

## EFFECT OF MINDFULNESS BASED INTERVENTION ON READING ANXIETY AMONG STUDENTS WITH DYSLEXIA

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### ABSTRACT

*Students with specific learning disabilities, particularly dyslexia, lag behind academically primarily because of their poor reading skill/ability. The task of reading is so daunting for most of the children with dyslexia that they get anxious. The present study endeavored to assess the effectiveness of mindfulness-based intervention on reading anxiety among students with dyslexia. A total of 44 students with dyslexia (22 in Experimental group and 22 in Control group) were selected from Government Model Schools of Chandigarh. The study used pretest-posttest control group experimental design. The reading anxiety of the participants was assessed through self-prepared Reading Anxiety tool. Six weeks' mindfulness based intervention was given to the experiment group. The difference in the mean gain scores on reading anxiety for both the groups was studied using t-test. The results proved that reading anxiety among students with dyslexia, who were exposed to Mindfulness-based intervention, has reduced significantly as compared to the students in control group.*

### Key-words

*Mindfulness; Mindfulness-based intervention; dyslexia; reading anxiety; elementary school students*

### INTRODUCTION

With an ever-increasing emphasis on education and literacy, reading has become an indispensable part of our lives. It will not be out of place to consider it as 'survival skill' in the age of information. Therefore, in any literate society, a lot of significance is attached to reading (Jena, 2013).

However, this emphasis on reading-ability causes a lot of harassment to those children who fail to develop competence in reading for one or the other reasons. Children with dyslexia, who find it difficult to acquire these literacy skills, suffer a lot of anguish and trauma. Many of them feel mentally abused by their peers within the school environment because they have a learning disability (Hodge, 2000). Because of their condition, students with dyslexia possess significantly low self-esteem, particularly related to social-peers aspect, as compared to their non-dyslexic counterparts (Kaur, 2014).

### **DYSLEXIA**

Dyslexia is a developmental reading disorder (DRD) that occurs in children with normal intelligence. Dyslexia is the most common form of language-based disability. It literally means “poor language” and affects around 15% of the population (Castro, 2016). It is a reading disability despite intelligence, motivation, and educational opportunities that occurs when the brain does not properly recognize and process certain symbols. Dyslexia is caused due to impairment in the brain’s ability to translate information received from the eyes (Shirole & Chari, 2016). It is one of several distinct learning disabilities. It is a specific language-based disorder, characterized by difficulties in single word decoding, usually reflecting insufficient phonological processing (Troia, 2011).

*“Dyslexia is a neurological learning disability, characterized by difficulties with word recognition, by poor spelling, and limited decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge.”*

- (International Dyslexia Association, 2002).

According to Smallridge (2009), individuals with dyslexia may possess some or many of these attributes, e.g., they may confuse symbols, letters and words that look similar; e.g., saw and was, b and d, or x and +; may have difficulty copying words from the board; may have difficulty paying attention to classroom tasks; may mispronounce words because they can’t discern details of sounds; e.g., ships instead

of chips; may be slower than peers to write decodable words; e.g., pet, pat, pin, bin, bit and bet may be easily confused; may mispronounce the multisyllabic words; may appear clumsy and bump into objects and people regularly, etc.

Davis (1992) also characterized individuals with dyslexia as having high I.Q but poor at academics. While reading or writing they repeat, add, transport, omit, and substitute words. They possess poor self-esteem; get frustrated easily; confused by letters, numbers, words, sequences, or verbal explanation; read and re-read with little comprehension; have difficulty in fine and/or gross motor skills, in telling time and managing time; and general inability to learn the information in sequence.

### **READING ANXIETY**

Anxiety is a normal human emotion. It is a state of mood or emotion that, if in excess, is unpleasant; it is concerned with the uncertainty and is directed towards the future rather than past (Tyrrer, 1999). There is a connection between anxiety and neurotransmitter-chemical substance that communicates information throughout the brain and multiple neurobiological interactions play their role in anxiety (Lydiard, 2002).

Reading anxiety is an unpleasant emotion experienced by individuals when faced the task of reading; it is a specific phobia, situational type (Piccolo, Giacomoni, Julio-Costa, Oliveira, Zbornik, Haase & Salles, 2017).

Reading anxiety is a specific, situational phobia toward the act of reading that has physical and cognitive reactions. Physical reactions to anxiety include the release of adrenaline (“fight or flight reaction”) and physical symptoms, such as sweating, feeling shaky or faint, a pounding heart, rapid breathing, “butterflies” in the stomach, headache, a stomachache, or even throwing up. Cognitive reactions to anxiety include an overwhelming sense of dread, low self-esteem, feelings of helplessness, and expectations of public humiliation. These physical and cognitive reactions also interact, as when a child thinks, “my hands are shaking.” or “I know my face is getting red”. As the child becomes overwhelmed by emotions and worries (e.g., “What if the other kids laugh at me?”) it leaves few cognitive reserves to deal with the task of decoding and comprehending print (Zbornik, 2001). Anxiety is the most

frequent emotional symptom reported by individuals with dyslexia. They become fearful because of their constant frustration and confusion.

## **MINDFULNESS**

Mindfulness can be defined as living fully in the present moment, with intention and without judgment. It has Buddhist roots, and the term “mindfulness” is related to the *Pali* word *sati*, meaning “awareness”. Over the last few decades, the practice of mindfulness has grown in popularity and in respect (Kriynovich, 2015).

In simple terms, it refers to a particular way of paying attention, and has been described as “the awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experience” (Kabat-Zinn, 2003).

Mindfulness practices range from brief and simple breath awareness practices such as counting the number of in-breaths to guided body-scan meditations, to more abstract emotion-based exercises focused on sending goodwill, or loving kindness, to the self and the others (Kriynovich, 2015).

## **MINDFULNESS BASED INTERVENTION**

Children with dyslexia often experience anxiety when faced with the task of reading. They usually avoid reading for the fear of failure to read, being ridiculed, criticism from teachers, etc. As a result, these children – despite being intellectually average or above average – lag behind in their academic growth. With increasing awareness, the practitioners are looking for the effective ways to alleviate reading anxiety among children with dyslexia and provide them efficient ways to cope with their condition.

Interventions based on training in mindfulness are immensely popular today. It has been used across different professions and in diverse fields with varied populations ranging from young ones to old ones with very encouraging outcomes. Mindfulness-based intervention to students with dyslexia significantly improved their self-esteem scores across all dimensions viz; general, school, and family (Kashyap & Kaur, 2017). Mindfulness based intervention demonstrates the changes in brain structure (McGreevey, 2011). Mindfulness practice involves multiple aspects of mental

function that use multiple complex interactive networks in the brain (Tang, Hölzel, & Posner, 2015). The reading improvement induced by mindfulness sheds light on the intricate relation between attention and reading. Mindfulness reduces impulsivity and improve sustained attention, and this, in turn, improves reading among individuals with developmental dyslexia and Attention Deficit Hyperactivity Disorder (ADHD), by helping them to read via the straight path of the lexical route (Tarrasch, Berman & Friedmann, 2016). So, it would be expected that mindfulness training might be helpful with the reading problems of students with dyslexia (Castro, 2016).

In the present research, mindfulness based intervention was used and its effect on reading anxiety was studied.

### **OBJECTIVES**

1. To study difference in pre-test and post-test Reading Anxiety mean scores of students with dyslexia in Control Group.
2. To study difference in pre-test and post-test Reading Anxiety mean scores of students with dyslexia in Experiment Group.
3. To study the effect of Mindfulness intervention on Reading Anxiety of students with dyslexia (Mean Gain score differences of CG and EG).

### **HYPOTHESES**

1. There will be no significant difference in the pre-test and post-test Reading Anxiety mean scores of students with dyslexia in Control Group.
2. There will be no significant difference in the pre-test and post-test Reading Anxiety mean scores of students with dyslexia in Experiment Group.
3. There will be no significant effect of Mindfulness intervention on Reading Anxiety of students with dyslexia.

### **METHODS AND PROCEDURE**

Design, sample and procedure of the study have been discussed below:

## Design

The study was based on pretest-posttest control group experimental design. Six weeks' Mindfulness intervention was given to experimental group only.

## Sample

The schools for the study were selected randomly and after identification of students with dyslexia studying in 6<sup>th</sup> class they were randomly assigned to the experimental and control groups. The final sample comprised of 44 students with dyslexia, out of which 22 students were placed in experimental (EG) group. The participants in both groups were matched on basis of locale (school) and intelligence.

## Procedure of Data collection

First step was to identify the students with dyslexia by using teacher's referral form and then test of intelligence (SPM) was administered. The students who possessed average or above average intelligence were then administered DTRD (Diagnostic Test of Reading Disorder).

The selected sample was matched and then randomly allocated Experimental group (EG) and Control group (CG). Students in EG were given mindfulness-based intervention for six weeks. Before and after the experiment reading anxiety of the students was measured through reading anxiety tool.

## Tools used

The following tools were used for the present study:

1. Teacher's Referral form to identify students with dyslexia (Self-prepared)
2. Diagnostic Test of Reading Disorder (DTRD) by Swarup and Mehta (2003)
3. Standard Progressive Matrices (SPM) by Raven, Raven & Court (2000) to assess intelligence level
4. Reading Anxiety tool (Self-prepared)
5. Mindfulness based intervention modules (Self-prepared)

## Statistical Techniques used

Descriptive statistical analysis mean, median, mode, standard deviation, skewness, and kurtosis were used to study the nature of distribution. Inferential statistics, i.e. t-test was employed to test the hypotheses.

## RESULTS AND DISCUSSION

**Table 1: Mean, Median, Mode, Standard Deviation, Skewness, and Kurtosis for Reading Anxiety of students with dyslexia at pre-test stage**

Group	Mean	Median	Mode	SD	Sk	Ku
EG (N=22)	54.27	54.0	30.0	14.082	-0.117	-1.051
CG (N=22)	52.77	56.5	40.0	15.699	-0.534	-0.642

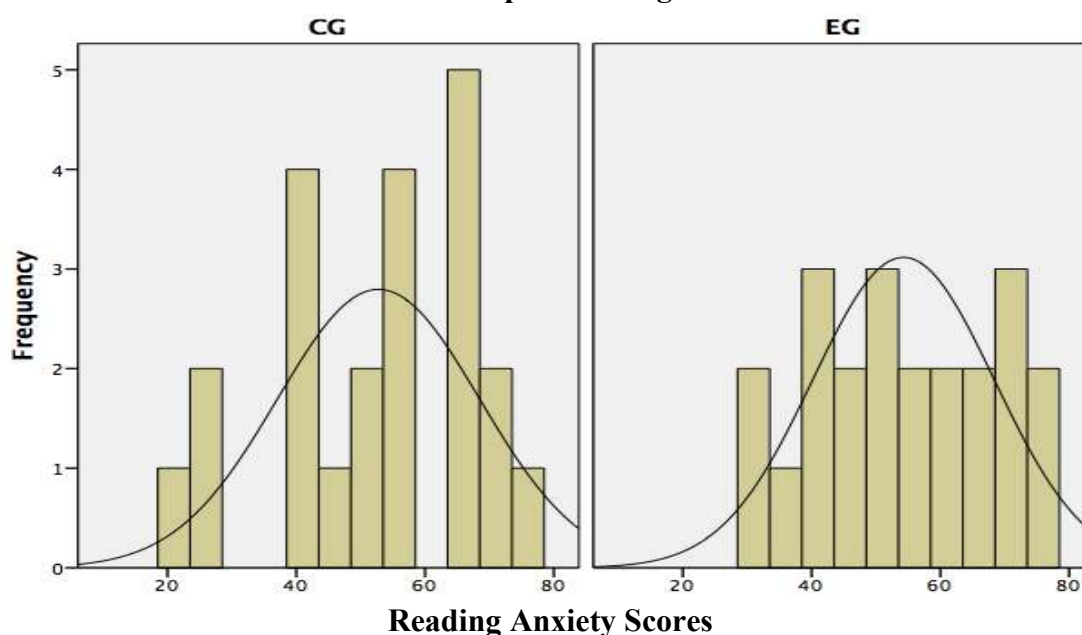
**Figure 1: Reading Anxiety score distribution of students with dyslexia in EG and CG at pre-test stage**

Table 1 shows that the mean scores for Reading Anxiety are 54.27 and 52.77 for EG and CG respectively. The value of Skewness for EG was -.117 and that of CG was -0.534. The values of skewness lie within the acceptable limits of normality of distribution. Thus, the distributions can be considered as normal. The value of kurtosis was found to be -1.051 for EG and -0.642 for CG indicating that the curves are slightly platykurtic.

**Table 2: Mean, Median, Mode, Standard Deviation, Skewness, and Kurtosis for Reading Anxiety of students with dyslexia at post-test stage**

Group	Mean	Median	Mode	SD	Sk	Ku
EG (N=22)	17.36	16.0	10.0	8.039	1.558	3.642
CG (N=22)	46.41	47.5	25.0	14.556	-0.168	-0.284

**Figure 2: Reading Anxiety score distribution of students with dyslexia in EG and CG at post-test stage**

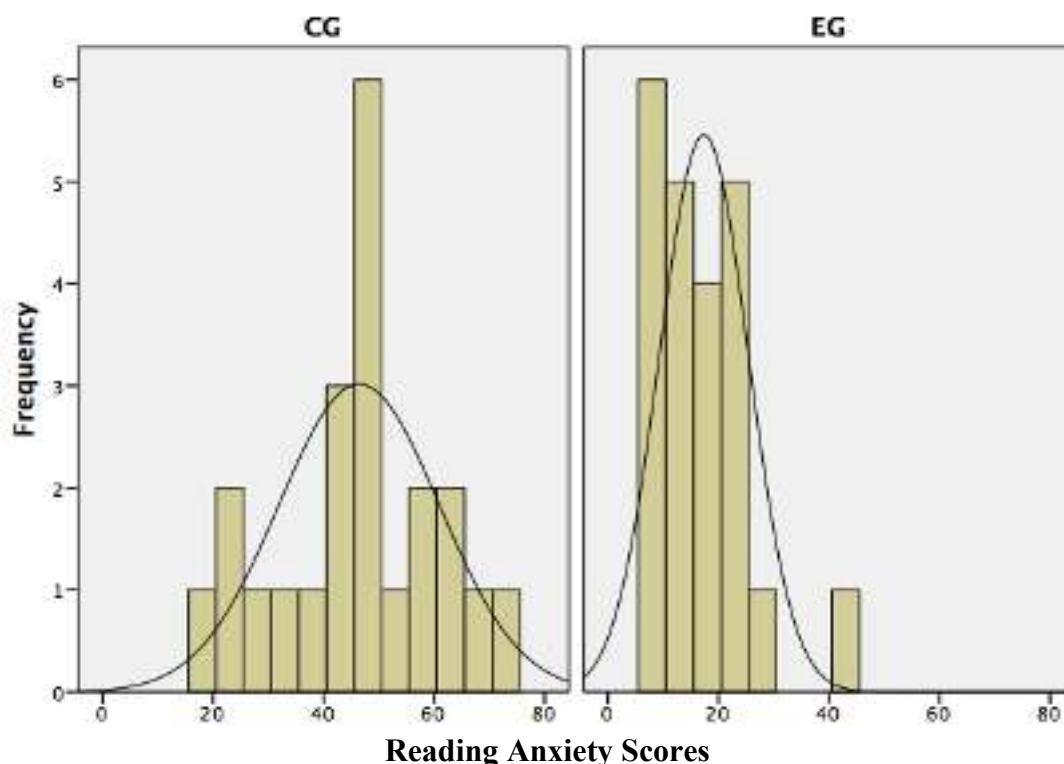


Table 2 shows that the mean scores for Reading Anxiety are 17.36 and 46.41 for EG and CG respectively for students with dyslexia at the post-test stage. The values of Skewness for EG was 1.558 and that of CG was -0.168, which lie within the acceptable limits of normality. The values of kurtosis were found to be 3.642 for EG and -0.284 for CG, indicating that both the curves are platykurtic.

#### **Homogeneity of variance for Reading Anxiety scores of students with dyslexia in EG and CG.**

The assumption of equal variance in the pre-test scores for assessment towards Reading Anxiety of students with dyslexia in EG and CG has been tested using Levene's test (Table 3).

**Table 3: Homogeneity of variance for Reading Anxiety scores of students with dyslexia in EG (N=22) and CG (N=22)**

	Levene Statistic	df <sub>1</sub>	df <sub>2</sub>	Sig.
Pre-test	.241	1	42	.626



The Levene statistic value for pre-test score on assessment towards Reading Anxiety of students with dyslexia is 0.241, with p-value of 0.626, which is insignificant. This implies that there exist equal variances at the pre-test stage of assessment towards Reading Anxiety of students with dyslexia in EG and CG.

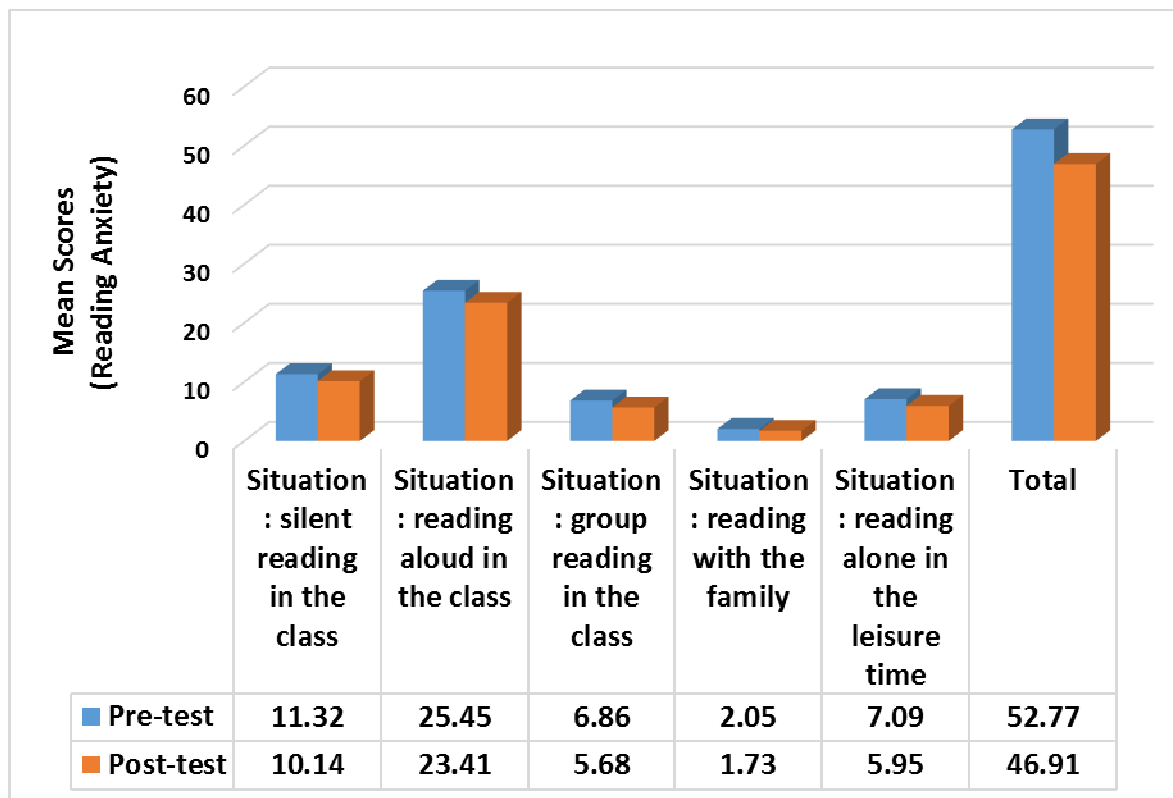
**Table 4: Paired samples t-test for pre-test and post-test scores on Reading Anxiety of students with Dyslexia of Control Group (N=22, df=21)**

Reading anxiety (component-wise)	Testing Stage	Mean	SD	SE <sub>D</sub>	Difference in means (post-pre)	t-value	p
1. Situation: silent reading in the class	Pre	11.32	3.48	.743	-1.18	-2.252	.035 *
	Post	10.14	2.98	.64			
2. Situation: reading aloud in the class	Pre	25.45	7.71	1.65	-2.04	-3.509	.002 **
	Post	23.41	7.90	1.69			
3. Situation: group reading in the class	Pre	6.86	3.24	.691	-1.18	-2.602	.017*
	Post	5.68	3.23	.688			
4. Situation: reading with the family	Pre	2.05	1.49	.319	-0.109	-2.084	.050
	Post	1.73	1.39	.296			
5. Situation: reading alone in the leisure time	Pre	7.09	2.79	.595	-0.191	-1.904	.071
	Post	5.95	2.98	.636			
<b>Reading anxiety (Total)</b>	Pre	52.77	15.69	3.35	-5.86	-3.675	0.001 **
	Post	46.91	14.56	3.10			

\* Significant at .05 level of significance

\*\* Significant at .01 level of significance

**Figure 3: Pre-test and post-test mean scores on Reading Anxiety of students with Dyslexia in Control Group (N=22, df=21)**



As presented in Table 4 and Figure 3, the difference in the pre-test and post-test scores on Reading Anxiety of students with Dyslexia in Control Group was found to be -5.86. It was found to be significant ( $t = -3.675$ ,  $p < 0.01$ ), hence the null hypothesis stating “There will be no significant difference in the pre-test and post-test Reading Anxiety mean scores of students with dyslexia in Control Group” stands rejected. It implies there exists significant difference in the pre-test and post-test mean scores on Reading Anxiety of students with dyslexia, which further implies that reading anxiety of the students with dyslexia has significantly declined over a period of time. However, situation-wise analysis shows that changes in reading anxiety of these children remained insignificant in situations, viz; reading with the family and reading alone in leisure time.

**Table 5: Paired samples t-test for pre-test and post-test scores on Reading Anxiety of students with Dyslexia of Experiment Group (N=22, df=21)**

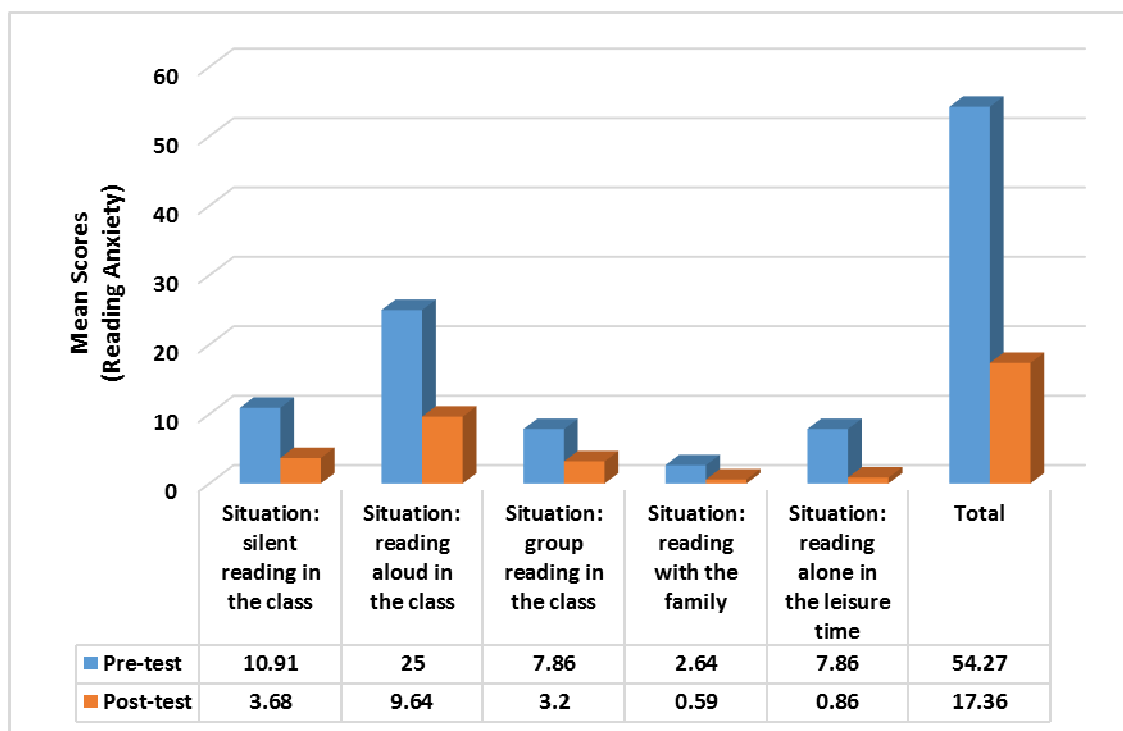
Reading anxiety (component-wise)	Testing Stage	Mean	SD	SE <sub>D</sub>	Difference in means (post-pre)	t-value	p
1. Situation: silent	Pre	10.91	3.517	.750	-7.23	-10.934	.000**

reading in the class	Post	3.68	1.585	.338			
2. Situation: reading aloud in the class	Pre	25.00	8.547	1.822	-15.36	-10.846	.000**
	Post	9.64	5.377	1.146			
3. Situation: group reading in the class	Pre	7.86	3.212	.685	-5.31	-7.693	.000**
	Post	2.55	1.011	.215			
4. Situation: reading in the family	Pre	2.64	1.432	.305	2.05	5.373	.000**
	Post	.59	.854	.182			
5. Situation: reading alone in the leisure time	Pre	7.86	2.475	.528	-7.00	-12.998	.000**
	Post	.86	1.246	.266			
<b>Reading anxiety (total)</b>	Pre	54.27	14.08	3.002	-36.91	-16.074	.000**
	Post	17.36	8.039	1.714			

\* Significant at .05 level of significance

\*\* Significant at .01 level of significance

**Figure 4: Pre-test and post-test scores on Reading Anxiety of students with Dyslexia of Experiment Group (N=22, df=21)**



As presented in Table 5 and Figure 4, the difference in pre-test and post-test mean scores on Reading Anxiety of students with Dyslexia in the Experiment Group was found to be -36.91 which is significant ( $t=-16.074$ ,  $p< 0.01$ ). Also, decline in reading anxiety scores were significant across all situations. Hence the null hypothesis stating “There will be no significant difference in the pre-test and post-test Reading Anxiety mean score of students with dyslexia in Experiment Group” stands rejected. It can be interpreted that the reading anxiety of the students with dyslexia in experiment group has significantly declined after the students were exposed to six weeks’ Mindfulness-based intervention.

**Table 6: Independent samples t-test between Experiment Group (N=22) and Control Group (N=22) for pre-test and post-test scores on Reading Anxiety of students with Dyslexia (df=42)**

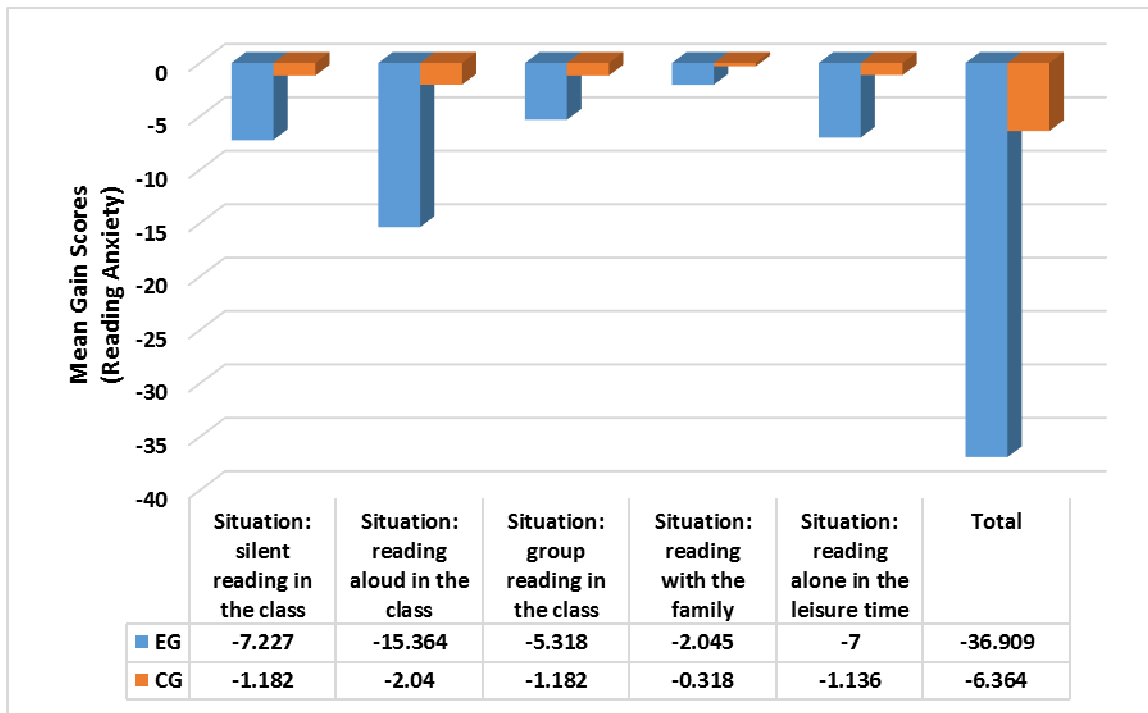
Reading anxiety (component-wise)	Group	Mean Gain scores	SD	SE <sub>M</sub>	df	t-value	p
1. Situation:	EG	-7.23	3.1	0.661	42	-7.162	.000**

silent reading in the class	CG	-1.18	2.462	0.523			
2. Situation: reading aloud in the class	EG	-15.36	6.644	1.416	42	-8.694	.000**
	CG	-2.04	2.733	0.583			
3. Situation: group reading in the class	EG	-5.32	3.242	0.691	42	-5.001	.000**
	CG	-1.18	2.129	0.454			
4. Situation: reading in the family	EG	-2.04	1.785	0.381	42	-4.211	.000**
	CG	-0.32	0.716	0.153			
5. Situation: reading alone in the leisure time	EG	-7.00	2.526	0.538	42	-7.294	.000**
	CG	-1.14	2.799	0.597			
<b>Reading anxiety (total)</b>	EG	-36.91	10.769	2.296	42	-10.621	.000**
	CG	-6.36	8.121	1.731			

\* Significant at .05 level of significance

\*\* Significant at .01 level of significance

**Figure 5: Mean gain scores on Reading Anxiety of students with Dyslexia in Experiment Group (N=22) and Control Group (N=22)**



As shown in Table 6 and Figure 5, the mean gain scores on Reading Anxiety of students with Dyslexia in the Experiment Group and Control Group were found to be -36.909 and -6.364 respectively. The t-value was found to be significant ( $t=-10.621$ ,  $p<0.01$ ). Hence the null hypothesis stating “There will be no significant effect of Mindfulness-based intervention on Reading Anxiety of students with dyslexia” stands rejected. Significant mean gain score differences across all the dimensions further indicate that Mindfulness intervention has significantly reduced anxiety of students in Experiment Group. Hence, it can be interpreted that the Mindfulness intervention had significant effect on the Reading Anxiety of the students with Dyslexia. In other words, the Reading Anxiety of students in Experiment Group reduced significantly after mindfulness-based intervention as compared to Reading Anxiety among students with dyslexia in Control Group.

**CONCLUSION**

The results/findings of the present study have revealed that exposure to the mindfulness-based intervention lead to significant decline in the reading anxiety among students with dyslexia. The findings point to the immense potential of mindfulness-based intervention which is not only low-cost but also has many more



benefits beyond the one empirically proven in this study (ample research is available that endorses this point).

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