

Review

Physical activity during pregnancy and the role of theory in promoting positive behavior change: A systematic review

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Abstract

Background: Physical activity (PA) during pregnancy provides physical and psychological benefits for mother and child. U.S. guidelines recommend ≥ 30 min of moderate exercise for healthy pregnant women most days of the week; however, most women do not meet these recommendations. Theory assists in identifying salient determinants of health behavior to guide health promotion interventions; however, the application of theory to examine PA among pregnant women has not been examined cohesively among multiple levels of influence (e.g., intrapersonal, interpersonal, neighborhood/environmental, and organizational/political). Subsequently, this systematic review aims to identify and evaluate the use of health behavior theory in studies that examine PA during pregnancy.

Methods: Articles published before July 2014 were obtained from PubMed and Web of Science. Inclusion criteria applied were: (1) empirically-based; (2) peer-reviewed; (3) measured factors related to PA; (4) comprised a pregnant sample; and (5) applied theory. Fourteen studies were included. Each study's application of theory and theoretical constructs were evaluated.

Results: Various theories were utilized to explain and predict PA during pregnancy; yet, the majority of these studies only focused on intrapersonal level determinants. Five theoretical frameworks were applied across the studies—all but one at the intrapersonal level. Few determinants identified were from the interpersonal, neighborhood/environmental, or organizational/political levels.

Conclusion: This systematic review synthesized the literature on theoretical constructs related to PA during pregnancy. Interpersonal, community, and societal levels remain understudied. Future research should employ theory-driven multi-level determinants of PA to reflect the interacting factors influencing PA during this critical period in the life course.

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Keywords: Physical activity; Pregnancy; Theory

1. Introduction

Physical activity (PA) during pregnancy has been proposed to have numerous health benefits across the life course. Being physically active during pregnancy is associated with reduced risk of adverse pregnancy and birth outcomes, including pre-eclampsia, gestational diabetes, and preterm birth.^{1,2} PA during pregnancy can also have implications for psychological health, including overall mood and self-esteem.³ Moreover, PA can support healthy gestational weight gain,⁴ particularly since the amount of excessive weight gain during pregnancy is a significant predictor of postpartum weight retention.⁵ Therefore, having adequate levels of PA during pregnancy can have long-term, positive impacts for women's health.

The American College of Obstetricians and Gynecologists (ACOG) has recommended that pregnant women should engage in moderate exercise for 30 min a day on most days of the week, with the exception of women with compromising health conditions (e.g., pre-eclampsia).⁶ Despite these recommendations, only 13.8% of pregnant women in the US are physically active.⁷ Furthermore, women are less likely to sustain PA as the pregnancy progresses into later trimesters⁸ and during the transition to parenthood.⁹ The salience of this issue is amplified given that pregnancy is identified as a “teachable moment” in which women are amenable to change behaviors that can benefit their health and their baby's health.¹⁰

In order to promote PA during pregnancy, theory serves as a powerful methodological tool for health behavior change. Theory can explain or predict a phenomenon and is extensively used in health behavior research.¹¹ Previous research on predictors of PA during pregnancy has primarily focused on demographic,

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non-modifiable correlates of the behavior.⁸ Yet, there is a need to understand the potentially modifiable factors for PA during this unique period that is sensitive to change. Moreover, it is well known that health behavior is influenced by multiple factors across the socio-ecological levels.¹² For example, intrapersonal (e.g., knowledge, attitudes, beliefs), interpersonal (e.g., social support), neighborhood/environmental (e.g., side walk availability), and organizational/political (e.g., workplace policies) factors can be interacting forces that influence PA patterns.

A firm understanding of the multi-level, theory-based factors for PA during pregnancy is critical to inform future health promotion intervention development.¹³ However, a previous systematic review examined the use of behavioral change techniques for PA interventions during pregnancy and found that out of the 14 studies included in the review, only 2 were grounded using theoretical frameworks. While behavioral change techniques (e.g., goal setting, feedback, repetition) can provide successful outcomes, the use of theory for developing interventions directly maps needs and assets to theory-based intervention components and improves generalizability of findings.¹⁴ Therefore, it is necessary to understand the current literature regarding the theory-based factors that influence PA during pregnancy in order to inform future intervention development. The purpose of this study was to systematically review and evaluate the use of health behavior theory in observational studies that examine PA among pregnant women.

2. Materials and methods

Methods of this systematic review were specified prior to commencement in a study protocol. The protocol referenced Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) guidelines¹⁵ and recommendations for integrative reviews (i.e., reviews of quantitative and qualitative research).¹⁶ Articles were systematically selected from a search of PubMed and Web of Science databases, during a date range of database inception until July 2014. Search terms were organized into general categories of pregnancy (e.g., pregnan*, gestation*, pregnant women), PA (e.g., leisure-time activity, physical activity, exercise, fitness, motor activity), and theory (e.g., theory, conceptual framework). The search strategy in each database used the Boolean term of “AND” for inclusion of each general category, and the Boolean term of “OR” for inclusion of each search term within the category.

Inclusion criteria applied were: (1) empirically-based; (2) published in a peer-reviewed journal; (3) measured factors related to PA during pregnancy; (4) comprised a pregnant sample; and (5) used a health behavior theory. Studies were excluded if they tested an intervention since this review focused on observational designs only, and not experimentally impacted theoretical determinants. Additionally, studies were excluded if only a published abstract was available since not enough data were available for abstraction.

Fig. 1 presents the search process for this systematic review. The primary search of the literature identified 326 articles. After removing 67 duplicates, 259 articles remained. Articles were then screened based on titles and relevance to the research topic; this removed 190 articles. Next, articles were assessed

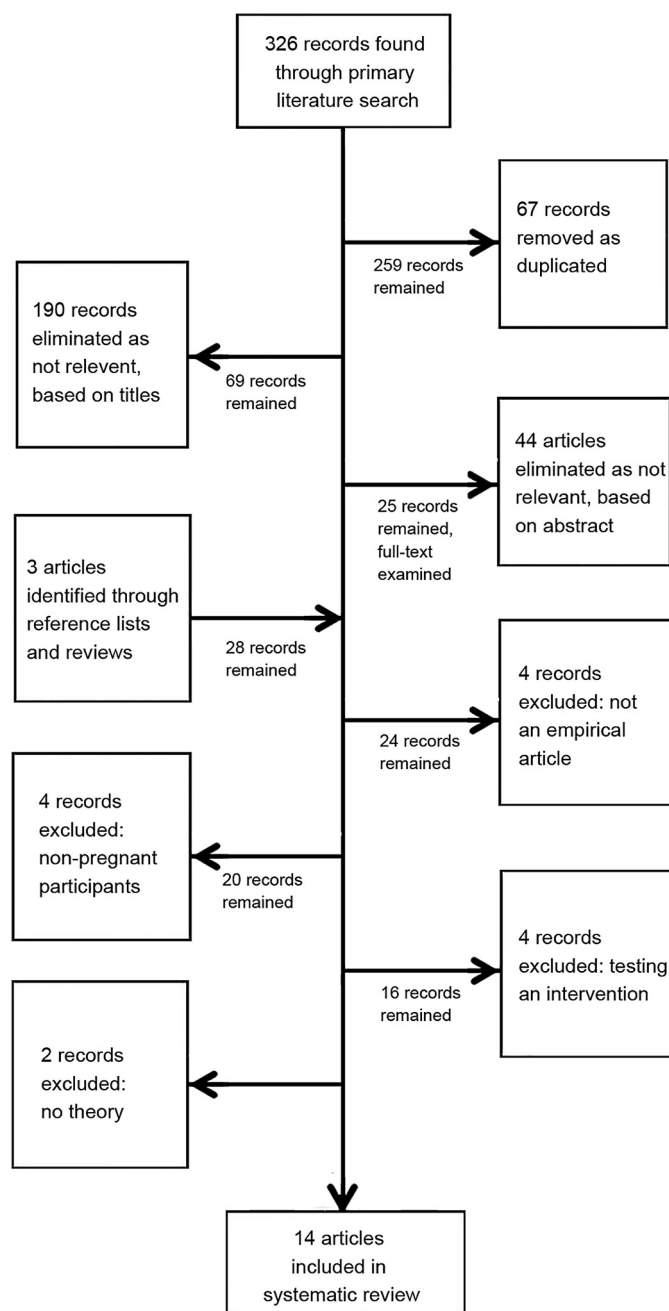


Fig. 1. Search strategy for systematic review of theory-based determinants of physical activity during pregnancy.

based on the abstract to determine the relevance to the research topic; this resulted in 25 articles remaining. Three additional articles were added to the search strategy from hand-searching reference lists from the remaining articles. Twenty-eight full-text articles were examined to determine eligibility based on inclusion and exclusion criteria. Four articles were excluded for not providing details of an empirical study (i.e., only a published abstract was available), 4 articles were excluded for not including pregnant participants, 4 articles were excluded for testing or describing an intervention, and 2 articles were excluded for not measuring theory-based constructs for PA.

Each article had the following information abstracted for review: publication year, authors, article title, journal title,

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