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Comparing and assessing physical activity and sedentary behaviour guidelines for different populations with and without chronic conditions and/or disabilities: a systematic review protocol

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ABSTRACT

Physical activity guidelines targeting different populations with and without chronic diseases or disabilities are required to meet the diverse functional and physiological needs experienced by different subgroups of people to achieve optimal health benefits. As the importance of physical activity guidelines in promoting optimal health and well-being becomes increasingly recognised, there is a critical need for their systematic evaluation to ensure they remain effective, applicable and aligned with evolving health needs and scientific insights. This study aims to systematically review, critically evaluate, and compare global physical activity and sedentary behaviour guidelines on frequency, intensity, time, and type of exercise for adults, pregnant and postpartum women, and people living with chronic conditions and/or disabilities. We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols checklist. We will search the Allied and Complementary Medicine Database, APA PsycInfo, Cumulative Index of Nursing and Allied Health Literature, Cochrane Library, Education Resources Information Center, Google Scholar, MEDLINE, PubMed, Scopus, SPORTDiscus, Web of Science and grey literature databases from 2010 to October 2024. Two reviewers will independently select guidelines, extract data and assess methodological quality using the Appraisal of Guidelines for Research and Evaluation II Instrument . Key recommendations will be summarised and classified as 'strong' and 'conditional' based on established criteria. A comprehensive evaluation of current guidelines will identify their differences and similarities and reveal their relevance in practical settings. The findings will guide healthcare professionals, researchers and policymakers in implementing evidence-based recommendations for managing physical activity and sedentary behaviour in targeted populations. Additionally, we will highlight current knowledge gaps and potential shortcomings in existing guidelines. PROSPERO registration number: CRD42023491339.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ While high levels of sedentary behaviour increase risks of non-communicable diseases, physical activity improves physical and mental health outcomes, among others.
⇒ Physical activity guidelines are designed to promote optimal health and manage or mitigate certain disease risks for various populations.
⇒ Systematic reviews have been published on physical activity and/or sedentary behaviour guidelines for children, adolescents and older adults.
⇒ A scoping review revealed that most existing physical activity and/or sedentary behaviour guidelines for vulnerable populations duplicated general adult population guidelines.
⇒ Systematic reviews on physical activity and sedentary behaviour of adults, pregnant and postpartum women, and people living with chronic illness or disabilities are further warranted.

INTRODUCTION

Physical activity is a fundamental determinant of health and well-being throughout the human lifespan. Many studies have highlighted the multifaceted benefits of regular physical activity, ranging from improved

WHAT THIS STUDY ADDS

⇒ This systematic review protocol narrates the steps that will be used to search, compare, critically assess (quality), and summarizse existing physical activity and sedentary behaviour guidelines across different populations (adults, pregnant and postpartum women, and people living with chronic illness or disabilities).

⇒ The 'Appraisal of Guidelines for Research and Evaluation II Instrument' (AGREE II) will be used to appraise the quality of the included guidelines.Guideline recommendations will be classified as 'strong' and 'conditional' based on established criteria.

⇒ Our review findings will reveal the evidence underpinning existing physical activity and sedentary behaviour guidelines to guide healthcare providers and other stakeholders in choosing appropriate recommendations to improve the health and well-being of various populations.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The review's findings will identify the current evidence and reflect on current knowledge gaps and potential shortcomings that require further research and refinement of the existing sedentary behaviour and physical activity guidelines for various populations.

⇒ The study will inform healthcare providers and relevant stakeholders about the appropriate recommendations for promoting physical activity and managing sedentary behaviour of adults, pregnant and postpartum women, and people living with chronic illness or disabilities.

⇒ Our findings will guide policymakers across various sectors (e.g., health, education, sport, transport, environment, and social/family welfare) in developing independent and context-specific physical activity and sedentary behaviour guidelines to promote optimal health of the target populations and achieve the WHO targets for physical activity by 2030.

physical fitness, mental health and well-being to reduced risk of non-communicable diseases such as obesity, diabetes, cancer and cardiovascular diseases.[1] Much evidence highlighting the negative health impacts of sedentary behaviour has rapidly accumulated within the past decade.[2] Consequently, formulating and disseminating evidence-based physical activity and sedentary behaviour guidelines have become a crucial strategy to promote population health and prevent the burden of non-communicable diseases.[3]

Although physical activity and sedentary behaviour guidelines have traditionally targeted the general adult population, it is essential to recognise the need for tailored guidelines based on physiological demands and circumstances facing different population subgroups.[2 4] This realisation has led to the development of specialised guidelines for specific demographic groups, such as older adults, pregnant women and people living with chronic conditions and/or disabilities.[4] These guidelines address the unique considerations and potential challenges these groups face while striving to safely maintain an active lifestyle and limit sedentary behaviour.

As the importance of physical activity and sedentary behaviour guidelines becomes increasingly acknowledged, so does the need for their critical evaluation.[5] A robust evaluation of existing guidelines is essential to determine their methodological rigour, evidence base and applicability in real-world contexts.[6 7] In addition, this review will identify similarities and differences between different guidelines targeting type, domain (eg, occupational, sports or leisure time activities), intensity, duration and frequency of physical activity, and ways to manage sedentary behaviour in the target populations of interest. By critically reviewing these guidelines, healthcare professionals, policymakers and researchers can make informed decisions regarding their adoption, adaptation and implementation to ensure the delivery of effective and safe recommendations on physical activity and sedentary behaviour recommendations.[8 9]

In this context, the 'Appraisal of Guidelines for Research and Evaluation II Instrument (AGREE II)' (https://www.agreetrust.org/) emerges as a vital tool for systematically assessing the quality and reliability of clinical practice guidelines.[10] By offering a structured framework for evaluating various aspects of guideline development (such as scope, stakeholder engagement, methodological robustness, presentation clarity and application feasibility), AGREE II helps evaluate physical activity and sedentary behaviour guidelines on a standardised scale. Using AGREE II, researchers can systematically assess the strengths and methodological limitations of guidelines originating from different countries, enabling meaningful cross-country comparisons and facilitating informed decision-making on a global scale.[10]

Within this systematic review, we will conduct comprehensive analyses and critical evaluation of existing physical activity and sedentary behaviour guidelines (including but not limited to 24-hour guidelines) for adults and older adults, pregnant and postpartum women, and people living with chronic conditions and/or disabilities. By systematically evaluating the quality, consistency and applicability of these guidelines (to the country of origin and beyond), this review aims to provide valuable information on the strengths and limitations of current recommendations, fostering a clearer understanding of their utility and potential implications on targeted populations. Furthermore, it seeks to identify potential gaps and inconsistencies that require further research and refinement in developing physical activity guidelines on an international scale.

While some guidelines are developed for the general public, others are created for special populations with different clinical conditions and/or disabilities. The rationale for our systematic review comes from the realisation that one-size-fits-all recommendations may not be optimally suited for diverse groups (the public vs clinical populations) with different physiological profiles, health challenges and lifestyle patterns.[11 12] 'Who, when, what, how and why' concepts in physical activity and sedentary behaviour contexts should be addressed clearly for specific populations of interest.[13] A systematic review focused on children's physical activity and

sedentary behaviour guidelines has concluded substantial variability in the quality of guidelines across different countries, underlining the need for rigorous guideline development processes to provide appropriate guidance for population-specific and country-level initiatives.[14]

While the findings from this review work will offer valuable insights, it is essential to recognise that the same principle of tailoring guidelines to unique population characteristics applies to other population groups. Adult individuals encompass a spectrum of ages, health statuses and physical capabilities, necessitating guidelines that address this heterogeneity. For instance, pregnant women undergo unique physiological changes that require careful consideration of the safety and benefits of physical activity[15] as judged appropriate by a healthcare provider. Similarly, older adults experience age-related changes that require guidelines that can accommodate these limitations while encouraging active ageing.[16] A previous systematic review focusing on physical activity patterns in older adults recognised the challenges and changes associated with ageing, underscoring the importance of tailored guidelines for this group.[17] This recognition emphasises the importance of such guidelines. However, this prior review and another recent systematic review[18] primarily examined the physical activity levels of older adults and/or their adherence to current physical activity guidelines found in the published literature. Our current systematic review focuses on evaluating the guidelines beyond the healthy older adult group, which is vital in determining their suitability for each unique population.

A recent literature review included postpartum physical activities guidelines from 22 countries and provided valuable recommendations to help public health practitioners promote healthy behaviours in postpartum women.[19] However, this narrative review lacked guidelines for quality assessment, which warrants further systematic reviews to ascertain the certainty of evidence in this area.

Considering the growing prevalence of physical inactivity and sedentary behaviour and the associated increase in chronic diseases and multimorbidity prevalence with advancing age in the population worldwide, the importance of prevention becomes even more critical. Evidence-based physical activity and sedentary behaviour guidelines are essential to guide healthcare providers and other stakeholders in combating these challenges, promoting physical activity and limiting sedentary behaviour to improve the health and well-being of various populations. There is a significant gap in physical activity guidelines for vulnerable populations (people living with chronic illness and disabilities), revealing that many countries either do not provide specific recommendations or replicate those of the general adult population to individuals with chronic conditions and disabilities.[20] This failure to offer tailored guidance underscores a broader issue of not meeting WHO recommendations and unique requirements for vulnerable populations with special needs. Therefore, the purpose of this study is to systematically review, critically evaluate and summarise the evidence underpinning the existing physical activity guidelines on frequency, intensity, time and type of exercise to promote physical activity and manage sedentary behaviour to achieve optimal health benefits in adults, pregnant and postpartum women, and people living with chronic conditions and/or disabilities. Moreover, screened guidelines will be examined to determine whether or not they address the specific needs and barriers these populations face.

METHODS

Study design

The systematic review protocol has been registered with the International Prospective Register of Systematic Reviews (PROSPERO; CRD42023491339). The protocol has been prepared using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols checklist.[21]

Data sources and search strategy

One reviewer will search each of the following databases/search engines: the Allied and Complementary Medicine Database, APA PsycInfo, Cumulative Index of Nursing and Allied Health Literature, Cochrane Library, Education Resources Information Center, Google Scholar, MEDLINE, PubMed, Scopus, SPORTDiscus and Web of Science in addition to the grey literature search. Searching for grey literature will comprise four methods: exploration of grey literature databases (eg, ProQuest Dissertations & Theses), utilisation of customised Google search, examination of specific websites and engagement with subject matter experts. This search will include and be limited to sources from 2010 to October 2024.

Database-specific search terms related to "physical activity", "sedentary behaviour", "guideline", "exercise", "recommendation", "adul*", "young", "older adul*", "pregnant women", "pregnan*", "postpartum", "chronic diseas*", "disabilit*", "special need*", "non-communicable diseas*", "developmental disability*", "physical disabilit*", "cerebral palsy", "cancer", "cardiovascular diseas*", "hypertension", "osteoarthritis", "type 2 diabetes", "communicable diseas*", "Parkinson's diseas*", "spinal cord injury", "intellectual disability*", "sensation disorder*", "people with hearing impairment*", "traumatic brain injury", "multiple sclerosis", "stroke", "muscular dystrophy", "Huntington's disease", "major clinical depression", "schizophrenia", "obesity", "anxiety", "frailty", and "chronic lung condition*" will be combined using the BOOLEAN operators "AND" and "OR" for retrieving relevant studies from the electronic databases. A pilot search conducted in PubMed and EBSCOhost is included in online supplemental appendix 1. The reference list of eligible studies, relevant literature/systematic reviews, and other secondary studies will be checked for other possible guidelines. Authors will be contacted if only summarised guidelines are found or if there is any important missing information. If the authors do not respond within 2 weeks of our initial

contact, a subsequent email will be sent to follow-up with their request.

Eligibility criteria

The document must be in the form of guidelines or clinical practice guidelines that are published in a peer-reviewed journal or a website by government or non-government organisations at the national or international level and primarily focus on physical activity and sedentary behaviour in any of the following populations: adults (18–64 years), pregnant and postpartum women, and people living with chronic conditions and/or disabilities. Physical activity and sedentary behaviour guidelines for individuals living with: (1) chronic (non-communicable) diseases such as cancer (including those who survived cancer), cardiovascular disease, hypertension, osteoarthritis and type 2 diabetes; (2) communicable diseases like HIV infection;[22] (3) those conditions that can lead to disability, including but not limited to Parkinson's disease, spinal cord injury, intellectual disability, sensation disorders, people with hearing impairments, traumatic brain injury, multiple sclerosis, stroke, muscular dystrophy, Huntington's disease, major clinical depression, schizophrenia, traumatic brain injury and developmental disabilities (eg, Down syndrome, cerebral palsy, spinal dysraphism and spina bifida);[23] and (4) gestational diabetes, postpartum depression and related conditions that will be screened for eligibility criteria. If there are physical activity guidelines for other chronic conditions or disabilities available in the literature, they will be reviewed to determine if they meet the eligibility criteria.

The language of the document should be in English. If multiple versions are available, the most recent/updated one will be included. Guidelines with one or multiple targeted populations of interest will be considered. In addition, for physical activity guidelines to be in the review, they must meet the following criteria:

- Following a well-documented systematic process involving evidence-based reviews, among other steps, in developing recommendations.
- Reporting certainty of the evidence for recommendations based on evidence-based findings using either the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework or a similar method (eg, the GRADE-ADOLOPMENT; approach of guidelines, addressing the integration of de novo ideas, adoption, and adaptation to produce reliable recommendations) established in the literature.

Guidelines developed by one individual, consensus statements, newsletters, news releases, incomplete documents, synopsis, abstracts or memoranda that do not follow appropriate methods for physical activity and sedentary behaviour guidelines development will be excluded.

Selection process of physical activity guidelines

The Covidence (https://www.covidence.org/) or similar web application will manage the records and eliminate duplicates. Initially, two reviewers (among RR, EA, SR, SA and MRKR) will independently assess titles and abstracts to determine if they meet inclusion criteria. Subsequently, these reviewers will obtain the full text of the potentially eligible studies and assess their eligibility based on the criteria irrespective of sex, ethnicity or setting. Any disagreements will be resolved through discussion between the two reviewers or escalated to a third reviewer (AA), or the entire group will participate in the discussion to arrive at a consensus decision.

Data extraction

One reviewer will extract, while another will verify the relevant extracted data retrieved from each guideline. Another reviewer (AA/TV/AP/SKD) will be available to adjudicate any disagreements between the two reviewers. A data extraction table will be used to extract data from different articles or documents to assess the risk of bias and the quality of each guideline. The table will include country, population of interest with their age group (if/as applicable), target users, panel members who developed the guidelines, year of issue or update, the aim of physical activity and sedentary behaviour guidelines, specific guidelines for the type, domain (eg, occupational, sports or leisure time activities), intensity, duration and frequency of physical activity, and sedentary behaviour management recommendations. Data extraction will be completed by a team of four reviewers (RR, EA, SR, SA).

Guidelines quality assessment

The AGREE II tool will assess the quality and risk of bias of each guideline among the chosen populations. This instrument is recognised as a standard guideline evaluation tool.[10] It was updated in 2017, 7 years after its development date (https://www.agreetrust.org/about-the-agree-enterprise/). It includes 23 items organised in six different quality domains with a 7-point Likert scale (https://www.agreetrust.org/resource-centre/agree-reporting-checklist/) and is identified as a valid and useful instrument for assessing the quality of guidelines.[24 25] The availability of the AGREE II manual and online training tool allowed the assessors to train and use the tool before the protocol (https://www.agreetrust.org/resource-centre/agree-reporting-checklist/). Two assessors (among RR, EA, SR and SA) will assess each guideline separately. The scores are calculated by 'summing all the scores for each of the individual elements in a domain and scaling the total as a percentage of the maximum possible score for that domain' and are applied to each domain of the six domains (https://www.agreetrust.org/resource-centre/agree-reporting-checklist/). Eligible guidelines will be evaluated by two independent assessors, and on the occurrence of varied scoring by a margin of 2 for a specific item, a third assessor (AA/TM/AP/SKD) will be consulted to assist in the review of the item and adjudicate any disagreements. High-quality physical activity guidelines will be classified according to the AGREE II if the score is equal to or greater than

50% of the maximum possible score in three domains: domain 2, stakeholder participation; domain 3, the rigour of development; and domain 6, editorial independence.[26 27]

Evidence summary

Two reviewers will undertake the following steps for evidence synthesis:

1. Summarising key recommendations from physical activity guidelines for frequency, intensity, duration, and type of exercise of physical activity or exercise for the target populations of interest (adults, pregnant and postpartum women and people living with and without chronic conditions and/or disabilities) to achieve optimal health benefits, regardless of their methodological quality.
2. Classifying recommendations as 'strong' and 'conditional' will involve the integration of the following factors, reported in the included guidelines, that will affect the implementation of physical activity recommendations in the target populations of interest: risk versus benefit (balance between desirable and undesirable consequences); the overall certainty of evidence based on all evaluated (health-related) outcomes; the values and preferences of stakeholders (mainly end users); and the use of resources and costs involved.[28 29]

DISCUSSION

As the significance of physical activity and sedentary behaviour guidelines becomes widely recognised, our systematic review will address the increasing need to critically appraise these guidelines.[5] By comprehensively assessing methodological rigour, evidence base and real-world applicability,[6 7] this review will inform decisions regarding guideline adoption, adaptation and implementation, ensuring effective and safe recommendations for diverse populations across the lifespan, including adults, pregnant and postpartum women, and people living with chronic conditions and/or disabilities. The review will consider guidelines targeting specific chronic conditions (eg, cancer, cardiovascular disease, hypertension, osteoarthritis, type 2 diabetes, HIV) and disabilities (eg, Parkinson's disease, spinal cord injury, intellectual disability, sensory impairments, traumatic brain injury, multiple sclerosis, stroke, muscular dystrophy, Huntington's disease, depression, schizophrenia). Furthermore, the review will encompass 24-hour activity guidelines, recognising the interplay between physical activity, sedentary behaviour and sleep. Our comprehensive approach distinguishes the current review from previous research that focused primarily on physical activity levels and guideline adherence or lacked rigorous quality assessment.[17–19] The findings of the systematic review will be disseminated as a series of manuscripts, each one involving the guidelines for a specific target population of interest, for peer review and publication in scientific journals.

The findings will guide policymakers across various sectors (eg, health, education, sport, transport, environment and social/family welfare) in developing country-specific guidelines and national/subnational plans to promote physical activity and reduce sedentary behaviour across the life course in low-to-middle-income and high-income countries. This review will also inform healthcare professionals (eg, physiotherapists, exercise professionals, physicians, nurses, paramedics, community health workers) and researchers in supporting evidence-based practice. The results will contribute to a more nuanced understanding of the strengths and limitations of existing guidelines, facilitating their effective implementation and informing future guideline development internationally. This includes highlighting potential gaps and inconsistencies between guidelines and identifying areas requiring further research and refinement. The review will also consider the 'who, when, what, how, and why' of physical activity and sedentary behaviour recommendations, ensuring clarity and relevance for the target populations.[13] Furthermore, cross-fertilisation across guidelines for different populations, whether adults, older adults, pregnant women or individuals with specific health conditions, will enrich the recommendations by incorporating diverse insights. This will lead to holistic and adaptable strategies for promoting physical activity and reducing sedentary behaviours across different demographic and socioeconomic groups.

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Contributors AA conceived the initial idea, designed the review, conceptualised the initial review protocol and led the writing of the manuscript. GPN, SM, PCD and CH contributed to the design of the review. AA, RJS, RMQ, NA and SAMZ wrote the initial draft and formulated the search strategy. AA, RJS, RMQ, NA, SAMZ, SR, RR, EA and SAA ran the pilot search on electronic databases and/or other resources. JPC, AJP, SKD, SJM, TV, SR, RR, EA, SAA, MRKR, HAJ, OCB, GPN, SM, PCD and CH reviewed, edited and revised the manuscript for important intellectual content. All authors approved the final version of the manuscript. AA is the guarantor of this work. RJS, RMQ, NA and SAMZ shared second authorship. GPN, SM, PCD, and CH shared last authorship.

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