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ORIGINAL PAPER

Feasibility, Acceptability, and Preliminary Effectiveness of the *OpenMind* (OM) Program for Pre-School Children

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Abstract

Objectives Preschool curricula often include social emotional learning (SEL) competencies, such as self-awareness and self-management. Emerging programs also include mindfulness-based practices that develop preschool children's awareness of the effects of their thoughts, feelings, and perceptions on their behaviors and ways by which they can make skillful choices through discernment. The objective of this study was to assess the feasibility, acceptability, and effectiveness of the OpenMind (OM) program that combines mindfulness-based practices with SEL competencies for preschool children.

Methods Preschools in a Head Start program were randomly assigned to either the OM program or a comparison group. A total of 262 children (3 to 5-year-old), 27 teachers, and 281 parents completed the study. Teachers in the OM program were provided training in the use of the program together with the existing preschool curriculum, and teachers in the Comparison group were provided an equivalent amount of training on relationship building and child bonding activities. At the end of the preschool year, the teachers in both groups responded to feasibility and acceptability questionnaires. In addition, child, teacher, and parent outcomes were assessed.

Results The teachers reported the OM program was feasible as an adjunctive program that could be integrated with the existing preschool curriculum, but finding enough time meditate during school hours was only partially feasible. The teachers perceived benefits for the children in terms of improved self-regulation, increased body and emotional awareness, improved self-calming, and increased empathy and awareness of the feelings of others. They rated the OM program as very acceptable, and which they would recommend to other preschool teachers. The outcome data indicated positive child outcomes for both groups, with some added advantage for the children in the OM program.

Conclusions The OM program offers a promising approach to enhancing preschool children's social, emotional, and academic development.

Keywords Preschool children · Social emotional learning · OpenMind (OM) program · Mindfulness · Meditation

Typical school educational programs focus primarily on academic achievement and secondarily on social and life skills that enable self-regulation of behaviors under adverse conditions. Social and life skills are developed through psychoeducation programs and behavioral skills training through direct instruction or incidental teaching. Recent years have seen the development and growth of classroom-based primary prevention programs in K-12 schools that foster self-regulation not only to enhance academic performance but also to curtail childhood affective disorders and problem behaviors (Greenberg et al. 2003; Meiklejohn et al. 2012; Semple et al. 2017; Tang et al. 2012). These programs fall into the general area of social emotional learning (SEL), which is based on a synthesis of the best research from diverse fields, including developmental psychology, affective neuroscience, health promotion, positive psychology, and prevention science (Zins et al. 2004).

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According to the Collaborative for Academic, Social and Emotional Learning [CASEL] (2017), SEL programs enhance the "students' capacity to integrate skills, attitudes, and behaviors to deal effectively and ethically with daily tasks and challenges". CASEL has identified five broad interrelated cognitive, affective and behavioral competencies for SEL programs (Collaborative for Academic, Social and Emotional Learning 2013) that include self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. The short-term goals of SEL programs are to acquire these five competencies and to improve student attitudes and beliefs about self, others, and schools, leading to longer-term positive outcomes. In schools that have implemented SEL programs, teachers directly teach the students the skills encompassed by the five competencies, using curriculum materials that engage and motivate the students to learn (January et al. 2011). In addition, teachers use a variety of instructional and management techniques for classroom learning and behavior (Durlak et al. 2011; Kress and Elias 2006). The emphasis in SEL programs is for the teachers to be emotionally supportive of their students and, if students engage in challenging behaviors, to use positive disciplinary practices that foster appropriate skill development rather than eliminate problem behaviors (Allen et al. 2011). These practices enable teachers to have positive interactions with their students and thereby foster a positive learning climate in the classroom (Cohen 2006). Furthermore, teachers in the United States believe that SEL programs are essential for student success and they are willing to implement them in their classrooms (Bridgeland et al. 2013).

In terms of the crucial question regarding outcomes, research reviews paint a rather rosy picture of the effectiveness of SEL programs across a number of key variables. For example, in a meta-analytic review of 213 studies, Durlak et al. (2011) reported that, when compared to control group students, those who participated in school-based SEL programs showed statistically significant improvements in social and emotional skills, attitudes toward self and others, positive social behaviors, and an equivalent of an 11-point percentile gain in academic performance. In addition, these students evidenced significant decreases in mental health issues, such as conduct problems and emotional distress, despite the fact that the teachers had not received any specific mental health training. In another meta-analytic review of 75 studies, Sklad et al. (2012) reported similar outcomes and, in addition, reported significant effects for enhanced social skills and decreased antisocial behavior in the students.

In general, students in SEL programs acquire skills and knowledge through external sources—teachers, psychoeducational programs, and behavioral contingencies—and utilize such skills and knowledge in terms of rule-governed or contingency-shaped behavior. However, there has been increasing interest in teaching students to manage their intrapersonal and interpersonal responses through a focus on internal states (e.g., thoughts, feelings, emotions, and perceptions) that come about by heightened attention and awareness (e.g., Flook et al. 2015; Semple et al. 2017). When students are able to increasingly focus their attention and awareness on these internal states, they can learn to more skillfully respond to changes in their internal and external stimuli (e.g., positive and negative emotional arousal) by making more informed choices. Mindfulness and mindfulness-based practices provide a skillful means of achieving this kind of cognitive and behavioral change in the students.

Mindfulness has been defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience" (Kabat-Zinn 2003, p. 145). Mindfulness is present in all humans, but it invariably requires strengthening and this can be achieved through a number of ways, most notably through meditation. The outcome of mindfulness depends on the nature of the intention behind the practice and, within the school system, the intention is to "increase [the students'] awareness of the influence of thoughts and emotions on speech and behaviors, and thereby enhance the likelihood of making more skillful or appropriate choices" (Semple and Lee 2011). While 3-to 5-year old children can learn to formally meditate, and in some Pre-K classrooms they certainly do, most programs for this population embed mindfulness practices in the context of play activities.

Semple et al. (2017) presented a review of mindfulness-based curricula being implemented in K-12 American schools, including the following: Inner Explorer (Bakosh et al. 2016); Master Mind (Parker et al. 2014); Moment Program (Parker and Kupersmidt 2016), Mindfulness and Mind-Body Skills for Children (Sheinman et al. 2011, Mindfulness for a whole school–mindfulness and mind-body skills with children); Mindful Schools (Mindful Schools 2017); Resilient Kids (unpublished); Still Quiet Place (Goldin et al. 2006); Stress Reduction and Mindfulness Curriculum (Mendelson et al. 2010); Mindful Moment (Holistic Life Foundation 2014); and Wellness and Resilient Program (MacNeil et al. 2011, Evaluation of the South Burlington Wellness and Resilience program, year three). Of these programs, only two include Pre-K children in their curricula: (1) the Inner Explorer program includes mindfulness education, breath meditation, body scan, progressive muscle relaxation, and personal journaling, and (2) the Mindfulness and Mind-body Skills for Children includes awareness of breath and body sensations, sounds, movement, thoughts and emotions, yoga, "lovingkindness" practice, guided imagery, and mindful circles. However, no outcome data are available for 3- to 5-year-old students

from either program, probably because neither program was designed specifically for 3- to 5-year-olds.

The aim of the present study was to assess the feasibility, acceptability, and effectiveness of OpenMind (OM; Jackman 2016a), a recently developed mindfulness-based program that includes CASEL's (2013) five broad interrelated cognitive, affective and behavioral competencies for SEL programs. The OM program provides training not only to 3- to 5-year-old preschool children, but also their teachers and parents.

Methods

Participants

The participants were from the Head Start program run by Jefferson Franklin Community Action Corporation. A total of 283 children, 27 teachers, and 281 parents participated in the study. Teacher participants included all teachers and teacher aides assigned to Head Start classrooms in Jefferson and Franklin counties in Missouri. All teachers were females. The 3- to 5-years-old children were enrolled in the Head Start program at the beginning of the study and were not grouped in classes by age. The parents included biological parents, adopted parents, legal guardians, grandparents, and great-grandparents of the children. Teachers ($n = 14$) from the OM group only were recruited to respond to the feasibility and acceptability questionnaires. Outcome data were deemed complete enough for analysis from 262 children (127 boys and 135 girls). The children's mean age was 3 years 8 months, with a standard deviation of 6 months, and an age range from 3 to 5 years. There were 143 children in the OM group and 119 children in the comparison group.

Procedures

Permission and ethical approval was obtained to include all classrooms in Head Start programs from two counties in Missouri. The classrooms were randomized into two groups: the OM group and the comparison group. Following randomization, 14 teachers, 163 children, and 147 parents were assigned to the OM group, and 12 teachers, 120 children, and 134 parents to the comparison group. Teachers and parents in both groups received an equal amount of training and education hours.

OM group

The OM group teachers implemented the seven daily practices in the OM program (i.e., focused meditation, loving-kindness meditation, bell exercises, yoga, gratitude practice, kindness and compassion reporting, and feelings finder practices) (Jackman 2016a) and supplemental learning activities for promoting the development of prosocial behavior by integrating these practices into the existing High Scope curriculum (Jackman 2016b). These activities and practices were occupation-based and taught in the context of meaningful and purposeful activity (e.g., play, transitions, work time), and multi-sensory in nature to promote mindful engagement. In addition, the activities were aligned with the developmental level, interests, and motivation typical of 3 to 5 year old children. The OM teacher program included an initial 5-day mindfulness training course, with a primary focus on teacher meditation. Following training on this course, the teachers were requested to meditate for a total of 20 min per day during school days (i.e., 100 min per week). Parents training included a series of three 2-h mindfulness-based training sessions and encouragement to practice and log meditation at home.

Comparison group

The comparison group teachers taught the High Scope curriculum, together with aspects of Trust-Based Relational Intervention, and social emotional learning interventions administered by mental health professionals. The comparison group teacher program included an initial 5-day course on relationship building, and 20 min of teacher-child bonding activities during each school day. Parent training included a series of education sessions on relationship building practices.

Measures

Feasibility questionnaire

This 34-item questionnaire was developed specifically to tap teachers' perceptions of different aspects of implementing the OM program, including: meditation practice of the teachers; motivation to implement the program; issues regarding implementation of specific activities; barriers to implementation; integration of the OM program with the High Scope curriculum used in the Head Start preschools; risks and benefits of the program; and administrative support provided by the agency for the program.

Acceptability questionnaire

This 8-item questionnaire is rated on a 5-point Likert scale: understanding the purpose and potential benefits of the OM program; ability to integrate the program with the High Scope curriculum used in the Head Start preschools; confidence in their ability to implement the program; beneficial

effects for the children; change in the classroom environment; whether the teacher would recommend the program to other preschool teachers; effects of the meditation practice; and the teacher being more present in the classroom.

Head toes knees shoulders (HTKS)

The HTKS provides a direct measure of inhibitory control, working memory, and attention focusing in young children (Ponitz et al. 2008). The task is presented in terms of a game in which the children are required to respond in a manner opposite to what the experimenter asks. For example, when the experimenter asks the children to touch their head (or toes), they perform an opposite action, i.e., touch their toes (or head). If they are able to do this, the children are then presented with another task involving the knees and shoulders. Children do well if they can inhibit their dominant response, remember the rules of the task, and focus their attention on the examiner's direction.

Go/No-Go (GNG)

The GNG task requires the children to respond to the "go" trials and withhold response to the "no-go" trials (Dowsett and Livesey 2000; Müller et al. 2012; Wiebe et al. 2012). Typically the go trials predominate the task, thus requiring the children to inhibit this response for the no-go trials. The children receive instructions sequentially, beginning with those for the go trials followed by 5 practice trials, instructions for the no-go trials followed by 5 practice trials, combined GNG trials followed by a mixed block of 10 trials, and then a recap of the instructions prior to the actual test. The trials are scored for proportional accuracy on the go and no-go trials.

Behavior rating inventory of executive function—preschool version (BRIEF-P)

The BRIEF-P is a reliable and valid parent and teacher scale used to assess executive functioning of children aged 2 through 5 years 11 months (Gioia et al. 2003). The scale consists of 63 items assessing inhibitory self-control, flexibility in thinking, and emergent metacognition. Respondents provide answers to questions on a 3-point scale (1 = never had a problem, 2 = sometimes had a problem, and 3 = often had a problem). Children's mean scores for three summary indices: Inhibitory Self-Control (ISCI), Flexibility (FI), and Emergent Metacognition (EMI), and an overall score (GEC) representing executive functioning are presented. Mean scores for boys and girls ages 4 to 5 years in the normative sample from the BRIEF-P manual are summarized in Table 1. Teachers completed the BRIEF-P for children in their classrooms.

Table 1 Mean scores for children four to five years from BRIEF-P normative sample

Index/summary score	Boys M(SD)	Girls M (SD)	Total
ISCI	38.41 (7.94)	39.06 (8.65)	38.74 (8.30)
FI	28.60 (6.52)	30.24 (6.63)	29.42 (6.58)
EMI	37.70 (7.45)	38.54 (8.27)	38.12 (7.86)
GEC	90.36 (16.48)	92.09 (17.45)	91.26 (16.97)

Mean scores for boys and girls ages four to five years from BRIEF-P in the normative sample, as per Gioia et al. (2003, p. 46)

ISCI inhibitory self-control, *FI* flexibility, *EMI* emergent metacognition, *GEC* overall score

Perceived stress scale-10 (PSS-10)

The 10-item PSS-10 is designed to measure the degree to which life situations are perceived as stressful (Cohen et al. 1983). Specific items tap how unpredictable, uncontrollable, and overloaded life can be for the rater. The items are rated in terms of the rater's feelings and thoughts during the last month, and how often the rater felt that way (e.g., *In the last month, how often have you felt confident about your ability to handle your personal problems?*). The items are rated on a 5-point Likert scale ranging from 0 (never) to 4 (very often). Four items are reversed scored and summed across all 10 items. Both teachers and parents completed the PSS-10.

Five facet mindfulness questionnaire (FFMQ)

The FFMQ is a 39-item rating scale that measures dispositional tendency to be mindful (Baer et al. 2006). The five facets are Observing (e.g., *When I'm walking, I deliberately notice the sensations of my body moving*), Describing (e. g., *I'm good at finding words to describe my feelings*), Acting with awareness (e.g., *When I do things, my mind wanders off and I'm easily distracted*), Nonjudging (e.g., *I criticize myself for having irrational or inappropriate emotions)*, and Nonreactivity (e.g., *I perceive my feelings and emotions without having to react to them)*. The items are rated on a 5-point Likert scale ranging from 1 (never or very rarely true) to 5 (very often or always true). Both teachers and parents completed the FFMQ.

Psychological well-being scale

This 42-item scale measures multiple dimensions of psychological well-being, including autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Ryff 1989). The scale taps into these six dimensions at a specific point in time. Parents respond to the items on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree) in terms of their agreement with the statements (e.g., *I am not afraid to voice*

my opinions, even when they are in opposition to the options of most people). The ratings are summed for each dimension (i.e., sub-scale), with higher scores indicating greater well-being on that dimension. Only the parents completed this rating scale.

Data Analyses

The data were collected, collated, uploaded, and checked for completion and accuracy before data analyses. The feasibility questionnaire data were coded if the answers were binary (i.e., yes or no) and categorized (i.e., for narrative answers) in terms of the teachers' response to each item. The acceptability questionnaire data were analyzed in terms of whether the teachers rated the items as disagree (strongly disagree + somewhat disagree), neutral, and agree (strongly agree + somewhat agree). Repeated measures ANOVAs were used to examine differences in pre- to post-intervention scores for children in the OM and comparison groups for measures assessing child, parent, and teacher functioning.

Results

Feasibility

Following training in meditation on the breath, the teachers were requested to meditate for a total of 20 min per day during school days (i.e., 100 min per week). The teachers reported meditating for an average of 43 min per week. The reasons given for not being able to meditate for 100 min per week included reduced staffing, limited time, job responsibilities, and deadlines unrelated to the OM program. The teachers suggested a number of possible solutions for increasing their meditation practice, including the hiring of permanent substitute teachers, increasing staff numbers, more flexible schedule, protected time for meditation, and creating a designated place for meditation.

Following initial training in the OM program, 92% of teachers wanted to implement the OM activities, and felt confident of their ability to do so. At the end of the school year, 46% of the teachers reported that they implemented all 7 daily practices, and all teachers indicated they used at least 3 of the 7 daily practices. All teachers reported doing meditation with the children in the classroom on a daily basis.

At the end of the school year, 77% of teachers responded that the OM program was easy and/or practical to implement and integrate into the existing High Scope curriculum. No teachers reported any perceived risks to the children from implementing the OM program. Furthermore, the teachers reported perceived benefits to the children including improved self-regulation, increased body and emotional awareness, improved self-calming, and increased empathy and awareness of the feelings of others.

Acceptability

The summary data on teachers' acceptability ratings of the OM program are presented in Table 2. Overall, the teachers found the OM program to be very acceptable. However, two items bear noting for their divergence from the generally positive ratings. First, only 4 teachers agreed that they were able to easily integrate the meditation practices into their regular school day, with 9 teachers disagreeing with this statement. Second the teachers had mixed perceptions on whether the meditation practice helped them to be more present for the children in their classroom. This may have resulted due to the much less than required adherence to the number of minutes the teachers engaged in meditation, perhaps due to a feeling of being rushed and not having adequate protected time for meditation.

Child Outcomes

Head toes knees shoulders (HTKS)

Four repeated measures analyses were used to examine pre- to post-intervention change in HTKS scores (HTKS1, HTKS2, HTKS3, and HTKS total scores) and intervention

Table 2 Teacher acceptability ratings of the OM program

Items	Agree	Neutral	Disagree
I understood the purpose and potential benefits of the OM 7 Daily Practice activities	12	1	0
I was able to integrate the OM 7 Daily Practice activities into my daily classroom routine	11	2	0
I was confident in my ability to implement the OM 7 Daily Practice activities	11	2	0
The OM 7 Daily Practice activities were beneficial for the children in my classroom	13	0	0
The OM 7 Daily Practice activities helped me to create a more peaceful classroom environment	12	1	0
The daily meditation practice was easy to integrate into my workday	4	0	9
The daily meditation practice helped me to be more present for the children in my classroom	6	5	2
I would recommend the OM program to other preschool teachers	12	1	0

Table 3 Differences in HTKS scores pre- and post-intervention for the OM program and comparison groups

Scale	OM program		Comparison group	
	Pre-intervention M (SD)	Post-intervention M (SD)	Pre-intervention M (SD)	Post-intervention M (SD)
HTKS1	5.27 (7.64)	9.00 (7.96)	4.17 (6.69)	6.64 (7.88)
HTKS2*	3.08 (5.54)	6.48 (7.51)	3.02 (5.95)	3.83 (6.24)
HTKS3	1.96 (4.74)	4.19 (6.34)	1.13 (3.96)	2.52 (6.66)
HTKS Total*	8.78 (14.71)	15.74 (19.27)	8.63 (14. 49)	9.29 (16.08)

*Significant difference between the OM program and comparison group. There was greater change in the OM group

HTKS head, toes, knees, shoulder

group (OM versus comparison) was the between subjects factor. Table 3 presents the means and standard deviations for the HTKS pre- and post-intervention scores for the OM and comparison groups before and after the intervention for the three HTKS scores and the total score.

For HTKS1, there was a significant effect for change within subjects for pre- to post-intervention scores, Wilks' Lambda = 0.878, $F(1, 134) = 18.54$, $p < 0.001$. The mean HTKS1 score pre-intervention was 4.89 ($SD = 7.32$, $n = 136$) and the mean HTKS1 score post-intervention was 8.18 ($SD = 7.90$). There was no significant difference between the OM program group and the comparison group for HTKS1 scores (see Table 3). Next, for the HTKS2 score there was a significant within subjects difference for pre- to post-intervention scores, Wilks' Lambda = 0.904, $F(1, 119) = 12.62$, $p < 0.001$. The pre-intervention mean was 3.06 ($SD = 5.68$, $n = 121$) and the post-intervention mean score was 5.47 ($SD = 7.14$). Also, for HTKS2 there was a significant difference between the two groups, Wilks' Lambda = 0.961, $F(1, 119) = 4.81$, $p = 0.03$. The HTKS2 score increased more from pre- to post-intervention for those children participating in the OM program compared to those in the Comparison group (see Table 3). For HTKS3 there was a main effect within subjects for pre- to post-intervention, Wilks' Lambda = 0.914, $F(1, 113) = 10.63$. The pre-intervention HTKS3 score ($M = 1.63$, SD = 4.44) was lower than the post-intervention HTKS score ($M = 3.52$, $SD = 6.50$). There was no significant difference between subjects for the HTKS3 score.

For the HTKS total score there was a significant difference within subjects for pre- to post-intervention change, Wilks' Lambda = 0.954, $F(1, 174) = 8.37$, $p = 0.004$. The total score for the HTKS was lower pre-intervention with a mean of 8.72 ($SD = 14.71$, $n = 176$) compared to a post-intervention mean of 13.25 ($SD = 18.33$). Also, there was a significant difference between groups for HTKS total scores, Wilks' Lambda = 0.968, $F(1, 174) = 5.72$, $p = 0.018$. There was a greater difference for the OM group compared to change for the comparison group (see Table 3).

Go/No-Go (GNG)

Two repeated measures analyses were performed for the GNG tasks, with pre-post differences within subjects and intervention group as the between subjects factor. *Go Task:* Mean scores increased post-intervention for the Go task indicating a significant within subjects difference, Wilks' Lambda = 0.968, $F(1, 129) = 4.26$, $p = 0.041$. The pre-intervention Go mean was 70.90 ($SD = 19.19$) and the post-intervention Go mean was 75.16 ($SD = 24.29$). There was no significant difference between the OM and comparison groups on the Go task. *NO Go Task:* The results for the repeated measures analysis for the No-Go task also indicated a significant within subjects' difference, Wilks' Lambda = .966, $F(1, 128) = 4.46$, $p = 0.037$. The pre-intervention No Go mean score was 64.58 ($SD = 23.12$) and the post-intervention No-Go score mean was 60.40 ($SD = 27.32$). There was no significant difference between the OM and comparison groups on the No-Go task.

BRIEF-P scale

Classroom teachers completed the BRIEF-P Scale for 183 children before and after the intervention. One hundred and twelve were in the OM group and 71 were in the comparison group. Four repeated measures ANOVAs were performed for ISCI, FI, EMI and GEC (total) scores (within group, OM versus comparison group as the between subjects factor). Means and standard deviations for the OM versus comparison group are presented in Table 4.

The repeated measures ANOVA for ISCI summary scores did not yield differences within *or* between subjects. Thus, there were no differences in inhibitory self-control over time or between the OM and comparison groups. The second repeated measures ANOVA for FI scores did not indicate a significant difference within subjects. On the other hand, there was a significant difference between subjects for FI scores, Wilks' Lambda = 0.955, $F(1, 180) = 8.42$, $p = 0.004$. Mean FI scores increased for the OM group (showing poorer performance) and decreased for the comparison group (see Table 4), indicating those in the OM group showed decreased cognitive flexibility compared to those in the comparison group. For the repeated measures ANOVA for EMI scores—there was a significant difference within groups, Wilks' Lambda = 0.884, $F(1, 179) = 23.55$, $p < 0.001$. The pre-intervention EMI mean score of 40.32 ($SD = 13.33$) was greater than the post-intervention EMI mean score of 36.91 ($SD = 11.40$). This indicated improvement in emergent metacognition for both groups. There were no differences between subjects for EMI scores,

Table 4 Differences in BRIEF-P scores pre- and post-intervention for the OM program and comparison groups

Scale	OM program		Comparison group	
	Pre-intervention M (SD)	Post-intervention M (SD)	Pre-intervention M (SD)	Post-intervention M (SD)
ISCI	36.29 (12.32)	38.03 (12.23)	41.09 (15.12)	41.99 (14.13)
FI**	25.67 (7.42)	26.89 (8.15)	31.25 (10.88)	29.13 (9.11)
EMI	37.62 (11.76)	34.59 (9.61)	44.49 (14.58)	40.49 (12.99)
GEC	85.58 (24.53)	84.20 (21.33)	101.01 (33.65)	96.39 (29.19)

*Significant difference between groups at $p < 0.005$. **Significant difference between groups at $p < 0.01$

ISCI inhibitory self-control, *FI* flexibility, *EMI* emergent metacognition, *GEC* overall score

indicating no differences in emergent metacognition between the OM and comparison groups. In terms of the GEC summary score, there were no significant differences within or between subjects. This suggested there were no changes in global executive functioning skills over time or between groups. It is important to review the mean scores to note that, in general, performance in all areas including self-control, shifting attention, and emotion regulation were lower (i.e., more positive) in the OM compared to the comparison group, both pre- and post-intervention.

Parent Outcomes

Psychological well being scale

Thirty-three parents completed this scale pre- and post-intervention. A repeated measures ANOVA indicated no within subjects differences. The pre-intervention mean across groups was 32.09 ($SD = 5.11$) and the post-intervention mean across groups was 32.45 ($SD = 4.84$). There were no differences between subjects. However, inspection of the means indicated that for the OM group, the pre-intervention was 29.79 ($SD = 5.39$) and the post-intervention mean was 31.42 ($SD = 5.17$) indicating a slight increase. For the comparison group, the pre-intervention mean was 33.79 ($SD = 4.26$) and the post-intervention mean was 33.21 ($SD = 4.58$) indicating fairly stable scores.

Five facet mindfulness questionnaire (FFMQ)

Thirty-four parents provided pre- and post-intervention data for the *FFMQ*. Means and standard deviations for the five scales pre- to post-intervention, representing within subjects differences are presented in Table 5. Means and standard deviations depicting between groups differences are presented in Table 6. A repeated measures ANOVA indicated that there was a significant difference in scores on the Observe scale within subjects before and after the intervention, Wilks' Lambda = 0.863, $F(1, 32) = 5.08$, $p = 0.031$. Specifically, the mean score pre-intervention (across both groups) was 28.44 (SD = 6.24) and the mean score post intervention was 30.85 (SD = 5.93). There was not a difference between subjects, for the Observe scale. There were not any significant differences within or between groups for the Describe, Act with Awareness, and Non-judgmental scales for repeated measures ANOVAs. There was a significant difference within subjects for the Nonreact scale, Wilks' Lambda = 0.833, $F(1, 28) = 5.62$, $p = 0.025$. The mean pre-intervention (across groups) score was 22.80 (SD = 4.02) and the mean post-intervention score was 24.67 (SD = 5.02). There was not a significant difference between groups for the Nonreact scale.

Table 5 Means and standard deviations for parent report for subscales of the *Five Facet Mindfulness Questionnaire (FFMQ)*

Subscale	Parent ratings for within subjects differences	
	Pre M (SD)	Post M (SD)
Observe	28.44 (6.24)*	30.85 (5.93)*
Describe	29.10 (6.94)	29.97 (6.73)
Act with awareness	28.93 (6.18)	27.74 (6.42)
Nonjudgmental	27.84 (6.09)	28.12 (6.88)
Nonreact	22.80 (4.02)*	24.67 (5.02)*

*Significant at $p < 0.05$ for parent ratings

Perceived stress scale-10 (PSS-10)

Thirty-seven parents completed the stress scale, with 18 in the OM group and 19 in the comparison group. The repeated measures ANOVA did not yield significant results between subjects. Mean score for parent stress pre-intervention across groups was 20.81 ($SD = 2.39$) with a post-intervention across groups mean score of 20.97 ($SD = 1.76$). There were no differences between the groups. However, the mean score for the OM group increased slightly pre-intervention ($M = 20.28$, $SD = 2.49$) to post-intervention ($M = 21.28$, $SD = 1.49$). On the other hand, the mean score for the comparison group decreased slightly from pre-intervention ($M = 21.32$, $SD = 2.24$) to post-intervention ($M = 20.68$, $SD = 1.97$).

Table 6 Means and standard deviations for parents on the five facet mindfulness questionnaire (FFMQ) for OM program and comparison groups

Subscale	OM program parent data		Comparison group parent data	
	Pre M (SD)	Post M (SD)	Pre M (SD)	Post M(SD)
Observe	29.18 (5.42)	31.53 (5.04)	27.71 (7.07)	30.18 (6.79)
Describe	28.62 (5.90)	28.62 (7.51)	29.50 (7.86)	31.06 (6.04)
Act with awareness	27.84 (7.47)	26.92 (7.30)	29.92 (4.75)	28.50 (5.65)
Nonjudgmental	26.30 (7.56)	25.2 (9.03)	28.86 (4.90)	30.07 (4.30)
Nonreact	22.77 (4.09)	24.69 (5.23)	22.82 (4.10)	24.65 (5.01)

Table 7 Means and standard deviations for teacher report for subscales of the five facet mindfulness questionnaire (FFMQ)

Subscale	Teacher ratings for within subjects differences	
	Pre M (SD)	Post M (SD)
Observe	29.45 (4.06)	31.36 (3.96)
Describe	28.70 (4.67)	30.30 (2.67)
Act with awareness	25.27 (4.22)	25.09 (6.35)
Nonjudgmental	25.88 (4.12)	22.00 (5.26)
Nonreact	23.25 (3.47)	23.83 (3.56)

Teacher Outcomes

Five facet mindfulness questionnaire (FFMQ)

Eleven teachers (6 in the OM group) completed this measure. Means and standard deviations for the five scales pre- to post-intervention (representing within subjects differences) for teacher scores are presented in Tables 7 and 8 presents between subjects differences, showing differences between the OM and comparison group. The repeated measures ANOVAs did not reveal a significant difference between or within subjects for the Observe, Act with Awareness, Nonjudgmental and Nonreact scales. Interestingly, while there was not a significant within subjects difference for the Describe scale, there was a statistically significant difference between subjects, Wilks' Lambda = 0.540, $F(1, 8) = 6.817$, $p = 0.031$. The mean score for the OM group improved from pre-intervention ($M = 26.60$, $SD = 4.72$) to post-intervention ($M = 31.00$, $SD = 3.16$). In contrast, scores decreased for the comparison group from pre-intervention ($M = 30.80$, $SD = 3.96$) to post-intervention ($M = 29.60$, $SD = 2.19$).

Perceived stress scale-10 (PSS-10)

Sixteen teachers completed the *Perceived Stress Scale* (9 in the OM group). A repeated measures ANOVA did not reveal differences between subjects. Mean teacher stress pre-intervention across groups was 20.69 ($SD = 1.82$) and post-intervention the mean score across groups was 20.75 ($SD = 2.21$). There were no differences within subjects. Inspection of the mean score for teachers in the OM group at pre-intervention was 20.33 ($SD = 1.58$) and at post-intervention was 21 ($SD = 2.24$), indicating a slight increase. Inspection of the mean for the comparison group at pre-intervention was 21.14 ($SD = 2.12$) and there was a slight decrease at post-intervention with a mean of 20.42 ($SD = 2.30$).

Discussion

This study investigated the feasibility, acceptability, and effectiveness of the OM program—a mindfulness-based social emotional learning program—against a comparison group of preschool children. The OM program was implemented adjunctively with the High Scope curriculum in Head Start preschool classrooms. Following training, most teachers were generally confident of their ability to implement the OM program activities. The OM program required the teachers to meditate for about 20 min a day during protected class time, but this was not feasible within the existing Head Start preschool schedule. However, on average, the teachers were able to engage in 8 to 10 min of daily meditation during school days. The teachers rated the OM program as being feasible to implement in their classrooms and, to some extent, integrate the program with the existing High Scope program. By the end of the school year, a majority of the teachers reported that the OM program was easy and/or practical to implement, and that there were no perceived risks of using the program activities in the preschool. On the contrary, the teachers reported perceived benefits for the children in terms of improved self-regulation, increased body and emotional awareness, improved self-calming, and increased empathy and awareness of the feelings of others. This is consistent with other literature indicating benefits of social and emotional learning programs (see Durlak et al. 2015). Overall, the teachers reported that they found the OM program to be very

Table 8 Means and standard deviations for teachers on the five facet mindfulness scale (FFMQ) for OM program and comparison groups

Subscale	OM program teacher data		Comparison group teacher data	
	Pre M (SD)	Post M (SD)	Pre M (SD)	Post M (SD)
Observe	28.83 (4.62)	31.16 (5.27)	30.20 (3.63)	31.60 (2.07)
Describe*	26.60 (4.72)	31.0 (3.16)	30.80 (3.96)	29.60 (2.19)
Act with awareness	24.50 (5.09)	25.0 (7.77)	26.20 (3.19)	25.20 (5.02)
Nonjudgmental	25.20 (5.26)	22.20 (4.38)	27.00 (1.00)	21.67 (7.64)
Nonreact	21.00 (2.97)	22.67 (4.13)	25.50 (2.35)	25.00 (2.76)

*Significant at $p < 0.05$. None of the teacher ratings showed significant differences

acceptable and would recommend the program to other preschool teachers.

In terms of child outcomes, it is noteworthy that children in both groups showed improved scores over time on the HTKS. However, children in the OM group performed better than the comparison group. This may have been because of the difference on the HTKS2 task, where there was a significant difference between the OM and comparison groups, with the OM group having higher scores. On the GNG task, both groups showed higher scores on the Go task and decreased scores on the No-Go Task over time. There were no appreciable differences between the OM and comparison group in performance on either the Go or No-Go task. When considering the summary scales on the Brief-P, children in the OM group showed decreased cognitive flexibility compared to the comparison group. Children in both groups showed improved metacognition over time. There were no significant changes in the Inhibitory Self-Control summary scale and total GEC score (overall executive functioning) over time. However, it may be that the statistics do not completely tell the clinical story of what was happening for our sample, as inspection of the mean scores in Table 4 indicated that, in general, performance was more positive for children in the OM group across all summary indices. Moreover, when one compares mean scores to those in the normative sample (see Table 1), children were performing similarly in both groups, with children in the OM group being slightly lower than averages for the normative group and children in the comparison group being slightly higher. Furthermore, analysis of the HTKS data, which is a direct measure of inhibitory control, showed that children in the OM group demonstrated increased inhibitory control when compared to the comparison group. This points to a discrepancy between teacher-reported and direct measures of inhibitory control. Given high teacher turnover, it is likely that the same teacher may not have provided the pre and post-intervention ratings for all children.

The parent and teacher outcomes were inconclusive. Given that fewer parents than those who completed the rating scales participated in the parent intervention groups for both the OM program and the comparison group indicates that the same group of parents did not complete the pre- and post-intervention self-ratings. This is an ubiquitous problem in school-based research because participation is determined by a number of parental demographic factors, and pre- and post-intervention ratings are affected by the continuous admission of new students and graduation of older students. The teacher situation was similar in the sense that high teacher turnover meant only some of the initially trained teachers completed both the pre- and post-intervention ratings, with some of the remaining teachers completing only the pre-intervention ratings and others completing only the post-intervention ratings. Future research needs to assess how to overcome these issues.

SEL programs have been shown to be effective in preschool, kindergarten, elementary and middle schools, as well as in higher education (Durlak et al. 2015). However, with the exception of self-management, the remaining CASEL (2013) SEL competencies are rarely represented in SEL programs (Feuerborn & Gueldner 2019). One of the strengths of the OM program is that it was designed specifically to include all five SEL competency areas. The activities included in the OM program (i.e., meditation, loving-kindness meditation, bell exercises, yoga, gratitude practice, kindness and compassion reporting, and feelings finder practices) (Jackman 2016a) and in the supplemental learning activities (Jackman 2016b) are directly aligned with the five SEL competency areas, thereby ensuring that the preschool children receive instruction that will enhance their social, emotional, and academic development. Indeed, the OM program can be used adjunctively with any preschool curriculum to develop and reinforce SEL competencies in preschool children.

Limitations and Future Directions

This study is not without limitations. The randomization by classrooms produced an unequal sample size across the OM group and comparison group. Future research should consider an alternative randomization procedure in order to produce comparable sample sizes for the two groups.

Another limitation is the issue of not having classes stratified by age so that SEL programs, like the OM program, can be taught at appropriate developmental levels. This problem may be unique to some Head Start schools where intake of new students may be dictated by the need to balance class size. Of course, this problem affected classrooms in both the OM group and the comparison group.

A more critical problem that may have inadvertently affected outcomes in the OM group and the comparison group concerned the high rate of staff turnover, and the minimal parent participation in both the OM program and comparison group interventions. The OM group teachers needed training in a new theoretical model (i.e., mindfulness), teaching practices that required more overt translation of SEL competencies into practice, and new activities that were to be used within the rhythm of classroom teaching. However, the Comparison group teachers were more heavily focused on implementation of the High Scope curriculum that required less training. With high staff turnover, the disparity in training requirements may have had an impact on the outcomes for the children. Future research should take into account inherent biases in the two groups when assessing outcomes. Further research is needed on how daily dose of OM program activities impact child outcomes, as teachers were unable to implement the full dose of activities in the present study. Future research should monitor how the OM program may impact academic performance (Durlak et al. 2011), and if program implementation results in a reduction of the children's negative behaviors, as evidenced in SEL programs (Skald et al. 2012).

Finally, the reported data in this paper are from the first year of a 3-year OM program development study. Taking the year 1 data as formative evaluation, changes were made to the OM program in Year 2 to enhance its effectiveness. These changes included expansion of the daily practices from 7 to 10 by bringing forward three key practices (i.e., Super Me positive behavior practices, "Are you present for me?" practice, and Soles of the Little Feet practice) from the learning activities manual to be used daily instead of as supplemental practices. The teacher manuals were also reorganized for easier reference and practice selection, with each daily practice having multiple options with varying modalities to appeal to child interest and motivation, and arranged to progress from easy to more difficult to account for varying child developmental levels (Jackman 2017a, 2017b). The Year 2 OM program was used in a Korean version (OM-Korea) of this program (Kim et al. 2019).

Further changes were made to the OM program in Year 3. Given teacher difficulty completing formal meditation due to time constraints, a series of informal mindfulness practices were added to enable teachers to embody mindfulness in daily life, and to mindfully pause with specific positive intentions. Due to an increase in children entering the program with challenging behaviors, several program elements to support positive behaviors and engagement were also added. While previous OM program versions emphasized the importance of child connection, non-judgment and present moment assessment of child needs, a specific process (i.e., the 5P process: Prepare, Process, Problem-solve, Prosocial Practice and Positive Praise) was developed and explicitly taught to help teachers view challenging behaviors as opportunities to grow and learn missing SEL skills, and to strengthen weak or emerging skills. An inhibitory control module was created to enhance the daily bell practices throughout the academic day to build skills from the bottom up through repeated practice. In addition, to assist teachers to more naturally embed practices in the rhythm of life rather than mechanically, the manual was updated to include vignettes to illustrate how practices could be applied to specific rhythm of life classroom situations (Jackman 2018a, 2018b). Future research should focus on the evaluation of the final version of the OM program.

In sum, this study compared the initial OM program against a comparison program (i.e., teaching-as-usual plus a mental health intervention). Future research could investigate how well the final OM program compares against other evidence-based SEL programs. For example, the effects of the final OM program could be evaluated against the Promoting Alternative Thinking Strategies (PATHS; Domitrovich et al. 2007) curriculum, a preschool program based on social learning theory. Research suggests that the use of the PATHS curriculum significantly enhanced preschool children's emotion understanding, social problem solving, and prosocial behaviors (Bierman et al. 2008). However, PATHS is not based specifically on either mindfulness or the five domains of SEL. In this respect, the MindUP curriculum (Flook et al. 2010) may provide a better control condition because it is a mindfulness-based program that includes instruction in breathing and mindful awareness practices.

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Author Contributions M.M.J. developed the OM program, and assisted with all aspects of the study; L.A.N. analyzed the data and helped with the writing of the paper; C.L.M. co-trained the teachers on the OM program to the teachers; J.D.Q. initiated the study, and enabled the implementation of the OM program; and N.N.S. collaborated in all phases of the study.

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Compliance with Ethical Standards

Conflict of Interest M.M.J. is the developer of the OM program and may receive royalties in the future. The other authors declare no conflict of interest.

Ethical Approval The Jefferson Franklin Community Action Corporation provided approval for the research component of the OM program. All procedures performed in this study were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from the three preschools, the parents, teachers, and assent from the children.

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