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Evaluation of the utility of group-based physical activity among university students: a systematic review protocol

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ABSTRACT

Introduction Sedentary behaviours are a prevalent issue among university students worldwide. The negative impact of low physical activity (PA) levels among university students on mental and physical health is well-documented. Regular PA is linked to numerous health benefits and protects against non-communicable diseases. While group-based physical activity (GBPA) interventions show promise, their effectiveness in increasing PA levels among university students remains uncertain. This review aims to identify, evaluate and elucidate the key determinants of successful GBPA interventions tailored to this population.

Methods and analysis We will search articles from PubMed, Web of Science, SPORTDiscus via EBSCOhost, Africa-Wide, PsycInfo and Cumulative Index to Nursing and Allied Health Literature. We will perform article screening, data extraction and quality assessment of eligible studies in duplicate. The risk of bias in individual studies will be assessed using the Cochrane Collaboration tool for randomised control trials, Risk Of Bias In Non-randomised Studies - of Interventions for non-randomised interventional studies and Risk of Bias in Non-randomised Studies - of Exposure. We will conduct a narrative synthesis of the findings. If there is homogeneity of primary outcomes, we will perform a meta-analysis to appraise evidence across studies. The Grading of Recommendations Assessment, Development and Evaluation will be used to synthesise the quality of evidence across studies.

Ethics and dissemination Ethical approval is not required for this systematic review protocol; we will analyse published primary studies. Findings will be published in a peer-reviewed journal and presented at conferences.

PROSPERO registration number CRD42024553196.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The systematic review will be reported using a robust framework.
⇒ Article screening and data collection will be done in duplicate to increase the review's internal validity.
⇒ Individual studies will be critically appraised.
⇒ We will only include articles published in English; this may introduce language bias.

INTRODUCTION

Non-communicable diseases (NCDs) are the leading cause of death and disability globally. The burden of NCDs is exponentially increasing, with hypertension and diabetes accounting for 30% of the disease burden by the year 2030.[1] Physical inactivity is a salient NCD risk factor, accounting for 7.2% of all deaths globally.[2 3] Regular physical activity (PA) is associated with multiple benefits and is protective against NCD risk.[3] For instance, regular PA is associated with a reduced risk of diabetes, hypertension, obesity, depression and metabolic, heart and cardiac diseases.[4 5] Consequently, the WHO recommends that all adults engage in 150–300 min of moderate-intensity PA per week for the realisation of optimal health benefits.[6] Unfortunately, only 27.5% of the global adult population is sufficiently physically active.[7] The burden of physical inactivity is even more significant in young adults. For example, the global prevalence of physical inactivity among university students is highly variable and in the range of 40–60%.[8] Among Australian and Malaysian undergraduate students, the prevalence of physical inactivity was found to be 65% and 41%, respectively.[9] Low PA in university students is associated with depression, poor physical health and low sleep quality, among other negative impacts.[10–13] Importantly, low PA engagement in young adulthood has potential spill-over into adulthood with greater NCD risk and greater societal economic costs.[14 15] It is, therefore, imperative to promote PA in young adults, particularly among college/university students.

Understanding the perceived barriers and facilitators to regular PA is fundamental in promoting regular PA engagement in any population. In university students, systematic reviews have consistently demonstrated a lack of social support, resource limitations (eg, lack of equipment, safe places and fitness trainers), lack of flexible timetables and time pressure as salient barriers to PA engagement.[8 16–18] Given these potential barriers, exploring innovative ways of improving PA in university students is essential. Group-based physical activity (GBPA) interventions show potential promise in improving PA in university students.[19] GBPA encompasses any form of PA or fitness activities, whether formal or informal, conducted in a group setting.[20] This involves two or more individuals with shared goals, such as improving PA or fitness, specifically tailored to the characteristics of a particular group.[21] GBPA includes leisure and structured physical activities such as dance classes (eg, Zumba), yoga, walking, cycling, jogging or organised team sports like hockey, netball and soccer. GBPA can also be conducted virtually via telephone, app-based sessions and virtual dance classes.[22] GBPA's unique characteristics, such as engagement with others, which leads to increased connectedness, increased social support and reduced loneliness, are desirable attributes that promote PA engagement among university students.[19 20 23] By exercising in a group, individuals can recognise themselves, interact and connect with other members based on self-categorisation theory.[20] GBPA allows individuals to explore their identities while engaging and interacting. This process fosters collective behaviours and enhances adherence to PA.[20] Previous systematic reviews and meta-analyses have demonstrated that, compared with individual PA regimens, GBPA interventions are associated with improved self-reported PA levels, social support, motivation, enjoyment and adherence to PA regimens.[19 24–26] For instance, in a review which included studies done on Australian adults, engaging in GBPA was protective against depression.[26] Another review showed that in older adults, GBPA decreases social isolation, improves enjoyment and PA adherence.[25] Also, in a cross-sectional study conducted on American college students (n=490), participation in group exercise was associated with lower anxiety.[27] Although GBPA shows promising results, its utility in university students is unknown. Previous systematic reviews have mainly focused on the utility of individualised PA regimens in university students.[9–13 18 28 29] Although evidence from the individualised PA regimens is crucial, it may not be transferrable for the understanding of the utility of GBPA interventions.[19] Besides exploring effectiveness, it is essential to understand the active ingredients of GBPA, including identifying for whom and under what conditions GBPA can be effective.[19] A limited understanding of what makes GBPA effective poses a challenge in blunting the potential utility of the intervention. Thus, this systematic review aims to:

1. Identify and characterise group-based interventions applied to university students.

2. Determine the effectiveness of GBPA interventions across health, social and academic outcomes among university students.
3. Outline factors associated with the effectiveness of GBPA interventions in university students.
4. Identify the essential active ingredients of effective GBPA interventions in university students, including dose, frequency, safety, delivery agent and location, among other contextual factors.

Methods and analysis

This protocol will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P) guidelines[30] (see online supplemental file 1). The review is registered on the International Prospective Register of Systematic Reviews (PROSPERO)—ref: CRD42024553196.

Eligibility criteria

We will include studies evaluating the utility of GBPA interventions in university students across all settings. We will include experimental designs, that is, randomised and non-randomised control trials, observational studies (cohort and cross-sectional studies) and mixed-methods studies. Due to time and financial limitations, we will only include peer-reviewed full-text articles published in English. Excluded from our review are review articles (systematic, rapid, narrative and scoping), study protocols and studies involving participants under 18 years old (table 1).

Information sources

We will search bibliographic data from the following eight electronic databases: PubMed, Web of Science, SPORTDiscus via EBSCOhost, Africa-Wide, PsycINFO, Cochrane Library, Embase and the Cumulative Index to Nursing and Allied Health Literature (CINAHL). Additionally, we will employ three complementary search methods to ensure that the identification of the literature is as complete as possible. First, we will search study registries, for example, clinical trial databases, and follow-up with corresponding authors via email to increase information saturation. Second, the researchers will hand-search the reference lists of included articles and any other reviews

Table 1 Eligibility criteria

Population	University students
Intervention	Group-based physical activity
Comparison(s)	Individual physical activity, no physical activity
Outcomes	Physical activity
Time	Any
Study designs	Randomised control trials, non-randomised control trials, cohort, cross-sectional, mixed methods and qualitative studies.
Setting	► University campuses ► Any country
Language	English

Table 2 Cumulative Index to Nursing and Allied Health Literature search strategy

Search number	Construct	Alternative terms/search string
1	Physical activity	((((physical activity) OR (exercise) OR (fitness) OR (physical exercise) OR (workout*) OR (work-out) OR (physical exertion) OR (training) OR (keeping fit) OR (sports) OR (fitness) OR (exercise class) OR (exercise class) OR (aerobics) OR (strengthening exercises) OR (yoga)) OR ((physical activity) OR exercise OR fitness OR (physical exercise) OR workout OR work-out OR (physical exertion) OR training OR (keeping fit) OR sports OR fitness)) AND (group OR (group-based)))
2	Group-based physical activity	(group physical activity) OR (group exercise*) OR (group fitness) OR (group physical exercise) OR (group workout*) OR (group work-out) OR (group physical exertion) OR (group training) OR (group keeping fit) OR (group sports) OR (group fitness) OR (exercise class) OR (group exercise class) OR (group aerobics) OR (group strengthening exercises) OR (group yoga)
3	University students	(university students) OR (college students) OR (university learners) OR (undergraduate students) OR postgraduate* OR (tertiary students)

examining overlapping core constructs. Last, we will use forward citation tracking for the seminal GBPA publications that are included. Forward citation tracking will be carried out using the following sources: Scopus, Web of Science and Google Scholar. Databases will be searched for English language articles published from the inception of the information source to the current date.

Search strategy

The key search terms for this review are 'group-based physical activity' and university students. Table 2 outlines an example search strategy for the CINAHL database. Articles will be identified using search strings consisting of the keywords and alternative terms using the Boolean logic operators 1 AND 2 AND 3. The search strategy will be adapted for other databases as necessary.

Data management

The searches will be reported according to the PRISMA guidelines, that is, lists of databases searched, dates searched (original and updated) and the strategies used per database. The search audit trail will be saved on the principal researchers' database user accounts; screenshots will also be taken and stored on a shared Microsoft Excel spreadsheet for backup. All searches will be exported to Mendeley Software for first-level deduplication. Afterwards, articles will be uploaded to Rayyan Software,[31] an internet-based software for secondary deduplication and screening by title and abstract. All duplicates missed by Rayyan software will be manually removed in Microsoft Excel and SPSS.

Selection process

We will conduct a quality assurance training followed by a pilot test of our procedure. All research team members will independently screen a common pool of 10 articles by title and abstract before convening to discuss each article and clarify any doubts about eligibility. Quality assurance training will be stopped on attainment of a modified Kappa ≥0.8. We will then split the remaining articles into four datasets and screen each set independently by title and abstract. Individual researchers will record the reason(s) for excluding an article on all articles in this

systematic review. All data screening will be done in duplicate within the four teams: team 1 (RS and IHM), team 2 (IM and MM), team 3 (LM and HM) and team 4 (PS and PMC). Any eligibility conflicts will be resolved through consensus discussions with senior researchers (DC and JD), making the final decisions in the event of an impasse. All included articles will proceed to full article retrieval, which will be done by SM, BKS, JD and TDT. A request for the full-text article will be sent out to corresponding authors via email when only the abstract or metadata of an article are available online. Follow-up emails to these authors will be sent every other week for a month. We will exclude all articles from data extraction where there is no correspondence after the stipulated month.

Data collection process

Data from all retrieved articles will be extracted using a standardised electronic form created on the Kobo-Collect platform. We will draw a sample of at least five articles to pilot all sections of our data extraction form. A single round of quality checking and debriefing of our procedure will precede full-scale data extraction to ensure consistency across the research teams. Data will be extracted in pairs by the research team: ARH, BKS, LM, RS, PMC, HM, PS, MM, IM, IHM, SRD and TDT. Senior researchers (DC and JD) will oversee all aspects of data extraction, including addressing emerging issues.

Data items

First, we will collect data on study characteristics such as the author's name, country, year of publication, study design, sample size, inclusion and exclusion criteria and response rates. Next, we will use the Template for Intervention Description and Replication (TIDieR) checklist to describe the GBPA interventions identified. The TIDieR checklist summarises the who, what, where, when and why when describing interventions used in reported studies.[32] For this study, we will use the TIDieR checklist to describe intervention characteristics such as theoretical framework, format, delivery agent, location, delivery agent, dosage, intensity and implementation fidelity, among other pertinent descriptors.[32] Next, we

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will use the Consolidated Framework for Implementation Research (CFIR), a deterministic implementation science framework that systematically appraises intervention implementation, including mapping the barriers and facilitators associated with implementing GBPA interventions in university students.[33] The CFIR assesses five domains that may influence the implementation of an intervention, that is, characteristics of an intervention, inner setting, outer setting, characteristics of individuals and the process of implementation.[33]

Outcomes and prioritisation

The primary outcome will be the clinical effectiveness of GBPA interventions in increasing PA levels and other biopsychosocial outcomes in university students. The review's secondary outcomes are active ingredients, barriers to and facilitators of implementing GBPA interventions in university students.

Risk of bias in individual studies

Critical appraisal of all included studies will be conducted to evaluate the quality of evidence by assessing the risk of bias (RoB). The Cochrane Collaboration tool[34] and the Risk Of Bias In Non-randomised Studies-of Intervention tool will be used to assess RoB in randomised and non-randomised-control trials, respectively.[35] The Risk of Bias in Non-randomised Studies-of Exposure will be used in assessing the RoB in observational studies (eg, cross-sectional and cohort studies).[36] The Joanna Briggs Institute Critical Appraisal Checklist for Qualitative research will be used in qualitative studies or qualitative components of the mixed methods studies included in the review.[37] The RoB assessments will consist of methodological considerations, including sequence generation allocation concealment, blinding, incomplete outcome data and selective outcome reporting, among other pertinent variables. Under each domain, procedures done in each study will be described, and the judgement will be given on whether the risk is 'high', 'low' or 'unclear'. SRD, ARH, BKS and TDT will assess RoB. If a conflict arises, a third reviewer (JD or DC) will be consulted for the final verdict. The assessment of RoB will be done at the outcome and study level. The RoB assessments will be used in data synthesis to compare different outcomes from different studies.

Data synthesis

Based on pilot searches, we will likely conduct a narrative synthesis of the findings. However, if there is sufficient homogeneity of primary outcomes, we will perform a meta-analysis to appraise evidence across studies. We will tabulate key findings, including summarisation of participant characteristics (eg, age, sex, country), mode of delivery of exercise interventions (eg, type of exercise, length of sessions and number of people in each group) and quality assessments of included studies. We will apply a deductive thematic analysis to analyse the qualitative studies.

Confidence in cumulative evidence

The Grading of Recommendations Assessment, Development, and Evaluation approach will be used to synthesise the quality of evidence for all the outcomes.[38] Domains that are assessed are RoB, consistency, publication bias, precision, study design and directness. The certainty of evidence will be classified as either high, moderate, low or very low.[39] Different study designs will pose different levels of quality of evidence, with randomised control trials (RCTs) having higher quality compared with cross-sectional studies.[39]

Patient and public involvement statement

No patients were involved in this systematic review protocol.

ETHICS AND DISSEMINATION

Ethical approval is not required for this systematic review protocol; we will analyse published primary studies. Findings will be published in a peer-reviewed journal and presented at conferences.

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