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INPLASY

A protocol for the impact of walking and its parameters on the brain-derived neurotrophic factor (BDNF) in adults and elders with healthy locomotion

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Khalil, MH.

Corresponding author:
Mohamed Khalil

mhmhk2@cam.ac.uk

Author Affiliation:
University of Cambridge.

ADMINISTRATIVE INFORMATION

Support - Cambridge Trust and Cambridge University Library.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 21 November 2024 and was last updated on 21November 2024.

INTRODUCTION

Review question / Objective Explore the impact of walking and its parameters on the brain-derived neurotrophic factor (BDNF) in adults and elders with healthy locomotion.

Condition being studied Walking interventions applied to adults and elders with any condition except for locomotion-related health issues.

METHODS

Search strategy PubMed, Scopus and Web of Science.

Participant or population Adult or older adult locomotor-healthy human subjects. This was important, regardless of any other health concerns, because locomotion-related impairments affect movement, walking, gait and speed, which all will affect the accurate interpretation of the impact of walking at this preliminary stage.

Intervention Walking in the form of a structured physical activity or free-living/lifestyle physical activity.

Comparator No comparison is needed but the aim is to explore the variability of walking parameters (i.e., step count, speed, environment) on the changes in BDNF levels. If a comparison exists in a study, it can be included if it shows the impact of walking independently without combination with other exercise types.

Study designs to be included Original articles.

Eligibility criteria Meeting the PICO criteria.

Information sources The screening criteria considered only English peer-reviewed journal original articles eligible, while grey literature references (books, book chapters, conference papers, notes, retracted papers, and reviews) were excluded from consideration. After including

articles that met the inclusion and exclusion criteria, duplicated articles across the three databases were removed before proceeding with data extraction and selection of articles for full-text reading. Articles were assessed based on title, abstract, and keywords to ensure alignment with the research aim for which the search strategy was designed. Following this, the eligible full-text studies underwent a thorough examination of their reference lists and citations for more relevant articles to consider for eligibility.

Main outcome(s) Changes in BDNF levels in any medium: serum, plasma or other.

Quality assessment / Risk of bias analysis In line with the PRISMA guidelines, the risk of bias assessment was conducted in this systematic review using the PEDro scale, which allows determination of the quality of the reviewed studies and the potential risk of bias.

Strategy of data synthesis Narrative review.

Subgroup analysis Summary table.

Sensitivity analysis Summary table.

Language restriction English.

Country(ies) involved United Kingdom.

Keywords Brain-derived neurotrophic factor; BDNF; walking; step count; exercise; physical activity; neuroplasticity; brain health.

Contributions of each author

Author 1 - Mohamed Khalil.
Email: mhmhk2@cam.ac.uk