Title Registration for a Systematic Review: School-Based Education Programs for Improving Knowledge of Back Health, Ergonomics and Postural Behaviour of Secondary School Children: A Systematic Review

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| ☑  | Crime and Justice |
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| ☐  | Disability |
| ☐  | International Development |
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TITLE OF THE REVIEW

School-Based Education Programs for Improving Knowledge of Back Health, Ergonomics and Postural Behavior of Secondary School Children: A Systematic Review

BACKGROUND

School-based education programs have been used previously in countries worldwide for improving knowledge of back health, postural awareness and behaviour. This systematic review will conduct and report on evaluating the effects of postural, ergonomic and back health education programs on knowledge and postural behaviour in secondary school children.

Back health, ergonomics and the prevention of back pain are important health issues worldwide. Indeed, school environment interventions are strongly supported by the World Health Organization (WHO) framework for Health Promoting Schools (HPS). However, whilst numerous school-based education programmes have been implemented to reduce smoking, decrease alcohol consumption and teenage pregnancies, increase physical activity and healthy eating, and prevent obesity in children and youth, educational programmes teaching children and youth about the importance of back health and posture, together with the prevention of back pain, have not received as much attention. Recent population-based studies conducted in a range of countries report point, one-year, and lifetime prevalence rates of back pain in adult populations of up to 52%, 84%, and 91%, respectively. However, spinal pain is an issue across the lifespan, not just in adulthood. Cross-sectional surveys conducted in different countries with children and adolescents between the ages of 8 and 16 years of age variably report one-month prevalence rates of up to 39%, and lifetime prevalence rates of back pain up to 69.3%. The high prevalence rates of back pain in children and adolescents, as well as the predictive value of adolescent spinal pain for spinal pain in adults, have caused several authors to advocate for, and implement, spinal health interventions in the school setting.

School-based education programs for improving knowledge of back health and postural behaviour have been used in numerous countries worldwide to improve children’s and adolescent’s knowledge of back health, postural awareness and behaviour. Historically, educating children and youth about the importance of back health and posture was an important element of the physical education national curriculum in many counties but was overlooked during the 1980’s when heart health became a greater priority (Tinning, 2001). The aim of these educational programs has been to decrease the risk of spinal, back and other musculoskeletal problems which may lead to disability and musculoskeletal pain both in the present and future (Arghavani, Zamanian, Ghanbary & Hassanzadeh, 2014; Habybabady et al., 2012; Vidal, Borras, Ponmseti, Cantallops & Ortego, 2013).
Low Back Pain (LBP) is defined as a musculoskeletal symptom that may be acute or chronic and is a frequently encountered complaint of the general population. It is often caused by postural defects when the normal relationship between muscles, bones and other tissues is distorted. The causes of LBP in youth are challenging and difficult to diagnose and have also been theorised to include mechanical back shape, incorrect posture while using technology (game consoles, computers, Gameboys, iPad, iPhone) and carrying heavy back packs, improper lifting techniques, incorrect posture during prolonged sitting and standing, and lack of back care knowledge and the lack of opportunity to move around frequently (in standing, sitting). These issues may be exacerbated by the educational environment because of inadequate or unavailable school lockers, ill-fitting school furniture and the changing structure of the school day which provides fewer opportunities for movement (Bettany-Saltikov, Warren & Stamp, 2008; Cardon, De Clercq, De Bourdeaudhuij, & Breithecker, 2004; Feingold & Jacobs, 2002; Legg & Cruz, 2004; Sheldon, 1994).

Cardon et al. (2001) further suggest that guidelines to support teachers made a difference to the back health of school children and strongly recommended that guidelines be formulated. Back care knowledge among children, parents and teachers has also been reported to be very poor (Arghavani et al., 2014). This is further compounded by the lack of media coverage and governmental structured programs to help to inform youth (Bettany-Saltikov et al., 2008; Cardon et al., 2004). This has subsequently resulted in not only children but also parents and teachers being unaware of the prevalence and risk factors of musculoskeletal pain and disorders (Arghavani et al., 2014; Habybabady et al., 2012) resulting in the increase of poor back health behaviours routinely being undertaken in schools. Rajan and Koti 2013 state that it is very important to identify health problems at an early stage as the long term consequences of this lack of knowledge may result in significant increases in low back and other musculoskeletal problems in adulthood if an educational program is not put in place during the children’s early years (Adams, Mannion & Dolan, 1999; Cardon et al., 2004; Geldhof, Cardon, De Bourdeaudhuij, Danneels, Coorevits & Vanderstraeten 2007; Sheldon, 1994).

**OBJECTIVES**

What is the effectiveness of school-based education programs in back health for improving knowledge of back health, ergonomics and postural behaviour in secondary school children?

**EXISTING REVIEWS**

There is a dearth of systematic reviews (SR) that have evaluated the effects of educational back-health care programs in schools (Cardon et al., 2004; Habybabady et al., 2012). Indeed, to our knowledge, no back health educational program has been implemented, with limited studies being found worldwide (Habybabady et al, 2012). Further, at present, there are no evidence-based guidelines and recommendations (Cardon et al., 2004).
A scoping search was initially performed, identifying ten potentially relevant research papers. Despite conducting a comprehensive search, only one completed systematic review (SR) could be identified in this specific area by Steele, Dawson, and Hiller (2006) as well as an unpublished review protocol that was funded by an EU grant (Kemper & Tholeen, 2008). A SR in a related area by Bonnell et al. (2013) looked at other school-based educational interventions; however, these interventions did not include educational interventions to improve back health and posture. Bonnell et al. (2013) concluded, however, that whilst there is definitely the potential for school environment interventions to promote young people’s health, the evidence base is far from definitive.

The only relevant complete SR we found by Steele et al. (2006) was published 10 years ago. Twelve papers were included in this review with all papers receiving a “weak” quality rating. The result of this SR indicates that educational school-based back health interventions may be effective in increasing back care knowledge, as well as decreasing the prevalence of spinal pain. However, overall, the evidence was inconclusive regarding spinal/back care behaviours. As this systematic review was conducted 10 years ago and a number of research papers have been published since then, a systematic review conducted with state of the art, high-quality Campbell Collaboration methodology is urgently needed.

**INTERVENTION**

The proposed review will include any back health, ergonomics and postural behaviour school-based program that is designed to support the academic success of students’ posture in educational establishments. Educational establishments, or schools are broadly defined as institutions dedicated to education. Eligible school-based programs can be secondary or post-secondary (college).

The intervention of interest in this systematic review is any formal educational school-based program of those eligible in population. To be eligible, the interventions must engage school children in some form of active learning that cognitively and physically engages them in learning to improve knowledge, ergonomics and postural behaviour. The contents (lectures or lectures with actual demonstrations and practice, workshops, individual lessons, class group lessons, curriculum lessons, educational modules), length (hours, days, weeks, months, years) and manner of delivery (face to face, face to face with complementary materials, group and individual practical participation, observations) of the program may vary in each of the studies to be included as there is no standard school-based educational programs for improving knowledge of back health, ergonomics and postural behaviour of school children.

Studies eligible for inclusion will be primary studies that compare educational interventions on back health and posture with schools which have no educational school programs on back health and posture interventions (i.e., no educational package). Interventions that include
only exercises and other school based interventions such as educational programs on healthy eating, sexual health education will not be eligible for inclusion.

We aim to compare to either “Usual” health and physical education programs provided by schools, schools which have no educational school program on back health and posture interventions (i.e., no educational package) or other type(s) of intervention(s) (e.g., different types of education, physical activity or exercise only interventions), depending on what control interventions were considered in the included primary papers. Other types of educational packages not related to back care will not be eligible for inclusion.

POPULATION

Eligible student populations will include students enrolled part-time or full-time in secondary school or 6th form (college) and internationally from 6th grade (junior) high school up to 12th grade (senior) high school educational institutions regardless of sex, race, ethnicity or socioeconomic status. All ages of students are eligible for inclusion provided they are enrolled in an educational institution, but most secondary, 6th form (college) and internationally from 6th grade (junior) high school up to 12th grade (senior) high school students are expected to be ages 11 – 18 years of age. Studies that include students who are not enrolled in educational institutions will not be eligible for inclusion.

Examples from searches of primary studies in this research area that clarify exclusion are students under 10 years and over 18 years (adults); students and youth with chronic disease or conditions or co-morbidities which prevent the students or youth from participating in the back health program for any reason will not be eligible for inclusion.

To be as inclusive as possible, no other eligibility restrictions will be placed on the eligible student populations. Students who are enrolled in educational institutions in any country will be eligible for inclusion. There will be no limitation on the nationality, race or ethnicity of the students where the intervention occurs.

OUTCOMES

To our knowledge there is no consensus regarding indicators for outcome measurement in the evaluation of Educational and health promotion programs. While a change in health outcome is the overall goal of most programs, often such changes may not occur within the evaluation timeframe, and intermediate endpoints must also be measured to gauge effectiveness. Intermediate endpoints often evaluated after implementation of a health promotion program are the level of knowledge regarding the health issue, and the frequency in which relevant health behaviours are undertaken.

Primary Outcomes

Studies will be included that examine at least one of the following outcome measures:
1. Back/back care knowledge,
2. Knowledge of back care ergonomics,

All outcomes (primary and secondary) will be measured at the beginning and the end of the educational program (weeks) and longer term (months, years). Any outcomes not mentioned above that are related to postural behaviour change will also be included. The included studies will include validated outcome measures that relate to the knowledge and/or understanding of all of the above using the results of surveys, measurements, and other validated specific questionnaires.

Secondary Outcomes

Secondary outcomes which include any adverse effects, for example pain or stiffness or other adverse effects reported in the included studies. If adverse effects are reported that are not listed here, we will still report them in our review.

STUDY DESIGNS

To be a qualifying design for this review, the primary analysis will combine the results of randomised control trials (RCTs) and quasi-randomised control trials (QRCTs). We will also include prospective non-randomised studies (NRSs) with a control group because it is anticipated that very few RCTs will be found.

Retrospective studies as well as qualitative studies will be excluded. Narrative and other types of non-systematic reviews (e.g. critical reviews, overviews, state-of-the-art reviews), clinical practice guidelines, evidence summaries, critically appraised topics, clinical paths, consumer information sheets, best practice information sheets, technical reports, and other evidence-based pieces, will be excluded.

REFERENCES


REVIEW AUTHORS

Lead review author: The lead author is the person who develops and co-ordinates the review team, discusses and assigns roles for individual members of the review team, liaises with the editorial base and takes responsibility for the on-going updates of the review.

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ROLES AND RESPONSIBILITIES

• Systematic review methods and content knowledge: Dr Josette Bettany-Saltikov will bring significant expertise of Systematic review methods and content to this systematic review, both in terms of knowledge about back health and ergonomics and to knowledge about developing educational programs. She has taught systematic review methods to university students at all levels for over 15 years. She has also published a book on how to conduct a systematic review and has been involved in 3 Cochrane reviews one of which she led. She has authored a number of systematic reviews on diverse topics published in other journals and has significant experience of developing educational programmes from her teaching experience for 23 years as a university Senior lecturer. She also has further content expertise related to the management of back conditions. Josette originally qualified as a physiotherapist and has been interested in the area of maintaining back health in children and adolescents for over 25 years.

• Content and Systematic Review methodology: Mrs Tracey Arnell is a Sports Therapist who is actively engaged with students and clients on a day to day basis. She brings knowledge about the content both in terms of teaching educational students about the back practically and theoretically for improving knowledge of back health, ergonomics and postural behavior in the educational environment. She has 10 years of teaching students in secondary, further and higher education of which she is passionate to engage learners and share her knowledge with them. Tracey is passionate to maintain back health in children and adolescents, she enthusiastically shares her knowledge of back care and posture with her students. She will also help with the methodological aspects of the systematic review. She has been involved as an author on a Cochrane review.

• Statistical analysis: Prof Paul van Schaik will contribute expertise in behavioral science in the context of education. He has extensive experience in advanced statistical data analysis in behavioral research and in behavioral measurement, including the analysis of psychometric questionnaires. His academic work has been recognized for international and national excellence. Paul will direct the analysis of literature with regard to instructional design of educational interventions. He has also been awarded the highly prestigious National Teaching Fellow award in the UK.
• Information retrieval: Mr Iain Baird brings Information retrieval expertise to the team. Ian is the Academic Librarian at Teesside University and will carry out the thorough and systematic search of the literature.

• Content: Professor Rob McSherry will be bring both methodological as well as content expertise relating to the development of teaching programs to the team. He is the coauthor of a book on systematic reviews and has over thirty years’ experience as a registered general nurse. His area of expertise is around evidence-informed practice, patient safety, quality and clinical governance using practice development. Practice development is about promoting person-centered care and approaches which Rob has integrated effectively within both educational and research programs. Robs educational and professional expertise has been recognized and rewarded international and nationally. He was awarded the highly prestigious National Teaching Fellow award in the UK in 2011.

• Statistical analysis: Mrs Vicki Whittaker is a very experienced statistician with over 18 years of experience of teaching and advising students and academics on their research projects and clinical trials. She has been involved in the data analysis and also meta-analysis of numerous research projects and systematic reviews.

POTENTIAL CONFLICTS OF INTEREST

I (Dr Bettany-Saltikov) have not to date conducted any systematic reviews or primary research specifically on maintaining back health and posture in school children but I have been involved in conducting primary studies as well as Cochrane reviews on the related area of adolescents with idiopathic scoliosis (spinal deformities). To my knowledge none of the other authors have any conflicts of interest to declare.

FUNDING

We are applying to the Jacobs foundation and Campbell’s grant call for children and young people. We plan to complete the systematic review within 1 year.

PRELIMINARY TIMEFRAME

Note, if the protocol is not submitted within 12 months of title registration and/or the review is not submitted within 24 months of protocol approval, the review area may be opened up for other authors.

• Date you plan to submit a draft protocol: May 2017
• Date you plan to submit a draft review: March 2018
DECLARATION

Authors’ responsibilities

By completing this form, you accept responsibility for preparing, maintaining, and updating the review in accordance with Campbell Collaboration policy. The Coordinating Group will provide as much support as possible to assist with the preparation of the review.

A draft protocol must be submitted to the Coordinating Group within one year of title acceptance. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Coordinating Group has the right to de-register the title or transfer the title to alternative authors. The Coordinating Group also has the right to de-register or transfer the title if it does not meet the standards of the Coordinating Group and/or the Campbell Collaboration.

You accept responsibility for maintaining the review in light of new evidence, comments and criticisms, and other developments, and updating the review every five years, when substantial new evidence becomes available, or, if requested, transferring responsibility for maintaining the review to others as agreed with the Coordinating Group.

Publication in the Campbell Library

The support of the Coordinating Group in preparing your review is conditional upon your agreement to publish the protocol, finished review, and subsequent updates in the Campbell Library. The Campbell Collaboration places no restrictions on publication of the findings of a Campbell systematic review in a more abbreviated form as a journal article either before or after the publication of the monograph version in Campbell Systematic Reviews. Some journals, however, have restrictions that preclude publication of findings that have been, or will be, reported elsewhere and authors considering publication in such a journal should be aware of possible conflict with publication of the monograph version in Campbell Systematic Reviews. Publication in a journal after publication or in press status in Campbell Systematic Reviews should acknowledge the Campbell version and include a citation to it. Note that systematic reviews published in Campbell Systematic Reviews and co-registered with the Cochrane Collaboration may have additional requirements or restrictions for co-publication. Review authors accept responsibility for meeting any co-publication requirements.

I understand the commitment required to undertake a Campbell review, and agree to publish in the Campbell Library. Signed on behalf of the authors:

Form completed by: Dr Josette Bettany-Saltikov (and Tracey Arnell)

Date: 02 November 2016