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School-based obesity prevention programs in rural communities: a scoping review protocol

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Abstract

Objective: The objective of this scoping review is to map the available literature on school-based obesity prevention programs in rural communities.

Introduction: Significant health disparities are associated with childhood obesity, and these disparities disproportionately affect children in disadvantaged communities, such as rural areas. Youth in rural areas are 26% more likely to be obese than youth in urban communities. To combat obesity in children, schools have become an avenue for educating children about the importance of healthy diet and physical activity. Although many school-based obesity prevention programs have been implemented in recent years, more information is needed on programs in rural communities.

Inclusion criteria: This scoping review will consider studies that include children 5 to 18 years of age who are enrolled in elementary, middle or high school in a rural setting and that investigate school-based obesity prevention programs. Studies that include children who are in non-rural areas, who are home-schooled, who are in an alternative setting (e.g. juvenile detention) or who are hospitalized will be excluded. Studies published in English since 1990 will be included.

Methods: Multiple databases will be searched, including PubMed, CINAHL, ERIC, Embase, Scopus and Academic Search Premier. Trials registers and gray literature will also be searched. After screening the titles and abstracts of identified citations, potentially relevant studies will be retrieved in full. Data will be extracted by independent reviewers and presented in a diagrammatic or tabular form, accompanied by a narrative summary.

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There is no conflict of interest in this project.

Keywords

Child health; pediatric obesity; preventive health programs; rural health; school health promotion

Introduction

Pediatric overweight and obesity continue to be a major public health concern in the United States as well as internationally. In the United States, 35.1% of youth 2–19 years of age are overweight (i.e., body mass index [BMI] at or above the 85th percentile for age and sex) and 18.5% are obese (i.e., BMI at or above the 95th percentile for age and sex).¹ According to the World Health Organization (WHO) in 2016, more than 340 million youth 5–19 years of age worldwide were overweight, and more than 124 million were obese.² Despite previous reports that the prevalence of overweight and obesity in youth has become stable or even declined, more recent examination reveals continued increases in prevalence rates of overweight and obesity severity classes in youth.¹

These increases are concerning because of the significant negative impact on physical and mental health.³ Increased weight status in children is associated with increased risk of abnormal glucose tolerance or type 2 diabetes, high blood pressure, nonalcoholic fatty liver disease, polycystic ovary syndrome, and sleep-disordered breathing, as well as later risk for heart disease, stroke and some cancers.^{4,5} In addition, psychosocial difficulties such as peer victimization, symptoms of depression and anxiety, body image concerns and difficulties in school are more common in children who are overweight and obese.^{4,6,7} Taken together, these comorbidities significantly impact the quality of life in youth. Previous research demonstrated that youth with obesity had a quality of life similar to children with cancer who were receiving chemotherapy.⁸ Overweight and obesity are also associated with increased morbidity and mortality⁹ and, not surprising, with increased healthcare costs.^{10–12}

Worldwide, there are significant health disparities associated with childhood obesity that disproportionately impact children from socially and economically disadvantaged communities, such as those in rural areas. Almost 20% of the U.S. population lives in rural areas,¹³ and about 3.4 billion people live in rural areas across the world.¹⁴ However, the definition of rural is ambiguous and is defined by each country.^{15,16} Generally, countries define rural by exclusion; any area that is not urban is considered rural.^{17,18} Many larger developed countries define urban based on total population within a geographical area created by the census. In general, Australia considers bounded localities and rural balance with an approximate population from 200–999 residents as rural,¹⁹ the United Kingdom defines output areas and wards with fewer than 10,000 residents as rural,^{18,20} and the United States considers census blocks with fewer than 2,500 residents as rural.¹⁷ Criteria other than population thresholds are often also considered such as population density, distance from urban areas and land use.¹⁷

People living in designated rural areas are one of the largest medically underserved populations.²¹ Research suggests that youth living in rural areas have a 26% greater chance of being obese compared to those living in urban areas,²² and youth from rural areas may engage in more unhealthy behaviors (such as spending more time in sedentary activities)

than those from non-rural areas.²³ There is also evidence that in some countries, rural communities are becoming more racially and ethnically diverse.²⁴ This may result in an additional health disparity, as there is recent evidence to suggest that prevalence rates of overweight and obesity in racial and ethnic minority youth are increasing, while prevalence rates in non-Hispanic white youth are stabilizing.¹ Thus, racial/ethnic minority youth living in rural areas may be at increased risk of obesity and obesity-related comorbid health conditions.

To combat the obesity epidemic, there is a need for prevention efforts in rural and underserved communities.²² Schools may be one possible avenue for intervening, given that children spend a large amount of time in school each week, many children eat breakfast and lunch at school, and education about healthy nutrition and physical activity can be implemented in academic subjects. In addition, rural community school personnel are often well-respected and viewed as important sources of information by parents.²⁵ Thus, schools may be able to provide parents with general education regarding current healthy lifestyle recommendations for children. The WHO's Commission on Ending Childhood Obesity provided six recommendations for policy makers worldwide, including one recommendation specific to the roles of schools in the fight to combat obesity in youth. The school-specific recommendation is to "implement comprehensive programmes that promote healthy school environments, health and nutrition literacy and physical activity among school-age children and adolescents".^{2(p.XI)} The U.S. Centers for Disease Control and Prevention (CDC) Whole School, Whole Community, Whole Child (WSCC) model²⁶ also emphasizes the role schools play in promoting health in children and adolescents, especially given that health behaviors are easier to modify in youth and can have a more significant impact than attempting to change unhealthy behaviors in adults.²⁶ In recent years, researchers have developed, implemented and evaluated school-based obesity prevention programs focused on healthy diet, increased physical activity, creating a motivating environment and training of teachers, in addition to educational curricula for use²⁷⁻³¹; however, it is unclear what has been implemented in rural communities.

A preliminary search for existing systematic and scoping reviews was conducted to locate literature related to rural school-based obesity prevention programs. The search was conducted using the following databases: PubMed (MEDLINE), CINAHL, *JBIC Database of Systematic Reviews and Implementation Reports*, Cochrane Database of Systematic Reviews, Campbell Collaboration and PsycINFO. Search terms used were school-based AND prevention AND obesity AND rural and limited to reviews. No systematic reviews were identified. The current review is needed to increase understanding regarding the types of school-based obesity prevention programs that have been implemented in rural schools to inform future development of school-based obesity prevention programs in rural communities.

Review objective/questions

The objective of this review is to explore existing literature related to school-based obesity prevention programs implemented in rural communities, to examine and conceptually map the evidence, and to identify any gaps in the literature.

The three questions of this review are: i) What types of school-based obesity prevention programs have been implemented in rural schools? ii) What specific elements/components are found in school-based obesity prevention programs that have been implemented in rural schools? and iii) What outcomes have been reported with the use of school based-obesity prevention programs implemented in rural schools?

Inclusion criteria

Participants

The review will consider studies that include children five to 18 years of age who are enrolled in an institution that provides instruction and teaching of children and includes elementary, middle or high school in a rural setting. Elementary schools are those that generally provide instruction to children in the first four years of instruction and may also include schools that teach children through the first eight years of instruction and self-identify as elementary. High schools generally include grades 9–12 or 10–12. Middle schools usually include grades 5–8 or 6–8. Schools may include those classified as private, parochial or publicly funded. Private schools are defined as schools that are supported by a nongovernmental agency, public schools are free and taxsupported and controlled by a local governmental authority, and parochial schools are defined as a private school maintained by a religious body. Children who are home-schooled or in an alternative setting, such as juvenile detention, or who are hospitalized for prolonged periods will be excluded.

Concept

This review will consider studies about school-based obesity prevention programs implemented in rural schools including, but not limited to, programs focused on nutrition and dietary changes, physical activity or exercise, decreasing screen-time, or mixed nutrition and physical activity. Physical activity is defined as bodily movement produced by skeletal muscle contraction with increased energy expenditure, while exercise, a kind of physical activity, is planned, structured, repetitive movement that is often intentionally aimed at improving or maintaining health or fitness. The school-based programs may be designed and delivered by health professionals, members of a community organization or via educators whose occupation is to teach, but the programs must be delivered in the school setting. Health professionals may be registered dietitians, occupational therapists, physical therapists, public health practitioners, licensed nurses, dentists, physicians, pharmacists, nutritionists, mental health providers (counselors, psychologists) or health educators. Studies that focus on physical fitness as an outcome and those conducted by health paraprofessionals, such as dental hygienists and nursing assistants, will be excluded. Studies with obesity programs delivered to children outside of elementary, middle, or high schools or those offered at community facilities will also be excluded.

Context

The context for this review will include studies conducted in schools in rural settings in any country. Rural is usually defined by each country,^{15,16} and is often defined by exclusion such that any area that is not urban is considered rural.^{17,18} This review will consider any study in

which the authors conducting the study classify the area as rural or the area is designated as rural by the country's census geographic entity.

Types of studies

This review will consider quantitative, qualitative and text and opinion data. This review will consider both experimental and quasi-experimental quantitative study designs published in English including randomized controlled trials, non-randomized controlled trials, before and after studies and interrupted time-series studies. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies, analytical cross-sectional studies and systematic reviews will be considered for inclusion. This review will also consider descriptive observational study designs including case series, individual case reports and descriptive cross-sectional studies for inclusion.

Studies that focus on qualitative data including, but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research and feminist research will be considered.

Studies published in English since 1990 will be included, as the rise in prevalence of childhood obesity began to be recognized during the 1980s in the United States, closely followed by recognized increases in trends in other developed countries. In addition, surveillance data and analysis of rates commonly use the baseline comparator of 1990 or later.^{32–36}

Methods

The Joanna Briggs Institute (JBI) methodology will be used to complete this scoping review.³⁷

Search strategy

The search strategy will aim to find both published and unpublished studies. A three-step strategy will be used and will include electronic and manual searches of reference lists, as well as government or agency websites. The aim is to identify published and gray literature. The initial step included a limited search of PubMed (MEDLINE) and CINAHL and analysis of the text words contained in the title and abstract, and of the index terms used to describe the article. This informed the development of a search strategy, which will be tailored for each information source. The second step will be a search using all keywords and index terms identified in the electronic databases identified below. The third step will be to search reference lists, trial registers and unpublished studies. A proposed search strategy for PubMed is detailed in Appendix I.

Information sources—The databases to be searched include PubMed, CINAHL, ERIC, Embase, Scopus and Academic Search Premier. The trial registers to be searched include Cochrane Register of Controlled Trials and clinicaltrials.gov. The search for unpublished studies will include ProQuest Dissertations and Theses, OpenGrey, Open Access Theses and Dissertations, Directory of Open Access Journals and PapersFirst. Organizational websites

to be searched include the Centers for Disease Control and Prevention and the U.S. Department of Education.

Study selection

Following the search, all identified citations will be imported into EndNote X8 (Clarivate Analytics, PA, USA). Duplicate citations will be removed. Titles and abstracts of citations will be screened by two independent reviewers and compared to the inclusion criteria for the review. Potentially relevant studies will be retrieved in full and their citation details imported into the JBI System for the Unified Management, Assessment and Review of Information (JBI SUMARI; Joanna Briggs Institute, Adelaide, Australia). The full text of selected citations will be assessed in detail against the inclusion criteria for review by two independent reviewers. Reasons for exclusion of full-text studies not meeting inclusion criteria will be recorded and reported in the scoping review. Disagreements that arise between the reviewers at each stage of the study selection process will be resolved through consensus or by the decision of a third reviewer. The results of the search will be reported in full in the final report and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping reviews (PRISMA-ScR) flowchart.³⁸

Data extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using the draft data extraction tool listed in Appendix II. The data extracted will include specific details about the populations, concept, context, defined rural designation and study methods of significance to the scoping review question and specific objectives. The specific details extracted will include the year or period of publication, countries of origin, method of rural designation, type of school-based prevention intervention used, intervention components, duration of intervention, provider of the intervention, study sample and size when reported, types of outcomes and key findings. Any disagreements that arise between the reviewers will be resolved through discussion or with a third reviewer. Authors of papers will be contacted to request missing or additional data where required. The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included study. Modifications will be detailed in the full scoping review report.

Presentation of results

The extracted data will be presented in a diagrammatic or tabular form in a manner that aligns with the objective and scope of this scoping review. The tables and charts will report on the distribution of studies by year or period of publication, countries of origin, method of rural designation, type of school-based prevention intervention used, intervention components, duration of intervention, provider of the intervention, study sample and size when reported, types of outcomes and key findings. Qualitative thematic analysis will be undertaken to provide an overview of the literature. A narrative summary will accompany the tabulated and/or charted results and will describe how the results relate to the review objective and questions. The findings will be discussed as they relate to practice and research.

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Appendix I:: Search strategy for PubMed

1. prevention OR intervention
2. “rural population”[MeSH] OR rural
3. preschool OR schools[MeSH] OR “school based” OR “head start” OR school-based OR “school health services”[MeSH]
4. obes* OR “childhood obesity” OR obesity[MeSH] OR “pediatric obesity” [MeSH] OR “pediatric obesity/prevention & control”[MeSH]
5. teen* OR child OR children OR “school age” OR child[MeSH] OR “child, preschool”[MeSH] OR adolescent[MeSH] OR adolescent
6. 1 AND 2 AND 3 AND 4 AND 5

Appendix II:: Data extraction tool

Author/ year of publication	Location	Country/ designated rural definition	Type of prevention/ intervention	Intervention components	Intervention frequency/ length	Provider	Sample	Type of outcomes	Key findings

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