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The impact of nature-based interventions on physical, psychosocial, and physiological functioning for physical chronic diseases: a systematic review

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ADMINISTRATIVE INFORMATION

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INTRODUCTION

Review question / Objective The aim of this systematic review was to explore the effects of nature-based interventions on physical functioning, while highlighting its effects of the psychosocial, and physiological functioning in individuals suffering from chronic diseases affecting their physical functionality.

Rationale Nature is increasingly recognized for its beneficial effects on psychological, cognitive, and physiological health, but its impact on physical function among individuals with chronic diseases remains underexplored. This systematic review aimed to examine the effects of nature-based interventions (NBIs) on physical functioning, while also highlighting their psychosocial and physiological impacts in adults with chronic conditions that affect physical capacity.

Condition being studied Physical chronic diseases.

METHODS

Search strategy The research was conducted during the year 2023. Three main databases were consulted: Cochrane, CINAHL Plus with Full Text (EBSCOHost) and PubMed. To minimize the risk of selection bias, a variety of keywords and keyword combinations were used. The main keywords included two main themes such as nature and chronic disease and variables such as “mobility”, “balance”, “pain”, “quality of life” and “physical endurance”.
The following structure was adopted: ((MH "Nature") OR Ecotherapy OR "Green spaces") AND ("Chronic disease" OR "Chronic pain") AND ((MH "Quality of life") OR Pain OR Function* OR Balance OR Strength OR mobility OR "physical endurance"). In each database, language filters (English and French), age (≥18 years) and publication date filters (from 2012 to May 2023) were applied (see the complete query for each database in the appendix). A total of 618 studies were found and analyzed for the first step of this research A systematic search of Cochrane,

CINAHL Plus, and PubMed databases (2012–2023) was conducted using terms related to nature and physical function.

Participant or population A population of men and women, aged 18 years and older, and suffering from a chronic disease affecting their physical function.

Intervention Nature-based Interventions (NBIs).

Comparator Usual care.

Study designs to be included All intervention designs.

Eligibility criteria The selection criteria for the articles were as follows: (i) Studies with an intervention design, (ii) a population of men and women, (iii) aged 18 years and older, and (iv) suffering from a chronic disease affecting their physical function. The exclusion criteria were as follows: (i) studies written in a language other than French or English, and (ii) studies published before 2012.

Information sources Electronic databases only (Cochrane, CINAHL Plus with Full Text (EBSCOHost) and PubMed).

Main outcome(s) Eight intervention studies (total n = 209, age 25–91) met the inclusion criteria. NBIs, such as horticultural therapy and forest therapy, demonstrated generally positive effects across physical, psychosocial, and physiological outcomes, though effect size and quality varied. Study quality ranged from low to high.

Quality assessment / Risk of bias analysis The evaluation of the quality was made using the Quality Assessment for Diverse Studies (QuADS) tool, designed for systematic reviews with studies of different designs. This tool has demonstrated excellent inter-rater reliability (k=0.66), face validity and content validity when applied to systematic reviews in health services research using mixed or multimethod approaches. The grid consists of 13 criteria rated from 0 (i.e., no mention) to 3 (i.e., a detailed description of each step of the data collection procedure). Indeed, this grid does not have a minimal threshold for a study to be considered of low or high quality. It is recommended to evaluate and discuss the methodological quality of the studies by considering each criterion separately, rather than calculating an overall score.
In the context of this mixed literature review, prioritized criteria were chosen and highlighted by the team (four physiotherapy master's students and RDS) to determine the overall quality of the studies. Since the subject is still emerging in the literature, the research team decided that studies needed to establish a solid theoretical foundation (criteria 1 from Table 1), clearly define their objectives (criteria 2 from Table 1) and explicitly describe the research intervention and the targeted population (criteria 3 from Table 1), use a study design appropriate for the research objectives (criteria 4 from Table 1), explain in detail the choice of measurement tools (criteria 6 from Table 1) and the data collection procedure (criteria 8 from Table 1), use an appropriate analysis method to address the research aims (criteria 1 from Table 1), and provide a precise thorough description of the research's strengths and limitations (criteria 13 from Table 1). Then, to assess the overall quality of the study, it was agreed by consensus that if a study met four criteria with a score of 3 and at least three criteria with a score of 2, its overall quality was considered high. If a study satisfied three criteria with a score of 3 and at least four criteria with a score of 2, its overall quality was judged to range from moderate to high. When a study predominantly presented criteria rated at 2, it indicated moderate overall quality. If a study met three criteria with a score of 2 and four criteria with a score of 1 or 0, its overall quality was assessed as ranging from low to moderate.

Strategy of data synthesis Two tables were initially created to organize the data from the selected studies in accordance with the review objectives. The first table was designed to present the general characteristics of the studies (Table 2), while the second table summarized the results (Table 3). Data for half of the studies were collected by two physiotherapy master's students, with another two students gathering data for the remaining studies. A Ph.D. student (EF) reviewed the data from all eight studies and standardized the tables for consistency.

Subgroup analysis Subgroup analyses were performed by type of chronic disease, type of intervention, and study quality to explore potential effect modifiers.

Sensitivity analysis Sensitivity analyses were planned but not performed due to the limited number of included studies.

Language restriction English.

Country(ies) involved Canada.

Keywords nature-based intervention; chronic disease; physical function; forest therapy; horticultural therapy; forest bathing; pain; psychosocial health; physiological health; quality of life.

Contributions of each author

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