

# INPLASY PROTOCOL

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**Conflicts of interest:**  
There was no conflict of interest in our study.

## Risk factors and improvement strategies in myopic adolescents: a scope review

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**Review question / Objective:** The purpose of our scope review is examining the scope of the myopia study to determine the future research direction, address a wide range of myopia issues, include all available research (regardless of study design) and provide a description of the available evidence on risk factors and improvement strategies in myopic adolescents.

**Information sources:** Following databases, before November 2020 will be searched: Chinese National Knowledge Infrastructure Database, VIP Chinese Science and Technique Journals Database, Wanfang Database, Pubmed, Cochrane, and Embase. The clinical.trials.gov and Chinese clinical trial registries were searched to find a clue for relevant published and unpublished studies to complement literature searching from databases. If unpublished relevant studies could be found, we will contact the corresponding person to try to obtain these data. Although we do not find similar studies in the database, this is a necessary process to ensure that the obtained literature is comprehensive. We will search multiple databases to minimize the risk of missing important literature. We will also researched the grey literature and the reference lists of all studies.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 December 2020 and was last updated on 03 December 2020 (registration number INPLASY2020120016).

### INTRODUCTION

**Review question / Objective:** The purpose of our scope review is examining the scope of the myopia study to determine the future research direction, address a wide range of

myopia issues, include all available research (regardless of study design) and provide a description of the available evidence on risk factors and improvement strategies in myopic adolescents.

**Condition being studied:** Myopia is a major health concern leading to important public health and economic problems. In the past few decades, the degree of myopia in East Asia and Southeast Asia has increased dramatically. More than 80% of young people are troubled by myopia. In countries with highly developed economies, the incidence of myopia is more prevalent because of high-intensity education and shorter outdoor time. High myopia not only affects the quality of life of individuals but also causes serious social and economic losses. The National Health and Nutrition Survey (NHANES) reported that the annual direct costs of myopia ranged from \$3.9 to \$7.2 billion in the United States. Although environmental and genetic factors are considered important causes of myopia, there is no consensus on the etiology of myopia. Further vision challenges are brought by myopia. The risk of pathological eye changes (such as cataracts, glaucoma, retinal detachment, and myopic macular degeneration) may increase due to high myopia. Thus, strategies to improve myopia also urgently need to be integrated and analyzed.

## METHODS

**Participant or population:** Myopic adolescents.

**Intervention:** All interventions to improve adolescent myopia will be included.

**Comparator:** Not applicable.

**Study designs to be included:** The type of study design will not be limited. Epidemiological studies will also be included.

**Eligibility criteria:** All studies which aimed at exploring the risk factors and improvement measures for myopia adolescents were included in our article.

**Information sources:** Following databases, before November 2020 will be searched: Chinese National Knowledge Infrastructure Database, VIP Chinese Science and Technique Journals Database, Wanfang

Database, Pubmed, Cochrane, and Embase. The clinical trials.gov and Chinese clinical trial registries were searched to find a clue for relevant published and unpublished studies to complement literature searching from databases. If unpublished relevant studies could be found, we will contact the corresponding person to try to obtain these data. Although we do not find similar studies in the database, this is a necessary process to ensure that the obtained literature is comprehensive. We will search multiple databases to minimize the risk of missing important literature. We will also researched the grey literature and the reference lists of all studies.

**Main outcome(s):** The risk factors and improvement measures for myopia adolescents.

**Data management:** Noteexpress will be used to manage the included A pre-designed pilot-tested topic collection form will be produced. Three pairs of pre-trained authors independently will extract the included articles and perform two-person checks. The extracted information include the information of studies (the first author, the country of first author, funding, the publication date, the study design), the information of adolescents (gender, age, the country of adolescents, the sample of adolescents), the risk factors, and the improvement strategies.

**Quality assessment / Risk of bias analysis:** Different risk assessment tools for bias will be applied to different types of research. The Cochrane Risk of Bias tool will be used to assess the risk of randomised controlled trials. MINORS will be used to assess the risk of non-randomised controlled trials. Newcastle-Ottawa Scale (NOS) will be used to assess the risk of case control and cohort studies. The Agency for Healthcare Research and Quality (AHRQ) scale will be used to evaluate cross-sectional studies.

**Strategy of data synthesis:** Group discussions will be conducted when researchers discover new risk factors and improvement strategies. When more than

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2/3 of all members of the researchers (JY Bian and T Sun, ZY Chen, CZ Li and JW Song) agree, the new factors or strategies will be added in the list. The process of subject extraction will be used to iteratively develop a list of the risk factors and potential strategies. The extracted subject will be categorized and induce to investigate which are the risk factors and strategies.

**Subgroup analysis:** If the number of studies permits, the following potential sources will be conducted in subgroup analyses: The design of study; Country; Intervention; Gender.

**Sensibility analysis:** Sensitivity analysis is not applicable in this study.

**Country(ies) involved:** China.

**Keywords:** risk factors; strategies; scoping review; myopic adolescents.

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