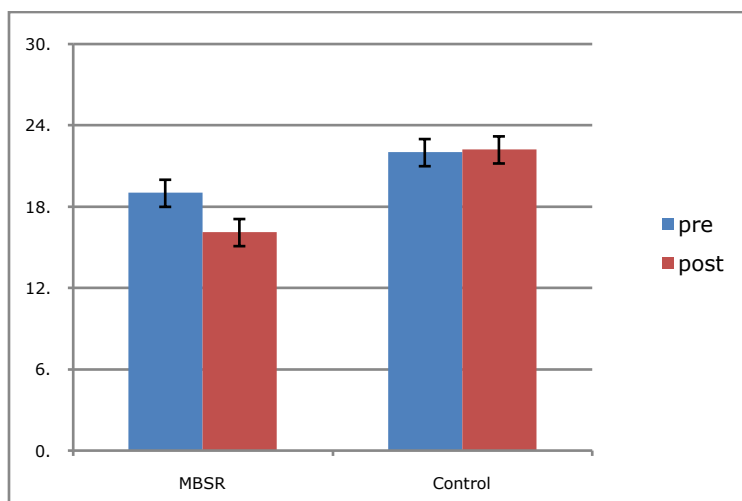
	MBSR		Control	
	mean	Std.dev	mean	Std. dev
Pre	19	4.909711	22	6.052403
Post	16.1	6.422821	22.2	5.376362

On the Perceived stress scale there was a significant decrease between MBSR pre and MBSR post task in relation to week 1 to week 8 (t. stat= 1.888793, t critical one tail= 1.729133), p<.05. There was no significant decrease between control pre and post task in relation to week 1 to week 8 (t.Stat= 0.18863, t critical one tail= 1.72913).

DISCUSSION

This pre-post randomized controlled study examined the efficacy of 8 weeks of MBSR as compared to the control group on both measures of attention task and KIMS and PSS questionnaires. To improve the strength of conclusions drawn from the results of the study, the protocol included a control group which was carefully matched to the MBSR group for subject demographics. The results showed significant increase in four scales of KIMS questionnaire (Observe, Describe, Act with Awareness, Accept without Judgment), and comparative analyses were conducted for each scale separately. In all the three scales of the questionnaire the MBSR group showed significant increase by the 8th week compared to control group except describing. There was a significant change in the control group for acting with awareness scale in KIMS questionnaire. Significant increase in proportion correct for change detection and significant decrease was also observed in reaction time for change detection and stroop task by the MBSR group when compared to the control group. There was a significant decrease observed in reaction time for control group but the proportion correct decreased as compared to the pre test of control group.

The results indicate that MBSR develops the ability to recognize when one's thoughts have wandered and be more self-aware of thoughts, feelings, sensations and perception about stress and how to deal with them by understanding them. Resulting in the ability to terminate or disengage from on-going mind wandering content, facilitating sustained attention and performance. From a neuroscience perspective, the Anterior Cingulate Cortex (ACC) and Dorso Lateral Prefrontal Cortex (DLPFC) interact with each other to resolve conflict through attentional modulation implemented via the Intra Parietal Sulcus (IPS) (Wang et al., 2009).

Meta- analysis of neuroimaging studies shows that mPFC gets inhibited during the mindfulness, resulting in the release of primary bottom-up experience from narrative top-down enslavement (shift away from default mode to direct mode) with corresponding significant differences on all measures. Neuroimaging studies have revealed that ACC and DLPFC functionally interact to support executive control (Ridderinkhof, Ullsperger, Crone, &Nieuwenhuis, 2004) and inhibition of word information in the Stroop task. When individuals detect a change, the neural networks of the parietal and right dorsolateral prefrontal lobe regions are strongly activated, Intra parietal sulcus (IPS) plays an initiative role in the fronto-parietal network in the processing of surprise targets, whereas ACC and DLPFC interact with each other to resolve conflict through attentional modulation implemented via the IPS (Wang et al., 2009)

The results are in line with Rani and Rao's (2000) assertion that the essential element in all meditation is the retraining of attention. Chan and Woollacott (2007), found that meditation experience was associated with reduced interference on the Stroop task (p < 0.03). Hodgins and Adair (2010) stated that in a change blindness task, meditators noticed more changes in flickering scenes and noticed them more quickly. Mindful music listening study found that Mindful music listening thus decreased the speed of response on the Stroop task (attention

regulation), and Change Detection tasks (visual awareness) and increased Acting with Awareness on KIMS (Divya, et al 2013).

CONCLUSION

According to the Buddhist thought the major cause of human sufferings are our own inaccurate thoughts and beliefs. Very often these are unrealistic expectations and insatiable desires. It is all about developing a mental image based on our experiences while at the same time we often distort these images based on our needs and unrealistic interpretations. This leads to inappropriate cognitive interpretations and behavioral choices. Learning to select the real and ignoring imaginary perceptions is possible by giving mindful attention to our present –moment experiences. Teaching the students how to accept and not avoid their suppressed emotions and evaluating them. This will further prevent failure in their life that they are afraid of.

DELIMITATIONS AND SUGGESTIONS

Stressors perceived by each participant are different and the intensity experienced could be different. Stressors can be psychosocial, economic, academic stress and relationships. Every participant has a different way of coping with their stressors. Helping them deal with such situations there has to be a prior detail about their stress and a follow up of how they are coping with it at present.

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