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Prevalence of physical inactivity and associated factors among adults in Eastern African countries: a systematic review and meta-analysis protocol

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ABSTRACT

Introduction Physical inactivity is a major global public health concern, increasing the risk factor of non-communicable diseases (NCDs) and mortality. The WHO has initiated the Global Action Plan on Physical Activity to reduce global physical inactivity by 15% by 2030. Rapid urbanisation and insufficient physical activity in the Global South have significant implications for public health, leading to increased NCDs. Understanding physical inactivity and related risk factors among adults is essential in addressing the growing NCD epidemic. This study aims to estimate the pooled prevalence of physical inactivity and its associated risk factors among adults in Eastern African countries.

Methods and analysis This review protocol will follow the Preferred Reporting Items for Systematic Review and Meta-Analysis (2020) Guideline. A comprehensive search will be conducted using the CoCoPop (condition, context, population) frameworks to include all observational studies published from 1 January 2010 to 31 October 2024. Databases such as PubMed, Scopus, Embase, CINAHAL, Web of Science, Science Direct and Google Scholar will be searched. Studies with citations without an abstract or full text and qualitative studies will be excluded. The Joanna Briggs Institute critical appraisal tool will be used to assess the quality of each study. The heterogeneity of studies will be quantified using the I^2 statistic, and a fixed-effects or random-effects model will be used for the pooled analysis. Publication bias will be assessed using visual (funnel plot) and statistical methods. The study countries will be the basis for subgroup analysis, and sensitivity analysis will be used to see how one study's results may affect the estimate as a whole.

Ethics and dissemination Ethical approval is not required for this systematic review. The results will be disseminated through peer-reviewed publications and conference presentations. Furthermore, this systematic review and meta-analysis will be used to generate comprehensive and robust evidence for public health interventions.

PROSPERO registration number CRD42024567592

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study will quantify the pooled prevalence of physical inactivity by pooling data from multiple countries in East Africa.
⇒ This study critically appraises, synthesises and pools evidence on physical inactivity, and it has profound implications for public health, disease prevention and intervention development. Furthermore, it will guide evidence-based decisions in East Africa.
⇒ Only quantitative studies published in English will be included.
⇒ The certainty of the evidence in this systematic review and meta-analysis may be limited by the limited number of studies and available variables.

INTRODUCTION

Regular physical activity is essential for preventing and managing non-communicable diseases (NCDs), such as cardiovascular disease, type 2 diabetes, certain cancers and chronic respiratory disease.[1 2] Engaging in recommended levels of physical activity can reduce the risk of developing these chronic diseases.[3] It also contributes to improved overall health by enhancing cardiorespiratory fitness, muscular strength and flexibility, and it benefits for the overall well-being by reducing stress, anxiety and symptoms of depression.[4] Promoting increased physical activity is a key public health strategy to address the growing prevalence of NCDs and their associated adverse health outcomes.[5]

The WHO defines physical activity for adults as both planned exercises and activities within daily routines, such as transportation, work tasks and household chores.[6] It includes a wide range of bodily movements, such as walking, running, swimming, cycling, dancing, gardening and sports.[7] These activities can help increase energy expenditure and promote overall well-being.[8] The key domains of physical activity include leisure-time physical activity (activities undertaken during free time for recreation, fitness or sports), occupational physical activity (physical demands

associated with one's job or work), household or domestic activities (related to housework, gardening and other chores around the home) and transport-related physical activity (activities involved in getting to and from places, such as walking or cycling for commuting).[9 10]

According to the WHO, adults aged 18–64 years should engage in at least 150–300 min of moderate-intensity aerobic physical activity per week, at least 75–150 min of vigorous-intensity aerobic physical activity per week or an equivalent combination of moderate- and vigorous-intensity activity.[6] Additionally, adults should perform muscle-strengthening activities involving major muscle groups at least 2 days per week.[11] Individuals can increase their overall energy expenditure and promote their physical, mental and social well-being by engaging in physical activities across these domains.[12]

Despite the WHO's recommendations on different levels of physical activity for adults older than 18 years, a significant number of individuals worldwide remain physically inactive.[13] Insufficient physical activity has become a pressing public health concern globally[14] and is responsible for an estimated 3.2 million deaths annually, further emphasising the critical importance of addressing this public health challenge.[8] Promoting increased physical activity participation is a key strategy to reduce the growing burden of NCDs and their associated adverse outcomes.[6 15]

In 2020, the WHO launched the Global Action Plan on Physical Activity (GAPPA) 2018–2030, which aims to reduce physical inactivity by 15% globally by 2030.[16] However, the latest data from the WHO shows that the progress towards this target has been low. Globally, nearly one-third of adults were insufficiently physically active (age-standardised prevalence of 31.3%) in 2022.[17] The global age-standardised prevalence of insufficient physical inactivity has increased from 26.4% in 2010 to 31.3% in 2022.[17] The prevalence was highest in the high-income Asia Pacific region (48.1%), closely followed by South Asia (45.4%). Oceania had the lowest prevalence (13.6%), followed by sub-Saharan Africa (SSA) (16.8%).[18]

Although SSA is on track to meet the WHO GAPPA target to reduce insufficient physical activity by 15% in 2030, more effort is needed to combat the growing burden of NCDs in the region.[16 19] The issue of physical inactivity is particularly relevant in SSA countries because the continent faces a double burden of both communicable and NCDs.[20] Eastern African countries face high rates of physical inactivity in the region; this trend is frequently attributed to urbanisation, changes in transportation and a shift towards more sedentary lifestyles.[21 22] The prevalence differs greatly between countries; in Ethiopia (29.8%),[23] Kenya (7%),[24] Uganda (37.6%)[25] and Tanzania (25%),[26] adults do not meet the WHO's recommended levels of physical activity. These variations highlight the need to comprehensively understand the prevalence and factors contributing to physical inactivity within the diverse contexts of these Eastern African nations.

Several factors have been identified to have significant determinants of physical inactivity, including age,[23] sex,[27] occupation,[28] educational attainment,[29] monthly income[30] and being overweight or obese.[31] Various strategies employed to address physical inactivity, and the prevalence of physical inactivity among adults in Eastern African countries remains varied across countries.[23 32] There has yet to be representative regional data on the physical activity status of adults.

Therefore, this systematic review and meta-analysis aims to estimate the pooled regional prevalence of physical inactivity and associated factors among adults in Eastern African countries. By synthesising the available evidence, this study aims to provide insights that could inform future public health interventions and policies that aim to increase physical activity in Eastern African populations.

METHODS AND ANALYSIS

Study protocol

This systematic review and meta-analysis will be reported per the Preferred Reporting Items for Systematic Review and Meta-Analysis Statement (PRISMA 2020) guidelines.[33] The search strategy will use the CoCoPop (condition, context and population) framework.[34] The prevalence of physical inactivity and associated factors (**Co**ndition), studies conducted in Eastern African countries, including Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, South Sudan, Uganda and Tanzania (**Co**ntext), and studies among adults age 18 and above (**Pop**ulation) will be used for the comprehensive search.

We will illustrate the four phases of the PRISMA flow chart to demonstrate the study selection process, starting from the initial identification of records to the final inclusion of studies. The protocol for this systematic review and meta-analysis is registered in the International Prospective Register of Systematic Reviews and obtained the registration number (CRD42024567592).

Eligibility criteria

We will include all population-based observational studies (analytical cross-sectional studies, cohort studies and case–control studies) that report the prevalence and/or determinants of physical inactivity among adults (18 years and older) in Eastern African countries. Only studies published in English from 1 January 2010 to 31 October 2024 will be included. We will only consider the quantitative findings in studies that reported both quantitative and qualitative results. Intervention studies that have baseline or post-intervention physical activity data and qualitative studies will be excluded.

Search strategy

Databases such as PubMed, Scopus, Embase, CINAHAL, Web of Science, Science Direct and the Cochrane Library will be considered to search for studies. We will search

studies using Google Scholar to include grey literature. Incompletely reported data will be handled by contacting the corresponding authors. The core search terms and phrases will be 'physical inactivity', 'adults', and 'Eastern African countries'. The search strategy will be based on keywords using 'Medical Subjects Headings (MeSH)' and 'All field' by linking Boolean operators 'AND' and 'OR' (see online supplemental table 1).

In particular, to fit the advanced PubMed database, the following search strategy will be applied ('physical activity' OR 'physical inactivity' OR 'insufficient physical activity' OR 'sedentary behavio*' (MESH Terms) OR 'exercise' (MESH Terms)) AND (Burundi OR Comoros OR Djibouti OR Eritrea OR Ethiopia OR Kenya OR Madagascar OR Mauritius OR Rwanda OR Seychelles OR Somalia OR 'South Sudan OR Uganda OR Tanzania). All papers published between 1 January 2010 and 31 October 2024 will be included. Endnote X9 software manager will be used to cite references and manage the searched literature. The reference lists of all relevant studies will be reviewed to find additional studies that may have not been detected in the database search.

Study selection process

The retrieved studies will be exported to the reference manager Endnote version 9 software, and duplicate studies will be removed. Three reviewers (HWA, NMD and MKY) will screen the remaining studies independently by title and abstract. Based on this screening, studies will be classified as included, excluded and undecided. After the screening, two authors (HWA and MKY) will search the full texts of the included studies and the undecided studies and assess their eligibility. The third author, TKA, will resolve any disagreement between the authors regarding the eligibility of full-text articles.

The reasons for exclusion will be documented. Studies published by the same author will be carefully reviewed to ensure that the results of a given study are not included twice in the review.

Assessment of the quality of individual studies

We will critically appraise the included studies for their validity using the validated modified version of a quality assessment tool for prevalence studies. The two authors (HWA and MKY) will check the methodological robustness and validity of the included studies.[35] In case of uncertainty, joint discussion between reviewers will be conducted and resolved through consensus. If there is a disagreement, the third author (TKA) will resolve it. The quality assessment tool has nine questions. Based on the score of the quality assessment tool, the highest score will be classified as having the minimum risk of bias. Overall scores range from 0 to 3, 4 to 6 and 7 to 9 will be classified as low, moderate and high risk of bias, respectively.

Variable measurement and definition

This systematic review and meta-analysis will have two outcome variables. The first outcome is the prevalence of physical inactivity, defined and measured as less than 150 min of moderate or 75 min of vigorous-intensity aerobic physical activity throughout the week.[6]

The second outcome of this study will be identifying associated factors of physical inactivity. We will use the OR to measure the associations between the outcome variable and predictor variables.

Data extraction

We will extract data using the Joanna Briggs Institute data extraction form.[36] The characteristics of the data, name of the first authors, year of publication, study area, study design, sample size, the prevalence of physical inactivity (assessed by the WHO Global Physical Activity Questionnaire (GPAQ) or International Physical Activity Questionnaire (IPAQ))[37] and Adjusted Odds Ratio (AOR) for factors will be extracted. If the AOR was not reported, other association measures, such as the crude odds ratio (COR), relative risk (RR) or correlation coefficient will be extracted. We will use the Covidence systematic review platform to facilitate the data extraction. Three reviewers (HWA, NMD and MKY) will independently extract data using the customised data extraction form within Covidence. Covidence will help track the extraction process and identify any discrepancies or inconsistencies among the reviewers. The review team will resolve any conflicts through discussion and repeating the extraction procedures as needed, all within the Covidence platform.

Statistical analysis

The statistical analysis will be carried out using STATA version 17 statistical software. The relationships between factors and the prevalence of physical inactivity will be reported using the OR.

We will check the publication bias using a funnel plot and more objectively through Egger's regression test.[38] The trim-and-fill technique will be considered if there is publication bias. The heterogeneity of studies will be quantified using the I^2 statistic and will be classified into low (25%), moderate (50%) and high (75%) degrees of heterogeneity.[39] A weighted fixed effect or random-effects model will be used for pooled analysis.[40] Subgroup analysis will be done by the study region, and sensitivity analysis will be employed to see the effects of a single study on the overall estimation. Sociodemographic factors and study characteristics factors will be considered in the subgroups and sensitivity analysis.

Ethics and dissemination

Ethical approval is not required for this review. The results will be disseminated through a peer-reviewed publication and conference presentations. The results of the study will inform health promotion in physical activity.

Patient and public involvement

We will not involve patients and the public in this study's design, conduct or reporting and dissemination plans.

DISCUSSION

The aim of this systematic review and meta-analysis is to provide comprehensive regional evidence on the prevalence of physical inactivity and its associated factors in the Eastern Africa region. Physical inactivity is a major global health concern, with consequences for various chronic diseases and premature mortality. This aligns with the WHO's Global Action Plan on Physical Activity (GAPPA) and the 2022 Global Status Report on Physical Activity, which emphasises the urgent need for countries to scale up actions to promote physical activity and reduce physical inactivity.

By establishing the current regional estimates of physical inactivity prevalence and its determinants in East African countries, this review will guide future research, policy and programme development to encourage physical activity. The findings can inform targeted public health interventions to reduce the risk of chronic diseases and ultimately promote the health and well-being of the population. We will use a rigorous methodology based on the Cochrane Handbook, and the results will be reported following the PRISMA 2020 preferred reporting statement to ensure the standards of evidence synthesis.

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Contributors HWA was involved in the conception, designing research questions, writing and reviewing the manuscript and acted as a guarantor. NMD, TKA and PG participated in validating an appropriate research method, critically revised the manuscript and approved the protocol. MKY was involved in the conception, reviewing the manuscript, supervision, final approval of the manuscript and acted as a guarantor.

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