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A study of middle and high physical activity intervention strategies during pregnancy based on a socioecological model -A systematic review

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Sun, JJ; Piernicka, M; Szumilewicz, A.

Corresponding author:
Junjiang Sun

sun.junjiang@awf.gda.pl

Author Affiliation:
Gdansk University of Physical Education and Sport.

ADMINISTRATIVE INFORMATION

Support - Gdansk University of Physical Education and Sport.

Review Stage at time of this submission - Data analysis.

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 19 March 2024 and was last updated on 19 March 2024.

INTRODUCTION

Review question / Objective This study analyzes the guidelines for pregnancy, the factors that influence pregnant women's participation in MVPA, and the effects of MVPA on Glucose and Lipid Metabolism Biomarkers and Blood Pressure (BP) interventions, to provide a reference for related research and MVPA interventions during pregnancy.

Rationale (1) Integration of physical activity into health care: embedding PAVS into EMRs to assess the physical activity (PA) of the entire population based on PA guidelines, guide individuals in fitness, disease prevention, disease treatment, and rehabilitation.
(2) Small social ecology theory based on group PA, which is a relatively supportive interpersonal, organizational, community, and public policy environment within a certain region based on group characteristics.

Condition being studied There is a need to strengthen PA education and interventions for pregnant women. This requires the provision of effective information to pregnant women and an understanding of their individual circumstances, as well as the provision of effective interventions based on individual characteristics. There are fewer comprehensive studies on moderate-to-vigorous intensity physical activity (MVPA) strategies during pregnancy, and a comprehensive analysis is still needed.

METHODS

Search strategy An intensive search was carried out in the following databases: PubMed, Scopus, Sport Discus and Web of Science. We manually searched the references of published studies, The detailed search strategy is presented in Supplementary Material. The search terms used were:
• (“physical activity” or “exercise” or ” fitness” or “physical exercise” or “sport ”)
• (“correlates” or “determinants” or “mediators” or “associated factors” or “psychosocial” or “environment”) • (“pregnant women” or pregnancy)
• (“guideline”)

- ("blood pressure")
- ("leptin" or "irisin"or "resistin" or "irisin")
- ("randomized clinical trial" or "RCT").

Participant or population Pregnant women.

Intervention Moderate-to-vigorous intensity physical activity.

Comparator Intervention experiments (moderate-to-vigorous intensity physical activity, including characteristics of participants (number, age, and obstetric characteristics); intervention features (type, duration, frequency, and intensity of physical exercise intervention); target of the study; strengths and weakness of each RCT; and results of outcomes.

Study designs to be included Guidelines; Influencing factors; Intervention experiments.

Eligibility criteria The criteria for inclusion were: (1) full-text available; (2) taking pregnant women as the research participants; (3) reporting of MVPA as an outcome for indicators relevant to pregnant women; (4) written in English; and (5) published in scholarly (peer-reviewed) journals.Exclusion criteria: (1) taking women with any disabilities or illnesses that could lower their ability in terms of bodily movement as the study population; (2) focusing on nutritional interventions or healthy eating; (3) involving a survey of parturient women; (4) only published as abstract, a comment, or review, due to a lack of data for extraction (but the reference lists were checked for relevant studies).

Information sources PubMed, Scopus, Sport Discus and Web of Science.

Main outcome(s) A total of 22 244 records were identified after systematically screening the grey literature and other sources, After removing duplicates and papers irrelevant to the selected topic (judging by the abstracts). 11 were guidelines, 9 were factors affecting physical activity during pregnancy, and 11 were Intervention experiments with moderate and high physical activity (blood pressure 11, Glucose and Lipid Metabolism 11).

Data management Using Microsoft Word, a data chart was constructed to facilitate the information stated within each included study (tables). The first author charted all study details, while the second author checked the accuracy of data extraction; all researchers used the same Excel table to avoid missing information. Based on the objectives of our study, the literature was categorized into three categories, namely, guidelines, influencing factors, and experimental interventions, and information was extracted according to the categories, (1) Guidelines: including, amount of exercise, type of exercise, testing methods, and recommendations/ precautions; (2) Influencing factors, including, research type, collection method, country , factors (facilitator"+", barrier"-", no association"0",as an inconclusive finding (coded with a "?"; (3) Intervention experiments, including characteristics of participants (number, age, and obstetric characteristics); intervention features (type, duration, frequency, and intensity of physical exercise intervention); target of the study; strengths and weakness of each RCT; and results of outcomes.

Quality assessment / Risk of bias analysis Two researchers were involved in the risk of bias and the quality of the study's analysis. A third researcher resolved discordances if necessary. It was used the TESTEX tool (Smart et al., 2015) to evaluate the study quality in five questions (eligibility criteria, randomization specification, allocation concealment, group similarity at baseline, and blinding of assessor for at least one key outcome) with one point for each question; and the study reporting in other seven questions (outcome measures assessment, intention-to-treat analysis, statistical comparisons reporting, point measures and measures of variability for all reported outcomes, control group monitoring, relative exercise intensity, and other exercise parameters), in a total of 10 points. Considering all the scales, a score of 15 points is possible. The following criteria were used to verify the risk of bias and quality of the studies: high quality and low risk of bias (≥10 points), moderate quality and risk of bias (7–9 points), poor quality and high risk of bias (1–6 points).

Strategy of data synthesis Using Microsoft Word, a data chart was constructed to facilitate the information stated within each included study (tables). The first author charted all study details, while the second author checked the accuracy of data extraction; all researchers used the same Excel table to avoid missing information. Based on the objectives of our study, the literature was categorized into three categories, namely, guidelines, influencing factors, and experimental interventions, and information was extracted according to the categories, (1) Guidelines: including, amount of exercise, type of exercise, testing methods, and recommendations/ precautions; (2) Influencing factors, including,

research type, collection method, country , factors (facilitator“+”, barrier“-”, no association“0”,as an inconclusive finding (coded with a “?”; (3) Intervention experiments, including characteristics of participants (number, age, and obstetric characteristics); intervention features (type, duration, frequency, and intensity of physical exercise intervention); target of the study; strengths and weakness of each RCT; and results of outcomes.

Subgroup analysis The guidelines contains details of the elements and how they differ. In addition to blood pressure, Glucose and Lipid Metabolism Biomarkers, other parameters were affected.

Sensitivity analysis None.

Language restriction English.

Country(ies) involved China/Poland.

Keywords physical activity; pregnant women; influencing factors; guidelines; blood pressure; lipid metabolism biomarkers; systematic review.

Contributions of each author

Author 1 - Junjiang Sun - JS contributed to the conception and design of the study. JS performed data collection and analysis. JS wrote the first draft of the manuscript.
Email: sun.junjiang@awf.gda.pl
Author 2 - Piernicka M.
Author 3 - Anna Szumilewicz.
Email: anna.szumilewicz@awf.gda.pl