

“Let's keep calm and breathe”—A mindfulness meditation program in school and its effects on children's behavior and emotional awareness: An Australian pilot study

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Abstract

This study aimed to understand how mindfulness meditation affects young people by examining its impact on self-regulation, happiness, emotional awareness, and school performance among two groups of school children. A 10-week mindfulness program was conducted by a meditation expert for 552 children aged 4–8 (Group 1) and 287 children aged 9–11 (Group 2). Results for the 4–8 years group (Group 1) showed meditation predicted an increase in happiness ($R^2 = .003$, $p < .001$) and self-reported school performance ($R^2 = .005$, $p < .001$) and a decrease in emotional ($R^2 = .017$, $p < .001$) and behavioral difficulties ($R^2 = .009$, $p < .001$); however, the effect sizes were small. In the 9–11 years group (Group 2), meditation predicted an increase in emotional awareness ($R^2 = .02$, $p < .001$), and a decrease in emotional ($R^2 = .014$, $p < .001$) and behavioral difficulties ($R^2 = .009$, $p < .001$) as measured by scores from baseline to postintervention. For Group 2, there was no significant change in happiness over the 10 weeks. The findings support incorporating mindfulness meditation in schools, noting significant enhancements in self-regulation with just 5 min of daily practice.

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KEYWORDS

children, emotional awareness, meditation, mindfulness, school trial, self-regulation

Practitioner Points

- Daily meditation of just 5 min for 4–8-year-olds predicted an increase in happiness, self-reported school performance, and a decrease in emotional and behavioral difficulties.
- Daily meditation of just 5 min in 9–11-year-olds predicted an increase in emotional awareness, and a decrease in emotional and behavioral difficulties, but no change in happiness.
- Daily meditation of just 5 min over 10 weeks enhanced self-regulation in primary school children.

1 | INTRODUCTION

In Australia, there is growing awareness about the high prevalence rates of psychological distress in school-aged children. The National Survey of Child and Adolescent Mental Health and Wellbeing conducted in Australia in 2013–14, estimated approximately one in seven Australians aged 4–17 years experienced stress, anxiety, and depression symptoms in the previous 12 months (Zubrick et al., 2015). During the COVID-19 pandemic, the National Mental Survey conducted in 2021 revealed that approximately one in five children reported feeling more distressed and anxious than they used to (De Young et al., 2021). Mental health related issues such as this, have been considered as a major cause of school dropouts, social isolation, and other emotional and behavioral problems (Albrecht, 2019; Amundsen et al., 2020).

1.1 | Role of self-regulation, emotional awareness, and happiness on mental health of school children

1.1.1 | Self-regulation

Self-regulation in children is significantly correlated with their mental health outcomes (Bub et al., 2016; Edossa et al., 2018; Robson et al., 2020). The Robson 2020 meta-analysis study that explored whether self-regulation in childhood relates to concurrent and subsequent levels of achievement, interpersonal behaviors, mental health, and healthy living showed that self-regulation in early school years was negatively related to depression and anxiety, obesity, unemployment, aggressive and criminal behavior, cigarette smoking, alcohol and substance abuse, and symptoms of physical illness in adulthood (Robson et al., 2020). Hence, it is imperative that schools promote and maintain a learning environment in which students feel safe, supported, and as such can be self-regulated (Viglas & Perlman, 2018; Zenner et al., 2014).

Self-regulation enables children to navigate various developmental challenges and adapt to the learning environment's demands. It allows for engagement in learning activities and provide the foundation for adjustment

to school (Blair & Raver, 2015). Self-regulation skills are associated with higher academic achievement and are foundational for lifelong learning and adaptation (Mega et al., 2014).

Behavioral self-regulation enables students to navigate the structured demands of the educational environment such as impulse control, task initiation and completion, and adherence to rules and expectations, contributing to effective learning and positive academic outcomes (Weis et al., 2013). Emotional self-regulation is foundational for maintaining focus, motivation, and perseverance in the face of academic challenges (Blair & Raver, 2015). Poor emotional self-regulation has been associated with a plethora of mental health problems, which includes conduct disorders, anxiety, depression, substance abuse, eating disorders, and nonsuicidal self-injury (Lazarus et al., 2020). Meta-analytic reviews on the association between emotional regulation and children's mental health outcomes by Sendzik et al. (2017) and Robson et al. (2020) suggest that emotional awareness and reappraisal hold potentials to minimize the impacts of life stressors on interpersonal behaviors and psychological wellbeing in later life and, to serve as pathways for adaptive coping and achieving goals. Hence, it is reasonable to suggest that the key element of effective self-regulation is the ability to acknowledge emotions and reframe a challenging situation to reduce its emotional impact rather than avoiding them.

According to Edossa et al. (2018), emotional regulation affected behavioral regulation more strongly at an early developmental stage (ages 3–5) than later developmental stages while the behavioral regulation during the third year of primary education (age 7) had a substantial and positive effect on teachers' evaluations of educational achievement during the last year of primary school (age 11). In contrast, emotional self-regulation only had a small indirect and positive effect via behavioral self-regulation. Hence, Edossa's study suggested that to gain a complete picture of the development of self-regulation and its effect on educational achievement, the facets emotional and behavioral regulation should both be studied in concert.

1.1.2 | Emotional awareness

As children grow, they realize that there are others in the world, and that other people have feelings, needs, and desires just like they do. Thus, they are aware about self & their emotional needs (Durlak et al., 2011). Emotional awareness is the ability to recognize and make sense of not just your own emotions, but also those of others (Tov et al., 2022). Whereas the attempt to inhibit undesired emotions and thoughts to avoid any forms of outward emotional expression is known as emotional suppression (Butler et al., 2003; Goldin et al., 2008).

Mancini et al. (2013), in a study done with children aged 8–13 years old, found that children who excel in emotional awareness often experience improved social and environmental adaptation, enhanced quality of social interactions, and reduced emotional and behavioral issues. The results of a Chinese study on school children showed that children with high emotional awareness were less likely to adopt expressive suppression as an emotion regulation strategy and had lower depression levels currently and in the future. In contrast, children with low emotional awareness were more likely to use suppression strategies and showed higher depression levels. Thus, the results indicated that emotional awareness could predict children's current and future depression status. Meanwhile, emotional regulation strategies are an important mediating variable explaining the relationship between emotional awareness and children's depression (Wang et al., 2023).

Meanwhile, Weissman et al. (2020) found that emotional awareness is negatively associated with psychopathology and may serve as a protective factor against the development of mental health issues. Their study indicates that low emotional awareness can be a transdiagnostic mechanism that contributes to the emergence of psychopathology, particularly during the transition to adolescence and in the context of childhood trauma. Kranzler et al. (2016), in a study that looked at the role of emotional awareness as a transdiagnostic predictor of subsequent symptoms of depression and anxiety in school children, found that low emotional awareness in children predicts both depressive and anxiety symptoms over a 1-year period, suggesting that emotional awareness training may be beneficial in treatment and prevention programs.

Collectively, these studies demonstrate the significant impact that emotional awareness has on childrens' mental health and social development, emphasizing both the importance for cultivating emotional awareness for positive developmental outcomes and the potential adverse effects of neglecting it at earlier age. Empirical research has suggested that emotional awareness and reappraisal, in contrast to emotional suppression, might contribute to improving individuals' psychological wellbeing (Crockett et al., 2006; Eisenberg et al., 2010).

1.1.3 | Happiness

Positive psychology sees happiness as a key sign of being in a good mental and emotional state, where people are at their best psychologically and feel great. Seligman et al.'s (2009) work called "Positive Education: Positive Psychology and Classroom Interventions" highlighted serious issues such as the widespread occurrence of depression among young people around the world, the slight improvement in how satisfied people feel with their lives over the last 50 years, and how positive feelings can enhance learning. Low satisfaction with school in many countries can be added to that list as well (Rijavec, 2015).

According to a 2019 Turkish study on factors affecting happiness of school children, it was found that children are happy the most when they are "Enjoying being with other people," "Having self-confidence," "Having fun," "Feeling a school is a safe place" (Mertoğlu, 2020). Seligman (2002) suggested that our happiness levels are influenced by our natural tendency to be happy, our life situations, and the things we can control ourselves. These factors above can be associated with self-regulation—both behavior and emotional along with emotional awareness. Hence, research in this area of happiness is essential to find what strategies are needed to train happy children and help those who are responsible for child care and education such as parents, teachers, and school managers.

As mentioned earlier, with rising mental health issues in school children, it is imperative to create a positive environment that facilitates self-regulation, emotional awareness, and happiness. One factor that appears related to improving these factors and is emerging as a response, is mindfulness meditation in classroom settings.

1.2 | Impact of mindfulness meditation on self-regulation, emotional awareness, and happiness in school/classroom setting

Mindfulness meditation that centers on open focus and targets the individuals' ability to focus their attention around present-moment awareness and acceptance, become less reactive, and live more engaged, fulfilling lives, which all foster the development of effective self-regulation (Andreu et al., 2021; Bockmann & Yu, 2022; Lindsay & Creswell, 2017). Mindfulness meditation has received growing empirical support from studies examining the feasibility and impact of school-based meditation programs on improving self regulation—emotional and behavioral outcomes (Bergomi et al., 2013; Neal, 2021). There are also interventions that are kindness and compassion-based meditation that have been shown to have various benefits for adults, and there is growing interest in using the same with children. A systematic review that explored the effects of kindness and compassion-based meditation on self regulation, prosociality, and cognitive functioning in children and adolescents did not show a strong evidence base for positive effects with children. However, the findings of the review were encouraging given the early stage of development of the field and further research is warranted (Perkins, 2022). Similarly, a heart-centered meditation that measured the extent to which the intervention affected life satisfaction, school satisfaction, and measured gratitude, among a culturally diverse cohort of middle school students found that it significantly affected life satisfaction, school satisfaction, and gratitude of the experimental group, when compared to the control group (Duthely et al., 2017).

Typically, open focus meditation sessions feature mindful breathing, mindful movements, mindful attention like focussing on elevated emotion and a sense of wholeness and oneness with the world, managing negative emotions,

and negative thinking, and have been used to improve children's anxiety symptoms, self-confidence, internalizing symptoms, and externalizing symptoms (Caldwell et al., 2021; Filipe et al., 2021; Gomes et al., 2021), ranging from 6-week programs (Amundsen et al., 2020; Britton et al., 2014), 8-week (Crescentini et al., 2016; Yoo et al., 2016), and 24-week (Napoli et al., 2005). Classroom mindfulness interventions can provide improved well-being to all students, including those with mental health disorders, by reducing levels of stress, depression, and anxiety and improving concentration and behavior regulation (Crescentini et al., 2016; Gomes et al., 2021; Wilson et al., 2021). Results indicate that generally intervention groups show significant improvements in emotional difficulties (Britton et al., 2014; Nelson et al., 2022), increases in subjective happiness (Nelson et al., 2022), improvements in attention and reduced anxiety (Santonastaso et al., 2020; Shapiro et al., 2015), and lower anxiety and aggression compared to control groups (Yoo et al., 2016). However, self-reported mood did not always respond (Crescentini et al., 2016), nor emotional awareness (Britton et al., 2014), and impact on academic skills is inconclusive (Filipe et al., 2021).

In more recent times, mindfulness activities in transitional kindergarten classrooms have shown to improve children's self-awareness, emotional regulation, and empathy, while also promoting equity and fostering positive peer relationships (Ward-Seitz, 2023). Similarly, the results of a pilot study of a classroom mindfulness training among lower secondary school children significantly decreases test anxiety in STEM-related disciplines, improving self-esteem, and reducing academic anxiety (Duraku et al., 2023). In another study, a relatively short, story based mindfulness meditation intervention improved the working memory capacities of first-graders which could potentially contribute to the academic performance of children in schools (Koncz, 2021). Also, in a paper that drew on data from an Australian study of a meditation program in Australian primary school classrooms, findings suggested that the practice of meditation and mindfulness supported the emotional and social wellbeing of both students and their teachers, and that these benefits presented in multiple, accumulative and often reciprocal ways (Graham & Truscott, 2020). Results from a controlled investigation (Ruini et al., 2023) showed that a Quiet Time based meditation school protocol was feasible in the school setting, and it yielded improvements in children's strengths and well-being and concluded that meditation programs could be easily included in the educational system to sustain children positive development. These suggests that classroom mindfulness interventions may provide improved mental health in children, by reducing levels of stress, anxiety, and improving concentration and behavior regulation.

While studies such as Parker et al. (2014) and Schonert-Reichl and Lawlor (2010) provided promising findings on the effect of mindfulness programs on positive changes in self-regulation and mental health outcomes, how mindfulness meditation programs that were delivered by classroom teachers impact on children's emotional awareness remained unknown. Some researchers have argued that the studies may be unreliable, suggesting that by participating in the program, children might not necessarily become more aware of their emotions and regulate their behaviors accordingly, but rather it is the student-teacher bonding and improved classroom climate that helps improve students' emotional and behavioral outcomes (Albrecht, 2019).

1.3 | Current study

Studies have found that mindfulness meditation might decrease levels of stress, anxiety, and depressive symptoms, as well as enhance emotion regulation. Thus, the aim of the present study was to conduct a pilot study assessing whether a 10-week classroom-based mindfulness meditation intervention could improve emotional wellbeing in two groups – children aged 4–8 and 9–11. The program was conducted for 10 weeks to fit into a school term. The intervention was modified to be suitable for the classroom setting, involving 5–10-min sessions on a day-to-day basis. To our knowledge, no existing study has explored the association between daily meditation sessions and children's emotional awareness along with emotional and behavior regulation (reduced difficulty). However, this may be more feasible for young children, given limited attention spans and other curricular based prioritizes.

It was hypothesized that for Group 1 (4–8 years), (1) meditation would increase happiness, (2) increase self-reported school performance, (3) decrease emotional difficulties, and (4) decrease behavioral difficulties. For Group 2 (9–11 years), it was hypothesized (5) happiness would increase, (6) emotional and behavioral difficulties would decrease, (7) mindfulness skill would decrease, and (8) emotional and behavioral difficulties would be negatively correlated with emotional awareness.

2 | METHOD

The current study examines the effects of 10 weeks of daily, classroom-based, mindfulness meditation instruction for wellness constructs in primary school children. This was a single arm trial designed as a proof of concept trial.

2.1 | Participants

From January 1, 2022, the Queensland Department of Education (DoE) introduced new criteria and for single-school, nonsensitive applications, approval is at the discretion of the relevant school principal. Therefore, no gatekeeper ethical approval was needed for this study from the DoE, and instead the School Principal approved the study. University ethical approval was granted. Participation in the study was voluntary. Parents and legal guardians of the participants received study information sheets that included the program details expected outcomes, and consent forms, and were offered an in-person education session before the study. In total, two children withdrew from the study (one from each group).

2.1.1 | Group 1 (4–8 years)

This group consisted of 552 students in grades prep to Year 3. The age of the participants ranged from 4 to 8 years old. All students spoke English, five students identified as Aboriginal or Torres Strait Islander, and within the school, 13.4% of students reported a disability, although the type was protected information from the researchers. No other demographic or identifying data was collected. The Index of Community Socio-Educational 16 Advantage (ICSEA) for this State School is 1128. ICSEA scores typically range from 500, representing extremely disadvantaged student backgrounds, to 1300, representing extremely advantaged student backgrounds.

2.1.2 | Group 2 (9–11 years)

This group consisted of 287 students from grade four to grade six (data taken from a larger sample of the whole intervention trial), to focus on children during the preadolescence period. The students belonged to the same government-funded primary school as above and this group comprised 2% Indigenous and Torres Strait Islander students, and 38% students with language backgrounds other than English.

2.2 | Intervention trial

The mindfulness-based program was supplied as audio tracks by Dr. Joe Dispenza who is an international mindfulness meditation expert. Students and their teachers listened to brief meditation recordings at the start of

each day over a 10-week period. Group 1 listened to tracks that were 5 min, and Group 2 listened to a longer version of the same track for 10 min. The difference in length was informed by the age brackets chosen, being aligned with Piagetian stages so as to correspond with the distinction between preoperational thought and concrete operational thought development. For each recording, there was an audio introduction track and an audio meditation track. Part 1 focused on introducing and explaining the importance of mindfulness in relating to different themes and part 2 targeted practising meditation in a sound-based instruction with relaxing music background. An outline of the themes covered in the program is shown in Table 1.

2.3 | Measurements

2.3.1 | Me and My Feelings (M&MF) questionnaire (Deighton et al., 2013)

The M&MF consisted of 16 items and was designed to measure children's self-regulation through the emotional difficulties subscale and the behavioral difficulties subscale. All items were rated on a 3-point Smiley Face Likert scale ranging from (0) *never* with a happy face to (2) *always* with a sad face. M&MF scores are computed by a total sum of ratings, such that a higher score on the emotional difficulties subscale indicates a lower level of emotion regulation, with the potential to range from 0 to 20 and for behavioral difficulties is 0 to 12. The original scale showed good internal consistency (Deighton et al., 2013), good convergent validity with the emotional and conduct subscales of the Strengths and Difficulties Questionnaire and good discriminant validity (Deighton et al., 2013).

The emotional difficulties subscale consists of 10 items and demonstrates an acceptable internal consistency with $\alpha = .79$. The behavioral difficulties subscale consists of six items and demonstrates an acceptable internal consistency with $\alpha = .78$ (Patalay et al., 2014). High positive correlations were also found between the Strengths and Difficulties Questionnaire and the emotional difficulties ($r = .85$) and the behavioral difficulties subscale ($r = .56$; Patalay et al., 2014). In the present study, internal consistency was validated in the selected age groups with the emotional difficulties subscale demonstrating good internal consistency with $\alpha = .87$. While the internal consistency for behavioral difficulties subscale being acceptable with $\alpha = .63$.

TABLE 1 Outline of themes in the mindfulness-based program.

| Week number | Theme |
|----------------|---|
| Weeks 1 and 2 | "Breathing" – Introduction to mindful breathing and recognizing bodily sensations. Learning to take slower, deeper and more relaxing breaths. |
| Weeks 3 and 4 | "Affirmations" – Promoting self-efficacy and practising kindness toward oneself and others. Repeating affirmations including "I am a good learner," "I have a great brain," and "I like myself." |
| Weeks 5 and 6 | "Heart-centred" – Paying attention to different emotions felt in the body. Practice feelings that make children feel good in their hearts including gratitude, kindness, and love |
| Weeks 7 and 8 | "Open Focus" – Maintaining an open-minded and non-judgemental attitude toward self, others, and the surrounding environment. Focus on the space between things, including body parts and spaces in the room. |
| Weeks 9 and 10 | "Change Game" – Developing mindful attention to manage negative emotions in challenging situations. Children are taught it is okay to feel an emotion, but they can change their emotion. Statements such as "what are you going to do if you feel sad about something? Sometimes it's okay to feel sad for a moment, but what do you do?" and the children respond "change." |

2.3.2 | Happiness questionnaire

To operationalize a change in subjective happiness, a single-item questionnaire ("How happy do you feel?") was used. This free-response questionnaire style was often used to reduce prompting bias from closed questions and allow for participants' most available feelings (Artino et al., 2014). The question was rated on a 5-point Smiley Face Likert scale with an angry face being (1) *not happy at all*, a neutral face being (3) *neither happy nor not happy*, and a happy face being (5) *very happy*.

2.3.3 | Cantril's Self-Anchoring Ladder (Cantril, 1965)

Group 1 used the Cantril's Self-Anchoring Ladder as a self-report measure of life satisfaction. An image of a ladder with the numbers 0–10 ranging from the bottom to the top of the ladder is accompanied by the following text "Here is a picture of a ladder. Suppose the top of the ladder represents the best possible life for you and the bottom of the ladder the worst possible life. Where on the ladder do you feel you stand at the present time?" The Health Behavior in School-aged Children (Mancini et al., 2013) has adapted Cantril's Self Anchoring Ladder for use in an adolescent population. Responses to the ladder appear to be substantially stable over the short term (Tov et al., 2022). Test–retest for the adapted Cantril's Self-Anchoring Ladder was acceptable $r = .66$ and $.70$ for 11- and 12-year-old samples and approaching acceptable for 15-year-old samples $r = .58$ (Mancini et al., 2013). Cantril's ladder also correlates strongly with the Satisfaction with Life Scale. Across five studies ($N = 762$), the average r was $.68$ (95% CI [0.56; 0.76]; Tov et al., 2022).

The following question will be asked with an image of a ladder "Looking at the ladder, pick where you think you are at for how you are doing at your schoolwork." The three options marked will be (1) "I'm doing great!" at the top of the ladder, (2) "I'm doing ok but I could be doing better!" in the middle, and (3) "I'm not doing my best." at the bottom. Lower scores indicate higher self-reported school performance.

2.3.4 | Child and Adolescent Mindfulness Measure (CAMM; Greco et al., 2011)

Rather than using the Cantril scale to measure school performance, Group 2 used the CAMM to measure emotional awareness. The CAMM consisted of 10 items and was designed to measure children's and adolescents' emotional awareness. All items were rated on a 5-point Likert Scale ranging from (0) *never true* to (4) *always true*. All items are reverse-coded and CAMM scores are the sum of ratings, such that a high score indicates a high level of emotional awareness (range is 0–40). The 10-item version correlated significantly negative with child-rated somatic complaints ($r = -.40$), internalizing symptoms ($r = -.50$), externalizing symptoms ($r = -.37$), thought suppression ($r = -.58$), psychological inflexibility ($r = -.60$), and teacher-rated problem behavior ($r = -.22$). In addition, expected significant positive correlations were found with teacher-rated social skills ($r = .14$) and academic competence ($r = .25$; Greco et al., 2011). Further, internal consistency was 0.80 and factor loadings ranging from 0.42 to 0.66.

Finally, at the end of each survey was an optional, open-ended question asking: "If you would like to write anything about the meditations you have been listening to this week, please type it here." This allowed the collection of participants' feedback or comments on their experiences and reflections after attending meditation sessions.

2.4 | Procedure

The present study took place between July and September of 2022, after ethical approval was granted. The assessment package was created in a web0based program (Qualtrics) and a QR code created for the two student

age groups. The teachers were provided with the study details and information, and survey link/code. The survey was administered at 11 points in time – before the program period, during each week of the program, and after completion of the program. To protect the student's identities and make participation anonymous for each week, no identifying data was collected and therefore only group analysis on different weeks was compared. Students completed the questionnaires in the classroom each Friday under the same conditions. Students accessed the survey through an electronic link in Qualtrics and as a QR code for use on an iPad (which every child had). The survey took less than 7 min each week.

Data were analyzed using the computer program Statistical Package for Social Science (SPSS Version 26.0) and the qualitative data was analyzed with frequency analysis and thematic analysis with nVivo.

3 | RESULTS

3.1 | Data analysis

Utilizing G*Power software (Faul et al., 2009), the minimum sample size was calculated using a priori power analysis to ensure the sample was robust. For a design with two predictor variables, an α criterion of .05, statistical power of 90 and a small effect size ($d = 0.20$; Cohen, 1988), a minimum sample size of 178 was needed in total. This was achieved with a sample of 839 students. Analyses included descriptive statistics, correlations, and the regression analyses. The data was screened for mistakenly entered or omitted data and all relevant assumption checks were performed.

3.2 | Correlation analyses

3.2.1 | Group 1

A correlation analysis assessed the relationship between happiness, school performance, emotional difficulties, and behavioral difficulties in Group 1. Results found that happiness was negatively correlated to all other variables ($p < .001$), suggesting increased happiness resulted in decreased emotional and behavioral difficulties and self-reported school performance. All other correlations can be seen in Table 2 below.

3.2.2 | Group 2

A correlation analysis assessed the relationship between emotional awareness, emotional difficulties and behavioral difficulties in Group 2. Results found that happiness was negatively correlated to all other variables ($p < .001$),

TABLE 2 Correlations and descriptive statistics for Group 1.

| Variable | M | SD | 1 | 2 | 3 | 4 |
|----------------------------|------|------|-------|------|------|---|
| 1. Happiness | 4.33 | 0.88 | - | | | |
| 2. School performance | 1.37 | 0.53 | -.27* | - | | |
| 3. Emotional difficulties | 5.46 | 3.66 | -.25* | .19* | - | |
| 4. Behavioral difficulties | 2.70 | 1.60 | -.13* | .10* | .47* | - |

* $p < .001$.

suggesting increased happiness decreased emotional and behavioral difficulties and self-reported school performance. All other correlations can be seen in Table 3 below.

3.3 | Regression analyses

3.3.1 | Group 1

A simple linear regression was conducted to predict changes in happiness, self-reported school performance, emotional difficulties, and behavioral difficulties over the 10 weeks of meditation compared to baseline. For happiness, a significant regression model was found $F(1, 4265) = 14.61, p < .001, R^2 = .003$, which suggests that as weeks of meditation increased, there was a 0.16 standard deviation increase in the children's happiness. The highest happiness score was in Week 10 which was the change game meditation, while the lowest score compared to baseline was in Week 4, the affirmations meditation.

For self-reported school performance, a significant regression model was found $F(1, 4265) = 19.65, p < .001, R^2 = .005$, which suggests that as weeks of meditation increased, there was a 0.11 standard deviation decrease in school performance scores, indicating a higher self-reported school performance. The highest score was found in Weeks 2 and 4 which was breathing and affirmations meditation, while the lowest score was in Week 10 which was the change game meditation.

For emotional difficulties, a significant regression model was found $F(1, 4265) = 72.61, p < .001, R^2 = .017$, which suggests that as the weeks of meditation increased, there was 151 standard deviation decreased in children's emotional difficulties. The scores decreased over the 10 weeks, however, there was a slight increase from Weeks 8 to 10 which was open focus meditation and the change game.

For behavioral difficulties, a significant regression model was found $F(1, 4265) = 38.87, p < .001, R^2 = .009$, which suggests as weeks of meditation increased, there was a 0.48 standard deviation decrease in children's behavioral difficulties. The highest score was in Week 1 which was the breathing meditation and the lowest was in Week 5 which was the heart-centered meditation.

3.3.2 | Group 2

A simple linear regression was conducted to predict changes in emotional difficulties, behavioral difficulties, mindfulness, and happiness across the 10 weeks of meditation compared to the baseline. For emotional difficulties, a significant regression model was found $F(1, 2560) = 4.6, p < .001, R^2 = .014$, with emotional difficulties significantly decreasing in Week 4 ($t(286) = -2.08, p = .004$) and remaining decreased for the remainder of the program.

For behavioral difficulties, a significant regression model was found $F(1, 2560) = 2.31, p < .001, R^2 = .009$, with behavioral difficulties significantly decreasing in Week 6 ($t(219) = -2.44, p = .015$) and remaining decreased for the remainder of the program. For emotional awareness, a significant regression model was found $F(1, 2545) = 5.6,$

TABLE 3 Correlations for Group 2.

| Variable | 1 | 2 | 3 |
|----------------------------|-------|------|---|
| 1. Emotional awareness | - | | |
| 2. Emotional difficulties | -.61* | - | |
| 3. Behavioral difficulties | -.48* | .39* | - |

* $p < .001$.

$p < .001$, $R^2 = .02$, with emotional awareness increasing in Week 4 $t(286) = 2.47$, $p = .014$ and remaining increased for the remainder of the program. For happiness, a nonsignificant regression model was found $F(1, 2571) = 1.03$, $p = .418$, with an $R^2 = .004$.

3.4 | Qualitative data

There were 635 (24.7%) responses out of 2571 total commenting on the optional open-ended question about the meditation sessions. Thematic analysis was undertaken using the nVivo software, using a method of inductive reasoning (Schulz, 2012). There were 61.7% of positive comments about meditation including 31.5% of student responses indicating that meditation helped them feel more calmed and relaxed, 27.7% of student responses indicated their liking of meditation, 2.5% responses indicated that meditation was slowly helping. There were 38.2% of responses indicating dislikes about meditation. Specifically, 22.7% of responses indicated that meditation was boring, 9.1% of responses indicated that meditation did not help at all, 3.3% of responses indicated that meditation was too long, and 3.1% of responses indicated that it was hard to concentrate during meditation sessions due to others talking. In addition, some students also engaged in journaling activities during their breaks to reflect their meditation learning journey.

4 | DISCUSSION

The aim of this study was to assess whether meditation sessions could help improve children's self-regulation, emotional awareness, happiness, and school performance. Preliminary studies in children and adolescents have shown numerous benefits, including reducing anxiety symptoms (Gomes et al., 2021), increasing self-compassion (Cheang et al., 2019), improving social behavior (Schonert-Reichl & Lawlor, 2010), improving behavior regulation (Klingbeil et al., 2017), executive function (Bigelow et al., 2021), and cognitive and socioemotional skills (Filipe et al., 2021). This research aimed to add to the growing research on mindfulness interventions in children with a 10-week daily meditation trial in primary school aged students.

4.1 | Group 1

For Group 1, it was hypothesized that meditation would predict increases in happiness and self-reported school performance, and predict decreases in emotional difficulties, and behavioral difficulties. Meditation was found to positively affect children's well-being as it reduced emotional and behavioral difficulties and increased happiness and self-reported school performance.

Hypothesis one was supported as meditation was a significant predictor of happiness, and students' happiness increased with the amount of meditation they participated in. These findings were in support of meditation research by Amundsen et al. (2020), who also found that meditation improved positive outlook and life satisfaction that contributed to happiness. The majority of research has focused on meditation as a way to reduce children's experience of negative emotions, including stress, anxiety and internalizing (Crescentini et al., 2016). This research indicates meditation can be used to improve children's well-being through increasing happiness compared to other research that focused on the reduction of negative emotions.

The highest happiness scores were in the final week of the intervention, which is to be expected as the participants had undertaken 10 weeks of meditation by that point. Happiness could also be expected to be higher in Week 10 of the term as children may be excited about the upcoming school holidays. The corresponding decreases in emotional and behavioral difficulties are expected to influence happiness as they were moderately correlated.

The children's happiness began to increase from Weeks 6 to 8, which corresponded to the lowest scores reported in emotional difficulties and behavioral difficulties.

Hypothesis two was supported as meditation was a significant predictor of self-reported school performance; however, it only accounted for 0.5% of the variance. Children's self-reported school performance increased with the weeks of meditation completed. There was no increase in self-reported school performance in the affirmation meditation weeks compared to previous weeks, which was of note as the affirmations included statements about having a good brain and being a good learner; this appeared to have no significant effect on children's perception of their school performance. The results do not measure improvements in the child's academic scores but their perception of how well they complete their schoolwork. The improvements could be due to the children's increased ability to engage with their schoolwork and maintain focus, as found in students with ADHD (Bigelow et al., 2021; Singh et al., 2015; Zylowska et al., 2007). Another way the meditation may have improved children's self-reported school performance may have been through an increase in self-confidence and a positive outlook (Amundsen et al., 2020; Fisher, 2006; Hernandez & Caçola, 2015). Most research has focused on meditation interventions to improve academic performance in children diagnosed with ADHD and learning disabilities (Agarwal & Sarthi, 2020; Flook et al., 2010; Singh et al., 2015; Zylowska et al., 2007). The evidence suggested that meditation interventions within these populations increase academic performance through increased attention and executive function (Flook et al., 2010; Hernandez & Caçola, 2015; Singh et al., 2015; Zylowska et al., 2007). The current research cannot confirm if meditation interventions improve academic performance within a healthy child population as no objective measures were used; however, it does support improvements in children's self-reported school performance within a healthy population.

Hypothesis three was supported as meditation was a significant predictor of emotional difficulties. Children reported a decrease in emotional difficulties as the weeks of meditation increased. The lowest reported emotional difficulties mean score occurred in Weeks 6 and 7, which were the heart-centered and open-focus meditations. Heart-centered meditation was focused on experiencing positive emotions such as happiness and kindness, which may impact children's experience of emotional difficulties. This supports Filipe et al. (2021) finding that body and affect-centered meditations were associated with improved socioemotional well-being. The reported decrease may have resulted from reduced anxiety (Yoo et al., 2016) and an improvement in positive outlook (Amundsen et al., 2020). Self-regulation in preschool (~age 4) was positively associated with social competency, school engagement, and academic performance, and negatively associated with internalizing problems, peer victimization, and externalizing problems, in early school years (~age 8) (Robson et al., 2020). Children's emotional difficulties were shown to correlate with behavioral difficulties, and a decrease in behavioral difficulties also occurred in Weeks 7 and 8. Children may experience a decrease in behavioral problems as they increase their ability to regulate their emotions and experience more positive emotions. The current findings support previous research that meditation can reduce children's emotional difficulties by reducing internalizing, anxiety, social, and emotional problems, and increasing children's stress coping strategies (Crescentini et al., 2016; Filipe et al., 2021; Huguet et al., 2017; Robson et al., 2020; Yoo et al., 2016). According to the Wellbeing Measurement for Schools, a score of 6.80 at baseline and 5.02 at Week 10 fall within the expected range and are not elevated (Deighton et al., 2013). Therefore, the sample was not experiencing any substantial emotional problems; and the meditation improved the children's emotional well-being.

Hypothesis four was supported as meditation was a significant predictor of behavioral problems indicating children's behavioral problems decreased as the weeks of meditation increased. The lowest score for behavioral difficulties was in Week 5, which was heart-centered meditations indicating that focusing on emotions such as kindness and gratitude may positively influence children's behavior. The school supplied a behavioral incident report indicating a substantial decrease in behavior incidents occurred from July 2022 when the intervention began, to October 2022, when the intervention ended. The reduction in behavioral problems could be linked to the children's increased ability to sustain attention which (Househam and Solanto, 2016; Singh et al., 2007) suggested allowed children to respond to factors that lead to maladaptive behavior. Therefore, reducing aggression and

improving impulse control (Singh et al., 2007). Semple et al. (2009) also found support for the relationship between increased attention skills and decreased behavioral problems, which could explain the low mean scores of behavioral difficulties in the open-focus weeks of meditation. According to the Wellbeing Measurement for Schools, scores of 3.14 at baseline and 2.59 at Week 10 fall within the expected range and are not elevated (Deighton et al., 2013). Therefore, the school population was not experiencing any elevated behavioral problems; however, the reduction in behavior problems was statistically significant. The majority of research has focused on reducing aggressive behavior in children diagnosed with conduct disorder and externalizing disorders and found meditation interventions reduced this behavior (Bögels et al., 2008; Filipe et al., 2021; Fishbein et al., 2016; Singh et al., 2007). The current research supports Semple et al. (2009) finding that meditation can reduce behavioral problems in a healthy sample of children; however, we cannot conclude this is due to improvements in the child's socioemotional resiliency.

The final assessment of children's well-being in Week 10 showed an improvement in means scores for all variables, as there was a decrease in emotional and behavioral difficulties and an increase in happiness and self-reported school performance. This finding supported meditation's role in improving children's well-being; however, the children would be experiencing reduced stress and increased excitement at the end of the school term. This research provides further support for the implementation of school-based daily meditation programs as statically significant improvements can be achieved in approximately 5 min a day.

4.2 | Group 2

For Group 2, it was hypothesized that by attending the meditation program, students would show significant positive changes in self-regulation, happiness, and mindfulness. Results supported three out of four hypotheses, indicated by a significant decrease in emotional and behavioral difficulties, alongside a significant increase in emotional awareness and significant negative correlations between emotional difficulties and emotional awareness and between behavioral difficulties and emotional awareness. However, there was no significant increase in happiness levels.

First, the present study found that mindfulness meditation was associated with reduced levels of emotional difficulties and behavioral difficulties. Compared to baseline measures, children's perceived behavioral difficulties decreased after 6 weeks of practicing mindfulness, whereas emotional difficulties decreased after 4 weeks of practicing mindfulness. These results are consistent with previous findings which suggested that mindfulness meditation could promote emotional wellbeing and behavioral outcomes (Nelson et al., 2022; Parker et al., 2014; Schonert-Reichl & Lawlor, 2010). In particular, these findings support the notion that mindfulness meditation might help individuals stay more calmed when facing a challenging situation (Parmentier et al., 2019; Van Gordon et al., 2015). By remaining calm, children might be more able to resolve conflicts without behaving in reactive ways such as yelling, being aggressive and so on (Ager et al., 2015; Shonin et al., 2014; Weare et al., 2013).

Second, results also indicated that emotional difficulties and behavioral difficulties were both negatively associated with emotional awareness. This finding supports the notion that emotional awareness might serve as a key element in regulating emotions and behaviors. That is, children who were more able to acknowledge their thoughts and feelings with an open and nonjudgmental attitude toward the environment were less likely to be affected by negative impacts of life stressors and emotions. Though the relationship could be bidirectional, it is reasonable to suggest that emotional awareness serves as an important factor in effective emotional and behavioral regulation (Iani et al., 2019; Kaunhoven & Dorjee, 2021; Parmentier et al., 2019).

Third, the present study found that mindfulness meditation was associated with an increase in levels of emotional awareness. When compared to baseline, children's self-report emotional awareness improved after 5 weeks of attending the meditation program. This finding is consistent with findings of Devcich et al.'s (2017) study and Schonert-Reichl et al.'s (2015) study, which all highlight the benefit of practicing meditation on enhancing the

acknowledgment and acceptance of emotional experiences rather than avoiding or suppressing them (Keller et al., 2017; Nelson et al., 2022). However, the finding is inconsistent with results obtained from Britton et al.'s (2014) study and Vickery and Dorjee's (2016) study, which found no improvements in emotional awareness during the program. This inconsistency might possibly result from the differences in the program's design. For example, meditation programs in Britton et al. (2014) and Vickery and Dorjee (2016) were delivered only once a week, with each session lasted for approximately 40 min to 1 h, whereas the present study's meditation program was run for 5 days per week with briefer daily sessions. Though the amount of time children spent practicing meditation each week in the present study was much the same as in the mentioned studies, children in the present study were exposed more frequently to the program. Perhaps, as children engaged more regularly in mindful breathing exercises and repetitive habits of thinking, feeling, and acting with gratitude and kindness, children might be more familiar with the meditation techniques and incorporate the activity into their daily routine. Therefore, future studies are promising to examine the impact of daily meditation sessions on children's emotional awareness.

Data on happiness levels found no significant change between baseline measures and postprogram. The finding is inconsistent with previous studies which reported a significant positive relationship between mindfulness practice and subjective wellbeing (Nelson et al., 2022; Vickery & Dorjee, 2016). The literature suggests that mindfulness meditation helps promote children's focus to present moments and fostering kindness and compassion toward themselves and others (Iani et al., 2019; Kaunhoven & Dorjee, 2021; Parmentier et al., 2019). Hence, it was expected that by being more present and appreciating the beauty of life, children would feel more calmed, relaxed and happier. However, the present study found no improvements in children's happiness. A possible explanation is that the single standalone item in the happiness scale led to a restricted range, minimizing the chance of detecting an effect.

4.3 | Limitations

The limitations of this study included the absence of a control group and no identifying data. The study used a pre- and postdesign to examine the effect of meditation on well-being; however, randomized control trials are the most effective way to determine if the outcome is a result of the intervention (Kendall, 2003). To maintain the ethical status of the intervention and ensure all participants could benefit from the intervention, a waitlist control design could be used. Future research is needed to examine the impact of mindfulness meditation on an intervention group compared to an active control group. No identifying data was collected to protect the student's identity and make participation anonymous; however, this limited the statistical analysis. The student's data could not be matched week by week; therefore, an ANOVA could not be conducted, and analysis by groups was used.

There are general limitations to consider around the use of self-report measures that might lead to response bias, acquiescence, and extremity bias. For example, the behavioral difficulties subscale was found to have a low internal consistency in this sample, an alternative approach could be the additional inclusion of teacher and parent-report, perhaps through the assessments of behavioral outcomes. Although the sample's socioeconomic status was not formally assessed, the majority of students who attended the selected school came from high-income Caucasian families. Thus, results may be limited in generalizability to a wider school population. Future research exploring the beneficial effects of mindfulness across different cultures, socioeconomic status, and ages, may provide more insights into the efficacy of mindfulness interventions in school children.

4.4 | Future research

The present research provided further support for the benefits of meditation in improving primary school-aged children's well-being through increasing happiness and self-reported school performance and decreasing emotional

and behavioral problems. The current research into the benefits of meditation in children is still in the initial stage; therefore, replication and stringent research designs are needed to test the efficacy of mindfulness interventions (Greenberg & Harris, 2011). Objective measures and parent or teacher reports could be used in conjunction with students' self-reports to assess if the perceived improvements in well-being are statistically significant in objective measures. The use of parent reports could also indicate if the benefits of meditation and associated changes in behavior generalize to the child's behavior at home. The use of a long-term follow-up would determine the longevity of the benefits of mindfulness and contribute to the finding that the cognitive changes from meditation are process specific and enduring over time (Bishop et al., 2004; MacLean et al., 2010).

4.5 | Conclusion

Increasing mental health issues prevalent among children warrants for further investigation of school-based mindfulness programs (Crescentini et al., 2016; Filipe et al., 2021). This study has contributed to the empirical evidence regarding the potential benefit of a school-based meditation program on improving children's emotional and behavioral difficulties and enhancing emotional awareness. The study findings are promising and longitudinal research with control-group design may provide greater demonstration of the benefit of meditation practice on children's self-regulation and happiness. The current research has provided support for meditation improving children's well-being; however, the effect sizes are small. This research supports the implementation and feasibility of brief, daily meditation in schools, and for both groups, this resulted in statistically significant improvements in well-being. Future research is required to determine the meditation interventions that provide the greatest improvements and enduring results in children's well-being. Future research could be strengthened by comparing a mindfulness-based program to other validated psychoeducation programs to fully explore the relationship between mindfulness, self-regulation, and psychological wellbeing. With a strong focus on fostering emotional awareness, mindfulness-based programs are hoped to maximize children's psychosocial outcomes and flourishing not only in the context of school but also in daily living.

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The authors have nothing to report.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are openly available in https://osf.io/3ehjd/?view_only=d4b93c5f57b9405f9ac01138c203cc2c.

ETHICS STATEMENT

This study received ethical approval under No. PS00189.

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