A systematic review and meta-analysis of school-based educational interventions to reduce body mass index in adolescents (aged 10-19)

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BACKGROUND

- Adolescence is marked by critical changes in body composition, physical activity (PA), sedentary and dietary behaviours that make adolescents at increased risk of becoming overweight/obese.
- Health education in schools has been widely recommended as a tool to improve health literacy in adolescents to address issues related to physical inactivity, diet and body composition and is associated with increased planning and critical thinking. This in turn sets up adolescents on a healthier trajectory for their future, and for the health of their children.
- To develop effective interventions that result in sustained changes in BMI and health behaviours of adolescents, it is necessary to understand which elements are effective.

RESEARCH QUESTIONS

- What is the effectiveness of health education interventions delivered in schools to prevent overweight and obesity in adolescents?
- Which intervention features are associated with effectiveness?

METHODS

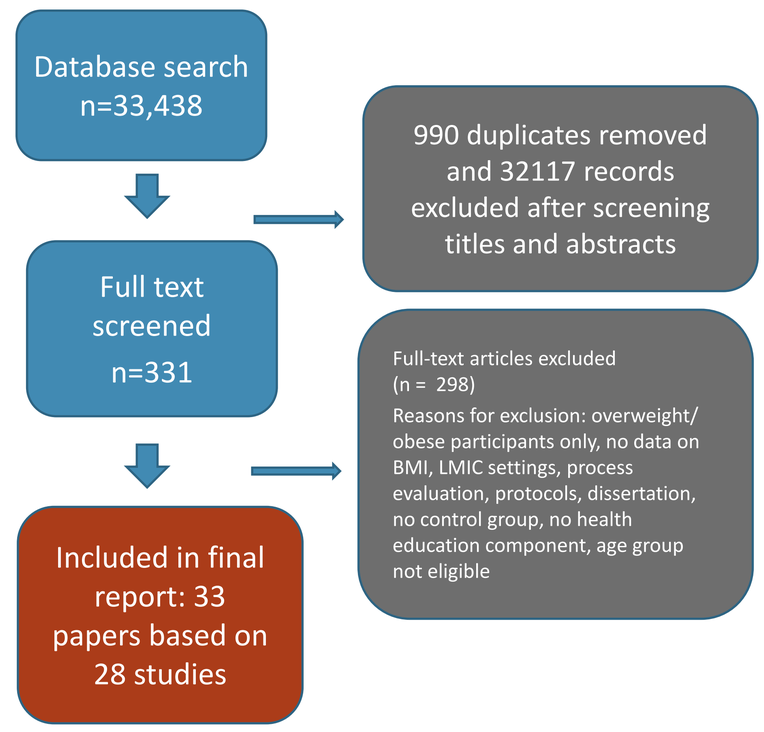
- Health education was defined as 'any combination of learning experiences designed to facilitate voluntary adaptations of behaviour conducive to health' (Green 1982).
- Databases: MEDLINE, PsychINFO, CINAHL, and ERIC limited by English Language and dated May 2019
- Inclusion criteria: a) evaluated the effect of school-based educational interventions in BMI / BMI Z-score b) in participants aged 10-19 years d) from high-income countries e) with comparison/control group f) and has measures at a minimum of two time points
- Search term categories: a) adolescence b) physical activity c) sedentary behaviour, d) diet and e) BMI
- Risk of bias assessed using a standardized checklist

RESULTS

- 28 studies were included based on interventions conducted in 10 countries.
- Most (21) were RCTs and 7 followed a quasi-experimental design with control group.

SEARCH FLOW DIAGRAM

(in accordance with PRISMA guidelines)



- Most interventions (22) were delivered by teachers in classroom settings.
- Other intervention features: parent involvement (15), digital media (11) and environment modification (10)
- Overall, 12 studies reported a significant reduction in BMI and/or BMI z-score in all (9) or a subset (3) of participants. All effective studies had a face-to-face component for intervention delivery in the classroom.
- Ten of the effective studies were delivered by teachers, all of which provided CPD for teachers prior to the intervention (e.g. workshops, seminars)
- A random effects meta-analysis was conducted for 13 studies reporting change in BMI Z-score (Fig 1). The pooled estimate of the meta-analysis showed a small but clinically useful difference between intervention and control groups (-0.07 [95% CI -0.11,-0.03]).

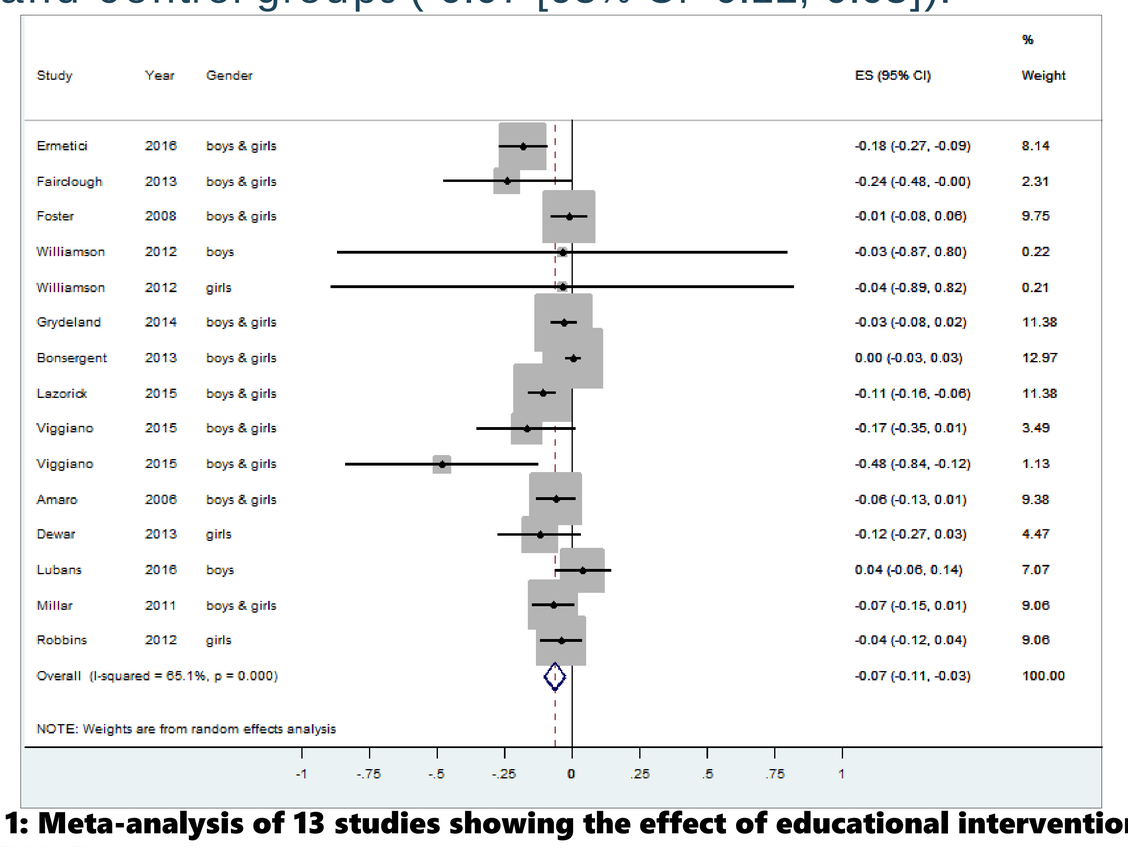


Fig 1: Meta-analysis of 13 studies showing the effect of educational interventions on BMI Z-score

CONCLUSIONS: Findings from our review suggest that BMI in adolescents can be reduced using school-based educational interventions. Intervention effectiveness was associated with training for teachers prior to the intervention and involving parents, thus indicating ways in which future interventions could be improved.

References: Alberga AS, Sigal RJ, Goldfield G, et al. Overweight and obese teenagers: why is adolescence a critical period? Pediatric Obesity 2012; Marks R. Health Literacy and School-based Education: Emerald Group Publishing; 2012.Patton GC, Viner R. Pubertal transitions in health. The Lancet 2007; Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. Journal of the American Dietetic Association 2002;102(3):S40-S51.

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