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Ramírez, A<sup>1</sup>; Rodríguez, D<sup>2</sup>; Ruiz, A<sup>3</sup>; Herrador, M<sup>4</sup>; Chillón, P<sup>5</sup>; Huertas-Delgado, FJ<sup>6</sup>.**ADMINISTRATIVE INFORMATION****Support** - N/A.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202420061**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 February 2024 and was last updated on 13 February 2024.**INTRODUCTION**

**Review question / Objective** The main objective of this systematic review is to investigate and quantify the perceived psychosocial barriers to bicycle use among children and adolescents. Specifically, this review aims to identify, synthesize, and analyze existing evidence on the various psychological, social, and cognitive factors that hinder or influence their engagement in cycling activities. Through a comprehensive examination of literature, including qualitative studies, surveys, and observational research, this review seeks to provide insights into the nature, prevalence, and impact of these barriers on cycling behavior. Additionally, this review aims to explore potential variations in perceived barriers across different demographic groups, geographical regions, and socio-economic backgrounds. By elucidating the psychosocial barriers to bicycle use, this review aims to inform the development of targeted interventions and strategies to promote cycling among children and

adolescents, thereby facilitating their physical activity levels and overall health and well-being.

**Rationale** The global imperative to promote physical activity and mitigate sedentary behavior among youth, as outlined in the World Health Organization's Global Action Plan on Physical Activity, underscores the significance of understanding and addressing barriers to bicycle use among children and adolescents. This plan advocates for transformative measures aimed at fostering enjoyable, accessible, and culturally relevant physical activity experiences to cultivate widespread participation. Cycling, as a form of physical activity, holds particular promise in this regard due to its potential to improve health outcomes and enhance overall well-being. Despite the recognized benefits of cycling interventions for young individuals, there exists a notable gap in our understanding of the psychosocial barriers that hinder bicycle use in this population. To address this gap, conducting a systematic review focused on perceived barriers to bicycle use among children and adolescents

becomes imperative. Such a review aims to provide critical insights into the factors impeding their engagement in cycling activities, thereby informing evidence-based interventions and policies tailored to address these challenges.

Understanding these barriers is crucial for empowering stakeholders, including policymakers, educators, and community leaders, to implement targeted strategies that promote cycling and active transportation among young individuals. By elucidating the psychosocial factors influencing bicycle use, this review seeks to guide the development of interventions that effectively overcome these barriers and promote increased participation in cycling among children and adolescents.

Moreover, addressing perceived barriers to bicycle use holds immense potential for fostering positive health outcomes and enhancing overall well-being among young populations. By facilitating increased participation in cycling, interventions aimed at mitigating psychosocial barriers can contribute to the prevention of chronic diseases associated with sedentary behavior and promote active and healthy lifestyles from an early age.

**Condition being studied** This systematic review encompasses the perceived psychosocial barriers to bicycle use among children and adolescent. These barriers constitute a multifaceted array of factors that influence or impede their participation in cycling activities. Psychological barriers may manifest as fear of injury concerns about traffic safety or negative attitudes towards cycling. Social barriers could include peer pressure against cycling routes, inadequate understanding of road rules or perceived lack of infrastructure for safe cycling. Exploring these perceived barriers comprehensively is essential for gaining insights into the complexities of promoting cycling behavior in young populations. By identifying and understanding these barriers, interventions and strategies can be developed to address the effectively, thereby fostering increased bicycle use among children and adolescents and promoting their physical activity levels, health and well-being.

## METHODS

**Search strategy** Keywords and synonyms were entered in various combinations in the title, abstract or keywords: (parent\* OR child\* OR famil\* OR adolescen\* OR pupil\* OR youth\* OR minority OR student\* OR young\* OR preadolescen\* OR juven\* OR teen\* OR infan\* OR boy\* OR girl\* OR kid\* OR pediatric\* OR puber\* OR minor\* OR preschooler\* AND barrier\* OR bar\* AND bik\* OR e-bik\* OR cycl\* OR bicycl\*).

**Participant or population** Children and adolescents aged between five and seventeen years old.

**Intervention** Studies evaluating perceived barriers to bicycle use among children and adolescents.

**Comparator** Conditions with varying levels of psychosocial barriers to bicycle use, including control conditions with absence or reduction of such barriers.

**Study designs to be included** All study designs, including qualitative studies, surveys, observational studies, and experimental designs, will be considered.

**Eligibility criteria** Inclusion criteria: (1) children and adolescents aged between five and seventeen years old; (2) studies evaluating perceived barriers to bicycle use among children and adolescents; (3) studies examining and quantifying the effects of psychosocial barriers in the context of cycling; (4) all study designs, including qualitative studies, surveys, observational studies; (5) Only studies with full texts written in English will be included, Exclusion criteria: (1) Studies involving populations other than children and adolescents; (2) studies involving children and adolescents with any type of injury, chronic or acute illness will be excluded; (3) studies focusing on physiological or physical conditions not directly related to perceived barriers to bicycle use will be excluded; (4) studies that do not provide relevant insights into psychosocial barriers to bicycle use among children and adolescents will be excluded. This includes articles lacking sufficient detail on perceived barriers or employing methodologies not conducive to understanding psychosocial factors influencing cycling behavior; (5) Studies not written in English will be excluded. Other articles other than original research, such as reviews, letters to editors, trial records, protocol proposals, editorials, book chapters, and conference abstracts, will be excluded from this systematic review.

**Information sources** Electronic databases (PubMed, Scopus, SPORTDiscus, and Web of Science) were searched for relevant publications prior to 15 January 2024.

**Main outcome(s)** Identification and characterization of psychosocial barriers to bicycle use among children and adolescents.

**Additional outcome(s)** None.

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**Data management** Data extraction will be prepared in a Microsoft Excel sheet using the data extraction template from the Cochrane Consumer and Communication Review Group. The Excel sheet will be used to assess inclusion requirements and will be approved for all selected studies. Additionally, the bibliographic manager EndNote version X6 will be used for extracting articles and including or excluding them from the review.

**Quality assessment / Risk of bias analysis** The quality of the studies to be included will be judged by two independent reviewers using the Cochrane Collaboration's risk of bias tool, consisting of seven elements: generation of random sequence, allocation concealment, blinding of participants and personnel, blinding of outcome assessors, incomplete outcome data, incomplete outcome reporting, and other biases. Low, uncertain, and high risk of bias will be graded as levels of study quality, respectively. Additionally, we will use the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to rate the findings as described in the GRADE handbook. Comparisons were initially rated as high-quality evidence and will decrease accordingly based on study limitations, imprecision, inconsistency, directionality, and publication bias.

**Strategy of data synthesis** The data synthesis strategy for this systematic review involves categorizing psychosocial barriers into psychological, social, and cognitive domains, followed by thematic analysis to identify recurring patterns. Systematic data extraction will capture key variables such as study characteristics and perceived barriers, facilitating a comprehensive overview. A narrative synthesis will integrate findings to develop a coherent narrative, while critical appraisal within existing literature will ensure rigor and transparency. This approach enables a thorough examination of psychosocial barriers' impact on cycling behavior in children and adolescents, enhancing understanding of factors influencing active transportation choices in this population.

**Subgroup analysis** Include age (children vs. adolescents), sex (male vs. female), previous cycling experience (experienced vs. inexperienced), and fitness status (fit vs. unfit).

**Sensitivity analysis** In this systematic review focusing on perceived barriers to bicycle use in children and adolescents, a sensibility analysis will be conducted to evaluate the impact of individual studies on the overall findings. This analysis will

assess whether the results may be influenced by factors such as low methodological quality studies, unpublished work, or studies that do not strictly adhere to the selection criteria. By examining the potential biases introduced by these factors, the validity and reliability of the synthesized findings will be ensured. The presentation of sensitivity analysis results will provide transparency regarding the robustness of the synthesized results in relation to the decisions made during the review process, allowing readers to assess the solidity of the conclusions drawn from the systematic review.

**Language restriction** N/A.

**Country(ies) involved** Spain.

**Keywords** psychosocial barriers; bicycle; children; adolescents; perceptions; cycling.

**Dissemination plans** N/A.

#### **Contributions of each author**

Author 1 - Ana María Ramírez Osuna - Performed the search and methodological search and made the synthesis of results. Wrote and revised the manuscript.

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