


# BMJ Open Strategies and best practices that enhance participation in regular physical activities among undergraduate university students: a systematic review protocol

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## ABSTRACT

**Introduction** Physical activity has health benefits, including lowered obesity, diabetes and hypertension levels. However, participation in regular physical activities among undergraduate students is declining and, instead, physical inactivity sets the path for sedentarism. Strategies and best practices used to enhance participation in regular physical activities among undergraduate students are beneficial for mitigating sedentariness and promoting healthy lifestyles. Therefore, this study aims to present a systematic review protocol that focuses on the strategies and best practices used to enhance participation in regular physical activities among undergraduate university students.

**Methods and analysis** Quantitative, qualitative and mixed-methods design studies will be included and appraised. The following databases will be searched: PubMed, Science Direct, Academic Search Complete, ERIC, Web of Science, SAGE, CINAHL Plus and SPORTDiscus. Database searches on physical activities among undergraduate university students will be generated to answer the following research question: What are the strategies and best practices used to enhance participation in regular physical activities among undergraduate university students? Two independent reviewers will conduct the primary screening of articles from 2011 to 2022. A third reviewer will be consulted to solve any disagreements. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines, and study quality will be assessed by the Johanna Biggs Institute checklist. Results from the selected articles will be extracted, summarised and categorised based on the type of study participants, study design and setting, and methodological quality. A narrative description will synthesise the findings to answer the objectives of this review.

**Ethics and dissemination** Ethics approval for this study was granted by the Humanities and Social Science Research Ethics Committee at the University of the Western Cape, reference number: HS21/10/24. The results will be disseminated through a peer-reviewed publication and conference presentation.

## INTRODUCTION

The WHO (2020) recommended guidelines indicate that adults over the age of 18 years

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A strength of this review is that this systematic review protocol follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocol guidelines.
- ⇒ A further strength is that this review will make use of eight electronic databases in the search strategy for a robust analysis.
- ⇒ Additionally, qualitative, quantitative and mixed-methodology research will be included in this review.
- ⇒ A limitation of this study is that restricting included papers published from 2011 onward could potentially exclude key articles related to the objective of this review.
- ⇒ A further limitation of this review is that only English language articles will be included, which may lead to the exclusion of some relevant articles.

should engage in at least 150 min of moderate-intensity or 75 min of vigorous-intensity physical activity throughout the week. Globally, physical activity among university students is a catalyst for habitual physical activity in adulthood.<sup>1</sup> Physical activity is important for the holistic well-being of university students, not only does regular participation benefit physical health, but has a positive impact on their academic career as well as their psychological and social development throughout their university journey.<sup>2</sup> Although university students are aware of the benefits of regular physical activity, previous literature indicates that the majority of students do not engage in a level of physical activity that is sufficient enough to maintain a healthy lifestyle.<sup>3 4</sup> Research suggests that a large student population in the university environment engages in low levels of physical activity, with about one-third of those who were previously active,

becoming inactive or less active, during their first year at university.<sup>5</sup>

A previous systematic review focusing on worldwide trends in insufficient physical activity from 2001 to 2016 among adults 18 years and older<sup>6</sup> indicated that the global physical activity target set by the WHO to reduce physical inactivity by 10% by 2025 has been too slow and is not progressing. Participating in insufficient amounts of physical activity is a serious health problem among university students, thus, creating and implementing early intervention activities are essential for establishing behavioural change.<sup>7,8</sup> This evidence suggests that university students need effective programmes for engaging in physical activities that are tailored to provide health gains. Equally important, it may be vital to include the students' activity preferences in creating effective physical activity programmes that are potentially self-sustaining.<sup>7</sup> Programmes to improve physical activity participation among university students should be further developed<sup>9,10</sup> and evaluated across university systems in various low-income, middle-income and high-income countries.<sup>11</sup> Opportunities for physical activity participation may include the promotion of healthy routines, institutional organisation of physical activity classes and ensuring the availability of facilities and resources for students.<sup>9</sup>

A systematic review conducted by Maselli *et al* reported limited evidence regarding the immediate and the long-term effects of interventions to promote physical activity among university students and indicated the need for further research.<sup>9</sup> More literature reporting on the strategies used to promote physical activity is needed, especially focusing on the methodology of the interventions.<sup>9</sup> Furthermore, García-álvarez and Fubel also highlighted the importance of using the environment approach at universities for the implementation of physical activity programmes. Universities are an ideal setting to promote healthy lifestyle behaviours, in terms of facilities and opportunities, as well as involving university personnel (especially in departments linked to health disciplines). Therefore, tertiary institutions are the ideal settings for implementing and evaluating physical activity interventions.<sup>8</sup>

Understanding the factors that promote regular physical activity participation among undergraduate university students remains scarce.<sup>7,10</sup> However, before student-tailored physical activity programmes can be developed, research is needed to understand which strategies and practices are suitable to enhance physical activity among undergraduate university students. Considering the gap that exists in the literature, this proposed systematic review aims to synthesise existing literature about the strategies and best practices that enhance participation in regular physical activities among undergraduate university students. Strategies take into consideration the plan for reaching an aim, such as enhancing physical activity among students, whereas best practices focus on the intervention or procedure found to be the most effective in enhancing physical activity participation

among undergraduate university students. Within this study, these terms will be used to provide a holistic view of previous research found to be effective in enhancing undergraduate university student participation in physical activity. This could provide directions for future research with regard to the conceptualisation and administration of effective physical activity interventions in tertiary institutional settings.

### Research aims

The aim of the study is to present a protocol for a systematic review that focuses on the strategies and best practices used to enhance participation in regular physical activities among undergraduate university students.

## METHODS AND DESIGN

### Patient and public involvement

As this research will be based on previously published data, there will be no patient and public involvement in the design, interpretation or dissemination of the findings.

### Population

Undergraduate students, males and females aged 18 years and older, registered at university or higher education institutions will be considered for this review. The population is not restricted to any geographical location, thus, papers obtained globally will be examined.

### Study design

To determine the strategies and best practices that enhance physical activities among undergraduate university students, this systematic review will consider quantitative research (such as longitudinal, cohort and random control trials), qualitative research (such as observational studies) and mixed-method research (such as explanatory and exploratory designs). The inclusion and exclusion criteria are described in [table 1](#).

### Search strategy

A comprehensive search strategy will be formulated by reviewing search terms used in previous systematic reviews of physical activity.<sup>12-14</sup> The search strategy will be modified, where necessary, according to the database (online supplemental appendix 1). An example of the key terms within the PubMed database can be found in [table 2](#).

The following electronic databases, along with their reasoning, will be searched:

1. PubMed: this database provides free access to the MEDLINE database of indexed citations and abstracts to medical, healthcare, and preclinical sciences journal articles.
2. Science Direct: this database will be selected, because it is considered one of the largest scientific databases currently available.
3. Academic Search Complete: is the world's most valuable and comprehensive scholarly, multidisciplinary, full-text database, with more than 8500 full-text peri-

**Table 1** Summary of inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Peer-reviewed articles.	Non-peer reviewed articles.
Full-text journal articles.	Articles not available in full text.
Participants who are undergraduate university students aged 18 years and older.	Participants not registered at university or postgraduate students at university.
Articles focusing on physical activity and exercise.	Articles focusing on physical education.
Articles conducted in English.	Articles not published in English.
Articles published from 2011 to 2022.	Articles published before 2011.
Articles published worldwide.	Unpublished journal articles.

odicals, including more than 7300 peer-reviewed journals.

4. ERIC: contains more than 2200 digests along with references for additional information, and citations and abstracts from over 980 educational and education-related journals.
5. Web of Science: consists of bibliographic citations of multidisciplinary areas that cover the various journals of medical, scientific and social sciences, including the humanities.
6. CINAHL Plus: provides a robust collection of full-text nursing and allied health journals.
7. Sage: provides access to 560 journals, including the social sciences, science and medicine.
8. SPORTDiscus: this database is the leading resource for sports-specific and medicine-specific research, providing access to 289 journals.

Grey literature will be sourced from methods, such as reference checking and contacting experts in the field of physical activity. Additionally, grey literature will be searched by entering terms in OpenGrey. This multidisciplinary European database is an open access search engine which provides information on grey literature, providing access to 700 000 bibliographical references.

### Study selection

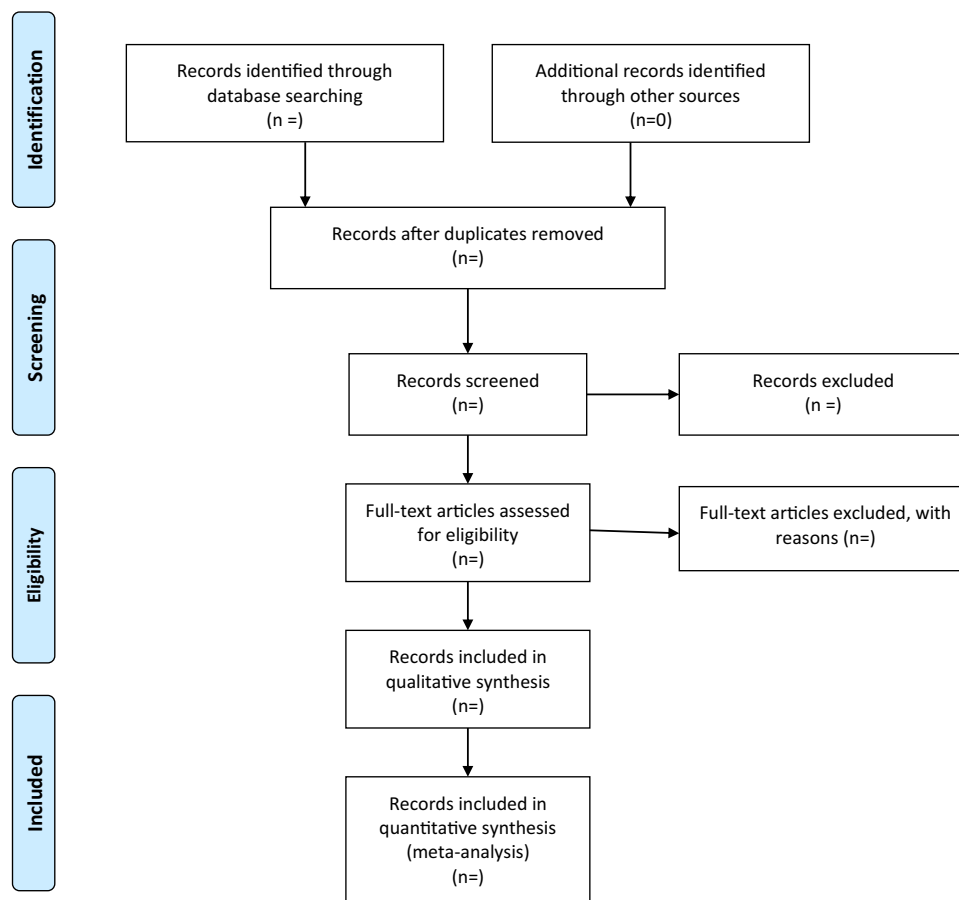
Quantitative, qualitative and mixed-method studies will be independently assessed by two reviewers (CJ and SO) and reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist 2020 (online supplemental appendix 2)<sup>15</sup> and flow diagram (figure 1).<sup>16</sup> Studies will then be assessed for their quality using the Johanna Biggs Institute (JBI) critical appraisal checklist for systematic reviews and research synthesis (online supplemental appendix 3).<sup>17</sup> Any disagreements that arise between the two reviewers will be resolved by a third senior reviewer (LL). The screening process will make use of the Mendeley software package.

### Quality assessment

The two reviewers (CJ and SO) will independently check each selected article. All selected articles will be judged for their quality based on the JBI critical appraisal checklist for systematic reviews and research synthesis (online supplemental appendix 3).<sup>17</sup> This checklist consists of 11 questions to guide the appraisal of the systematic review. Each question will be answered as 'yes', 'no', or 'unclear'. Not applicable 'NA' is provided as an option and may be appropriate in rare instances. The overall appraisal of the article will then

**Table 2** Example of key terms for the search strategy in PubMed

Concept	Search term(S)
Physical activity	("exercise"[MeSH Terms] OR "exercise"[All Fields] OR ("physical"[All Fields] AND "activity"[All Fields]) OR "physical activity"[All Fields]) NOT ("physical education and training"[MeSH Terms] OR ("physical"[All Fields] AND "education"[All Fields] AND "training"[All Fields]) OR "physical education and training"[All Fields] OR ("physical"[All Fields] AND "education"[All Fields]) OR "physical education"[All Fields])
Undergraduate	"undergraduate"[All Fields] OR "undergraduate s"[All Fields] OR "undergraduated"[All Fields] OR "undergraduates"[All Fields]
University student	("universiti"[All Fields] OR "universities"[MeSH Terms] OR "universities"[All Fields] OR "university"[All Fields] OR "university s"[All Fields]) AND ("student s"[All Fields] OR "students"[MeSH Terms] OR "students"[All Fields] OR "student"[All Fields] OR "students s"[All Fields])
Strategies	"strategie"[All Fields] OR "strategies"[All Fields] OR "strategy"[All Fields] OR "strategy s"[All Fields]
Best practices	"practice guidelines as topic"[MeSH Terms] OR ("practice"[All Fields] AND "guidelines"[All Fields] AND "topic"[All Fields]) OR "practice guidelines as topic"[All Fields] OR ("best"[All Fields] AND "practices"[All Fields]) OR "best practices"[All Fields]



**Figure 1** Flow diagram for study selection based on the PRISMA guidelines. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

be selected as ‘include’, ‘exclude’ and ‘seek further information’. Disagreements between the two reviewers regarding quality assessment will be resolved by a third senior reviewer (LL).

### Data extraction

The two reviewers (CJ and SO) will independently extract the data from each of the selected articles included in the review. A Microsoft Excel spreadsheet will be used as an extraction form (online supplemental appendix 4) for the systematic review and will contain data such as:

1. Study details: author/s, date of publication study title, study design, study period and study purpose.
2. Study population: country/geographical location of study and sample size.
3. Characteristics of study population: age and sex.
4. Data: data collection measures such as the frequency, intensity, time and type (FITT) principle.
5. Study results: main findings, implications and conclusions.

Articles will be managed and stored in a referencing manager known as Mendeley. Duplicates will be removed by one reviewer (CJ). Disagreements between the two reviewers regarding data extraction will be resolved by a third reviewer (LL).

### Outcomes

The primary outcome will be to assess participation in regular physical activity. This will be determined through strategies, such as the FITT principle, for the enhancement of physical activities among undergraduate students. The secondary outcomes will include exploring the best strategies and practices of physical activity participation.

### Risk of bias

Critical appraisal of articles will be performed using the JBI checklist<sup>17</sup> developed to assess the methodological quality of each article included in the review. The full texts will be appraised by two independent researchers (CJ and SO). Disagreements between the two reviewers regarding the methodological quality of the articles will be resolved by a third senior reviewer (LL).

### Study status

This study is expected to commence in January 2023 and be completed by June 2023.

### Analysis

#### Descriptive analysis

A narrative synthesis of the outcomes of the selected studies will be presented in the final review. This method will be used to investigate any similarities and/



or differences between the findings of different studies. The narrative synthesis will be presented in the form of text and tables, to summarise the results of the included studies. The following framework, consisting of four elements, will guide the narrative synthesis:

1. Generating opinions of strategies and best practices to enhance physical activities of undergraduate students.
2. Developing a preliminary synthesis of findings.
3. Exploring relationships between studies.
4. Assessing the robustness of the synthesis.

### Meta-analysis

Meta-analysis of data will be conducted on relevant quantitative studies, if appropriate. If meta-analysis is not possible, a narrative synthesis will be conducted as the primary mechanism of data synthesis.

## DISCUSSION

Despite the health benefits of physical activity, many studies concluded that participation patterns in regular physical activity among university students are not sufficient enough to experience all the potential benefits associated with physical activity.<sup>18–20</sup> To the best of the author's knowledge, no conclusive evidence exists pertaining to the enhancement of participation in regular physical activities among undergraduate university students. This review will provide a comprehensive summary of the current evidence of strategies used to enhance participation in regular physical activity of undergraduate university students globally. The process of conducting this review will be divided into four sections: identification, study inclusion, data extraction and data synthesis.

Although we have developed this protocol according to the highest criteria for this type of research, including validated tools such as the PRISMA guidelines and the JBI checklist, some limitations may exist. First, research conducted in languages other than English will not be covered, because of language barriers, thus a language bias may exist. Second, it is possible that we may miss relevant studies due to various synonyms of key concepts, therefore, we will try to avoid this likelihood by consulting with a specialist librarian to develop a broad search strategy. Additionally, experts in the field of physical activity and undergraduate university students will be consulted to ensure that important studies are not missed. Lastly, a limitation of this study is that restricting included papers published from 2011 onward could potentially exclude key articles related to the objective of this review. The broad inclusiveness of the current systematic review, such as using eight electronic databases and including studies from qualitative, quantitative and mixed-method designs, increases the potential and generalisability of the results.

This review is expected to make a significant contribution to the international body of literature and thus

the results of this review will be beneficial to universities and students, policy makers and stakeholders. The results of this systematic review will provide comprehensive and rigorous evidence regarding which type of strategies and best practices have been investigated for enhancing physical activity levels among undergraduate university students. Furthermore, the outcomes obtained from this review will assist policymakers in developing strategies to enhance the health and well-being of undergraduate students (young adults) in South Africa and globally. Furthermore, this review may allow the identification of gaps in the literature thus this information will be useful for future research initiatives.

### Ethics and dissemination

Ethics approval for this study has been granted by the Humanities and Social Sciences Research Ethics Committee at the University of the Western Cape, reference number: HS21/10/24.

The findings from this systematic review will be written using the PRISMA guidelines. The results will be disseminated by the publication of the manuscript in a peer-reviewed journal and as conference presentations.

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**Contributors** CJ and LL designed the systematic review protocol and prepared the first draft. The study selection will be independently assessed by CJ and SO. Quality assurance, data extraction and risk of bias will be assessed by CJ and SO. All disagreements will be resolved by LL. LL, SO and NR reviewed and revised the protocol drafts. All authors read and approved the final manuscript. All authors have approved the publication of the protocol.

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