MENTAL HEALTH OUTCOMES FOR CHILDREN IN YMCA OF REGINA PHYSICAL LITERACY PROGRAMS: A PILOT STUDY

A Thesis

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by

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Abstract

According to the Canadian Mental Health Association (2006), mental health disorders are the most common health problems affecting children and youth in Canada; meanwhile, only 20% of children diagnosed receive treatment. Mental health symptoms that go untreated are associated with negative developmental outcomes in adolescence and adulthood. For instance, children who display symptoms of hyperactivity have higher rates of depression in adolescence (Weeks et al., 2016). Statistics on mental health in Canadian children indicate a need for not only appropriate treatment but also prevention programs. Physical activity is well established as a determinant of psychological health; thus, it can be a protective factor against the development of mental disorders (e.g., Reid et al., 2015). The YMCA has taken steps to support youth in achieving a lifetime of physical activity, specifically with the introduction of physical literacy courses. In order to ensure program quality and improved wellbeing, evaluation of YMCA programming is necessary. The current study aims to evaluate children’s change in hyperactivity, emotional symptoms, conduct problems, peer relationship problems and pro-social behavior after participating in one of four physical literacy programs offered at the YMCA of Regina. Both parents and children completed the Strengths and Difficulties Questionnaire (Goodman, 1997) during the first class and last class of the program. We found that parents reported an increase in conduct problems, while children reported a decrease. A decrease in hyperactivity, peer relationship problems and internalizing behavior was noticed by parents, while children identified a decrease in hyperactivity following the physical literacy intervention. There was no effect for emotional symptoms and pro-social behavior. This research will help inform a stable youth mental health prevention curriculum at the YMCA of Regina.
Mental Health Outcomes for Children in YMCA of Regina Physical Literacy Programs:

A Pilot Study

Statistics from the Government of Canada (2006) indicate a need for acknowledgement of the current state of child mental health across Canada. Mental health disorders (MHD) affect between 15-20% of children and youth in Canada and are the most common health problem affecting them (Government of Canada, 2006). MHD are characterized by a severe behavioral or psychological dysfunction, which has considerable negative effects on wellbeing. Disorders such as anxiety and depression can cause distress or disability, which, when present, puts individuals at risk of suffering, pain, disability or death (American Psychological Association, 2013). The concerning reality of MHD is further emphasized in that they do not occur in isolation, and often present concurrently with an alternative disorder; for example, anxiety is frequently presented in conjunction with depression in young people (McLeod et al, 2012). MHD in youth are ranked as the second highest hospital care expenditure in Canada, after injuries (Government of Canada, 2006), and of all the children diagnosed with a MHD, only about 20% actually receive treatment (Waddell et al, 2002).

Developmental Cascades

The presence of mental health symptoms, when left untreated, can have detrimental developmental trajectories, as approximately 70% of adults with MHD can trace the onset back to childhood (Government of Canada, 2006). These trajectories are best understood within the framework of developmental cascades. The developmental cascade is a process whereby problems in one domain of functioning can lead to a domino effect of subsequent problems for children (Masten et al., 2005). There are three main domains of adaptation that are central to the theory of developmental cascades: externalizing behaviors, such as conduct problems and
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hyperactivity; internalizing behaviors, such as depression and anxiety; and school performance, such as reading levels and test scores (Weeks et al., 2016). These three domains are heavily interrelated, thus, a disruption in one will cause an imbalance in the other two. Typically, those imbalances lead to negative outcomes longitudinally. This theory has been extensively studied, and results have led to the conclusions that internalizing and externalizing behaviors in childhood are positively correlated, and exhibit a negative cascade effect on academic performance and various domains of mental health in the future (Burt et al., 2010; Korhonen et al., 2014; McLeod et al., 2012; Masten et al., 2005; Moilanen et al., 2010; Van der Ende et al., 2016; Weeks et al., 2016). Findings from Englund et al., (2012) revealed an association between externalizing symptoms and the likelihood of alcohol and marijuana use.

The central feature of internalizing behaviors is dysregulation of emotions or mood. In contrast, the central feature of externalizing behaviors is dysregulation of behaviors (Kovacs et al., 1998). The majority of studies looking at academic achievement and the correlation with internalizing and externalizing behaviors have found significant, but varied results. Overall, the most notable and common findings were that higher levels of academic competence at 9 years old significantly predicted lower levels of internalizing and externalizing symptoms by 12 years of age (Englund et al., 2012). The reverse was also found, as lower academic achievement in childhood was linked to higher levels of internalizing behaviors in adolescence. The presence of externalizing behaviors in childhood predicted depression in adolescence (McLeod et al., 2012).

Findings from research on developmental cascades have highlighted the importance of prevention programs for youth, specifically targeting internalizing and externalizing behaviors (Reeves et al, 2016; Weeks et al, 2016). Findings by Reeves et al. (2016) indicate that physical activity interventions can have a preventative effect on the symptoms of hyperactivity, thus
aiding the management of these symptoms in children. Prevention initiatives have significant implications on the individual and society. Individuals may experience an increased well-being and society may see a decrease of cost of care for patients with MHD. Many studies regarding prevention initiatives within the past 7 years have focused predominantly on school-based intervention programs. There are significantly fewer studies that directly investigated community programs operated out of preexisting community organizations.

**Physical Literacy**

Physical literacy has its roots in philosophy and has become a movement of educating and engaging youth in physical activity that has grown enormously in popularity since it was coined in an unpublished paper in 1993 by Margaret Whitehead (Whitehead, 2008). The purpose of physical literacy is to create learners who are confident, motivated, knowledgeable, and competently able to engage in physical activity throughout their lifespan and into adulthood, through the instruction of various fundamental movement skills which thus lead to a more active life (Stevens-Smith, 2016). Physical Literacy is focused on a child’s ability to successfully complete a movement and to know how to incorporate that movement into diverse environments and challenges (Corlett et al., 2013). For example, running is an integral component of many different sports and daily activities, thus learning to run properly can encourage a child to be more competent and confident to engage in a variety of activities from running to catch the bus to playing a game of soccer. This notion is supported by longitudinal studies which have found that motor skills proficiency in childhood is linked to an increase in physical activity in adolescence (Barnett et al., 2009; Larsen et al., 2014;). In one such study by Barnett et al., (2009), researchers found that higher fundamental motor skill proficiency in elementary school lead to greater time spent in any moderate to vigorous physical activity in adolescence.
Subsequently, engagement in physical activity in early adolescence is a predictive factor of physical activity into later adolescence and early adulthood (Jaakkola et al., 2016).

Physical activity is a very well established determinant of mental and physical health for children (Reid et al., 2015). The majority of the studies which have focused on the effects of physical activity on children’s mental health behaviors have been inconsistent in the types of physical activity interventions used; to my knowledge, none have thus far used physical literacy as the chosen intervention. Despite the inconsistencies in measuring physical activity, studies have found significant, albeit small, results (Biddle et al., 2011; Brown et al., 2013).

Physical literacy has been studied predominantly under the umbrella of physical education and athletic development. Lundval (2015) identified three themes in which physical literacy is most present in the literature; for educational purposes, assessment, and sports development. Physical literacy has yet to be evaluated for mental health outcomes, such as internalizing and externalizing disorders in children.

YMCA

The YMCA is a global charitable organization that is dedicated to the growth and well-being of youth in the community. According to the YMCA of Canada webpage, the organization was founded in London, England as a result of unhealthy social conditions brought on by the industrial revolution. At the time of the YMCA’s creation, it was founded as an institution supporting the community through religious practices, as illustrated by the acronym, YMCA, which stood for “Young Men’s Christian Association”. The organization has since evolved its practice of supporting the community, however its goals have remained consistent over time and focused towards improving social conditions for citizens within a given community. The YMCA of Regina, according to its webpage, considers itself “the premier values-based builder of health,
leadership and personal development in the City of Regina” and has three locations across the city. There are currently no statistics readily available that provide an approximate number of children who engage in YMCA of Regina programming per year; however, according to the YMCA of Regina webpage, there are upwards of 40 programs offered to children through the YMCA of Regina per year.

Due to the wide community reach the YMCA has, and its commitment to supporting a healthy community, it is an excellent platform for providing quality prevention programming. Despite the efforts that the YMCA of Regina has put into administering programs to improve the well-being of children, to this date, there has been no initiative put in place, which specifically targets improving mental health behaviors that is applicable across different types of programs.

Program Evaluation

Program evaluation is the assessment of the processes and/or outcomes of a program with the intent of furthering its development or improvement (Spiegelman, 2016). Program evaluation is responsive to the purpose of the inquiry and is focused on promoting social welfare. Program evaluation can be applied with numerous different outcomes in mind, including those of program improvement, such as decision-making, judgments of merit, worth, and significance, with the ultimate goal of promoting social welfare (Gargani, et al., 2016). Program evaluation contains components of both implementation science and impact evaluation (Spiegelman, 2016). Implementation science refers to the extent to which health interventions can be integrated into practice and impact evaluation is how a specific intervention affects intended and unintended outcomes (Spiegelman, 2016). Impact evaluation typically involves two groups, including essentially a control group and an intervention group. Typically, the findings from program evaluation are then used for program continuation or expansion (Spiegelman, 2016).
As of yet, the YMCA has not evaluated any of their physical literacy programs for the potential of mental health prevention. The YMCA is currently evaluating the courses in terms of physical skill confidence and activity levels, however, they have not implemented sound mental health research into these such programs.

**Hypothesis**

The current project aimed to evaluate the physical literacy programs at the YMCA in Regina. We approached physical literacy programs through a program evaluation framework whereby the findings will provide information about the mental health effects of the current programs. We predicted that children who engage in the YMCA physical literacy courses would show an increase in positive mental health behaviors, such as pro-social behaviors, and a decrease in negative mental health behaviors, such as hyperactivity, emotional symptoms, conduct problems and peer relationship problems. In short, we predicted that physical literacy would have an impact on children’s internalizing and externalizing behaviors.

**Method**

**Participants**

Recruitment occurred in programs at all three YMCA locations in Regina, SK. Participants were children between the ages of 6-12 years, who were registered in selected physical literacy programs offered at the YMCA. In addition, one caregiver for each child was asked to participate in this study. The number of participants recruited was limited to the courses offered by the YMCA. Each offered course had a maximum registration of 10 participants, and participants were recruited from 4 courses. Due to unfilled program spots and high participant attrition, complete data was obtained from 13 children and 10 parents, for a total of 23
participants. These data contained three sets of siblings, thus the number of parent participants is lower than that of children.

**Measures**

Child and parent participants completed the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ is a widely used, brief questionnaire developed to be used with children between the ages of 3-15, analyzing their strengths and difficulties across five domains: conduct problems, pro-social behavior, peer relationship problems, hyperactivity and emotional symptoms (Goodman, 1997). Both the parent and self-report versions for children measure these same five attributes, differing only in a grammatical shift between third person and first person (Goodman, et al, 1998). The self-report version of the questionnaire was intended for youth aged 11-16; however, children as young as six are able to successfully complete the questionnaire as long as it is administered verbally to them (Curvis et al, 2014). In total, 25 questions are spread evenly between the 5 scales, (Goodman, 1997). Participants were asked about the frequency with which the child engages in any given behaviors, and response choices follow a 3-point Likert scale, with response options of *not true*, *somewhat true* and *certainly true*. The psychometric properties, such as reliability and validity, are found to be satisfactory (Van Roy et al., 2008). Research from Van Roy et al., (2008) investigated the construct validity of the SDQ. Chronbach’s alpha for the difficulties subsection was .78 in a pre-adolescent sample and was .64 for the strengths subsection. The Hyperactivity subscale produced an alpha of .57, emotional symptoms produced .61, conduct problems produced .44, peer problems produced .54 and pro-social behaviors produced a .64 alpha. Demographic information, including age of participant and gender, was collected along with the SDQ.
In the present investigation, each of the five subscales was analyzed separately. In addition, two of the subscales, emotional problems and peer relationship problems, were combined to form the internalizing symptoms scale. The externalizing symptoms scale was formed from the sum of the conduct problems and the hyperactivity subscales. A score for total difficulties was also calculated by combining four of the subscales (emotional problems, peer relationship problems, conduct problems, and hyperactivity). Therefore, analyses focused on changes in eight areas from pre-intervention to post-intervention: emotional symptoms, conduct problems, peer problems, hyperactivity symptoms, pro-social behavior, internalizing symptoms, externalizing symptoms, and total difficulties.

**Procedure**

Four physical literacy- kids level 1 and 2, courses offered at various YMCA locations were selected for this research. The four courses were chosen based on two criteria, time and location. Specifically, they were chosen so as to not overlap in time, and to ensure variation in location, as there are three Regina locations. All physical literacy- kids level 1 and 2 courses at the YMCA follow a mandatory curriculum and are thus nearly identical in structure, the only difference being in location and instructor. Kids level 1 and 2 follow the same framework, however they differ based on the skill set instructed. Each of these four courses involved a commitment of ten weeks, while each weekly session was one-hour long. Each session was administered by YMCA staff who have undergone the same training. During the first session of each course, the research team approached each parent regarding this study. Parents provided voluntary informed consent to their own participation and that of their children in the study. Children verbally provided assent to participating. All participants completed the SDQ during the first session of the program (i.e., the pre-intervention rating) and during the last session of the
physical literacy program (i.e., the post-intervention rating). Parents were asked to complete the parent-version of the questionnaire upon dropping off or picking up their child or children from the program on the first day and the last day. If the parent had more than one child, he or she was asked to complete a different SDQ measure for each of his or her children. During the first day and last day of the program, children were individually taken aside from the class for a 5-minute time period, where they were verbally administered the self-report questionnaire by the researchers.

Results

In order to determine whether a change in SDQ scores occurred from pre-scores to post-scores, paired samples t-tests were conducted for each of the subscales of each version: the parent report version of the SDQ and the self-report version. According to Cohen (1994), null-hypothesis significance testing (NHST) may be insufficient for interpreting data in the realm of the social sciences. One of the reasons for this claim, which pertains directly to this study, is that NHST is confounded by sample size, thus a small sample size has a greater likelihood of leading to insignificant results. A potential antidote to this conundrum of small sample size is by calculating effect size estimates (Fergusen, 2009). Effect size estimates the magnitude of the association, or effect, between two or more variables and is not sensitive to sample size (Fergusen, 2009). Therefore, effect sizes were determined using g*power for each paired samples t-test. The magnitude of effect sizes was mainly determined using Cohen’s (1992) convention for small ($d = .20$), medium ($d = .50$) and large ($d = .80$) effects. Taking Cohen’s conventions into consideration and given the data in this analysis, a meaningful cutoff for a small effect size might be anywhere between ($d = .18$) – ($d = .20$) within this sample. The present sample included complete data from 13 child participants, with 11 males and 2 females and 10
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parent participants, as 2 parents had more than one child registered in the programs. Participant ages varied from 6 to 11, where three participants were 6, two participants were 7, four participants were 8, two participants were 9, one participant was 10 and one was 11. The results from the parent report version will be reported first, followed by the self-report.

**Parent Report Results**

Results from the parent analysis on each of the five subscales, emotional problems, conduct problems, hyperactivity, peer relationship problems and pre-social behavior, as well as on internalizing symptoms, externalizing symptoms, and total difficulties is as follows. The paired samples t-test measuring the pre-scores ($M = 2.38, SD = 1.76$) versus the post-scores ($M = 2.23, SD = 2.01$) for the subscale of emotional problems was not significant, $t (12) = .35, p = .73$. The effect size for this analysis ($d = .10$) was found to be trivial. There was no effect from pre-scores to post-scores in terms of emotional problems.

Results from the paired samples t-test measuring pre-scores ($M = 1.23, SD = 1.17$) and post-scores ($M = 1.85, SD = 1.52$) of the parent report version for the subscale of conduct problems was statistically significant, $t (12) = -2.31, p = .40$. The Cohen statistic for this analysis ($d = .65$) indicated a medium effect. Parent reports showed an increase in conduct problems from pre-assessment to post-assessment.

The paired samples t-test measuring pre-scores ($M = 5.15, SD = 1.86$) versus the post-scores ($M = 4.85, SD = 1.73$) of the parent report version for the subscale of hyperactivity was not statistically significant, $t (12) = 1.00, p = .34$. The Cohen statistic for this analysis ($d = .27$) indicated a small effect. Although the results did not reach statistical significance, a small effect in the expected direction was found, indicating that hyperactivity symptoms as reported by parents tended to decrease post-intervention.
The paired samples t-test measuring pre-scores \( M = 2.31, SD = 1.97 \) versus post-scores \( (M = 2.08, SD = 1.61) \) of the parent report version for the subscale of peer relationship problems was not significant, \( t(12) = .71, p = .49 \). The Cohen statistic for this analysis \( (d = .20) \) indicated a small effect. Although the results did not reach statistical significance, a small effect in the expected direction was found, indicating that peer relationship problems as reported by parents tended to decrease post-intervention.

The paired samples t-test measuring pre-scores \( (M = 8.77, SD = 1.64) \) versus post-scores \( (M = 8.46, SD = 1.77) \) of the parent report version for the subscale of pro-social behaviors was not statistically significant, \( t(12) = .54, p = .60 \). The effect size for this analysis \( (d = .15) \) was found to be trivial. There was no effect from pre-scores to post-scores on pro-social behavior.

Paired samples t-tests were conducted for internalizing behaviors, externalizing behaviors, and total difficulties. The paired samples t-test measuring pre-scores \( (M = 4.69, SD = 3.45) \) versus post-scores \( (M = 4.31, SD = 3.47) \) for internalizing symptoms and was not statistically significant, \( t(12) = .72, p = .49 \). The Cohen statistic for this analysis \( (d = .20) \) indicated a small effect. Although the results did not reach statistical significance, a small effect in the expected direction was found, indicating that internalizing symptoms as reported by parents tended to decrease post-intervention.

The paired samples t-test measuring pre-scores \( (M = 6.38, SD = 2.14) \) versus post-scores \( (M = 6.69, SD = 2.14) \) of externalizing symptoms was found to be not statistically significant, \( t(12) = -.65, p = .53 \). The effect size for this analysis \( (d = .18) \) is trivial to small. Although the results did not reach statistical significance, a trivial to small effect size was found, indicating that this result may have a small effect however would require further study.
The paired samples t-test measuring pre-scores ($M = 11.08$, $SD = 4.87$) versus post-scores ($M = 11.00$, $SD = 4.85$) for total difficulties was not statistically significant, $t(12) = .10$, $p = .92$. The effect size for this analysis ($d = .03$) is trivial. There was no effect on total difficulties pre-assessment versus post-assessment.

**Child Self-Report Results**

Paired samples t-tests for pre-scores and post-scores for the child self-report version of the SDQ were conducted for each of the five subscales, as well as for internalizing symptoms, externalizing symptoms and total difficulties. The results from the paired samples t-test measuring pre-scores ($M = 3.23$, $SD = 1.64$) versus post-scores ($M = 3.15$, $SD = 2.12$) for emotional problems was not statistically significant, $t(12) = .15$, $p = .88$. The effect size ($d = .04$) for this analysis is trivial. Children did not indicate an improvement in emotional problems from pre-assessment to post-assessment.

The paired samples t-test measuring pre-scores ($M = 2.38$, $SD = 1.94$) versus post-scores ($M = 1.92$, $SD = 1.61$) for the subscale of conduct problems was not statistically significant, $t(12) = .79$, $p = .45$. The Cohen statistic for this analysis ($d = .22$) indicated a small effect. Although the results did not reach statistical significance, a small effect in the expected direction was found. This indicates a tendency for children to report a decrease in conduct problems from pre-assessment to post-assessment.

The paired samples t-test measuring pre-scores ($M = 4.85$, $SD = 2.23$) versus post-scores ($M = 4.31$, $SD = 2.06$) for the subscale of hyperactivity was not statistically significant, $t(12) = 1.53$, $p = .15$. The Cohen statistic for this analysis ($d = .43$) indicated a small effect. Although the results did not reach statistical significance, a small effect in the expected direction was found.
This indicates a tendency for children to report a decrease in hyperactivity behaviors from pre-assessment to post-assessment.

The paired samples t-test measuring pre-scores ($M = 3.31, SD = 1.93$) versus post-scores ($M = 3.23, SD = 2.62$) for the subscale of peer relationship problems was not statistically significant, $t(12) = .10, p = .92$. The effect size for this analysis ($d = .03$) is trivial. Children did not indicate an effect on peer relationships after the program.

The paired samples t-test measuring pre-scores ($M = 7.77, SD = 2.13$) versus post-scores ($M = 7.62, SD = 2.73$) for the subscale of pro-social behavior was not statistically significant, $t(12) = .40, p = .70$. The effect size for this analysis ($d = .11$) is trivial. Children did not indicate an effect on pro-social behavior after the program.

The paired samples t-test measuring pre-scores ($M = 6.54, SD = 3.10$) versus post-scores ($M = 6.38, SD = 4.07$) for the cluster of internalizing behaviors was not significant, $t(12) = .13, p = .90$. The effect size for this analysis ($d = .04$) is trivial. Children did not indicate an effect on internalizing behaviors after the program.

The paired samples t-test measuring pre-scores ($M = 7.23, SD = 3.32$) versus post-scores ($M = 6.23, SD = 3.42$) for the cluster of externalizing behaviors was not significant, $t(12) = 1.30, p = .22$. The Cohen statistic for this analysis ($d = .36$) indicated a small effect size. Although the results did not reach statistical significance, a small effect in the expected direction was found, such that children tend to report a decrease in hyperactive behaviors from pre-assessment to post-assessment.

The paired samples t-test measuring pre-scores ($M = 13.77, SD = 5.83$) versus post-scores ($M = 12.62, SD = 6.78$) for the cluster of total difficulties was not significant, $t(12) = .68, p = .51$. The effect size for this analysis ($d = .12$) is trivial. There is no effect for total difficulties.
Discussion

The results of this investigation only partly supported the hypotheses. It was predicted that both internalizing and externalizing symptoms would decrease following the completion of the physical literacy groups, both in the children’s self-reports and in the parent-reports. While most relationships between variables were not found to be statistically significant, effect sizes, however, indicated that the physical literacy courses may have had an effect on externalizing behaviors but not internalizing behaviors.

Consistent with our hypothesis, children’s self-reports revealed a small effect size in the expected direction for hyperactivity, conduct problems and overall externalizing symptoms, that is, children reported a decrease in externalizing symptoms from pre-assessment to post-assessment. This small effect signifies that a change did occur from the beginning of the physical literacy class to the end, and statistical significance would likely be reached with a larger sample size. Additionally, parents reported a small effect size in the expected direction for hyperactivity, peer relationships problems and overall internalizing behaviors. Thus demonstrating that parents identified a slight decrease in hyperactivity, peer relationship problems and overall internalizing behaviors from pre-assessment to post-assessment. Similarly, the results are expected to reach significant with a greater sample size. One can conclude, from these results, that the physical literacy program did have an effect consistent with our hypothesis in improving mental wellbeing for children in the community, specifically by decreasing most externalizing behaviors both as observed by parents and as self-reported by the children and internalizing behaviors as observed by the parents. Additionally, a trivial to small effect size was found for parent reported overall externalizing behaviors, thus there may be a decrease in overall externalizing behaviors.
from the parent perspective, however more study would be required to definitively conclude this particular result.

Counter to our hypothesis, however, we found that parents indicated a significant increase in conduct problems with a reported medium effect size. There are a number of possible explanations for this result, including effects related to the season change, parental stress levels and the transition from playing outdoors to indoors. Some studies suggest that children’s levels of physical activity are influenced by the seasons. Findings across North America and Northern Europe have indicated that children are more active in the spring and summer months than in the fall and winter months, with winter being particularly low for physical activity levels (Rich et al., 2012). This effect is found in geographic locations where winter days are cold and short and children are forced indoors (Carson et al., 2010). Given that the location this study has taken place is in Saskatchewan Canada, similar effects may have been present in this population. The present study had been conducted over the Fall session; thus it is possible that the increase in parent perceived conduct problems is due to children being forced indoors and engaging in less physical activity overall, while children self-reported experiencing less conduct problems. A study by Käll and colleagues (2015) found that children who engaged in regular physical activity saw a decrease in conduct problems compared to the control group. Therefore, a potential drop in physical activity may cause a greater display of conduct behaviors. Additionally, parental stress levels have been shown to influence externalizing and conduct behaviors in children (Mackler et al., 2015). Mackler and colleagues (2015) found that higher levels of parental stress were associated with reportedly more behavior problems for children, particularly in early and middle childhood. Post assessment data for the current study was collected in early December, during a time which may be particularly stressful for parents as the holidays approach.
This investigation did not find any evidence of a change in internalizing symptoms following the physical literacy courses. As our sample was made up primarily of boys (84.6%), one would expect to find a greater impact on externalizing behaviors. Boys in middle childhood demonstrate greater conduct problems than girls (Lahey et al., 2000), as well as greater hyperactivity levels (Chen et al., 2015). Results from the present study have found impacts on externalizing behaviors, however no impact on internalizing behaviors. While girls are traditionally known to demonstrate more internalizing behaviors, these behaviors become identifiable in adolescence (Armstrong et al., 2002), and therefore it is possible that internalizing symptoms are less present in the age group of this investigation.

There are a number of limitations in the present study. The study was limited to participants who chose to register for the programs and the maximum number of children who could participate in the classes restricted the potential sample size. A greater sample size would have been ideal for this study. The programs took place at various YMCA locations, with various instructors. Although the content of the classes was the same and curriculums were uniformly created for the instructors, different instructors’ styles and environment of the different locations could have had an impact on results. This study did not control for socioeconomic status, which could have confounded results as children who are from lower socioeconomic households are seen to display greater externalizing behaviors (Keiley et al., 2000).

It seems that the YMCA can continue offering physical literacy courses with confidence that there is an increased wellbeing for children associated. Replications of this study are needed to identify whether the reported increase of the conduct problems is an anomaly, and if not, what may be the cause of this result. To take this study even further in identifying successful programs for children, future research can examine the effects of an added mindfulness intervention to the
physical literacy programs and examine whether this addition has a further impact on behaviors. A replication of this study with a larger sample size, as well as more background demographic information would be useful. Additionally, future studies would benefit from including different cultural samples and different age groups.
References


problems: A cross-sectional household study of middle childhood and adolescence.


doi:10.1017/S0954579410000337


doi:10.1080/03004279.2014.918160


doi:10.1007/s12310-015-9150-3


doi:10.2105/AJPH.2015.302923


Appendix A. Ethics Approval

The University of Regina Research Ethics Board has reviewed the above-named research project. The proposal was found to be acceptable on ethical grounds. The principal investigator has the responsibility for any other administrative or regulatory approvals that may pertain to this research project, and for ensuring that the authorized research is carried out according to the conditions outlined in the original protocol submitted for ethics review. This Certificate of Approval is valid for the above time period provided there is no change in experimental protocol, consent process or documents.

Any significant changes to your proposed method, or your consent and recruitment procedures should be reported to the Chair for Research Ethics Board consideration in advance of its implementation.

ONGOING REVIEW REQUIREMENTS
In order to receive annual renewal, a status report must be submitted to the REB Chair for Board consideration within one month of the current expiry date each year the study remains open, and upon study completion. Please refer to the following website for further instructions: http://www.uregina.ca/research/for-faculty-staff/ethics-compliance/human/forms1/ethics-forms.html.

Dr. Katherine Robinson
Chair, Research Ethics Board

Please send all correspondence to:
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Appendix B. Consent Form

**Project Title:** Program Improvement: Physical and Emotional Literacy in Children

**Researcher:** Miranda Reid, University of Regina, Department of Psychology, 306-581-1476, reid200m@uregina.ca/miranda_reid@regina.ymca.ca, Andreea Tamaian, M.A., University of Regina Department of Psychology, 306-585-4300, tamaiana@uregina.ca, and Bridget Klest, PhD, University of Regina Department of Psychology, 306-585-4214, Bridget.Klest@uregina.ca. The research team includes Andreea Tamaian, Dr. Klest, and some undergraduate students at University of Regina.

**Purpose and Objectives of the Research:**
This is a study of the effects of physical literacy and mindfulness on children’s emotional wellbeing. The primary goals of this research are:

- To understand how physical literacy can impact children’s ability to identify emotions and regulate emotions.
- To understand what kind of effect physical literacy combined with mindfulness can have on children’s emotional regulation and identification of emotions.

Information gathered as part of this study will be presented in journal articles and conference presentations.

**What you will be asked to do if you decide to participate:**

- Participate in a parent report questionnaire about your child’s behavioral conduct across various domains.
- Complete a questionnaire before and after the physical literacy programming, which will take about 5-10 minutes.
  - You will be asked to rate your child from not true to certainly true on a variety of behaviors.

**What your child will be asked to do if you decide to participate:**

- Participate in a child-report version of the parent report questionnaire, on the same domains of behavior.
- Complete the questionnaire verbally via a 5-minute interview with the researchers.
  - Your child will be asked to rate themselves from not true to very true on a variety of behaviors.
Potential risks to you or your child if you decide to participate:
Some research participants who are asked about personal experiences and behaviors may experience an emotional response or disclose personal information.

- Usually this emotional response goes away quickly.
- All YMCA staff in direct contact with youth have undergone child protection training. Staff have been trained in the protocols of handling different types of disclosures from youth. All disclosures of abuse are to be reported to Child Protective Services immediately.
- Should you or your child require immediate assistance, please contact the 24-hour Mobile Crisis Helpline (306-757-0127) or Kids Help Phone (1-800-668-6868). For further support and more information on services available in the community, please contact Child and Youth Mental Health Services at 306-766-6700.

Potential Benefits:
- There are no known benefits directly to you or your child related to participating in this study.
- This research may be helpful in understanding the impacts of physical literacy and mindfulness exercises on children’s emotional wellbeing.
- It may also contribute to a body of evidence that can inform a stable emotional wellbeing curriculum in youth programming.

Confidentiality:
- In order to be able to match pre and post responses, your and your child’s name will be recorded. However, once the post test is complete, your names and identifying information will be deleted and replaced with a participant number.
- All information collected in this study will be kept confidential – only the researchers and YMCA management will have access to the raw data, and any of your responses presented in journal articles or presentations will be combined with the responses of other participants.
- When data collection is complete, physical copies of data will be shredded and data will be transferred to a password locked electronic file with names and identifying information erased.
- Data will be stored indefinitely in a password locked file on computers located at the University of Regina, that only the research team members (researchers named above and students under their supervision) have access to.

Right to Withdraw:
- Your participation is voluntary and you can answer only those questions that you are comfortable with. You may withdraw from the research project for any reason, at any time without explanation or penalty of any sort. Your choice to withdraw will not impact yours or your child’s ability to access YMCA programs.
- Your right to withdraw data from the study will apply until you and your child are finished with the course.
- If you choose to withdraw from the study while the course is still in session, you may choose to re-enter before the course finishes.
Follow up:
* A summary of results from the study will be posted to the website [http://schlab.ca/completed-research-projects.php](http://schlab.ca/completed-research-projects.php)

Questions or Concerns:
* You may contact the researcher with any questions, comments, or concerns, using the information at the top this page. This project has been approved on ethical grounds by the U of R Research Ethics Board on November 8th 2016. Any questions regarding your rights as a participant may be addressed to the committee at 306.585.4775 or research.ethics@uregina.ca. Out of town participants may call collect.

Consent: By signing below, yours and your child’s free and informed consent is implied and indicates that you understand the above conditions of participation in this study. Please save a copy of this consent form for your records.

__________________________________________
Child name(s)

__________________________________________
Parent/Guardian Name

__________________________________________
Date

__________________________________________
Parent/Guardian Signature

__________________________________________
Researcher Signature
Appendix C. Assent Script

R: Hi there! My name is “researcher name”. I am from the University of Regina and I am doing a research study on feelings. Is it okay if I ask you some questions about how you’ve been feeling?
Appendix D. Strengths and Difficulties Questionnaire

**Strengths and Difficulties Questionnaire**

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of how things have been for you over the last six months.

<table>
<thead>
<tr>
<th>Item</th>
<th>Not True</th>
<th>Somewhat True</th>
<th>Certainly True</th>
</tr>
</thead>
<tbody>
<tr>
<td>I try to be nice to other people. I care about their feelings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am restless, I cannot stay still for long</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get a lot of headaches, stomach-aches or sickness</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I usually share with others, for example CD’s, games, food</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get very angry and often lose my temper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would rather be alone than with people of my age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I usually do as I am told</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I worry a lot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am helpful if someone is hurt, upset or feeling ill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am constantly fidgeting or squirming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have one good friend or more</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I fight a lot. I can make other people do what I want</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am often unhappy, depressed or tearful</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people my age generally like me</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am easily distracted, I find it difficult to concentrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am nervous in new situations. I easily lose confidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am kind to younger children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am often accused of lying or cheating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other children or young people pick on me or bully me</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>I often offer to help others (parents, teachers, children)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think before I do things</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I take things that are not mine from home, school or elsewhere</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I get along better with adults than with people my own age</td>
<td></td>
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<tr>
<td>I have many fears, I am easily scared</td>
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<tr>
<td>I finish the work I am doing. My attention is good</td>
<td></td>
<td></td>
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</tbody>
</table>

Your Signature ..................................................................................

Today’s Date ..........................................................................................

Thank you very much for your help
### Strengths and Difficulties Questionnaire

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of this young person’s behavior over the last six months or this school year.

<table>
<thead>
<tr>
<th>Item</th>
<th>Not True</th>
<th>Somewhat True</th>
<th>Certainly True</th>
</tr>
</thead>
<tbody>
<tr>
<td>Considerate of other people’s feelings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restless, overactive, cannot stay still for long</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often complains of headaches, stomach-aches or sickness</td>
<td></td>
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<tr>
<td>Shares readily with other youth, for example books, games, food</td>
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<td></td>
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<tr>
<td>Often loses temper</td>
<td></td>
<td></td>
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<tr>
<td>Would rather be alone than with other youth</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Generally well behaved, usually does what adults request</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Many worries or often seems worried</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpful if someone is hurt, upset or feeling ill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constantly fidgeting or squirming</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has at least one good friend</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often fights with other youth or bullies them</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often unhappy, depressed or tearful</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Generally liked by other youth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily distracted, concentration wanders</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervous in new situations, easily loses confidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kind to younger children</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Often lies or cheats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picked on or bullied by other youth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Often offers to help others (parents, teachers, children)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Thinks things out before acting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steals from home, school or elsewhere</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gets along better with adults than with other youth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Many fears, easily scared</td>
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<td></td>
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<tr>
<td>Good attention span, sees work through to the end</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</table>

Parent / Teacher / Other (Please specify):

Thank you very much for your help
Appendix E. Letter of Support from YMCA

To Whom It May Concern:

My name is Amy Kent, General Manager of health, fitness and membership at the YMCA of Regina. I am writing a letter of support in regards to partnering with the University of Regina research team lead by Dr. Bridget Klest and including Andreea Tamaian and Miranda Reid as primary researcher, for program improvement research.

The YMCA of Regina will be collecting information for in-house program improvement and we would like to have this information analyzed by a University partner.

Best Regards,

[Signature]

Amy Kent, General Manager Health, Fitness and Membership, YMCA of Regina