

Physical activity as both predictor and outcome of developmental trajectories of emotional distress from ages 6 to 10 years

Sport Canada Research Initiative Conference (SCRI) October 24 – 25th, 2019

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Background

Research suggests that childhood involvement in physical activity is associated with better mental health (Eime et al., 2013), but also that depressive and anxious symptoms could reduce participation in physical activity (Stavrakakis et al., 2012).

Previous studies are not without limits. (1) The use of cross-sectional data does not reveal the long-term contribution of physical activity to emotional distress or vice versa. (2) The focus has been on adolescents, and even more so on adults. (3) Mainly one-way associations of physical activity on emotional adjustment have been examined. Very few studies have examined whether if this relationship could be bidirectional.

This study has three main objectives:

1. To identify distinct childhood trajectories of emotional distress from ages 6 to 10 in a representative population-based sample.
2. To examine physical activity at age 5 as a predictor of emotional distress trajectory outcomes in gender-based analyses.
3. To examine how the emotional distress trajectories relate to physical activity at age 12 in gender-based analyses.

We expect that lower emotional distress symptoms from ages 6 to 10 will be distinctly associated with higher levels of physical activity at ages 5 and 12 in both boys and girls, above and beyond potential confounders.

Methods

Participants

Participants are from a prospective-longitudinal birth cohort of 1 438 children (48% boys) from the Quebec Longitudinal Study of Child Development.

Measures

- Emotional distress symptoms (ages 6, 7, 8, 10): e.g. child seemed unhappy or sad, appeared fearful or anxious; assessed by teachers.
- Physical activity (age 5): past-year participation in physical activity (never/any participation); assessed by parents.
- Physical activity (age 12): number of days/week child does physical activity (1 to 7); assessed by children.
- Potential confounders (5 months to age 5): individual (e.g. temperament, body mass index) and family characteristics (e.g. maternal education, family income, family functioning).

Data analytic procedure

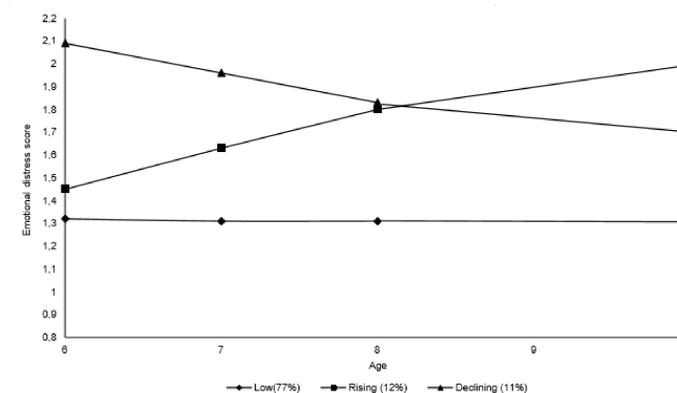
- Trajectories of emotional distress symptoms (ages 6 to 10) were generated using longitudinal latent class analysis (LLCA).
- Multinomial logistic regression analyses examined physical activity (age 5) as a predictor of emotional distress trajectory outcomes.
- Analyses of covariance (ANCOVAs) compared physical activity (age 12) by different trajectories of emotional distress.
- Multiple imputation was used to correct for response and attrition bias.

Results

Trajectories of emotional distress

We selected the 3-class model illustrated in Fig. 1.

Figure 1. Trajectories of emotional distress from ages 6 to 10 years.



Physical activity at age 5 as predictor of emotional distress trajectories

Boys who never participated in physical activity at age 5 were more likely to be in a 'Rising' (adjusted OR = 1.63) or a 'Declining' (adjusted OR = 2.19) emotional distress trajectory compared to boys who participated in physical activity. No significant results were found in girls.

Physical activity at age 12 as outcome of emotional distress trajectories

Boys in the 'Low' emotional distress trajectory showed a higher level of physical activity at age 12 (see Table 1). No significant results were found in girls

		F (2, 1438)	Low	Rising	Declining
Weekly physical activity	Boys	6.04**	4.50 ^a	3.91 ^a	3.95 ^a
	Girls	1.29	3.84 ^a	3.59 ^a	3.66 ^a

Notes. ^aAdjusted means. *p < .05, **p < .01.

Conclusions

This study allowed us to examine the unique longitudinal and bidirectional contribution of physical activity in relation with child emotional distress.

First, we identified 3 developmental emotional distress trajectories, as reported by teachers. The majority of boys and girls (77%) remained at a low level, 12% followed a rising trajectory, and 11% showed a higher level of depressive and anxious symptoms that declined over time.

Second, we found that boys who never participated in physical activity at age 5 were more likely to look unhappy and tired, to show difficulty having fun, to cry a lot, and to appear fearful or worried between the ages of 6 and 10.

Third, we found that boys who exhibited lower levels of depressive and anxious symptoms during middle childhood were more physically active in early adolescence, as reported by children themselves.

No significant results relating emotional distress and physical activity were found in girls.

For boys, this study supports the relevance of maintaining current public health effort to promote physical activity and emotional adjustment in youth in order to achieve better physical and mental health.

Acknowledgments

We thank the SSHRC for support (M.-J. Harbec, scholarship number 752-2019-1325), (F. N. Brière and L. Pagani as Co-PIs, grant number 435-2017-0784) and Natalie Castellanos Ryan (University of Montreal, Canada) for assistance with the statistical analyses.