

Online Art Therapy in Elementary Schools During COVID-19: Results from A Randomized Cluster Trial and Impact on Mental Health.

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Abstract

Background: Emerging literature on the current COVID-19 crisis suggests that children may experience increased anxiety and depression as a result of the pandemic. To prevent such school and mental health-related problems, there is a timely need to develop preventive strategies and interventions to address potential negative impacts of COVID-19 on children's mental health, especially in school settings. Results from previous child clinical research indicate that art-based therapies, including mindfulness-based art therapy, have shown promise increase children's well-being and reduce psychological distress.

Objective: The goal of the present pilot and feasibility study was to compare the impact of an emotion-based directed drawing intervention (experimental condition) and a mandala drawing intervention (active control condition), both group-based, delivered online and remotely, on mental health, in elementary school children ($N=30$), in the context of the COVID-19 pandemic. A randomized cluster trial was implemented to evaluate and compare the impact of both interventions on anxiety, depression, inattention and hyperactivity symptoms.

Results: ANCOVAs revealed a significant effect of the type of drawing intervention on levels of inattention, after controlling for baseline levels. Participants in the emotion-based directed drawing group showed lower inattention scores at post-test, when compared to participants in the mandala group.

Conclusion: Overall, results from this pilot and feasibility study showed that an emotion-based directed drawing intervention was more beneficial than a mandala drawing intervention on inattention symptoms of elementary school children, in the context of the current COVID-19 pandemic. From a feasibility standpoint, results indicate that the implementation of both interventions online and remotely, through a videoconference platform, is feasible and adequate in school-based settings. Further work incorporating larger sample sizes, longitudinal data and ensuring sufficient statistical power is warranted to evaluate the long-term impact of both interventions on children's mental health.

Background

Emerging literature on the current COVID-19 crisis suggests that children may experience increased anxiety and depression in the context of the COVID-19 pandemic (Morneau Shepell, 2020). Specifically, emotional and behavioral problems arising in children who have been or are still confined to their homes have been reported (Golberstein et al., 2020; Jiao et al., 2020; Liu et al., 2020; Pisano et al., 2020; Wang et al., 2020). A lack of social interactions, boredom and family tensions may all contribute to the emergence of these problems (Liu et al., 2020). Early evidence indicates that the effects of the COVID-19 pandemic are particularly salient among children who have a pre-existing psychological disorder (Degli Espinosa et al., 2020).

Recent data suggests that elementary school children are experiencing an increase in school and psychosocial adaptation problems, in the context of the current pandemic (Morneau Shepell, 2020). It has been suggested that these problems may impede academic achievement and school perseverance (Wang

et al., 2020) which may have long-lasting impacts extending well beyond the current pandemic. To prevent such school and mental health-related problems, there is a timely need to develop preventive strategies and interventions to address potential negative impacts of COVID-19 on children's mental health, especially in school settings.

Results from previous child clinical research indicate that interventions based on social-emotional learning could potentially increase children's well-being and reduce psychological distress, while encouraging perseverance and academic achievement in school (Jiao et al., 2020). Art-based therapies, including mindfulness-based art therapy, have shown promise in this regard (Coholic & Eys, 2016; Freilich & Shechtman, 2010).

In the current context of the COVID-19 pandemic, online psychological interventions delivered at school (either in-class, or as a virtual learning activity) have the potential of leading to wide-scale provision of psychological support to high numbers of children. Available empirical evidence from previous natural disasters and pandemics indicate that providing children with online psychological services, such as tele-health, have significant positive effects on their mental health (Galea et al., 2020). Preliminary results have suggested that online-based group interventions can be beneficial to improve mental health of elementary school students, in the context of the current COVID-19 pandemic (Malboeuf-Hurtubise et al., 2020, submitted). The goal of this study was thus to compare the impact of two online, group-based, art- and mindfulness-based drawing interventions on elementary school students' mental health, within the context of the current COVID-19 pandemic.

Art-based interventions for youth

Although art-based interventions and art therapy initially drew their theoretical framework in psychoanalytic perspectives, recent work has shown influence by a variety of theoretical paradigms, such as cognitive-behavioral therapy and social-emotional learning (Coholic, 2011; Waller, 2006). The use of art in clinical contexts with youth has been shown to facilitate and encourage self-expression, discussion and awareness of emotions, through an alternative means of communication (Waller, 2006). This, in turn, encourages verbal expression of emotions and allows for easier communication of difficult emotions (Eaton et al., 2007).

Although there is a paucity of empirical research on the impacts of art therapy for children, preliminary evidence of its usefulness in children who are chronically ill suggests it holds promise in improving mental health, namely by decreasing anxiety and improving overall quality of life (Beebe et al., 2010; Favara-Scacco et al., 2001). These improvements are explained in part by the fact that art helps children gain a sense of control over their decisions, in a context where there usually is little or none (Favara-Scacco et al., 2001). Parallels can be drawn between the lack of control over one's life in the context of a chronic illness and in the current context of the COVID-19 pandemic. As such, it appears likely that art-based interventions could have similar benefits on children's mental health during this global crisis.

Previous research on the impacts of art-based interventions conducted in school settings indicate that they promote awareness and self-understanding in children with learning disabilities, which in turn fosters better emotional and social adjustment (Freilich & Shechtman, 2010). Furthermore, in a group setting, art therapy was shown to decrease hyperactivity and internalizing behaviors, while increasing social skills, in a sample of autistic children (Epp, 2008). However, although preliminary evidence suggests that art-based interventions are beneficial in clinical populations, further research is warranted to determine if similar effects can be found in non-clinical populations and as a preventive measure to reduce psychological distress, namely with elementary school students.

Mindfulness-based art therapy

Mindfulness can be defined as paying attention open-mindedly to the present moment, without judgement (Kabat-Zinn, 1994). Mindfulness-based interventions tailored to children have shown benefits for reducing psychological distress and improving overall mental health when implemented in elementary school classrooms, specifically with regards to anxiety, depression and inattention (Carsley et al., 2018; Zenner et al., 2014). Although youth mindfulness studies report results from interventions which use formal meditative practices, recent research has started to explore alternative, informal mindfulness practices and interventions that may be beneficial for youth mental health, for example, through artistic expression (Coholic, 2011; Coholic & Eys, 2016; Coholic et al., 2012).

In order for a practice to be considered mindful, it must include a structured component that encourages the focus of attention (Greenberg & Harris, 2012). As such, mindful art making is defined as a practice in which both the physical and creative processes of art are included, along with a specific intent to concentrate on the unfolding of the present moment (Carsley et al., 2015). Drawing-based interventions, such as mandala drawing, are considered a form of mindfulness-based art therapy, and are easily implemented in school settings. Past research with adults and teenagers has shown mandala drawing to be beneficial to decrease anxiety in school settings and clinical contexts (Kostyunina & Drozdikova-Zaripova, 2016; van der Venet & Serice, 2012). However, a small study conducted with elementary school children suggested that mandala drawing was no more effective than free drawing (non-mindful) in reducing test anxiety (Carsley et al., 2015). Thus, further research is warranted to establish if mandala drawing represents a viable intervention to improve youth mental health, specifically in school settings.

Present study

The goal of the present pilot and feasibility study was to compare the impact of an emotion-based directed drawing intervention (experimental condition) and a mandala drawing intervention (active control condition), both group-based, delivered online and remotely, on mental health, in elementary school children, in the context of the COVID-19 pandemic. Specifically, the impact of both interventions on anxiety, depression, inattention and hyperactivity symptoms was compared. To do so, a randomized cluster trial was implemented. Based on the existing literature, we hypothesized that the children in the emotion-based intervention group would have lower anxiety, depression, inattention and hyperactivity than the ones in the mandala intervention.

Methods

All available students from three classrooms of 1st to 5th grade ($N=30$; $M_{age}=11.2$ years old; 43% boys and 57% girls) from an elementary school in the Eastern Townships region in Quebec, Canada, took part in this study and were randomly allocated to either the mandala drawing group (1 classroom of 5th grade students; $N=8$) or the emotion-based directed drawing group (1 classrooms of 1st grade students and one multi-age classroom of 4th and 5th grade students; $N=22$; Please refer to Table 1). Interventions occurred simultaneously in the Spring of 2020, during the COVID-19 pandemic and after the gradual reopening of the school, following a 6 weeks confinement period. Informed consent was obtained from all participating students and their parents as well as from the teachers involved. Randomization occurred immediately after completion of pre-intervention measures. Students completed pre-intervention (one week before the beginning of the intervention) and post-intervention (one week after the end of the intervention) measures. Two research assistants assisted students remotely in completing the questionnaire package, namely by reading all question items out loud and answering students' questions. There was no attrition in this study.

Table 1
Descriptive statistics and sample distribution

Classroom grade	N	Mean age	Condition
1st	8	6,5	Emotion-based
Multi-age 4th – 5th	14	11,2	Emotion-based
5th	8	11,5	Mandala
Total sample	30	11,3	
Girls	17		
Boys	13		

Procedure

As part of this study, two distinct group-based interventions were implemented. Both interventions lasted 5 weeks during the months of May and June 2020 (1 session per week), with each session lasting approximately 45 minutes. Sessions occurred through a secure, password protected, video conferencing platform, during which research assistants would log on remotely and join students in their classroom, using the classrooms' smart board. The classroom would stay on the videoconference call for the whole duration of the drawing activity. All students were back in school at the time of this study. Sessions were led by two undergraduate psychology students with previous experience leading mindfulness-based interventions in elementary schools as well as prior research experience related to art-based therapy. Research assistants worked as a pair and led all groups together for both modalities. They were blinded

to the research hypotheses. Supervision was offered weekly by a licensed child clinician (CMH, first author of this study) throughout this project.

The emotion-based directed drawing intervention that was used in this project consisted of five weekly sessions during which children were instructed to complete varying drawing activities. Details of the weekly sessions can be found in Table 2. This intervention was based on Elise Gravel’s (a children’s book author and illustrator) *How Do You Doodle? Drawing my Feelings and Emotions* and on the author’s recently published COVID-19 themed drawing worksheets for children, available on the author’s website (<http://elisegravel.com/livres/dessins-a-colorier/>). Group discussions followed each activity, during which children were invited to share their thoughts, emotions and overall reactions to their drawings.

Table 2
Content of emotion-based drawing intervention

Session	Content
1	<ul style="list-style-type: none"> • COVID-19/story of a virus Comic strip • Looking inside yourself – draw how you feel
2	<ul style="list-style-type: none"> • Recipe for a nice day • Drawing viruses with funny names
3	<ul style="list-style-type: none"> • Fear: draw what you are afraid of in a bottle and put a cork in it • Irritation: draw what aggravates you and throw it in the garbage can
4	<ul style="list-style-type: none"> • Worry: draw makes you anxious and where you feel it in your body
5	<ul style="list-style-type: none"> • Weekly forecast: what’s the forecast in your heart today? • Draw your COVID-19 cure

The mandala drawing intervention consisted of 5 different mandala drawing sessions taken from the *CBT Art Activity Book* (Guest, 2015). Following the drawing of their mandalas, children had the opportunity to discuss and share their reflections related to their drawings as a group.

Measures

Participants completed selected items from the anxiety (3 items, e.g., “I worry about little things”), depression (5 items, e.g., “I feel sad”), inattention (3 items, e.g., “I forget to do things”) and hyperactivity (2 items, e.g., “I have trouble sitting still”) subscales of the *Behavior Assessment Scale for Children-3rd edition* (BASC III) (Reynolds & Kamphaus, 2004). Items were selected following discussions with the research team members. Internal consistency was acceptable to good for all subscales (α anxiety_{pre/post} = .77/.79; α depression_{pre/post} = .65/.76 ; α inattention_{pre/post} = .93/.66 ; α hyperactivity_{pre/post} = .74/.72) in this sample. Individual scale scores were used in the analyses.

Participants also completed selected items from the Mindful Attention Awareness Scale for Children (Lawlor et al., 2014) (7 items; e.g., “I find it difficult to stay focused on what is happening in the present moment.”). In this scale, all items are reverse scored. Internal consistency was good ($\alpha_{\text{pre/post}} = .83/.85$) in this sample.

Data Analysis

We tested our hypotheses using analyses of covariance (ANCOVAs), which can increase statistical power in randomized controlled trials, and which allowed for a comparison of post-intervention scores between each group, controlling for pre-intervention scores (Van Breukelen, 2006). Effect sizes, Partial η^2 scores, were computed in order to assess the magnitude of the observed effects. Post-hoc sensitivity analyses using paired t-tests were also completed to examine changes from pre-to-post intervention within the full sample.

Results

Given the unequal size of both groups, we tested for homogeneity of variance for all analyses. Results from Levene’s tests of equality of error variances showed that our data met the homogeneity of variance assumption and that results could be confidently reported in this regard. ANCOVAs revealed a significant effect of the type of drawing intervention on levels of inattention ($F(1, 26) = 5.16, p = .03, \text{partial } \eta^2 = .18$), after controlling for baseline levels of symptoms. Participants in the emotion-based directed drawing group showed lower inattention scores at post-test ($M_{\text{post, adjusted for baseline}} = 1.15$), when compared to participants in the mandala group ($M_{\text{post, adjusted for baseline}} = 2.12$). However, sensitivity analyses using paired t-tests did not show significant pre-to-post changes in inattention scores in participants from each group ($p_{\text{emotion-based}} = .26; p_{\text{mandala}} = .35$). We found no impact of type of drawing intervention on levels of anxiety, depression, hyperactivity or mindfulness (please refer to Tables 3 and 4).

Table 3

Means and standard deviations for anxiety, depression, inattention, hyperactivity and mindfulness

Dependent variable	Mandala group		Emotion-based drawing group	
	Pre-test (SD)	Post-test (SD)	Pre-test (SD)	Post-test (SD)
Anxiety	3.25 (2.05)	2.87 (.83)	4.1 (1.99)	3.5 (1.70)
Depression	2.62 (1.84)	2.62 (1.50)	3.05 (2.04)	2.60 (2.11)
Inattention	1.75 (1.83)	2.12 (1.24)	1.73 (2.30)	1.15 (1.06)
Hyperactivity	1.37 (1.4)	1.12 (1.12)	1.30 (1.08)	0.95 (1.19)
Mindfulness	2.30 (.81)	2.03 (.77)	2.29 (.91)	1.95 (.84)

Table 4

Results of ANCOVA for anxiety, depression, inattention, hyperactivity and mindfulness

Variable	df	F	<i>p</i>	Partial η^2
Anxiety	1	.229	.63	.009
Depression	1	.109	.74	.005
Inattention	1	5.16	.03	.18
Hyperactivity	1	.165	.68	.007
Mindfulness	1	.07	.79	.003

Post-hoc sensitivity analyses showed significant decreases in pre-to-post scores for levels of hyperactivity ($t(27) = 2.54, p = .01$) for the complete sample. It thus seems that participants from both groups showed a decrease in scores from pre-intervention ($M_{\text{pre total sample}} = 1.32$) to post-intervention ($M_{\text{post total sample}} = 1.00$). Furthermore, sensitivity analyses showed significant decreases in pre-to-post mindfulness scores ($t(28) = 2.40, p = .02$) for the complete sample. It thus seems that participants from both groups showed a decrease in scores from pre-intervention ($M_{\text{pre total sample}} = 2.29$) to post-intervention ($M_{\text{post}} = 1.98$).

Discussion

The goal of the present pilot and feasibility study was to compare the impact of two group-based drawing interventions, implemented remotely and online, on elementary school children's mental health, in the context of the COVID-19 pandemic. In accordance with our initial hypothesis, the emotion-based directed drawing intervention was more beneficial to decrease inattention symptoms than the mandala intervention. However, sensitivity analyses did not indicate significant pre-to-post variations in inattention scores among participants from the emotion-based drawing intervention group, which leads us to question the robustness of these results and thus warrants caution in their generalization. Furthermore, post-hoc sensitivity analyses also showed significant decreases from pre-to-post intervention in hyperactivity and mindfulness scores in our total sample.

Results from this preliminary study suggest that a directed, emotion-based drawing intervention can be useful to alleviate symptoms that may be attributed to increased levels of psychological distress such as inattention in elementary school children, in the current context of the COVID-19 pandemic. Although it is undeniable that results from this study are underpowered due to the study's small sample size, the decreases found in inattention scores are promising, as shown by the moderate to large effect size. Indeed, giving children the opportunity to reflect on their feelings, as well as providing them with a safe space in which to process what they understand of the COVID-19 pandemic and how they feel about it, through artistic expression, may be helpful to improve attention capacities. It should be noted that across both groups, discussions lasted approximately the same time. Indeed, given the different nature of both interventions and the fact that the mandala intervention was not intended to discuss COVID-related events, it is possible that post-drawing discussions may be driving these results. However, given the fact that school teachers, professionals and researchers in child mental health alike will most likely continue to face significant issues with regards to student mental health in the upcoming year, these preliminary results indicate that a drawing-based intervention, which can be implemented easily, with minimal training involved, may be an interesting option to provide psychological support to children in school settings. These results also lend support to previous studies in which art-based interventions had positive effects on children's mental health (Eaton et al., 2007; Epp, 2008; Freilich & Shechtman, 2010).

In children of elementary school age, manifestations of inattention, such as being easily distracted, forgetful or having difficulty paying attention to the teacher, can often be the primary manifestation of underlying anxiety and depression (American Psychiatric Association, 2013). This may lead to mislabeling or misdiagnosis of either condition as attention deficit hyperactivity disorder (ADHD). Thus, it is possible, although results did not indicate a significant impact of either intervention on anxiety and depressive symptoms, that pre-to-post changes in inattention scores in participants from the emotion-based drawing group may reflect, at least in part, some improvements on these variables. It is also possible that children themselves were less attuned to their own variation in depression and anxiety symptoms, which may explain the lack of significant results in this regard. Using a larger number of scales and items for each variable would help in solving this issue in future work, although it should be noted that internal consistency was acceptable to good for all subscales in this study. Including teacher and parent reported data would also help in this regard, as children, especially younger

ones, may not always have the best insight to report on their own variations of symptoms. Finally, further work, with larger sample sizes, could help confirm or infirm this hypothesis.

Post-hoc sensitivity analyses conducted on pre-to-post changes in our total sample showed significant decreases in hyperactivity scores. These results lend further support in showing the promising impact of both drawing interventions on children's mental health. It is quite possible that the lack of statistical power and unequal groups prevented us from seeing significant between-group differences on hyperactivity symptoms, although this remains to be further investigated. Sensitivity analyses also revealed pre-to-post decreases in mindfulness scores across both groups. The decrease in scores from participants in the mandala group is counter-intuitive. It is possible that the mandala intervention did not, as intended, have an impact on mindfulness abilities in children. It is also possible that the scale used in this study, which has been previously suggested as measuring mindlessness rather than mindfulness, was not sensitive enough to document changes in mindfulness abilities in children (Van Dam et al., 2010).

From a feasibility standpoint, both interventions were implemented with very few technical issues. Indeed, teachers participating in this study were highly motivated in ensuring that this online research project could run smoothly and were keen to assist the research team, for instance, by facilitating group discussions and questionnaire completion. Feedback collected from teachers and students alike shows that both interventions were well accepted and appreciated, especially by teachers, who had very clearly expressed a need to address the COVID-19 pandemic and its consequent psychological impacts on their students upon reopening of their school. Teachers also mentioned that we were able to provide a playful and creative approach to discussing current events and alleviating psychological distress, through a stimulating art-based intervention, especially for students in the emotion-based drawing group. Given that our research team does not anticipate that research assistants will be allowed in schools during the 2020–2021 school year, knowing that the online modality is feasible and yields encouraging results on youth mental health is quite encouraging.

Results from this study do not allow us to conclude whether both interventions are effective or not to alleviate anxiety or depressive symptoms and whether one intervention is more effective than the other in this regard. However, results offer preliminary evidence that an emotion-based directed drawing intervention can be helpful to decrease manifestations of inattention among elementary school children, more so than a mandala drawing intervention. Although the lack of statistical power is one of our study's main limitations, it appeared important to members of our research team to publish these preliminary, yet encouraging results, in light of the time-sensitivity of the COVID-19 pandemic. Given the ease of a remote and online implementation of these interventions, it appeared important to disseminate these results, as researchers who are interested in exploring avenues to improve child mental health, especially in the context of the COVID-19 pandemic, could aim to build on this study's design and preliminary results for future projects.

Logical next steps for our study include recruiting a larger sample size and including longitudinal data which could help further the knowledge on the usefulness of mandala and emotion-based drawing interventions to address psychological distress in youth, as well as their long-term impact. Variations in pre-to-post mean anxiety and depression scores, albeit not statistically significant, seem to indicate that the emotion-based directed drawing intervention may be useful to improve such symptoms, although this remains to be confirmed in future, more robust work. Finally, the comparative and long-term impact of both interventions also remains to be investigated in more detail.

Conclusion

Overall, results from this pilot and feasibility study showed that an emotion-based directed drawing intervention was more beneficial than a mandala drawing intervention on inattention symptoms of elementary school children, in the context of the current COVID-19 pandemic. From a feasibility standpoint, results indicate that the implementation of both interventions online and remotely, through a videoconference platform, is feasible and adequate in school-based settings. Further work incorporating larger sample sizes, longitudinal data and ensuring sufficient statistical power is warranted to evaluate the long-term impact of both interventions on children's mental health.

Declarations

Ethics approval and consent to participate

This study was approved by the Bishop's University Research and Ethics Board (file 102247, date of approval: May 6th 2020). Participation in this study was voluntary. Written consent was obtained from each participant and their parents, as well as from all teachers taking part in this study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Author contributions

CM-H conceptualized and coordinated the study, adapted the art-based interventions and trained research assistants, who led sessions remotely, performed data analysis, and drafted the manuscript. TLG contributed significantly in data entry and drafting the manuscript. GM contributed significantly in data analysis and to the revision of the manuscript. GT, CH, NC and DL contributed significantly to the revision of the manuscript.

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Availability of data and materials

All datasets used and analyzed in the current study are available on request from the study's first author.

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