Relationships between physical activity level and psychosocial and socioeconomic factors and issues in children and adolescents with asthma: a scoping review protocol

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Review question/objective: The objective of this scoping review is first to identify and map instruments to measure psychosocial and socioeconomic factors associated with level of physical activity in children and adolescents with asthma that have been reported in the quantitative literature, and to report on the construction and validation of these instruments. The second objective is to identify and map psychosocial and socioeconomic issues related to PA level reported in the qualitative literature and to identify gaps in the evidence about the relationships between psychosocial and socioeconomic factors and PA level in children and adolescents with asthma.

Review question 1: Which instruments have been used to assess the associations between psychosocial and socioeconomic factors and PA level in children and adolescents with asthma in quantitative primary studies, and how has information about the construction, validity, and reliability of these instruments been reported?

Review question 2: Which psychosocial and socioeconomic issues related to PA level in children and adolescents with asthma have been explored in qualitative primary studies?

Keywords: Adolescents; asthma; children; physical activity; psychosocial factors

Background

Asthma is a chronic disease, characterized by airway inflammation which causes expiratory airflow limitation, shortness of breath, chest tightness, wheeze, and cough.[1] In children and adolescents with asthma, the disease may reduce perceived capability for,[2] and participation in physical activity (PA).[3] Physical activity is defined as any bodily movement such as play, exercise, or daily activities produced by the contraction of skeletal muscles that increases energy expenditure above resting levels.[4]

The PA level may be assessed in terms of the intensity, frequency, type, mode, and duration.[5] Physical activity can be recorded by objective measures of energy expenditure or movement (e.g., steps per day, distance, accelerometer counts per minute, heart rate, or oxygen consumption), by subjective reports of exhaustion, or by descriptive measures of the activities.[6]Objective measures of acute airflow limitation induced by vigorous PA (exercise-induced bronchoconstriction (EIB)) do not completely explain children's and adolescents' reports of exercise-induced symptoms.[7,8] Nevertheless, exercise limitation and reduced PA are frequently reported to be associated with physiological mechanisms, respiratory symptoms,[3,9-19] and psychosocial and socioeconomic factors in children and adolescents with asthma.[2,9,10,14,18,20-26] Barriers to PA have been described in qualitative research and include fear of breathlessness and misinterpretation of symptoms,[27]and are influenced by gendered habits,[28,29] social support,[30-32] role models, and efforts to appear similar to peers.[33,34]

Participation in PA is considered feasible by children and adolescents with asthma when using appropriate controller medications.[35-38] Increased PA is associated with increased

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cardiorespiratory fitness,[36,37,39] psychological functioning,[38] health-related quality of life,[36-40] psychological well-being, and self-esteem, and decreased morbidity.[37-39] Increased fitness may also elevate the EIB threshold by reducing ventilatory requirement for any PA involving play or exercise.[37,41]

There is no consensus in the literature about whether children and adolescents with asthma perform less PA than their healthy peers.[38,42] Some studies have reported similar fitness and PA levels in children with asthma compared with controls.[43-46] Lower PA and fitness levels[2,10,14,15] have been identified in children and adolescents who are newly diagnosed or have poor asthma control.[3,19] Asthma control is defined as "the extent to which the manifestations of asthma have been reduced or removed by treatment."[47(p545)]

Asthma symptoms and lung function may change rapidly in response to environment and/or treatment, whereas airway wall remodeling and responsiveness tend to change slowly. Thus, the clinical manifestations and the underlying disease mechanisms of asthma do not always correspond.[47] An asthma diagnosis may include four domains: symptoms, variable airway obstruction, inflammation, and hyperresponsiveness.[47] Various combinations of one or more of these four domains and other features are included when defining the disease, and there are also differences in asthma control and severity between study populations. Asthma severity is defined by the treatment intensity required to obtain asthma control.[47] Deficient asthma control may also occur through poor compliance, poor inhaler technique, under-prescribing, environmental factors, severe disease, and/or resistance to therapy.[47] Hence, the associations between PA and asthma, asthma control, and asthma severity are complex and involve both psychosocial and socioeconomic issues.[20]

Asthma and PA from childhood into adolescence

The disease,[48] level of PA,[49-51] and management of both asthma and PA continue to develop throughout childhood and adolescence.[48,52] Asthma is more common in boys than girls during childhood [53] but is more common in girls during adolescence.[48,54] Parents are responsible for managing their child´s asthma, whereas shared responsibility by the adolescent and parents is desired to enhance the adolescent's growing responsibility for managing his/her disease.[55]

In healthy children, PA level varies according to gender[49-51] and social support.[50] Peer support positively influences PA across gender,[50] age and location.[56,57] The influence of social support from parents and teachers, and the influence of the physical environment may change with time and location (at school, or home, during school or leisure time, and during the week and weekend), and age development.[56,57] Such changes may be related to major shifts in autonomy, parental license, and movement to different schools during childhood and adolescnce.[56] Eighty percent of school-age adolescents worldwide do not reach international recommendations of 60min/day of moderate-to-vigorous PA (MVPA).[58,59] There is a need for more information about why some individuals are active

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and others are not, in particular the psychosocial and socioeconomic determinants of differences in PA levels.[60]

Psychosocial factors include individually measured perceptions or cognitions of intrapersonal factors (motivation, beliefs and cognition), interpersonal factors (support from others and cultural norms and practices), and contextual factors (social, built and natural environment), These factors and their interactions have been described by several theories and models.[60] Socioeconomic factors are explained by a multidimensional concept comprising resources, power, and/or prestige, and include educational level, income, and occupation at an individual, household, or neighborhood level.[61] These measures are not interchangeable[61] and, in children and adolescents, indicative measures are often used, such as car ownership, internet access, and unshared bedrooms.[62,63] Such indicative measures must be refined according to economic, technological and societal changes in a given society.[63] Hence, transparency concerning the steps taken in the development of instruments and reporting of in-study reliability and validity is needed when mapping knowledge about the associations between these factors and PA in given populations. In addition, mapping of psychosocial and socioeconomic issues in relation to PA by qualitative research may strengthen the evidence derived using quantitative instruments.

Rationale for the review

As outlined above, there is a need for more detailed evidence about the psychosocial and socioeconomic influences on PA level[60] in children and adolescents with asthma, especially in those with specific challenges to being active because of airflow limitation, who may benefit from increased PA. To our knowledge, there is no consensus about the best instruments to assess psychosocial and socioeconomic factors that may influence PA in children and adolescents with asthma. A scoping review on this topic is therefore needed before further studies or synthesis of research findings can be conducted to identify the factors that may be feasible, appropriate, meaningful, and effective for inclusion in interventions aimed at increasing PA level in children and adolescents with asthma. This scoping review will follow the methodology of Peters et al.[64] An initial search in *JBI Database of Systematic Reviews and Implementation Report*, PROSPERO, Cochrane Library, PEDro, Embase, CINAHL, Medline, SPORTDiscus, SocINDEX, Academic Search Complete, PsycINFO, and ISI Web of Science was performed. To our knowledge, no systematic or scoping review on this specific topic has been published or is currently under way.

Inclusion criteria

Types of participants

In this review, we will consider studies that include children and adolescents with asthma aged 6-18

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years. The given age range includes school-age children and adolescents, who are more likely to participate autonomously in physical education and organized sports than are preschool children and therefore are more likely to report autonomously about their participation in PA and associated factors. No uniform definition of asthma will be required for inclusion. The definitions of asthma and descriptions of participants with regard to asthma control, severity, comorbidities, and other conditions given in the primary studies will be mapped and reported. Studies including caregivers as research participants who report the psychosocial and socioeconomic factors and issues relating to their children's PA participation will be included. The distinction regarding children/adolescents' own reports and caregivers' reports will also be mapped and reported.

Concept

In this review, we will consider studies that have investigated or explored the psychosocial and socioeconomic factors and issues in relation to the level of and participation in PA.

Context

In this review, we will consider studies including all contexts of PA such as school time, leisure time, time at home, and organized exercise time performed in all and countries.

Types of studies

In this review will consider primary research studies only. In accordance with the aim of the review, we will ensure that all known studies identified by the comprehensive literature search are reported only once and are not double-reported in both primary and review studies.

The quantitative component of the review will consider for inclusion both experimental and epidemiological study designs including randomized controlled trials, nonrandomized controlled trials, quasi-experimental studies, before-and-after studies, prospective and retrospective cohort studies, case-control studies, analytical and descriptive cross-sectional studies, case series, and individual case reports.

The qualitative component of the review will consider studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, action research, and feminist research, and in which children and adolescents with asthma are interviewed and/or observed themselves.

Search strategy

The search strategy aims to trace both published and unpublished studies. A three-step search strategy will be used for the review. An initial limited search of Medline and SPORTDiscus has been undertaken followed by an analysis of the text words contained in the title, abstract, and index terms used to describe each article. Search terms for psychosocial and socioeconomic factors partly covering the concept components did not delimit the search results and were thus excluded. A

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second search using all identified keywords and index terms will then be undertaken across all included databases. The reference list of all identified reports will then be searched, and forward citation searches in ISI Web of Science, Scopus, and Google Scholar will be performed. Studies published in English, unrestricted by the date of publication, will be considered for inclusion.

The databases to be searched will include:

Medline, Embase and PsycINFO via Ovid interface, CINAHL, SPORTDiscus, Academic Search Complete and SOCIndex via EBSCHO Host interface, Social Science Index and ISI Web of Science.

The search for unpublished studies will include:

Primo Central Index, ProQuest Nursing & Allied Health Source, ProQuest Health Management, ProQuest Psychology Journals and ProQuest Health & Medical Complete.

The initial keywords to be used will be:

(adolescen* OR child* OR schoolchild* OR teenage* OR young OR youth*) AND ((exercise* OR inactiv* OR motor activ* OR physical activ* OR play* OR sport* OR training*) ADJ4[1] (amount* OR daily* OR dose* OR duration* OR energy expenditure* frequen* OR hour* OR insufficient* OR intens* OR less* OR level OR minute* OR moderate* OR more* OR participat* OR sufficient* OR vigorous* OR week* OR)) AND asthma*.

Extraction of the results

For review, relevant descriptive information, data, and findings will be extracted and charted from papers included in the review. Appendix 1 presents the initial information that will be extracted. This table may be expanded and adapted during the course of the review, and changes will be reported in the published scoping review report. In line with the review questions, there will be no attempt to contact authors for extraction concerning information not reported.

Presentation of the results

The presentation of results will follow the logical form of the review questions. Identified psychosocial and socioeconomic issues and factors associated with PA level will be classified as intrapersonal, interpersonal, or contextual and will be presented in an overview chart, including the references as a way to identify the study characteristics, population, and design of each study. The instruments identified will be presented in a separate chart, which will report the instrument's construction, and the

[1] *ADJ4 means keywords combined with no more than 4 other words in between. N4/NEAR4 is also used in different interfaces and databases.*

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in-study validity and reliability analyses. A narrative summary will be used to answer each review question and will include commentary on the consensus between studies and gaps in knowledge. In the narrative summaries, if feasible, the key findings will be described in terms of the characteristics of the study population and design.

Conflicts of interest

The authors report no conflicts of interest. The authors alone are responsible for the writing of the study protocol.

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Appendix 1 Extraction chart for papers included in the review.

Author(s), year of publication, and origin/country of study	Aim of the study	Study population (recruitment strategy, gender, age, asthma status and definition)	Design	Outcome assessment (PA level)	Instrument used to assess (1) psychosocial or (2) socioeconomic factors	Key findings: associations between PA level and (1) psychosocial and (2) socioeconomic factors	Key findings: construction and validation of instruments used to asses associations between PA level and (1) psychosocial and (2) socioeconomic factors	Key findings: psychosocial and socioeconomic issues related to participation in PA

Abbreviations: PA; physical activity

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