INPLASY PROTOCOL

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Corresponding author:
Lluis Capdevila

lluis.capdevila@uab.cat

Author Affiliation:
Universitat Autònoma de Barcelona (UAB), Spain

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Conflicts of interest:
None declared.

Physical Activity and Planetary Health: a scoping review protocol

Capdevila, L[1]; Losilla, JM[2]; Alfonso, C[3]; Estrella, T[4]; Lalanza, JF[5].

Review question / Objective: **The aim of this scoping review is to scope the body of literature, clarify concepts, investigate research conduct and to identify knowledge gaps about the physical activity (PA) behavior in a context of planetary health. The proposed study will review the existing literature considering PA beyond the scope of mere health behaviour, focusing on its potential impacts on planetary health and sustainable development. We will differentiate the PA behavior of the PA facilities or context like green-space or blue-space.**
Specific objectives are to provide knowledge about:
1. Which PA behaviors are sustainable for the planet and which are not.
2. What are the characteristics of sustainable PA behaviors.
3. What are the positive and negative impacts of PA behaviors on planetary health.
Condition being studied: **In this case, it is studied how the active lifestyle and the practice of physical activities, exercise or sports of people affect planetary health.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 07 June 2022 and was last updated on 07 June 2022 (registration number INPLASY202260028).

INTRODUCTION

Review question / Objective: **The aim of this scoping review is to scope the body of literature, clarify concepts, investigate research conduct and to identify knowledge gaps about the physical activity (PA) behavior in a context of planetary health. The proposed study will review the existing literature considering PA beyond the scope of mere health behaviour, focusing on its potential impacts on planetary health and sustainable development. We will differentiate the PA behavior of the PA facilities or context like green-space or blue-space.**

Specific objectives are to provide knowledge about:
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2. What are the characteristics of sustainable PA behaviors.
3. What are the positive and negative impacts of PA behaviors on planetary health.

Rationale: Physical inactivity is a leading cause of death worldwide. It is considered a pandemic in the 21st century. However, there are no published reviews about the physical activity behavior in a context of planetary health. In contrast, there is more literature on other behaviors related to the planetary health and lifestyle of the population, such as the one related to planetary diet. We present a scoping review to fill this gap, focusing on how physical activity can be conceptualized as sustainable (or not) behaviour considering the interdependence of human health and planetary health.

Condition being studied: In this case, it is studied how the active lifestyle and the practice of physical activities, exercise or sports of people affect planetary health.

METHODS

Search strategy: The search strategy will consist of 3 filters composed of search terms for the following: (Planetary Health) AND (Physical Activity OR Exercise OR Sport). Additional group of terms preceded by the boolean operator NOT to improve the specificity of the search strategy will be added. All filters will be adapted for all databases. To ensure the transparency of the search strategy we will follow the Preferred Reporting Items for reporting Literature searches in Systematic Reviews (PRISMA-L) (Rethlefsen et al., 2021).
The specific search strategy for all three databases used was:
1) "physical activity" OR exercise OR sport$ OR "physical inactivity" OR walking OR "physical outdoor activity" OR "nature hikes" OR Bicycling OR "active transport" OR "outdoor activ*" OR Olympic
2) "planetary health" OR "natural environment" OR "pro-environmental behavio$r" OR "ecological environment" OR "ecological impact" OR "environmental impact" OR "environmental concern" OR "environmental health" OR "sport ecology" OR "landscape damage" OR "climate change" OR "carbon footprint"
3) Therapy OR cancer OR HIV OR ebola OR covid OR Diabetes OR disease OR disorder OR obesity OR physiology OR physiological OR "mental health" OR injuries OR rehabilitation OR cardiovascular OR "body weight" OR disorders OR stress OR anxiety OR "physical health" OR "health promotion" OR "general health"
4) Diet OR DASH OR metabolism OR nutrition
5) Informatic* OR Robot* OR "Learning Algorithm" OR sensors OR neuro* OR Engineer* OR "immune system" OR gaming OR Biomechanics OR infection OR seed OR fisheries OR Exoskeleton OR "geodesic flow" OR wireless
6) "green exercise" OR "blue space" OR "green-exercise" OR "blue-space" OR "green-space"
7) #1 AND #2 NOT #3 NOT #4 NOT #5 NOT #6.

Participant or population: The target population will be participants in physical or sports activities, of all ages and genders, with any of the following roles: practitioners, spectators or organizers.

Intervention: Not applicable

Comparator: None.

Study designs to be included: Empirical studies with experimental, quasi-experimental, observational, or qualitative designs are included. The relevant review studies found during the searching or data extraction will be mention in the introduction and the discussion of the final manuscript, but review studies are not including in the systematic search.

Eligibility criteria: Inclusion criteria: Studies that provide empirical or measurement information on: 1. Negative effects of physical activity/sport/exercise on planetary health; 2. Ways to create/design

more sustainable physical activity/ exercise/sport; 3. Physical activity/ exercise/sport as constructs/actions/ vehicle to improve present or future "planetary health"; 4. Physical activity/ exercise/sport that contributes to improve "planetary health"; Exclusion criteria: Theoretical studies; Studies dealing with: Green/blue space as extra beneficial for physical activity/exercise/sport, or effects of environment on improving/enhancing/ increasing physical activity/exercise/spor; or sustainability as social, economic, politic, etc. way; or studies related to urban planification, architecture or smart cities. // Additional inclusion or exclusion criteria: Restricted by language (English and Spanish).

Information sources: A systematic search was performed in PsycINFO, Psychological Information, by ProQuest; WOS,Web of Science CORE, by Thomson Reuters; and Scopus by Elsevier

Main outcome(s): The main outcomes of the included studies will be divided in 3 topics during data extraction:
- type of study, including: design and goals
- type of PA, including: sport or exercise, sample and its characteristics, and place and environmental context
- outcomes related to planetary healthy, including: response variables, type of assessments, instruments or tools used, validation of these instruments, main outcomes, and a summary of the main results in relation to the impact of PA on planetary health.

Additional outcome(s): None.

Data management: References identified by the search strategy will be entered into Mendeley bibliographic software, and duplicates will be removed. Titles and abstracts will be screened independently by two reviewers. When decisions are unable to be made from title and abstract alone, the full paper will be retrieved. Full-text inclusion criteria will be screened independently by two reviewers. Discrepancies during the process will be resolved through discussion (with a third reviewer where necessary). Agreement between reviewers during the study selection will be analyzed by Cohen's kappa (Cohen, 1960). Extracted information of each selected study will include general information (author, year, country of origin and papers); year of data collection; methodological data; target population; type of PA; sample characteristics. Authors of eligible studies will be contacted to provide missing or additional data if necessary. Agreement during the information extraction process will be analyzed by Cohen's kappa (Cohen, 1960).

Quality assessment / Risk of bias analysis: To maximize quality of reporting of this review protocol we will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols Guidelines (PRISMA-P) (Moher et al., 2015), and we will follow the PRISMA Extension for Scoping Reviews (PRISMA-ScR) to improve the quality of the review report (Tricco et al., 2018).

Strategy of data synthesis: Data summaries will be presented in figures and tables. Narrative synthesis will be adopted. The synthetized results will be organized based on major aspects including the study design, a description of general bibliographic data (author, year, country), year of data collection, methodological data, target population, type of PA, sample characteristics, and map of countries practices. The synthesis will address limitations, strengths and recommendations for further research and practices.

Subgroup analysis: None.

Sensitivity analysis: None.

Language: Only documents published in English or Spanish will be considered for inclusion.

Country(ies) involved: Spain, Norway.

References: Cohen, J. (1960). A Coefficient of Agreement for Nominal Scales. Educational and Psychological

Measurement, 20(1), 37–46. https://doi.org/10.1177/001316446002000104
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Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. The BMJ, 372. https://doi.org/10.1136/bmj.n71
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Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., ... Straus, S.E. (2018) PRISMA Extension for Scoping Reviews (PRISMA-ScR) : Checklist and Explanation. Annals of Internal Medicine, 169, 467-473. https://doi.org/10.7326/M18-0850.

Keywords: Scoping review, planetary health, physical activity, physical inactivity; healthy lifestyle; sustainability; sustainable behaviour; global health; public health.

Dissemination plans: Results will be disseminated by its publication in a peer-reviewed journal and presented at a relevant conference.

Contributions of each author:

Author 1 - Dr Lluis Capdevila - Contributions to the protocol or review: conceiving and designing the review; coordinating the review; data collection; data management; analysis of data; interpretation data; writing the protocol and the review manuscript; providing funding.
Email: lluis.capdevila@uab.cat
Author 2 - Dr Josep-Maria Losilla - Contributions to the protocol or review: conceiving and designing the review; coordinating the review; data collection; data management; analysis of data; interpretation data; writing the protocol and the review manuscript.
Email: josepmaria.losilla@uab.cat
Author 3 - Carla Alfonso - Contributions to the protocol or review: conceiving and designing the review; coordinating the review; data collection; data management; analysis of data; interpretation data; writing the protocol and the review manuscript.
Email: carla.alfonso@uab.cat
Author 4 - Tony Estrella - Contributions to the protocol or review: conceiving and designing the review; coordinating the review; data collection; data management; analysis of data; interpretation data; writing the protocol and the review manuscript.
Email: antonio.estrella@uab.cat
Author 5 - Dr Jaume F Lalanza - Contributions to the protocol or review: conceiving and designing the review; coordinating the review; data collection; data management; analysis of data; interpretation data; writing the protocol and the review manuscript.
Email: jaume.f.lalanza@uit.no