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Physical activity during pregnancy and its association with postpartum depression, weight retention, and quality of life – a narrative review

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Abstract

Background:
Regular physical activity during pregnancy is recommended due to its beneficial effects on maternal and fetal health. In recent years, increasing attention has been directed toward potential long-term benefits of antenatal physical activity extending into the postpartum period. However, evidence regarding its influence on postpartum mental health, body weight outcomes, and quality of life remains heterogeneous.

Aim:
The aim of this narrative review was to synthesize evidence on the association between physical activity during pregnancy and selected maternal outcomes after childbirth, focusing on postpartum depressive symptoms, postpartum weight retention, and maternal quality of life.

Materials and methods:
A narrative literature review was conducted using the PubMed database. Articles published between 2000 and 2026 were identified using keywords and MeSH terms related to physical activity, exercise, pregnancy, postpartum outcomes, depression, gestational weight gain, postpartum weight retention, and quality of life. Randomized controlled trials, cohort studies, systematic reviews, meta-analyses, umbrella reviews, and clinical guidelines were included.

Results:
Evidence from systematic reviews and meta-analyses suggests that physical activity during pregnancy may reduce postpartum depressive symptoms, particularly in structured exercise interventions. Prenatal physical activity may also contribute to lower postpartum weight retention by limiting excessive gestational weight gain. Limited evidence indicates a positive association between prenatal physical activity and postpartum quality of life.

Conclusions:
Physical activity during pregnancy may provide benefits extending into the postpartum period, particularly for maternal mental health and weight outcomes. Current evidence supports promoting regular and safe physical activity during pregnancy as part of preventive health strategies.

Keywords: physical activity; exercise; pregnancy; postpartum depression; postpartum weight retention; quality of life

Introduction

Physical activity is widely recognized as a key element of health promotion and disease prevention across the lifespan. Regular movement contributes to improved cardiovascular fitness, metabolic regulation, psychological well-being, and overall quality of life. In the context of pregnancy, historical recommendations were often restrictive, emphasizing rest and avoidance of exertion. However, over the past several decades, accumulating scientific evidence has led to a paradigm shift toward encouraging appropriately prescribed physical activity during pregnancy as a safe and beneficial behavior for most women (1–4).

Current international and national guidelines consistently emphasize that, in the absence of medical or obstetric contraindications, pregnant women should engage in regular moderate-intensity physical activity. The American College of Obstetricians and Gynecologists recommends at least 150 minutes of moderate-intensity aerobic physical activity per week during pregnancy, distributed across several days, and highlights benefits including improved cardiovascular function, reduced risk of gestational diabetes, lower incidence of hypertensive disorders, and enhanced psychological well-being [1]. Similar recommendations are provided by the World Health Organization and national guideline panels in North America and Europe (2–4).

From a physiological perspective, pregnancy is characterized by profound cardiovascular, metabolic, and musculoskeletal adaptations. Regular physical activity during pregnancy has been shown to support these adaptations by improving insulin sensitivity, maintaining cardiorespiratory fitness, and reducing excessive fat accumulation (5,6). Importantly, large-scale systematic reviews and meta-analyses indicate that prenatal exercise is not associated

with an increased risk of adverse fetal outcomes, including preterm birth or fetal mortality, when performed within recommended intensity ranges (5,6). These findings have contributed to growing confidence among clinicians and exercise professionals in promoting physical activity during pregnancy.

Beyond physical health outcomes, increasing research attention has focused on the potential mental health benefits of physical activity during pregnancy. Both pregnancy and the postpartum period constitute critical and vulnerable phases for the development of depressive and anxiety symptoms, with postpartum depression representing a major public health concern worldwide. Evidence from systematic reviews and meta-analyses indicates that physical activity performed during pregnancy is associated with lower levels of anxiety and depressive symptoms during pregnancy and in the postpartum period (7-9). Given the substantial individual, familial, and societal burden associated with postpartum depression, the identification of modifiable behavioral factors, such as physical activity, is of considerable importance for clinical practice and public health strategies.

Postpartum weight retention represents another critical outcome linking pregnancy behaviors to long-term maternal health. Retention of pregnancy-related weight after childbirth has been identified as a major contributor to the development of obesity and cardiometabolic disease later in life, as well as increased risk in subsequent pregnancies (10-12). Gestational weight gain is one of the strongest predictors of postpartum weight retention, and excessive weight gain during pregnancy is common. Physical activity during pregnancy may influence postpartum weight outcomes indirectly by limiting excessive gestational weight gain and promoting healthier body composition changes (13,14).

Quality of life is a multidimensional construct encompassing physical functioning, psychological well-being, social participation, and perceived health status. While the positive association between physical activity and quality of life is well established in the general population, fewer studies have examined this relationship in the context of pregnancy and the postpartum period. Emerging evidence suggests that physical activity during pregnancy may be associated with better quality of life during pregnancy and after childbirth, particularly in psychological and functional domains (15-17). However, findings remain inconsistent, and quality of life has rarely been included as a primary outcome in intervention studies.

Importantly, many women reduce their level of physical activity after childbirth, largely due to fatigue, time constraints, and increased caregiving responsibilities (5,16). This observation raises a clinically relevant question as to whether physical activity performed during pregnancy may exert sustained beneficial effects on postpartum outcomes, even in the context of reduced physical activity following delivery. Addressing this issue is essential for informing prenatal counseling, guiding the development of effective antenatal interventions, and framing realistic and evidence-based health promotion messages for pregnant women.

Therefore, the aim of the present narrative review is to synthesize and critically evaluate the available evidence on the association between physical activity during pregnancy and selected maternal outcomes in the postpartum period, with particular emphasis on postpartum depressive symptoms, postpartum weight retention, and maternal quality of life.

Results

2.1. Physical activity during pregnancy and postpartum depressive symptoms

A substantial body of evidence has examined the association between physical activity performed during pregnancy and depressive symptoms in the postpartum period. Results from systematic reviews and meta-analyses generally indicate a protective association, although the magnitude of the effect and consistency across studies vary.

A comprehensive systematic review and meta-analysis including observational studies and randomized controlled trials reported that women who engaged in physical activity during pregnancy had significantly lower postpartum depressive symptom scores compared with inactive women (7). The pooled standardized mean difference indicated a small-to-moderate effect size favoring physically active participants, although heterogeneity between studies was substantial (7). Importantly, subgroup analyses demonstrated stronger effects in intervention studies than in observational cohorts, highlighting the potential importance of structured and supervised exercise programs (7).

Similar conclusions were drawn in a meta-analysis of randomized and nonrandomized controlled trials evaluating exercise-based interventions for postpartum depressive symptoms (8). In the included studies, maternal depressive symptoms were assessed using validated

screening instruments, most commonly the Edinburgh Postnatal Depression Scale (EPDS) and the Beck Depression Inventory (BDI) (8). The meta-analysis demonstrated that exercise-based interventions implemented during pregnancy and/or the postpartum period were associated with a significant reduction in postpartum depressive symptom scores (overall effect size 0.41, 95% CI 0.28–0.54) (8). Subgroup analyses further indicated that the magnitude of the effect was greater among women presenting with elevated depressive symptoms at baseline compared with those without baseline symptoms (8).

Another systematic review and meta-analysis focusing specifically on physical activity during pregnancy and postpartum depression confirmed a statistically significant inverse association between prenatal physical activity and postpartum depressive symptoms (9). In the included studies, postpartum depression or depressive symptoms were identified using structured clinical interviews, validated screening instruments such as the Edinburgh Postnatal Depression Scale (EPDS), or clinical judgment by healthcare professionals (9). The meta-analysis demonstrated that women who were physically active during pregnancy had significantly lower postpartum depression scores compared with inactive women (overall SMD = −0.22, 95% CI −0.42 to −0.01) (9). However, the authors emphasized a high level of heterogeneity across studies, noting substantial variability in physical activity assessment methods and outcome measurement approaches (9). These findings suggest that while the overall direction of the association is favorable, observed effects may depend on methodological differences between studies (9).

Interestingly, a prospective cohort study assessing moderate-to-vigorous physical activity (MVPA) at two gestational time points found no significant association between total MVPA during pregnancy and postpartum depressive symptoms assessed three months after delivery (18). However, domain-specific analyses suggested differential patterns, with leisure-time physical activity showing more consistently inverse associations with postpartum depressive symptoms compared with occupational or household activity (18). These findings underscore the importance of considering the type and context of physical activity when interpreting associations with mental health outcomes.

Evidence from advanced comparative analyses further highlights the importance of exercise intervention characteristics. A Bayesian network meta-analysis comparing different exercise-

based interventions for postpartum depression indicated that aerobic and mixed exercise programs were associated with greater reductions in depressive symptoms compared with usual care or minimal-intervention controls (19). Most included interventions involved structured exercise programs, defined by predefined protocols specifying the type, frequency, and duration of exercise, and often delivered under supervision (19). Although the majority of interventions were initiated in the postpartum period, these findings suggest that structured exercise programs may be more effective for improving maternal mental health than general physical activity advice alone. When considered alongside evidence from antenatal exercise studies, this supports the potential relevance of exercise structure and delivery characteristics across the perinatal period.

Notably, only one randomized controlled trial has directly evaluated the effect of prenatal exercise on postpartum depressive symptoms as a primary outcome. In this multicenter trial, pregnant women assigned to a moderate-intensity aerobic water exercise program reported significantly lower postpartum depressive symptom scores compared with women in the control group, who received routine prenatal care without participation in a structured exercise intervention (20). In the context of this study, routine prenatal care refers to standard obstetric follow-up and counseling typically provided during pregnancy, without the inclusion of a supervised or protocol-based physical exercise program. These findings provide direct experimental evidence suggesting that participation in structured physical activity during pregnancy may reduce the severity of depressive symptoms in the postpartum period.

2.2. Physical activity during pregnancy and postpartum weight retention

Observational cohort studies indicate that women who remain physically active during pregnancy tend to retain less weight postpartum compared with inactive women (21). After adjustment for sociodemographic characteristics and pre-pregnancy body mass index, higher levels of prenatal physical activity remained associated with lower postpartum weight retention, although the magnitude of the effect was modest (21).

Meta-analytic evidence highlights gestational weight gain as a key determinant of postpartum weight retention. A meta-analysis demonstrated that excessive gestational weight gain is strongly associated with higher weight retention beyond six months after childbirth (11).

Several systematic reviews and meta-analyses have evaluated antenatal lifestyle interventions combining physical activity and dietary components. These interventions are consistently associated with reduced gestational weight gain and a lower risk of excessive weight gain during pregnancy. Although postpartum weight retention is not always assessed as a primary outcome, studies including postpartum follow-up generally report more favorable weight trajectories among women participating in antenatal lifestyle interventions (14,22).

Evidence also suggests that combined physical activity and dietary interventions may be more effective than physical activity alone in reducing postpartum weight retention (22,23). Together, these findings indicate that while physical activity during pregnancy plays an important role in weight management, its effects may be enhanced when integrated into broader lifestyle interventions targeting multiple behavioral determinants of weight change.

2.3. Physical activity during pregnancy and postpartum quality of life

Compared with depressive symptoms and weight-related outcomes, the association between physical activity during pregnancy and postpartum quality of life has received relatively less attention in the literature. Nevertheless, broader evidence suggests that physical activity during pregnancy may contribute to improved maternal well-being and psychological functioning in the perinatal period (5).

Observational evidence indicates that women who meet recommended physical activity levels during pregnancy tend to report higher quality of life scores during pregnancy and in the postpartum period compared with less active women (15).

Evidence from randomized controlled trials further supports these findings. In a multicenter randomized controlled trial evaluating a moderate-intensity aerobic water exercise program during pregnancy, women assigned to the intervention group reported significantly better postpartum quality of life compared with women receiving standard prenatal care. Improvements were observed primarily in psychological well-being and perceived health status (20).

Discussion

This narrative review examined the association between physical activity during pregnancy and selected maternal outcomes in the postpartum period, focusing on depressive symptoms, postpartum weight retention, and maternal quality of life. The findings indicate that antenatal physical activity may contribute to improved postpartum well-being, although the strength of evidence differs across outcomes and study designs.

3.1 Physical activity, postpartum mental health, and maternal well-being

Among the outcomes examined, the association between prenatal physical activity and postpartum depressive symptoms appears to be supported by the most substantial body of evidence. Systematic reviews and meta-analyses consistently suggest that women who engage in regular physical activity during pregnancy tend to report lower levels of postpartum depressive symptoms compared with inactive women (7-9). Importantly, intervention studies often report clearer associations than observational studies, suggesting that structured exercise programs implemented during pregnancy may have particularly beneficial effects on maternal mental health.

Several mechanisms may explain the relationship between prenatal physical activity and improved postpartum psychological outcomes. Physical activity may influence inflammatory pathways and neuroendocrine mechanisms involved in mood regulation, including processes related to the hypothalamic–pituitary–adrenal axis (5).

In addition to these physiological mechanisms, psychological and behavioral factors may also contribute to the observed associations. Participation in regular physical activity during pregnancy may enhance self-efficacy, promote adaptive coping strategies, and provide a sense of control during a period characterized by substantial physical and emotional changes (26). Furthermore, structured or group-based exercise programs may increase opportunities for social interaction and perceived social support, both of which are known protective factors against postpartum depression (25).

Nevertheless, findings from observational studies indicate that the relationship between prenatal physical activity and postpartum depressive symptoms may vary depending on the type and context of physical activity. For example, analyses of moderate-to-vigorous physical activity during pregnancy have shown that leisure-time physical activity may be more strongly

associated with favorable mental health outcomes than occupational or household activity (18). These findings suggest that not only the amount, but also the context and perceived purpose of physical activity may influence its psychological benefits.

Although quality of life has been less frequently examined than depressive symptoms, available evidence suggests that prenatal physical activity may also be associated with improved postpartum well-being. Observational cohort studies indicate that women who meet recommended physical activity levels during pregnancy tend to report higher quality-of-life scores during pregnancy and in the postpartum period compared with less active women (15). Similarly, randomized controlled trials evaluating structured exercise programs during pregnancy have demonstrated improvements in postpartum quality of life, particularly in psychological well-being and perceived health status (20).

Taken together, these findings suggest that physical activity during pregnancy may contribute not only to reduced depressive symptoms but also to broader aspects of maternal well-being during the postpartum period.

3.2 Physical activity, gestational weight gain, and postpartum weight outcomes

The evidence linking physical activity during pregnancy to postpartum weight retention appears to be largely indirect and mediated through gestational weight gain. Excessive gestational weight gain has been consistently identified as one of the strongest predictors of postpartum weight retention and long-term maternal obesity (10-12). Consequently, interventions that limit excessive gestational weight gain may also contribute to more favorable postpartum weight trajectories.

Systematic reviews and meta-analyses indicate that antenatal lifestyle interventions incorporating physical activity, particularly when combined with dietary counseling, are effective in reducing excessive gestational weight gain (13,14,22). Although postpartum weight retention is not always reported as a primary outcome, studies including postpartum follow-up generally suggest more favorable weight trajectories among women who participated in antenatal lifestyle interventions.

From a behavioral perspective, physical activity during pregnancy may also promote long-term engagement in health-promoting behaviors. Women who remain physically active during pregnancy may be more likely to resume activity after childbirth or adopt healthier dietary patterns, which may contribute to improved postpartum weight outcomes. However, this hypothesis requires further investigation in longitudinal studies that assess both antenatal and postpartum lifestyle behaviors.

3.3 Implications for future research

Despite growing interest in the role of prenatal physical activity in maternal health, several gaps remain in the existing literature. First, many studies rely on self-reported measures of physical activity, which may introduce measurement bias and limit comparability across studies. Second, postpartum outcomes are often secondary endpoints in intervention trials, and follow-up periods are frequently limited to the early postpartum period.

Future research should therefore prioritize standardized measurement of physical activity exposure, include postpartum outcomes as predefined endpoints, and extend follow-up periods to better understand the long-term implications of prenatal physical activity. In addition, further research is needed to determine whether the potential benefits of physical activity during pregnancy persist independently of postpartum physical activity patterns.

Conclusions

The findings of this narrative review suggest that physical activity during pregnancy may contribute to improved maternal well-being in the postpartum period. The most consistent evidence concerns postpartum depressive symptoms, with physically active women generally reporting lower symptom severity than inactive women. Prenatal physical activity may also support healthier postpartum weight trajectories and better quality of life, although evidence for these outcomes remains more limited. Overall, these results support current recommendations encouraging regular moderate-intensity physical activity during pregnancy (approximately 150 minutes per week) as a safe strategy that may provide benefits extending beyond pregnancy into the postpartum period.

Disclosure:

Author Contributions:

Conceptualization: [KŁ], [NM]

Methodology: [NM], [AK]

Software: [KT], [MK]

Check: [AK], [WP]

Formal analysis: [KŁ], [AK]

Investigation:[KŁ], [AK], [AK]

Resources: [AK], [JD]

Data curation: [KŁ], [KT], [MK]

Writing -orginal draft: [KŁ]

Writing -review and editing: [KŁ], [AK], [AK]

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