The Role of Outdoor Mindfulness Intervention in Optimizing Mental Well-Being in Adolescents with Specific Learning Disabilities

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KEYWORDS

Mindfulness, Mental Well-Being, Adolescents, Specific Learning Disabilities, Outdoor Mindfulness Intervention

ABSTRACT

Adolescents with specific learning disabilities may experience mental well-being challenges as a result of struggling academically, facing social stigma, being subjected to negative stereotypes, and experiencing heightened levels of anxiety, poor mental health, lower self-esteem, and increased stress. This study explores the potential benefits of outdoor-based mindfulness interventions as a complementary approach to remedial education, in improving mental well-being in adolescents with specific learning disabilities. This study was conducted at an institution that gives remedial education for children with specific learning disability in Thrissur, Kerala. Convenient sampling was used to select 30 students aged 13-18 years. Later, participants were randomly divided into two groups the experimental group (n=15) received outdoor mindfulness training in addition to their regular remedial education program. In contrast, the control group (n=15) received only remedial training. The study duration spanned four weeks, during which the mindfulness group participated in weekly outdoor mindfulness sessions conducted individually. They were instructed to practice mindfulness exercises daily between sessions. Both groups were assessed using the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) at the beginning (pre-intervention) and at the end (post-intervention) of the four weeks to measure changes in mental well-being. The outdoor mindfulness interventions included a range of activities, designed to optimize the level of well-being experienced by the participants in their day-to-day lives. These activities focused on enhancing the skills of mindfully listening, walking, breathing, and observing without any judgments of self and surroundings and being in the present at the moment. Results indicated significant improvements in mental well-being scores among participants in the mindfulness group compared to the control group. This underscores the potential of integrating mindfulness practices into educational settings to enhance emotional regulation and overall well-being in adolescents with specific learning disabilities, highlighting interdisciplinary opportunities across psychology, education, environmental psychology, public health, and social work to support comprehensive student development.

1. Introduction

Children with Specific Learning Disability (SLD) are at risk of acquiring negative feelings of self-worth due to academic difficulties, struggles in social situations requiring the use of reading and writing skills, social stigma, and being subjected to negative stereotypes (Stathopoulou &Karathanasi, 2023). Rather than learning and developing attitudes about tasks they ‘can do’ youngsters with learning disability often focus on what they ‘can't do’. Studies highlight higher levels of anxiety and lower levels of optimism among adolescents with specific learning disability (SLD) (Nelson & Harwood, 2011). Children cannot flourish when burdened with anxiety, it affects their mental well-being. Evidence shows that early life experiences contribute to determining health, well-being or diseases. Thus, interventions during childhood and adolescence are most effective in promoting overall health and development (WHO, 2018). Interventions for the reduction of psychopathological conditions and interventions for the promotion of mental well-being are equally important for the complete mental health. The present study focuses on exploring the potential benefits of outdoor-based mindfulness interventions as a complementary approach to remedial education, in improving mental well-being in adolescents with specific learning disabilities. Mindfulness is purposefully directing attention to the present moment with openness, curiosity acceptance and a non-judgemental attitude (Bishop et al., 2004). Being fully present and accepting of thoughts, emotions, physical sensations, and the environment around us is the core of mindfulness, and it has been shown to provide greater self-acceptance and mental well-being (Beauchemin et al., 2008; Kabat-Zinn et al., 1998). Being mindful allows to reconnect with mind and body as it involves pausing, observing breath, acknowledging physical existence, and achieving a heightened state of conscious awareness in the present moment. In

mindfulness, focus is directed to breathing or another chosen focal point to establish an anchor in the present moment (Djernis et al., 2019)

Practicing mindfulness improves self-awareness and having increased awareness about one's thoughts and emotions leads to better emotional regulation, reduced stress levels and enhanced overall well-being. Mindfulness also reduces the tendency to be distracted by emotions, prevents rigid thinking patterns and aids in consciously choosing how to respond rather than being impulsive (Bockman&Yu, 2022). Blair and Dennis(2010) state that mindfulness heightens emotional balance, enhancing the ability to have a positive outlook and cope with the ups and downs of life with more resilience. Thus, practicing mindfulness helps students with learning disability to acknowledge their disability and fosters resilience and positive self-image. Mindfulness intervention has a positive impact on overall wellbeing. Wellness includes various factors like an individual's positive evaluation of life experiences, and how optimistic they are in handling emotions, behavior and weaknesses (Manderscheid et al., 2010). Even though more progress has been made in positive health and well-being studies, mental health has been primarily viewed through a disease-centred lens with a lot of focus on diagnosing and treating problems. Research indicates that wellness and illness are not simply opposites on a single continuum but are two different constructs measured on two different continua (Manwell et al., 2015). That is, not having an illness does not ensure mental wellness. Therefore, the illness-centric approach should incorporate positive psychological functioning as a core element (WHO, 2014). Therefore, while giving remedial training for children with learning disability, it should focus on academics, emotional and behavioral problems as well as positive aspects of mental well-being.

Positive mental health means having awareness about one's strengths and using them, managing day-to-day stressors, being productive and functioning well within the community and building interpersonal relationships. Having positive mental health is the base for personal and communal well-being and each individual and community should give importance to strengthening, safeguarding and restoration of mental health. Child and adolescent development programs help in promoting mental health and well-being (WHO, 2018). Rodrigues et al. (2023) state that 25% percentage of adolescents require interventions to improve their mental wellbeing. The research emphasizes the need for collaboration between healthcare professionals, schools and parents in implementing these interventions. Adolescence is a vital period for developing social and emotional habits that are essential for mental well-being (WHO, 2018). When considering mental wellbeing among adolescents it not only includes treating, managing and reducing the prevalence rates of mental illness, it should also include enhancement of habits that promote overall well-being and prevent mental illnesses. Interventions focusing on the development of mental well-being include providing psychosocial interventions, and promotion of mental health through psychoeducation and community-based education (Manderscheid et al., 2010). Mental well-being during adolescence supports the development of healthy adults who can play a vital role in a country’s social and economic progress (Sapthiangs et al., 2018). Adolescents with Specific Learning Disability (SLD) experience twice the risk of psychological distress compared to adolescents without learning disability (Svetaz et al., 2000). 5 to 15 % of school-age children have SLD. Learning disability, otherwise known as specific learning disorder is a neurodevelopmental disorder manifested as significant and persistent difficulties in reading, writing, numeration skills and mathematical reasoning. These difficulties are not primarily due to low levels of intelligence, sensory impairments, psychiatric disorders or socio-economic backwardness. Children, adolescents and adults with SLD try to avoid activities that require reading, writing and numeracy. Also, they commonly experience severe anxiety or anxiety disorder line panic attacks and somatic complaints. SLD is also associated with an increased risk of suicidal attempts in adolescents and adults (American Psychiatric Association, 2013). Problems in the ability to self-regulate behaviors, problems of social perception and social interaction may exist with learning disabilities (NJCLD, 1991). Other comorbid disorders associated with SLD are attention deficit hyperactivity disorder (ADHD), communication disorders, and developmental coordination disorders, autistic spectrum disorders. SLD with comorbid conditions elevates mental health problems, it is

important to note that SLD differs from person to person in its combination and intensity of symptoms. Intensive individualized instruction using evidence-based interventions helps to overcome academic difficulties due to SLD (American Psychiatric Association, 2013).

Due to the complexity of the problems associated with SLD and comorbid disorders, along with academic skills interventions children and adolescents with SLD need psychological interventions to develop socio-emotional competencies and positive mental health. Literature in this area proposes that intervention studies that inculcate positive thoughts, attitude and behaviours that enhance mental well-being of children with SLD are needed. Mindfulness is a well-established strategy for promoting mental health and well-being among adults and adolescents (Burke, 2009; Sapthiang et al., 2018). Studies showed that mindfulness can interrupt negative thinking patterns and behavior, handling difficult emotions more effectively and promoting self-compassion (Farb et.al., 2012). Bistagani & Najafi (2017) state that mindful-based 'child-centred mind-focused therapy' has increased the social skills and self-efficacy of children with learning disabilities. Mindfulness training improved attention, reading and writing skills, reduced anxiety and increased positive affect. It was also found that in children with SLD mindfulness training improved the use of meta-cognitive strategies (Keller et al., 2019). Outdoor mindfulness interventions demand exposure to the natural environment, which enhances experiences of mindfulness. Nature-based outdoor mindfulness activities have been associated with increased self-regulation, calmness, reduced stress levels and overall positive experience related to physical, psychological, social and spiritual aspects (Djernis et al., 2023). This includes better physiological habits, reduced pain levels, increased positive affect, emotional regulation, better thought process, improved connectedness with others as stress and conflict are managed well (Argyriadis et al., 2024). Therefore, outdoor mindfulness intervention is an effective approach to promote mental wellbeing. While there is research available on mindfulness and its benefits on mental health, there is comparatively less focus on outdoor mindfulness intervention, particularly for adolescents with SLD. This study aims to investigate the effectiveness of outdoor mindfulness interventions in increasing the mental well-being of adolescents with SLD who undergo remedial education alongside.

2. Methodology

The research employs a quasi-experimental design. The independent variable for the study is outdoor mindfulness interventions and the dependent variable is the mental well-being of adolescents with specific learning disability. The population of the study included all the adolescents with specific learning disability within the age group of 13-18 at the institution where the study was carried out. The study was conducted at an institution at Thrissur, Kerala, India which provides remedial training for children with SLD. A total of 30 adolescents aged between 13-18 years were selected using the convenience sampling method. Prior to the study informed consent was obtained from participants and their parents. Participants were randomly divided into two groups the experimental group (n=15) and control group (n=15). Inclusion criteria required participants to be diagnosed with SLD, within the specific age range and obtain parental consent to participate.

Procedure

Participants in the experimental group received outdoor mindfulness training in addition to their regular remedial education program. The control group received only remedial education during the experimental phase. Over a span of five weeks, participants in the experimental group underwent a structured intervention. For four weeks, in each week they received a 15-minute individual mindfulness session introducing a new technique. These sessions, facilitated by the researcher, aimed to familiarize participants with a variety of mindfulness practices. Following each session, participants were instructed to engage in daily mindfulness practice throughout the week. To monitor adherence, both parents and children maintained a chart documenting completion of these exercises. Maintaining this accountability tool allowed the researcher to track participants' consistency and engagement with the assigned mindfulness practices, this helped to provide personalized guidance and reinforce techniques

through regular practice.

Scale

Both groups were assessed using the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS), pre-test was given at the beginning of the study and post-test was conducted at the end of the five weeks. WEMWBS is developed by the University of Warwick and the University of Edinburgh in 2006 by a panel led by Sarah Stewart Brown and Stephen Platt. It consists of 14 items on a 5-point Likert scale. WEMWBS showed good content validity and internal consistency. Cronbach's alpha coefficient is 0.89 for students and 0.91 for the population sample. Test-retest reliability at one week is 0.83(Tennant et al., 2007). Warwick Edinburgh Mental Wellbeing Scale (WEMWBS) represents mental well-being as not the absence of mental illness, but the ability to function well on a day-to-day basis and have positive feelings.

Intervention

Age-appropriate mindfulness interventions were selected from existing outdoor mindfulness interventions and these interventions were customised according to the study. These activities focused on enhancing the skills of mindfully listening, walking, breathing, and observing without any judgments of self and surroundings and being in the present at the moment. Each session was individually conducted for 15 minutes which included instruction time and practicing mindfulness. Afterward, participants were instructed to practice this every day for one week till the next session. To achieve a calm state guided breathing exercise was implemented as the first step. Intervention for Day 1 was mindful listening, this can be done by sitting comfortably somewhere outside, keeping the eyes closed, taking deep breaths and focus attention on everything that can be heard and identifying each sound separately. Intervention for Day 2 was mindful walking, after taking a few breaths start walking slowly and while walking focus attention to all the sensations. Intervention for day 3 was bubble thoughts, sit comfortably outside and focus on breathing, imagine that thoughts are placed within a bubble and notice it floating away. Let the bubble move freely with the wind, don't try to grab it. Intervention for day 4 was mindful observation, for this sit outside comfortably and focus on breathing, come to a state of calmness, look at the surrounding features and pay attention to all the details using all the senses (Ballew & Omoto, 2018; Fleming et al., 2007; Segal et al., 2002; Kabat-zinn, 2023; Ackerman, 2024; Thompson & Gauntlett-Gilbert, 2008)

Analytical tools

In this study to analyse the data Kolmogorov-Smirnov and Shapiro-Wilk tests are used to see if the data followed a normal distribution. Paired sample t-tests and independent sample t-tests are other tests used for analysis. These tests aimed to assess the impact of outdoor mindfulness practices on mental well-being, differences in mental well-being scores based on gender and to make a comparison between adolescents who received mindfulness training along with regular remedial education and with those receiving only remedial education.

3. Results and discussion

Table 1. Tests of Normality

	Kolmogorov-Smirnov[a]			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Pretest	.096	30	.200*	.992	30	.997
Posttest	.079	30	.200*	.986	30	.950

Here the P value is greater than 0.05 so the data is normal.

Objectives

1) To evaluate the effectiveness of outdoor-based mindfulness practices in enhancing the mental well-being of adolescents with specific learning disabilities.

H0: Outdoor-based mindfulness practices is not effective in enhancing the mental well-being of adolescents with specific learning disabilities.

Table 2.Paired Simple t-Test Results for Mental Well-Being Scores Pretest and Post-Test in Children With Specific Learning Disability

Paired Sample t Test							
	Mean	**N**	**Std. Deviation**	**Std. Error Mean**	**t**	**P value**	**Remark**
Pretest	45.6	15	7.39498	1.90938	-6.615	0.000	Significant
Posttest	50.0667	15	5.78751	1.49433			

Here the P value is less than 0.05 so we reject the null hypothesis, ie outdoor-based mindfulness practices are effective in enhancing the mental well-being of adolescents with specific learning disabilities. The post-test mean score is significantly increased than the pretest score.

2) To investigate the presence of gender-based disparities in mental well-being scores among adolescents with specific learning disabilities before implementing outdoor mindfulness interventions.

H0: Gender has no impact on mental well-being scores among adolescents with specific learning disabilities before implementing outdoor mindfulness interventions.

Table 3. Independent Simple t-Test Results of Gender Disparities in Mental Well-Being Scores of the Intervention Group Before Implementing Outdoor Mindfulness Interventions.

Independent Sample t Test							
Gender	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**	**t**	**P value**	**Remark**
MALE	16	42.8125	5.38168	1.34542	-2.982	0.007	Significant
FEMALE	14	49.0714	6.3302	1.69182			

Here the P value is less than 0.05 so we reject the null hypothesis, ie Gender has impact on mental well-being scores among adolescents with specific learning disabilities before implementing outdoor mindfulness interventions. The mean score is more for females than males. 3) To analyse how participation in outdoor mindfulness interventions impacts gender-based disparities in mental well-being outcomes among adolescents with specific learning disabilities. H0: There is no association between gender and mental well-being outcomes among adolescents with specific learning disabilities after the outdoor mindfulness interventions.

Table 4.Independent Simple t-Test Results for Gender Differences in Mental Well-Being Outcomes

Independent Sample t Test							
Gender	N	Mean	Std. Deviation	Std. Error Mean	t	P value	Remark
MALE	8	-5.25	3.1053	1.09789	-1.267	0.227	Not significant
FEMALE	7	-3.571	1.71825	0.64944			

Here the p value is greater than 0.05 so accept the null hypothesis ie there is no significant difference in the mean difference score among males and females. 4)Compare the mental well-being outcomes between two groups: adolescents with specific learning disabilities who receive outdoor mindfulness training alongside their regular remedial education program, and those who receive only remedial education. H0: There is no significant difference in the mental well-being outcomes between two groups: adolescents with specific learning disabilities who receive outdoor mindfulness training alongside their regular remedial education program, and those who receive only remedial education.

Table 5. Independent Simple t-Test Results of Mental Wellbeing Scores of Intervention Group and Control Group in the Post-Test

Independent Sample t Test							
Group	N	Mean	Std. Deviation	Std. Error Mean	t	Sig.	Remark
Control	15	-0.3333	1.83874	0.47476	5.008	0.000	Significant
Case	15	-4.4667	2.61498	0.67518			

Here the p value is less than 0.05 so we reject the null hypothesis ie there is significant difference in the mental well-being outcomes between two groups. The mean difference score is more in adolescents with specific learning disabilities who receive outdoor mindfulness training alongside their regular remedial education program than those who receive only remedial education.

The study was conducted to find out whether outdoor-based mindfulness practices enhance the mental well-being of adolescents with specific learning disabilities. The results indicate that outdoor mindfulness intervention is effective in enhancing the mental well-being of adolescents with SLD who are undergoing remedial education programs. The result of the study is consistent with the findings of Bistagani & Najafi (2017) where social skills and self-efficacy was improved by implementing mindfulness. Similarly, mindfulness training reduces anxiety and improves positive affect (Keller et al.,2019). With regard to the finding of a group program implemented in schools for adolescents, it was found that mindfulness training can improve mental well-being, students learning performance, classroom behavior and resilience (Sapthiang et al., 2018). With regard to gender-based disparities in mental well-being scores among adolescents with specific learning disabilities before implementing outdoor mindfulness interventions, baseline scores indicate that females have better mental well-being when compared to males. While analysing how participation in outdoor mindfulness interventions impacts gender-based disparities, findings show that there is no gender difference in the effect of outdoor mindfulness intervention. The rise in the level of mental well-being scores among boys and girls doesn't show much difference. This study contributes to the existing literature by finding out that mindfulness training can support any adolescent with SLD regardless of gender in improving mental well-being. When mental well-being outcomes between two groups who received intervention and who didn't get intervention are compared, adolescents who received both remedial education and mindfulness training showed greater improvements in mental well-being compared to those who only received remedial education. Practicing mindfulness increases positive states of mind and reduces fear and anxiety (Sapthiang et al., 2018; Farb et.al., 2012). The results go on par with the findings of Argyriadis et al. (2024) which state that nature-based mindfulness intervention has a notable effect on the reduction of stress and an increase in positive attitude and cognitive restoration.

4. Conclusion and future scope

Findings support that giving mindfulness interventions along with remedial education is beneficial in both cognitive and emotional aspects, which leads to holistic development of children with SLD. Schools and remedial education programmes should consider incorporating outdoor mindfulness intervention in their curriculum for children especially for children with SLD. The study also suggests

that when outdoor mindfulness interventions are incorporated with remedial sessions it is not required to develop different mindfulness programs for boys and girls.

Limitations

Sample size of the study is a limitation when it comes to generalizing findings. The study focused on short-term outcomes only. Additionally, the study didn't consider the severity rage of the learning disability, co-morbid conditions and socioeconomic status of each individual.

Recommendations

Further studies can incorporate qualitative data analysis to understand their experience and perception of how mindfulness intervention helped them. Also, the long-term impact of outdoor mindfulness intervention in adolescents with SLD can be investigated to analyse the effect of the intervention on mental health. Future studies can also include an assessment of attention levels to evaluate whether there is an improvement.

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