

Research paper

The Impact of a Harry Potter-Based Cognitive-Behavioral Therapy Skills Curriculum on Suicidality and Well-being in Middle Schoolers: A Randomized Controlled Trial

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ABSTRACT

Objective: To evaluate the impact of a Harry Potter-based mental health literacy curriculum, imparting cognitive behavioral therapy (CBT) skills, on suicidality and well-being in middle-schoolers.

Methods: Students (aged 11–14; grades 7–8) who received a 3-month teacher-delivered intervention embedded in the language arts curriculum (N=200) were compared to a wait-list control group (N=230) in the largest urban school board in Canada. Suicidality defined as a composite measure of self-reported suicidal ideation and attempts [primary outcome], self-reported emotion dysregulation, interpersonal chaos, confusion about self, and impulsivity [Life Problems Inventory (LPI)] and self-reported depression and anxiety symptoms [Revised Child Anxiety and Depression Scale (RCADS)] were the outcomes of interest. Measurements occurred prior to and after curriculum delivery with independent t-tests used to compare mean change scores between groups clustered by class.

Results: Thirty-seven English teachers in 46 classes across 15 schools comprised the planned study cohort. Composite suicidality scores were significantly worse in the control than intervention group at endpoint (0.05±0.54 vs. 0.17±0.47, $t = -2.60$, $df=428$, $p=0.01$). There were also significant improvements in LPI and RCADS scores in the intervention group compared to controls (LPI: -3.74 ± 7.98 vs. 1.16 ± 10.77 $t=5.28$, $df=428$, $p<.001$; RCADS: -3.08 ± 5.49 vs. -1.51 ± 6.53 $t=2.96$, $df=429$, $p=0.01$). Sub-analyses revealed that these improvements were largely driven by a significant difference in scores in girls.

Limitations: Sample size constraints as study terminated prematurely during COVID pandemic.

Conclusions: This study demonstrates significant improvement in suicidality, emotional regulation, self-concept, interpersonal difficulties, depression and anxiety in youth, particularly girls following this intervention. Replication studies in larger samples are needed to confirm these results.

1. Background

Stress- Suicide is the second leading cause of death (after accidental injury)

in those aged 10–24 in high income countries. An estimated 800,000 people die by suicide globally every year and many of these individuals are children and youth who now represent the group at highest risk for

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suicide in one-third of all countries in the world [World Health Organization 2020]. In a U.S. national sample involving more than 6,000 adolescents (aged 13–18) and their parents, the estimated lifetime prevalence rates for suicidal ideation, suicide plans and suicide attempts were 12.1%, 4% and 4.1% respectively (Nock et al. 2013). It is generally accepted that life stress and deficits in coping skills are key antecedents of suicide (Brent et al. 2011; Seguin et al. 2014). Yet suicide-prevention efforts in youth often fail to address these factors at a level that is developmentally appropriate. Therefore, a scalable, feasible and effective, early, universal prevention intervention addressing these factors is urgently needed. -topic

A Cochrane Review of 53 randomized trials with a total of 17,699 adult participants reported that compared to treatment as usual, Cognitive Behaviour Therapy (CBT)-based therapy results in a decrease of 6% of self-harming behaviours (Hawton et al. 2016). For adolescents, a Cochrane Review protocol has noted an absence of evidence, mainly due to the lack of specific studies with a focus on young people (Hetrick et al. 2016). However, two large school-based studies aimed at reducing suicide by promoting mental health literacy (MHL) have been conducted. The Saving and Empowering Young Lives in Europe (SEYLE) study of 2,000 teenagers in Europe found that the MHL curriculum was the only intervention that was significantly better than a control group reducing suicidal ideation and attempts after one year by approximately half (Wasserman et al. 2015). The other large study was conducted in the U.S. and examined the Signs of Suicide (SOS) prevention program in high school students. Rates of reported suicide attempts in the intervention group were lower than those in waitlist controls (Shilling, 2016).

Schools may be ideally situated for teaching and enhancing resilience (Dray et al. 2017) developing social-emotional awareness (Wasserman et al. 2015; Durlack et al. 2011 & Kutcher et al. 2016), monitoring changes in individual student well-being, identifying emerging problems and intervening with youth when and where they need it (Alleyne et al. 2019 & Kutcher et al. 2015). Schools provide easy access to a range of mental health support and care (Christiansen et al. 2013). Nevertheless, reviews of the effectiveness of various programs, implemented to improve mental health identify limited evidence of clinical (Calear et al. 2010; Robinson et al., 2019) and cost effectiveness (Wei et al. 2015).

School-based interventions that impart CBT and enhance resilience and coping, while doing so through an engaging, developmentally appropriate narrative may augment suicide prevention efforts. Our group has co-developed a universal, school-based suicide prevention intervention (Sinyor et al. 2017) with the assistance of educators and youth from the Catholic District School Board of Eastern Ontario (CDSBEO) (Sinyor et al. 2020). The intervention is imparted as a literature unit while reading the third book in the Harry Potter series ('Harry Potter and the Prisoner of Azkaban') (Rowling, 1999) in English language class. Middle school aged youth learn how both the protagonist and author (J.K. Rowling) learn to be resilient when faced with depression and anxiety. Portrayals of mastery over distress are emphasized in the intervention with direct examples taken from the novel using various characters who exemplify resilience and coping. The intervention's primary aim is to reduce suicidality by emphasizing resilience and practical skill acquisition, in part, given research in the area of media and suicide indicating that portrayals of mastery and coping can reduce suicide death and ideation, termed the Papageno effect (Niederkrotenthaler et al. 2010 & Niederkrotenthaler et al. 2019).

We conducted a study testing the feasibility of implementing the intervention in middle schoolers in a rural school board in Ontario, Canada (Conforti et al. 2020). This uncontrolled study found that a composite measure of suicidal ideation, attempts and self-harm scores were reduced by nearly half and a scale measuring core symptoms of borderline personality disorder (Rathus et al., 2015) also decreased significantly. While the study found the intervention to be feasible, limitations included a small sample size and no control group.

The current study reports on the first randomized control trial of the Harry Potter curriculum, and indeed of any such intervention embedded within a children's literature unit, conducted in the largest urban school board in Canada. We hypothesized that the students will have significantly improved suicidality, depression, anxiety, and well-being scores following the Harry Potter curriculum compared to a control group.

2. Method

2.1. Intervention

This 3-month literature unit is imparted during regular English language classes. Mental health/CBT education in the protocolized manual includes a) how risk factors contribute to emotional distress and how protective factors promote resilience b) how depression and anxiety manifest c) how cognitive distortions differ from rational thoughts d) basic cognitive restructuring techniques e) behavioural interventions for improving mood and f) the promotion of help seeking behaviour should these skills fail to adequately provide emotional regulation. The curriculum encourages cognitive flexibility, resilience, and an internal locus of control established through identification of personalized coping strategies (called "stress busters") as well as problem solving skills using cognitive behavioral therapeutic principles. Students engage in classroom discussion consistent with their level of comfort and are encouraged to maintain private workbooks if they desire. We provided participating teachers with copies of the manual. The manual is structured to facilitate the creation of additional lessons to meet grade 7 and 8 language arts educational requirements. Although the intervention was specifically developed for suicide prevention, in keeping with the model that primary prevention of suicide emphasizing healthy responses to distress, suicide is not mentioned within the curriculum apart from a brief note that suicidal ideation can be a symptom of depression. The lesson objectives for each chapter are explicit in the manual. Checklists and mandated homework assignments were provided to teachers as part of the curriculum manual to assist in preserving fidelity. The intervention was designed with the aim of modifying potential risk factors for youth suicide including lack of social connection and support, social conflict, school problems, poor school performance, and mental health.

2.2. Participant Flow

Participants were randomized according to class. The study structure is presented in PRISMA Fig. 1 and discussed in the statistical analysis section below.

2.3. Study Design and Participants

This study is a randomized controlled trial (RCT) comparing students who received the intervention in the Fall semester of 2019 to wait listed controls who did not receive any intervention other than the usual language arts curriculum. Eligible participants were those 11 to 14 years of age in grades 7 or 8 whose teachers received training in delivering the curriculum and agreed to do so during the school year. Given that the curriculum is designed to be a universal intervention, students were only excluded if they could not read and write in English.

3. Recruitment

The RCT took place in Toronto, Ontario in an urban, diverse, school board that is the largest in Canada. School system administrators were approached by study investigators to recruit English teachers across the school board. All students were to receive the curriculum as part of their regular English language classes regardless of whether they agreed to participate in this study. Written consent for students to participate in the research trial was obtained from their parents or legal guardian and assent was obtained from the students. Study staff were present for

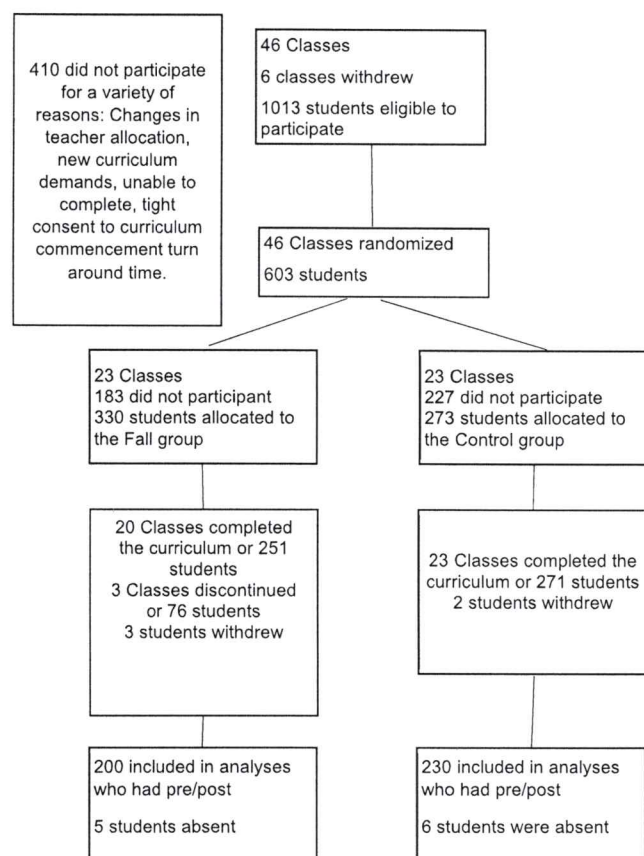


Fig. 1. PRISMA Diagram Showing Class Randomization and Students Included in the Intervention and Control Conditions of the Trial.

recruitment and/or the consent process at parent information sessions and/or “meet the teacher” nights scheduled in the evening at the schools, in addition to separate visits to each of the classes to discuss the project and answer any questions from the students. For students whose parents did not attend the evening events, or where schools were unable to offer the evening sessions just prior to when the curriculum was required to start, the students were asked to take the parental consent forms home to share with their parents. Students were also permitted to take the assents home to discuss the study with their parents if they felt more comfortable doing so. As per usual practice at a school board, parents were encouraged to reach out to their child’s teacher with basic questions regarding the curriculum/classroom programming such as the general content. Questions related to the research were directed to study staff members and investigator contact information was provided on the consent forms. School board translation services were accessed by study staff for parents, if the consenting guardian presented with language barriers to ensure equitable access to the study. Information about mental health and crisis resources both internal and external to the school board were provided to each student and posted in the classroom.

3.1. Research Ethics and Privacy

A minimum of two weeks was provided for parents to provide written consent. The study was approved by the Sunnybrook Health Sciences Research Ethics Board (Project Identification Number: 238-2018) and the Toronto District School Board’s Research and Development Department. Study participants were preassigned a unique identification number which was utilized across all measures to ensure anonymity. Identifying information was then destroyed. Privacy issues that were addressed were the maintenance of confidentiality, ensuring

participant protection from unauthorized access, use or disclosure, and physical and technical safeguards. In sum, there was no way to discern a student’s mental health status for reporting purposes to school board staff or parental inquiry.

3.2. Randomization

Thirty-seven English teachers in 46 classes across 15 schools comprised the planned study cohort. The 46 classes were randomized in early-September following teacher indicated preference, to either receive the 3-month intervention in fall, or not to receive any intervention in fall. Teachers were permitted to express a preference for a specific term in which the curriculum was taught and then the remaining classes were randomized. (see Fig. 1).

3.3. Training and Delivery of the Curriculum

Administrators invited teachers from each of their schools who explicitly expressed readiness to commence the curriculum in the Fall of 2019 or the Winter of 2020 to a training session prior to study initiation. Given the ultimate intent for broad dissemination of this curriculum, the training was intentionally kept to a half day yet covered a broad range of topics. Training consisted of an overview of CBT with specific emphasis on core principles, CBT techniques and models as it specifically relates to depression and anxiety, an overview of the research literature pertaining to suicide and mental health literacy, the role of resilience, learning modules were discussed by book chapter (see “Intervention” above for details), an overview was provided of the research design, and time was allotted for consolidation and discussion of implementation lessons that we learned from the pilot study.

The curriculum was then delivered by the trained teachers for a period of 3 months, with measurement prior to the start of the curriculum (pre, mid-September to mid-October) and after the delivery of the curriculum (post, mid-January to mid-February). Measurement occurred at the same time points for those students who acted as controls. The unit of randomization was the classroom. The lead investigator (PC) visited each class to assess implementation, interacting with both students and teachers, who shared work samples representative of the core concepts and lessons. Fidelity was deemed to be adequate across all classes and no classes were observed to miss key learning objectives or areas; note that, although informal oversight suggested adequate fidelity, there was no formal protocol for implementation monitoring.

4. Measures

4.1. Primary and Secondary Outcomes

The Life Problems Inventory (LPI) is a self-report scale measuring core symptoms of borderline personality disorder including emotion dysregulation, interpersonal chaos, confusion about self, and impulsivity. The primary outcome measure was change in a composite score of suicidality inclusive of three combined suicide-related items derived from the LPI [that is, “Killing myself may be the easiest way of solving my problems” (item 7); “More and more often I think of ending my own life” (item 11) and “I have made at least one suicide attempt.” (Item 26)]. Secondary outcomes included changes in overall LPI scores, the four sub-scales measured in the LPI, and overall depression and anxiety scores as measured by the total score on the Revised Child Anxiety and Depression Scale (RCADS). The LPI is a 60-item, 5-point Likert scale scored 1-5 with a value of 1 indicating “none at all like me”. To avoid misinterpretation, the scale was adjusted when analyzed to scores of 0-4 with negative responses coded as 0. The adjusted maximum total score on the LPI was 240.

The RCADS (Chorpita et al., 2005) is a 47-item self-report measure for youth ages 6 to 18 assessing six domains of anxiety and depression. The RCADS maximum total score was 141.

4.2. Questionnaire Administration

Each respondent was counselled that survey data is anonymous to alleviate any concerns that responses could be shared with parents and thereby to maximize the chances of honest responses. Questionnaires were read aloud in class and each participant had an opportunity to ask for clarification if needed, only to ensure that there was no misunderstanding of either the instructions or the questions. For example, it was not uncommon for students to seek clarity for items which used the word “relationship;” students often asked if this was referring exclusively to a boy/girlfriend. Another example for the statement, “I get so angry that I hit people or throw things,” students often asked how to respond if this behaviour was only towards their brother or sister. Investigators were present to assist with clarification during questionnaire completion and made themselves available to assist with any study-related queries at other times.

4.3. Statistical Analysis

Complete outcome data was available for all randomized subjects provided they were not absent on the data collection day(s). Participants who completed the curriculum and were present during the administration of both pre and post measures were included in the statistical analyses. Two subjects left a blank on one of the suicide items. We nevertheless retained both participants given that they endorsed other risk items, consistent with Henggehold et al. 2019 who reported that youth patients screened for suicide risk who chose the “no response” option for suicide items are clinically similar to patients screening positive for suicide risk (See Fig. 1).

The analysis was initially intended to include a larger sample size (3 years of data rather than one-half year) and to test group X time interactions for all measures at multiple time points. However, the study was cut short due to the COVID-19 pandemic, which resulted in school closures, a smaller than expected sample size, and measures at only two time points. Given the relatively small number of clusters (e.g. students in each class) per arms (intervention versus control), we elected to use the aggregate cluster-level analysis using cluster means which has the benefit of being straightforward and easy to implement. Walters, Morrell, and Slade (2011) recommend this approach when there are a small number of clusters per treatment arm (around 15 clusters). The aggregate cluster-level analysis involves two stages: 1) calculate the mean outcome for all students in a cluster (in this case an individual class), and 2) analyzing the aggregate cluster means using standard statistical methods. For all outcome measures, pre-post changes were computed at the aggregate cluster level and independent samples t-test was used to examine differences between the intervention and control groups. Note that there were no significant demographic differences between those who completed both pre-post measures (included participants) compared with those that only completed the baseline assessment (not included). See Supplementary Table 1.

The composite score of suicidality included two questions about suicidal ideation and one about suicide attempts. We have also included a supplementary sensitivity analysis inclusive of the previous three LPI suicide items with the addition of a non-suicidal self-injury (NSSI) item [“I have deliberately hurt myself without meaning to kill myself (such as cutting or scratching myself: Item 22)]. The rationale for combining these two types of measures is that people who engage in self-injury even when there is no intent to die have, by definition, already shown themselves capable of harming themselves in response to psychological distress which is considered one of the necessary pre-requisites for suicide death (Kapur et al., 2013; Mars et al., 2019).

All analyses were run using SPSS version 26.

5. Results

A total of 1,013 students received the informed consent package with

Table 1

Comparison of Change in Suicidality, Total Life Problems Inventory (LPI), and Total Revised Children's Anxiety and Depression Scale (RCADS) Scores in Middle Schoolers Prior to and Immediately After the Harry Potter-Based Cognitive Behavioural Therapy (CBT) Skills Intervention (N=200) versus Controls (N=230) According to Class.

Variable	Intervention Mean (SD)	Controls Mean (SD)	t	df	p
LPI Change in Suicidal Items (7, 11, 26)	0.05 (0.54)	0.17 (0.47)	-2.60	428	0.01
Intervention					
Item 7: <i>Killing me may be the easiest way of solving my problems.</i>	0.02 (0.24)	.09 (0.19)	3.64	428	<.001
Item 11: <i>More and more I often think of ending my own life.</i>	-.03 (0.24)	.04 (0.20)	3.24	385	<.001*
Item 26: <i>I have made at least one suicide attempt.</i>	0.06 (0.20)	0.04 (0.18)	-0.90	406	0.37*
LPI Change in Total Raw Scores	-3.74 (7.98)	1.16 (10.77)	5.28	428	<.001
Change in Total Emotional Dysregulation	-1.26 (2.04)	-.044 (3.04)	4.91	404	<.001*
Change in Interpersonal Chaos	-1.56 (2.68)	.03 (3.18)	5.53	428	<.001
Change in Confusion About Self	-0.51 (3.11)	1.33 (3.32)	5.87	428	<.001
Change in Impulsivity	-0.05 (1.19)	-.20 (2.05)	-.976	376	0.33*
RCADS Change in Total Raw Score	-3.08 (5.49)	-1.51 (6.53)	2.69	429	.01

Note.

* Homogeneity of variance assumption was violated, so the Welch's t-test was used.

603 (59.5%) consented to enroll into the study. Of these, 430 (71.3%), including 265 girls, 164 boys and 1 non-binary, had both pre- and post-measures and comprised the group used for data analysis.

Results of the primary and secondary analyses for the total sample as well as according to sex are shown in Table 1 and 2. For the primary analysis comparing the mean aggregate cluster total for pre-post changes in composite suicidality scores between the intervention and control groups, results were significant favoring the intervention group (0.05 ± 0.54 vs. 0.17 ± 0.47 $t = -2.60$, $df = 428$, $p = 0.01$) (Fig. 2a-c). Sub-analyses examining each of the three suicide items separately revealed a significant difference between the groups favouring the intervention for items 7 [0.02 ± 0.24 vs. $.09 \pm 0.19$ $t = 3.64$, $df = 428$, $p < .001$; “Killing myself may be the easiest way of solving my problems”] and 11 [$-.030 \pm 0.24$ vs. $.039 \pm 0.20$ $t = -3.24$, $df = 385$, $p < .001$; “More and more often I think of ending my own life”].

Secondary analyses comparing pre-post changes in total LPI scores were significant favoring the intervention group (-3.74 ± 7.98 vs. 1.16 ± 10.77 $t = 5.28$, $df = 428$, $p < .001$) (Fig. 3a). Sub-analyses revealed that the LPI improvement in the intervention group was largely driven by a significant difference in scores in girls (-4.13 ± 8.30 vs. 1.93 ± 10.82 $t = -5.06$, $df = 264$, $p < .001$) (Fig. 3b-c). Moreover, the specific subscale improvements that drove this difference in girls were in Interpersonal Chaos [-1.76 ± 2.76 vs. 0.22 ± 3.32 ; $t = 5.09$, $df = 264$, $p < .001$], Emotional Dysregulation [-1.42 ± 2.08 vs. 0.18 ± 3.04 ; $t = 4.72$, $df = 264$, $p < .001$] and Confusion About the Self [-0.60 ± 3.21 vs. 1.48 ± 3.32 ; $t = -5.05$, $df = 264$, $p < .001$]. Confusion About the Self [-0.40 ± 3.02 vs. 0.98 ± 3.31 ; $t = 2.77$, $df = 162$, $p = 0.01$] was also significantly improved in males; however, male Impulsivity increased significantly in the intervention group [0.08 ± 1.08 vs. -0.58 ± 1.98 ; $t = -2.52$, $df = 97$, $p = 0.01$]. Depression and anxiety (RCADS) scores were significantly improved in the intervention group (-3.08 ± 5.49 vs. -1.51 ± 6.53 $t = 2.96$, $df = 429$, $p = 0.01$). The effect was evident in females [-3.40 ± 5.71 vs. -1.29 ± 6.55 ; $t = -2.69$, $df = 263$, $p = 0.01$] (Fig. 4a-c). Supplementary Tables 2 and 3 report total sample

Table 2

Comparison of Change in Suicidality, Life Problems Inventory (LPI), and Revised Children's Anxiety and Depression Scale (RCADS) Scores in Middle Schoolers Prior to and After the Harry Potter-Based Cognitive Behavioural Therapy (CBT) Skills Intervention versus Controls According to Sex (Male n=164; Female n=266) By Class.

Variable		Intervention Mean (SD)	Controls Mean (SD)	t	df	p
Change in LPI Suicidal Items (7, 11, 26)	Male	.03 (.53)	.12 (.48)	-1.16	162	0.25
	Female	.07 (.56)	.20 (.47)	-2.10	264	0.04
LPI Change in Total Raw Score	Male	-3.05 (7.59)	-0.64 (10.53)	1.62	117	0.11 *
	Female	-4.36 (8.30)	1.93 (10.82)	5.06	264	<.001
Change in Total Emotional Dysregulation	Male	-1.07 (1.99)	-0.56 (2.99)	1.23	110	0.22 *
	Female	-1.42 (2.08)	.18 (3.04)	4.72	264	<.001
Change in Interpersonal Chaos	Male	-1.32 (2.58)	-0.43 (2.79)	2.11	162	0.04
	Female	-1.76 (2.76)	0.22 (3.32)	5.09	264	<.001
	Male	-0.40 (3.02)	.98 (3.31)	2.77	162	0.01
	Female	-.60 (3.21)	1.48 (3.32)	5.05	264	<.001
Change in Impulsivity	Male	.08 (1.08)	-.58 (1.98)	-2.52	97	0.01 *
	Female	-0.16 (1.27)	-.04 (2.06)	.61	263	0.54 *
RCADS Change in Total Raw Score	Male	-2.73 (5.28)	-2.01 (6.49)	.760	130	0.45 *
	Female	-3.40 (5.71)	-1.29 (6.55)	2.69	263	0.01

Note.

* Homogeneity of variance assumption was violated, so the Welch's t-test was used.

and sex-based changes of the primary and secondary analyses on an individual comparison level rather than clustering by class. That analysis demonstrated trends in the same direction, but differences in the suicide and RCADS scores were no longer significant. Supplementary Table 4 includes the NSSI question in the suicide composite which likewise showed a non-significant trend favoring the intervention group. No adverse effects were reported to the investigators during the study.

6. Discussion

This controlled study prospectively examined a teacher delivered, Harry Potter-based CBT skills intervention. While several school-based programs exist that derive from CBT, this is the first intervention which embeds both basic CBT psychoeducation, resilience and coping skills within a literature unit that is taught within the language arts curriculum. For those who received it, the intervention diminished suicidality in middle school youth. Sub-analysis showed specifically that the intervention significantly reduced suicidal ideation with no effect on suicide attempts. This supports the idea that the intervention may have more acute effects on cognition than behavior. However, youth suicide is a complex and rare phenomenon and identification of meaningful reductions in suicide attempts, as well as self-harm, may require more detailed observation over a longer timescale. This trial arose from a study which was initially intended to follow a stepped-wedge design over several years that had to be cut short due to the suspension of classroom activities in early 2020 during the COVID-19 pandemic. While the results are promising, and the sample size and design is substantial for a study conducted in a school board setting, it is nonetheless likely to be underpowered for rarer outcomes such as suicide attempts. Data from this study and our prior pilot study suggest that a sample size of at least 2,000 and possibly as many as 7,000 may be optimal to detect differences particularly for suicidal attempts as the prevalence rates are lower. Whether the suicide findings can be replicated in an even larger study remains to be determined.

Our secondary outcome, overall LPI (borderline personality disorder symptom scale) with subscales measuring Emotional Dysregulation, Interpersonal Chaos and Confusion about the Self significantly improved in the intervention group consistent with the *a priori* hypothesis. Interpersonal Chaos and Confusion about the Self significantly improved in both sexes as did Emotional Dysregulation in girls with a non-significant trend of improvement in boys. These results are highly consistent with the hypothesis that the intervention helps with cognition, self-regulation, and behaviour. There was a single unexpected, significant finding which was an improvement in impulsivity in boys in the control group with no change or a slight worsening in boys in the intervention group. This finding requires replication to determine whether it may

represent chance variation or a true effect.

Notably, our previous feasibility study conducted in a rural school board identified a significant 33% reduction in LPI scores/borderline personality disorder symptoms in boys, however girls' scores were nearly unchanged. The difference in sample size and analyses between the two studies (the prior pilot had only 78 participants and did not account for clustering by class) may have been a factor that influenced these observed differences. Depression and anxiety scores were reduced from baseline to endpoint in both groups, however the reduction was double in size in the intervention group. Again, numeric differences in the expected direction were observed in both sexes but these differences were only significant for girls. These results are also encouraging and support the potential efficacy of the intervention although larger studies are needed to identify whether these findings might be replicable and significant across sexes at scale.

This study had several strengths including a wait list control group and an intervention that specifically addressed and targeted the developmental and communication needs of youth through narrative and story. The developmental appropriateness of the intervention represents a substantial innovation compared to the current practice of applying interventions designed for adults. The intervention was intentionally co-developed (i.e. created jointly by mental health experts, teachers and students) to enhance generalizability and usability, meeting youth needs where and when they need it (minimizing attrition), and was implemented with the hope that it will provide a strong baseline for increased inter- and cross-disciplinary/agency collaboration. It is also important to note that teachers from Canada's largest, urban schoolboard who participated in this RCT were "novices" in delivery of this curriculum with no prior opportunity to practice the intervention. It is possible that the effect size of the intervention could be higher if delivered by teachers with more experience. Nevertheless, this study supports the notion that this intervention can be delivered by teachers who are not mental health experts and still confer benefit to their students without extensive prior experience or training.

This study had several limitations. Although the study included a large number of youth, it nevertheless may have been underpowered for some of the analyses. Future studies with larger sample sizes are needed to establish efficacy and generalizability of findings. The study reports post intervention data immediately following the 3-month delivery of the curriculum meaning that we are unable to determine its longer-term impact. The fact that approximately 40% of participating students (and their parents) did not consent to answer research questions is also a limitation. It is also uncertain whether different results would have been observed for students in different regions or countries or with teachers who had more experience delivering the intervention. The province of Ontario was also in negotiations with the Ministry of Education at the

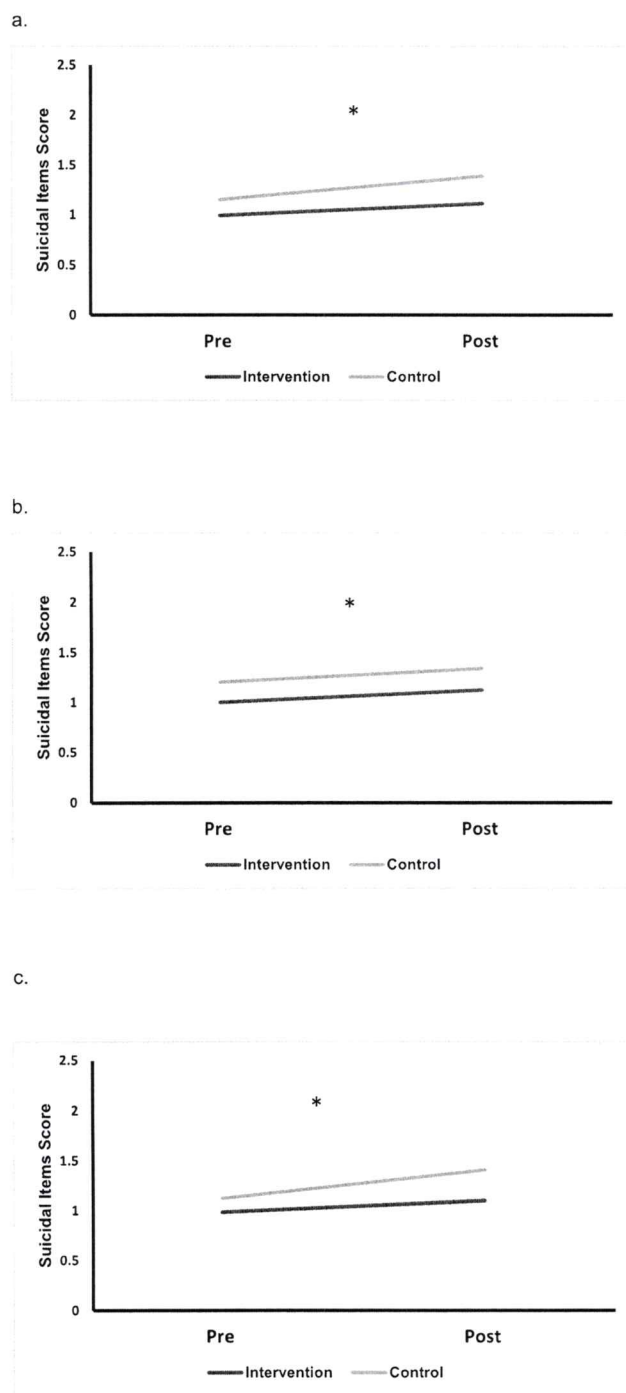


Fig. 2. Comparison of Change in Suicide Composite Scores in Middle Schoolers Prior to and After the Harry Potter-Based Cognitive Behavioural Therapy (CBT) Skills Intervention versus Controls. Both Sexes (a), Boys (b), Girls (c) * $p < 0.05$ for pre-post change between groups.

commencement of the study and the various stages of the negotiating process resulted in classroom dropouts/impacted some teachers' ability to deliver the intervention due to competing demands.

In addition, although the lead investigator visited each classroom to assess implementation and interacted with both students and teachers who spontaneously shared a representative sampling of work related to each of the key learning concepts outlined in the protocolized manual, we did not systematically investigate this. In future studies we could

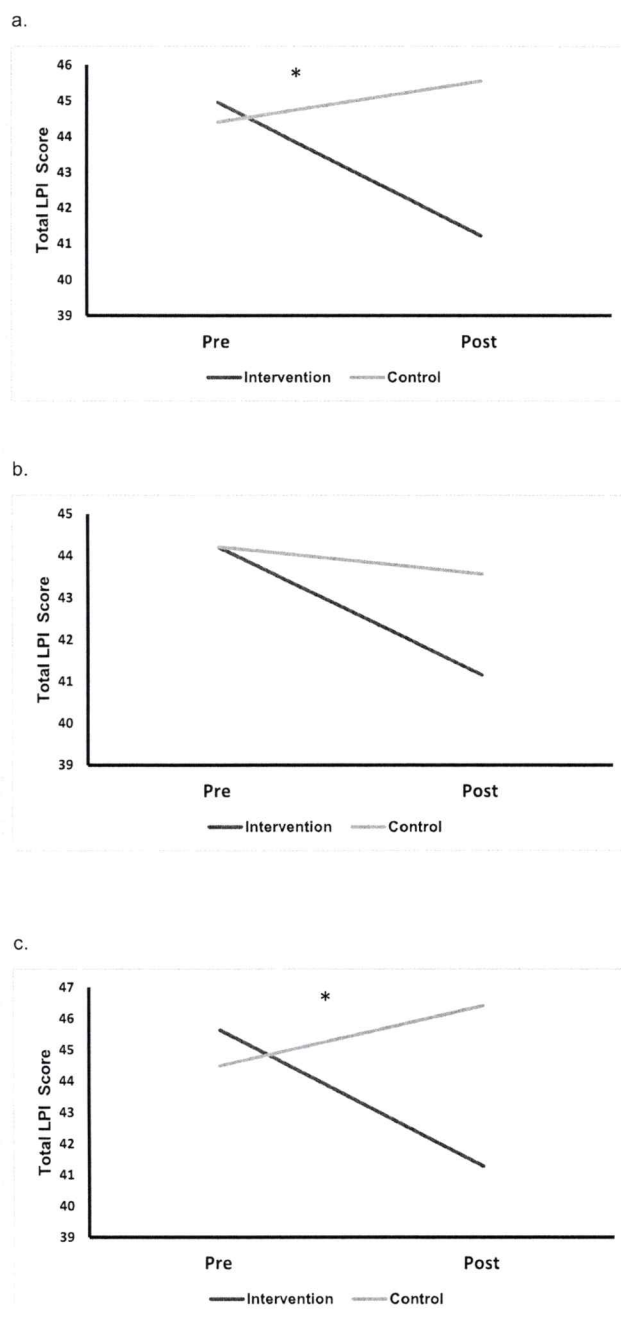


Fig. 3. Comparison of Change in Symptoms of Borderline Personality Disorder Scores (Total LPI) in Middle Schoolers Prior to and After the Harry Potter-Based Cognitive Behavioural Therapy (CBT) Skills Intervention versus Controls. Both Sexes (a), Boys (b), Girls (c). * $p < 0.05$ for pre-post change between groups.

strengthen fidelity checks through checking teachers' understanding of each learning objective via short interviews and/or questionnaires.

7. Conclusion

This study examined a universal intervention, embedded within usual school activities and using a novel that is both adored by youth and ubiquitously available. It demonstrated significant reductions in suicidality scores as observed in the non-controlled pilot. It also found improved Emotional Regulation, Interpersonal Chaos, and Confusion about the Self in youth who received it. Overall, this study provides

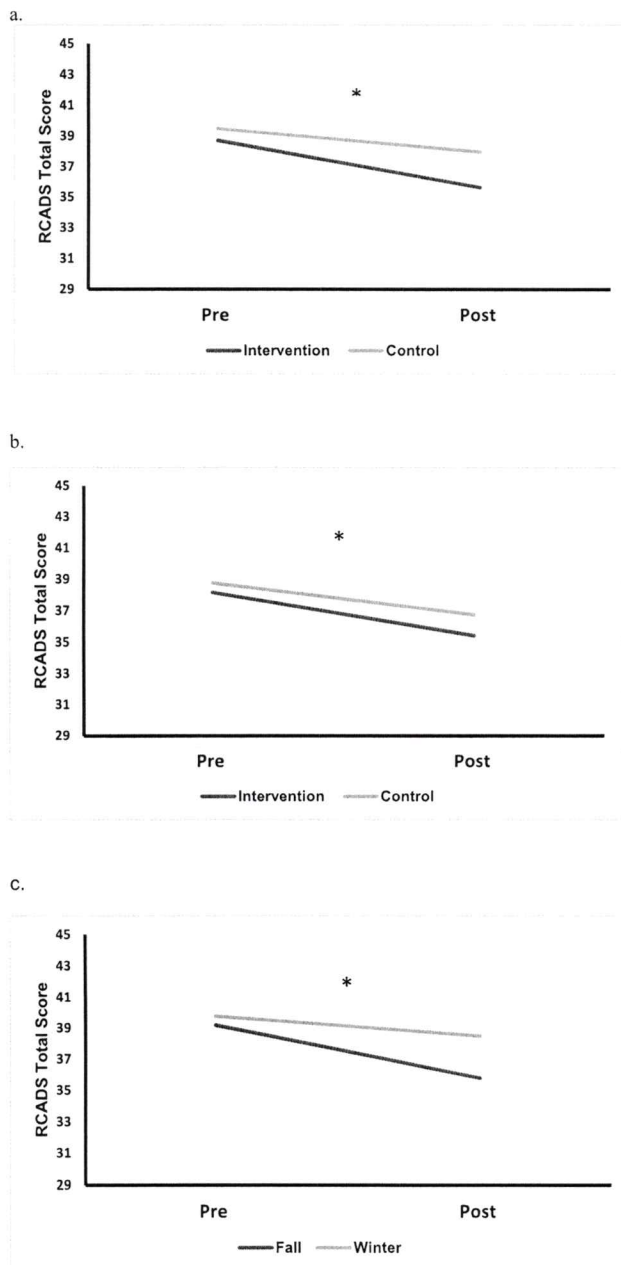


Fig. 4. Comparison of Change in Depression and Anxiety Scores (Total RCADS) in Middle Schoolers Prior to and After the Harry Potter-Based Cognitive Behavioural Therapy (CBT) Skills Intervention versus Controls. Both Sexes (a), Boys (b), Girls (c). * $p < 0.05$ for pre-post change between groups.

substantial preliminary support for the notion that the intervention yields benefits for students of both sexes but may yield specific benefits to girls. This study was implemented in an unprecedented time during the onset of the global pandemic with promising findings. If results here can be further replicated in a larger study, this intervention might provide an important, novel tool to improve the mental health and well-being of youth.

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Individual Author Contributions

MS, PC, AS, AHC, AJL, TN, BG and MF conceived of and designed the study. MS, PC, RS, AJL and AS conducted the analysis. All authors were involved in interpretation of data. PC drafted the article. All authors revised it critically for important intellectual content and gave final approval of the version to be published.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jad.2021.02.028.

References

- Alleyne, S., Beil, M.G., Joshi, S.V., 2019. Meeting Children "Where They Are At": Models for the 21st Century School Based Mental Health Clinic. *JAACAP* 58 (105). <https://doi.org/10.1016/j.jaac.2019.07.134>.
- Brent, D.A., 2011. Preventing youth suicide: time to ask how. *JAACAP* 50 (8), 738–740. <https://doi.org/10.1016/j.jaac.2010.09.017>.
- Calear, A.L., Christensen, H., 2010. Systematic review of school-based prevention and early intervention programs for depression. *J Adolesc* 33, 429–438. <https://doi.org/10.1016/j.adolescence.2009.07.004>.
- Chorpita, B.F., Moffitt, C., Gray, J., 2005. Psychometric properties of the Revised Child Anxiety and Depression Scale in a clinical sample. *Behaviour Research and Therapy* 43, 309–322. <https://doi.org/10.1016/j.brat.2004.02.004>.
- Christiansen, H., Petrie, K., 2013. Suicide Prevention: Signposts for a new approach. *Medical Journal of Australia* 189 (9), 472–474. <https://doi.org/10.5694/mja12.11793>.
- Conforti, P., Zaheer, R., Goldstein, B.I., Levitt, A.J., Schaffer, A., Fefegrad, M., Cheung, A., Sinyor, M., July 2020. The Feasibility of a Harry Potter-based Cognitive-behavioral Therapy Skills Curriculum on Suicidality and Well-being in Middle Schoolers. *Can J Psychiatry* <https://doi.org/10.1177/0706743720944046>.
- Dray, J., Bowman, J., Campbell, E., Freund, M., Wolfenden, L., Hodder, R.K., McElwaine, K., Tremain, D., Bartlem, K., Bailey, J., Small, T., Palazzi, K., Oldmeadow, C., Wiggers, J., 2017. Systematic review of universal resilience-focused interventions targeting child and adolescent mental health in the school setting. *JAACAP* 56 (10), 813–824. <https://doi.org/10.1016/j.jaac.2017.07.780>.
- Durlack, J.A., Weissberg, R.P., Dymnicki, A.B., Taylor, R.D., Schellinger, K.B., 2011. The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development* 82 (1), 405–432. <https://www.jstor.org/stable/29782838>.
- Hawton, K., Witt, K.G., Salisbury, T.L.T., Arensman, E., Gunnell, D., Hazell, P., Townsend, E., van Heeringen, K., 2016. Psychosocial interventions for self-harm in adults. *Cochrane database of systematic reviews* 10. CD012189. <https://doi.org/10.1002/14651858.CD012189>.
- Hengehold, T., Boyd, S., Liddy-Hicks, S., Bridge, J., Grupp-Phelan, J., 2019. Utility of the "No Response" option in detecting youth suicide risk in the pediatric emergency department. *Pediatrics, Annals of Emergency Medicine*. PMID: 30503383.
- Hetrick, S.E., Cox, G.R., Witt, K.G., Bir, J.J., Merry, S.N., 2016. Cognitive behaviour therapy (CBT), third wave CBT and interpersonal therapy (IPT) based interventions

- for preventing depression in children and adolescents. Cochrane database of systematic reviews 8. CD003380.
- Kapur, N., Cooper, J., O'Connor, R.C., Hawton, K., 2013. Non-suicidal self-injury v. attempted suicide: new diagnosis or false dichotomy? *Br J Psychiatry* 202 (5), 326–328.
- Kutcher, S., Wei, Y., Coniglio, C., 2016. Mental health literacy: Past, present, and future. *Can J Psychiatry* 61 (3), 154–158 <https://doi.org/10.1177/0706743715616609>.
- Kutcher, S., Wei, Y., Morgan, C., 2015. Successful application of a Canadian Mental Health Curriculum resource by usual classroom teachers in significantly and sustainably improving student mental health literacy. *Can J Psychiatry* 60, 580–586 <https://doi.org/10.1177/070674371506001209>.
- Mars, B., Heron, J., Klonsky, E.D., Moran, P., O'Connor, R.C., Tilling, K., Wilkinson P & Gunnell, D., 2019. Predictors of future suicide attempt among adolescents with suicidal thoughts or non-suicidal self-harm: a population-based birth cohort study. *Lancet Psychiatry* 6, 327–337 [https://doi.org/10.1016/S2215-0366\(19\)30030-6](https://doi.org/10.1016/S2215-0366(19)30030-6).
- Niederkrotenthaler, T., Voracek, M., Herberth, A., Till, B., Strauss, M., Etzersdorfer, E., Eisenwort, B., Sonneck, G., 2010. Role of media reports in completed and prevented suicide: Werther v. Papageno effects. *The British Journal of Psychiatry* 197, 234–243 <https://doi.org/10.1192/bjp.bp.109.074633>.
- Niederkrotenthaler, T., Till, B., 2019. Effects of suicide awareness materials on individuals with recent suicidal ideation or attempt: Randomized controlled online trial. *The British Journal of Psychiatry* 1–8 <https://doi.org/10.1192/bjp.2019.259>.
- Nock, M.K., Green, J.G., Hwang, I., McLaughlin, K.A., Sampson, N.A., Zaslavsky, A.M., Kessler, R.C., 2013. Prevalence, correlates and treatment of lifetime suicidal behaviour among adolescents: Results from a national comorbidity survey replication adolescent supplement. *JAMA Psychiatry* 70 (3), 300–3010 <https://doi.org/10.1001/2013>.
- Rathus, J.H., Wagner, D., Miller, A.L., 2015. Psychometric Evaluation of the Life Problems Inventory, a Measure of Borderline Personality Features in Adolescents. *J Psychol Psychother* 5, 198 <https://doi.org/10.4172/2161-0487.1000198>.
- Robinson, K., Cox, G., Malone, A., Williamson, M., Baldwin, G., Fletcher, K., O'Brien, M., 2019. A systematic review of school-based interventions aimed at preventing, treating, and responding to suicide-related behaviour in young people. *Lancet Psychiatry* 6 (12), 1011–1020. [https://doi.org/10.1016/S2215-0366\(19\)30403-1](https://doi.org/10.1016/S2215-0366(19)30403-1).
- Rowling, J.K., 1999. *Harry Potter and the Prisoner of Azkaban*. Bloomsbury Publishing, London. ISBN: 9781408855911.
- Schilling, E.A., Aseltine Jr, R.H., James, A., 2016. The SOS Suicide Prevention Program: Further Evidence of Efficacy and Effectiveness. *Prev Sci* 17 (2), 157–166 <https://doi.org/10.1007/s11121-015-0594-3>.
- Seguin, M., Beauchamp, G., Robert, M., Di Mambro, M., Turecki, G., 2014. Developmental model of suicide trajectories. *The British Journal of Psychiatry* 205, 120–126 <https://doi.org/10.1192/bjp.bp.113.139949>.
- Sinyor, M., Fefergrad, M., Cheung, A., Selchen, S., Zaretsky, A., 2017. The Boy Who Lived Well: Harry Potter as a Novel Tool for Teaching Cognitive-Behavioral Therapy Skills to Youth. *Journal of the American Academy of Child and Adolescent Psychiatry Connect* 4 (2), 15–21.
- Sinyor, M., Hawes, D., Rector, N., Cheung, A., Williams, M., Cheung, C., Goldstein, B., Fefergrad, M., Levitt, A., Schaffer, A., 2020. Preliminary Investigations of a Novel Cognitive Behaviour Therapy Curriculum on the Well-Being of Middle Schoolers. *J Can Acad Child Adolesc Psychiatry* 29, 2. <https://doi.org/10.1177/0885265520921392>.
- Walters, S.J., Morrell, C.J., Slade, P., 2011. Analysing data from a cluster randomisation trial (cRCT) in primary care: a case study. *Journal of Applied Statistics* 38 (10), 2253–2266 <http://www.tandfonline.com/doi/abs/10.1080/02664763.2010.545375>.
- Wasserman, D., Hoven, C.W., Wasserman, C., Wall, M., Eisenberg, R., Hadlaczky, G., Kelleher, I., Sarchiapone, M., Apter, A., Balazs, J., Bobes, J., Brunner, R., Corcoran, P., Cosman, D., Guillemin, F., Losue, M., Kaess, M., Kahn, J.P., Keeley, H., Musa, G.J., Nemes, B., Postuvan, V., Saiz, P., Reiter-Theil, S., Varnik, A., Varnik, P., Carli, V., 2015. School-based suicide prevention programmes: the SEYLE cluster-randomised, controlled trial. *Lancet* 385 (9977), 1536–1544 [https://doi.org/10.1016/S0140-6736\(14\)61213-7](https://doi.org/10.1016/S0140-6736(14)61213-7).
- Wei, Y., 2015. Hot idea or hot air: a systematic review of evidence for two widely marketed youth suicide prevention programs and recommendations for implementation. *J Can Acad Child Adolesc Psychiatry* 24 (1), 5–16. <https://doi.org/10.1177/0885265514557329>.
- World Health Organization, 2020. Preventing Suicide: A global imperative. Author, Geneva, Switzerland.