Feasibility Study of a Mindfulness-Based Educational Program (MBEP) for First Year High School students in a Regular Classroom

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1 INTRODUCTION

For adolescents, the transition from elementary to high school leads to a demand for adaptation that can be stressful (Grills-Taquechel et al., 2010).

Many mindfulness based educational programs (MBEP) are set up to help adolescents cope with stress issues, and several meta-analysis support their efficacy among adolescents, for anxiety reduction and cognitive abilities enhancement in clinical and general population settings (Zenner et al., 2014, Zoogman et al., 2015).

However, recent school-based studies question the effectiveness of IBPAs in adolescents, showing mitigated or even negative results on anxiety symptoms (Jonhson et al., 2016, 2017).

The discrepancy in these results stresses the importance of developping and implementing evidence based interventions with adolescents in school settings, with a carefull attention placed on the processes involved during the intervention.

2 OBJECTIVE

This study aims to test the feasibility of a program created for the Quebec high school students community.

3 METHOD

Design: Experimental single case design : A-B-A-C-A

Participants : 1 group : 5 girls / 4 boys, age 11-12 (M=11,89) high school 1e year. 1 dropout (1 boy) .

Program (PA^2) and research phases :

- Phase A : 5 measurements before and after each intervention phase
- Phase B : Mindfulness educationnal program : 1 h session X 10 weeks, meditation exercises and group activities : mindful bite, body scan, sitting and movement meditation, compassion, acceptance of differences, group sharing, emotions, sensations and toughts processing (10 measurements)
- Phase C : 5 minutes meditation per day over 4 weeks (4 measurements)

Instruments :

- French version of the **Child and Adolescent Mindfulness measure – CAMM** (Greco et al., 2011; vf Dion et al., 2018) (10 items) (alpha > .70)
- French version of the **State-Trait anxiety scale for children – STAIC** (Spielberger et al., 1983; traduction : vf Turgeon & Chartrand, 2003) : 20 items state anxiety scale only (alpha > 0,80)
- French version of the **Toronto Alexithymia Scale – TAS-20** (Bagby et al., 1994; vf Loas et al., 1996) – 4 items version measuring emotions identification difficulty (alpha > 0,70)
- Self-report Weakly frequency of meditation at home and life events

Qualitative component : Appreciation questionnaire at the end of the interventioyn

Analysis :

- Visual analysis : trend, immediacy of the effect, overlap (Kratochwill et al., 2010)
- Percentage exceeding median of baseline phase (PEM, Ma, 2006)

4 QUANTITATIVE RESULTS

ANXIETY

Group mean for anxiety (STAI–C state)
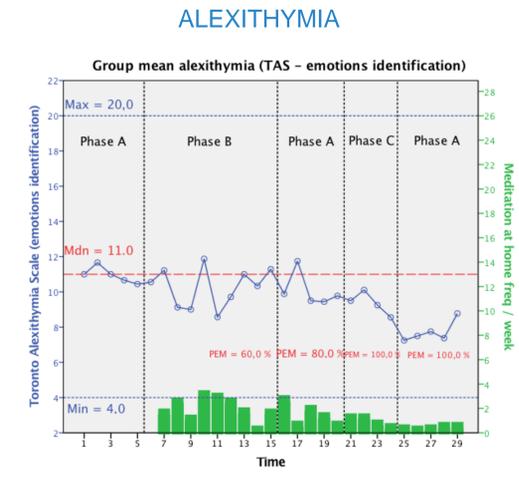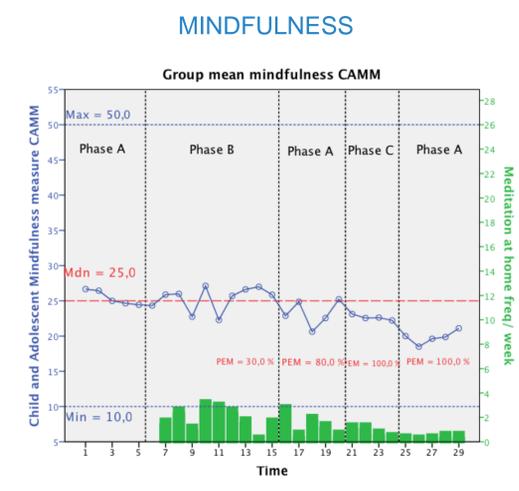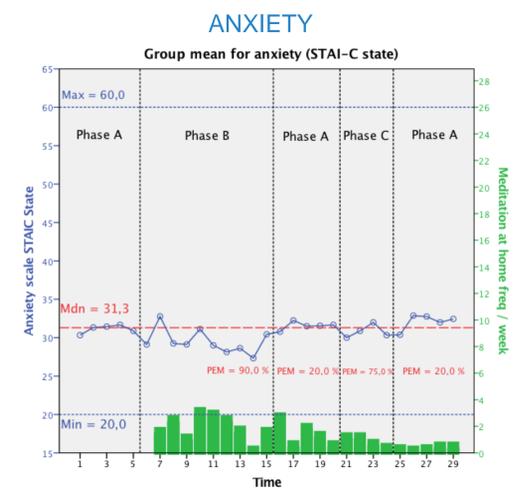
INDIVIDUAL RESULTS FOR ANXIETY (PEM)

Participant (Phase A median)	Phase B (IBPA X 10 wk)	Phase A (post X 5 wk)	Phase C (5min X 4 wk)	Phase A (post X 5 wk)
1 (Mdn = 34,0)	70,0%	40,0%	75,0%	100,0%
2 (Mdn = 26,0)	100,0%	100,0%	100,0%	80,0%
3 (Mdn = 29,0)	30,0%	0,0%	0,0%	0,0%
4 (Mdn = 45,0)	88,0%	40,0%	75,0%	60,0%
5 (Mdn = 32,0)	42,9%	50,0%	50,0%	0,0%
6 (Mdn = 27,0)	87,5%	100,0%	100,0%	100,0%
7 (Mdn = 24,0)	0,0%	0,0%	0,0%	0,0%
8 (Mdn = 34,0)	75,0%	60,0%	50,0%	20,0%
9 (Mdn = 31,0)	66,7%	100,0%	100,0%	0,0%

MINDFULNESS

Group mean mindfulness CAMM

INDIVIDUAL RESULTS FOR MINDFULNESS (PEM)

Participant (Phase A median)	Phase B (IBPA X 10 wk)	Phase A (post X 5 wk)	Phase C (5 min X 5 wk)	Phase A (post X 5 wk)
1 (Mdn = 42,0)	40,0%	60,0%	25,0%	100,0%
2 (Mdn = 14,0)	55,5%	80,0%	100,0%	100,0%
3 (Mdn = 22,0)	60,0%	100,0%	100,0%	100,0%
4 (Mdn = 35,0)	77,7%	100,0%	50,0%	60,0%
5 (Mdn = 31,0)	42,9%	0,0%	0,0%	0,0%
6 (Mdn = 17,0)	50,0%	80,0%	0,0%	0,0%
7 (Mdn = 26,0)	70,0%	100,0%	100,0%	100,0%
8 (Mdn = 28,0)	25,0%	20,0%	75,0%	100,0%
9 (Mdn = 18,0)	100,0%	100,0%	100,0%	100,0%

ALEXITHYMIA

Group mean alexithymia (TAS – emotions identification)

INDIVIDUAL RESULTS FOR ALEXITHYMIA (PEM)

Participant (Phase A median)	Phase B (IBPA X 10 wk)	Phase A (post X 5 sem)	Phase C (5 min X 4 wk)	Phase A (post X 5 sem)
1 (Mdn = 16,0)	40,0%	40,0%	50,0%	0,0%
2 (Mdn = 4,0)	0,0%	0,0%	0,0%	0,0%
3 (Mdn = 8,0)	80,0%	100,0%	50,0%	100,0%
4 (Mdn = 18,0)	87,5%	100,0%	75,0%	80,0%
5 (Mdn = 13,0)	0,0%	0,0%	0,0%	0,0%
6 (Mdn = 6,0)	62,5%	80,0%	100,0%	40,0%
7 (Mdn = 8,0)	100,0%	100,0%	75,0%	100,0%
8 (Mdn = 20,0)	0,0%	0,0%	50,0%	100,0%
9 (Mdn = 6,0)	83,3%	75,0%	100,0%	80,0%

LEGEND
Green = improvement
Yellow = no improvement / no deterioration
Red = deterioration

5 QUALITATIVE RESULTS

Appreciation of the program

- Over all appeciation of the program was strong. A single participant dropped out of the program and all participants made positive comments on the program.
- When asked about negative experiences during the program, comments were linked to logistics (having to walk to the program site, having to miss school for the program) and one activity was disliked by one participant (water bowl in circle / group judgments).

Self-reported improvements linked to the program

- Some participants reported less stress as a result of the program (N = 4), less negative toughts (N = 1) a better ability to concentrate (N = 1), less impulsivity (N =1) and 4 participants saw nothing different as a result of the program.

Life events

- Participant 5 experienced psychosocial adversity and a deteriotation on all dimensions.
- Participants 7 experienced psychosocial adversity and a deteriotation of mindfulness.
- Participants 1 experienced psychosocial adversity and a deterioration of alexithymia.
- Participants 4 and 8 experienced psychosocial adversity with no deterioration during program.

6 DISCUSSION

- For anxiety, PEM analysis show that even if the qualitative appreciation of the program is strong among participants, the effect on state anxiety is of short term only during the program and post-intervention measures show an increase in anxiety for the group. Individual results indicates deteriotation for 3 participants, suggesting that the program may have a negative impact on anxiety after the program for some participants. Only one participant could have a deterioration of anxiety as a result of life events.
- For minfulness and alexithymia, similar results indicate a short term small effect and an improvement trend in the last Phases C and A, indicating a better capacity to identify emotions and more mindfulness at the end of the school year. However, the absence of immediacy of this effect makes it difficult to establish a direct relationship between this effect and the program participation during phase B.
- A possible interaction between mindfulness and alexithymia could explain the rise in anxiety at the last phase A, but this small sample does not allow a statistical test of this effect.
- These results indicate a feasability of the program in regard to the appreciation by the participants, but the quantitative results suggest the need for a better follow-up and an improvement of the program. A better ability to identify emotions could lead to a rise in self-reported anxiety, showing a need to improve the program on emotion regulation strategies.

7 LIMITATIONS AND LESSONS LEARNED

- Event if the single case design offers an interesting insight about the evolution of psychological dimensions during different phases of the intervention, the small sample size does not allow generelization of the results or statistical analysis of the data to detect a possible interaction effect between psychological dimensions.
- High overlap of the data for anxiety makes it difficult to get any clear conclusion about the program effect for the first 3 phases.
- For alexithymia, the 4 items scale limitates the interpretability of the results.
- An improvement of the program and other studies are needed before the implementation of this program in a school setting.
- An other version of the program should not lead the participants to miss class.