SUSTAINABILITY & SPORTS SCIENCE JOURNAL

REVIEW ARTICLE

Physical exercise effects on weight during pregnancy: A review

Elga Damo . *Department of Collective Sports. Faculty of Movement Sciences. Sports University of Tirana. Tirana, Albania.*
Bardhyl Misja. *Department of Collective Sports. Faculty of Movement Sciences. Sports University of Tirana. Tirana, Albania.*

ABSTRACT

Regular physical activity has numerous benefits, including reducing the risk of gestational diabetes, hypertension and pre-eclampsia, promoting healthy weight gain and reducing the risk of postpartum depression. This paper's primary objective was to search for the most recent research on the effects of physical exercise on weight control during pregnancy. We searched in PubMed for, Studies of the last 10 year (2014-2024). Free full texts studies randomized controlled trials studies. From 38 results only 7 studies were selected to be part of this review. A total of 1383 (aged 18 to 40 years) pregnant women were recruited to be part of these studies. Different types of physical activity intervention programs were used focusing on the management of weight during pregnancy. Promoting a healthy weight increase throughout pregnancy, physical exercise especially in the second part of pregnancy can bring general benefits on weight management also in pregnant women overall health. More review studies with a larger sample size, more specifics, and a variety of interventional exercise program types are needed to highlight more effective exercise programs (and their combinations) and improve the quality of scientific research-based information about weight gain management during pregnancy.

Keywords: Sport health, Effects, Exercises, Pregnancy, Physical activity.

Cite this article as:
Damo, E., & Misja, B. (2025). Physical exercise effects on weight during pregnancy: A review. *Sustainability and Sports Science Journal*, *3*(3), 177-183. https://doi.org/10.55860/ATIT9163

Corresponding author. *Sports University of Tirana. Faculty of Movement Sciences. Department of Collective Sports. Tirana, Albania.*
E-mail: edamo@ust.edu.al
Submitted for publication March 04, 2025.
Accepted for publication April 13, 2025.
Published June 10, 2025.
Sustainability and Sports Science Journal. ISSN 2990-2975.

Identifier: https://doi.org/10.55860/ATIT9163

INTRODUCTION

Obesity in pregnant women is associated with reproductive challenges, such as reduced fertility and increased maternal and foetal risks during pregnancy (Blomberg, 2011). According to Checheir (2011), obesity also increases the possibility of a pregnant woman being at risk of possible ischemic stroke in the future, from type 2 diabetes, osteoarthritis, gall bladder disease, hypertension, coronary heart disease and a number of malignancies, including breast and colon cancer. Weight gain during pregnancy is a predisposing factor for obesity in the future, as women with excessive gestational weight gain (GWG) also are more likely to have high postpartum weight retention (PPWR) (Siega-Riz et al., 2009) and their children to have an increased risk of later overweight or obesity (Oken et al., 2007). Pregnancy and delivery difficulties are less likely to occur in women who gain the required amount of weight (Streuling et al., 2010; Da Silva et al., 2017). In pregnancy and childbirth, pre-training can facilitate birth and prevent complications (Thornton et al., 2006) (Márquez et al., 2009 (b)).

A vital component of a healthy lifestyle, physical exercise is described as a planned, structured physical activity carried out to enhance one or more aspects of physical fitness, helping to prevent and treat certain diseases (Davenport et al., 2018 (a)). Because pregnancy is linked to greater incentive to maintain or begin a healthy lifestyle and more frequent medical checkups, which make exercise tracking easier, it's a fantastic time to begin training (Davenport et al., 2018 (b)). Regular exercise during pregnancy has several benefits, including reducing the risk of postpartum depression, excessive weight gain and management in the postpartum period, as well as hypertensive problems and gestational diabetes (Davenport et al., 2018 (a); Davenport et al., 2018 (a)). Another interesting and healthful approach to keep active throughout pregnancy is via aquatic-aerobic exercise. It has several benefits for the health of the pregnant woman such as reducing the risk of miscarriage, less oedema, increased diuresis, lower arterial pressure and less back pain. It also enables pregnant women to interact emotionally with one another (Rising & Senterfitt, 2009). Along with worries about the possible hazards of exercise, pregnant women are not adequately encouraged to engage in regular exercise, which leads to their abandonment or unwillingness to begin at this time (Coll et al., 2016). Pregnant women who engage in regular physical activity during the first six months of their pregnancy have a lower risk of caesarean delivery; this is because physical activity at the right intensity during pregnancy makes childbirth easier during the second stage (Krzepota et al., 2018).

Objective

This paper's primary objective was to search for the most recent research on the effects of physical exercise on weight control during pregnancy.

METHODOLOGY

We searched in PubMed using the keywords; Effects; Exercises During Pregnancy; Pregnancy; Physical Activity. Filters applied were: Studies of the last 10 year (2014-2024), Free full texts studies, Randomized controlled trials studies. Exclusion criteria: Studies that included subjects with different maternal diseases such as: pre-eclampsia, cardiac diseases, deep anaemias, rheumatic disease or special interventions in the mother's body that recommend restriction of movements.

RESULTS

From 38 results only 7 studies were selected to be part of this review.

1. Ronnberg et al., 2016

2. Mizgier et al., 2018
3. Brik et al., 2019
4. Darvall et al., 2020
5. Navas et al., 2021
6. McDonald et al., 2022
7. Roland et al., 2023

Table 1. The final 6 selected studies.

Nr	Author, year of publication	Subject number and age	Exercise intervention duration
1	Ronnberg et al., 2016	445 women randomized, 267 remained for analysis at ≤16 weeks postpartum and 168 at 1 year postpartum.	1 year postpartum.
2	Mizgier et al., 2018	57 pregnant females.	18 weeks
3	Brik et al., 2019	A total of 120 women.	8 months
4	Darvall et al., 2020	30 obese pregnant women aged ≥18 years with a BMI (weight in kilograms/height in m^2) ≥30 kg/m^2.	3 months
5	Navas et al., 2021	320 women.	12 weeks
6	McDonald et al., 2022	192 women (18–40 years).	24+weeks
7	Roland et al., 2023	219 pregnant women in good health who were not active had a median pre-pregnancy BMI of 24.1 (21.8–28.7) kg/m^2.	4 years 2018–2021

DISCUSSION

A total of 1383 (aged 18 to 40 years) pregnant women were recruited to be part of these studies. Different types of physical activity intervention programs were used including; yoga, swimming, and stationary bike exercises, aerobic activities, strengthening exercises, coordination and balance exercises, pelvic floor exercises, brisk walking, dancing, aquatic exercises, stretching and relaxation, and any combination of these group exercises, focusing on the management of weight during pregnancy. The primary goal of the Ronnberg et al. (2016) study was to determine if a prenatal intervention might lower postpartum weight retention (PPWR) when compared to routine care. The exercise intervention was focused on the individual education which was based on BMI category and was part of the intervention approach during the first prenatal appointment. A customized graph with the suggested weight growth interval shown on it was added to the data. There were official recommendations for exercise. The type and quantity of exercise recommended was modified based on prior activity levels and any pregnancy-related restrictions.

At every prenatal appointment and upon admission to the delivery ward, the mother's weight was measured, discussed, and documented in the case files and on the graph. In Mizgier et al., 2018 study, the main goal was to carefully carry out designing a physical activity program for 18 weeks with pregnant women and its long-term continuation second and third trimesters, to determine its impact on obstetric outcomes (birth weight, mode of delivery, week of pregnancy at birth and weight gain during pregnancy) to patients with different durations of physical activity. Pregnant women in the examined groups were compared based on body mass index (BMI), weight, height, age, and date of assessment. Movement activitie**s** for pregnant women, such as yoga, swimming and stationary cycling exercises, are safe and the only ones included in the fitness regime. The exercises were performed under instructions of licensed physical therapists. The main objective of Brik et al., 2019 study was to assess the relationship between mother gestational weight

increase and foetal cardiac function and physical activity during pregnancy. The exercise intervention was focused on week's 9–38, the women in the exercise group participated in three 60-minute sessions each week as part of a supervised physical conditioning program. Warming up for ten minutes, aerobic activities for twenty-five minutes, strengthening exercises for ten minutes, coordination and balance exercises for five minutes, pelvic floor exercises for five minutes, and stretching and relaxation for five minutes were all part of each session. The recommended level of aerobic exercise was mild to moderate (55–60% of maximal heart rate).

The Darvall et al., 2020 study objective was to evaluate a pedometer-based strategy to increase exercise and decrease excess gestational weight gain (GWG) in expectant mothers. 30 obese pregnant women were given Fitbit Zip pedometers and randomly assigned to one of three groups: app-coach (a behavioural change program offered by a health coach), control (pedometer only), or app-coach (pedometer connected to the patient's own smartphone with self-monitoring of activity). The exercise intervention program was based on written materials on pregnancy and exercise, such as the Australian Physical Activity and Sedentary Behavior Guidelines, were given to all research participants at the time of recruitment. Basically, general recommendations for physical activity are given: 150 minutes per week, or at least 30 minutes of moderate physical activity most days of the week. Examples of activities that correspond to a reasonable or very active level of physical activity as defined by pedometer which includes brisk walking, jumping, sweeping, window washing and pushing stroller than the child.

Analysing the effects and safety of moderate intensity water aerobic exercise. this program for postpartum depression, sleep problems and quality of life in women one month after birth was the aim of the research Navas et al., 2021. A control group (regular prenatal care) and an intervention group (moderate aerobic water activity) were randomly selected 320 pregnant women. where sleep quality (MOS sleep), quality of life (EQ-5D) and presence of anxiety or sadness (EPDS) which was measured one month after birth. Scientists concluded that moderate-intensity aquatic exercise during pregnancy was safe for both mothers and their unborn children and reduced postpartum anxiety and symptoms of depression in mothers. The goal of the study conducted by McDonald et al., 2022, was to ascertain how various forms of mother activity during pregnancy affected the health of the unborn child. The framework of the exercise program included a 5-minute warm-up, 50 minutes moderate-intensity exercise (40-59% VO_{2max}) and a 3-5-minute rest per each exercise session. Using treadmill, elliptical, recumbent bike, rowing or stair equipment, the aerobic exercise group engaged in moderate-intensity exercise. At a moderate intensity, the resistance training group performed two to three sets of fifteen repetitions of each exercise.

Roland et al., (2023) study aim was, to examine the motivational impact of physical activity (MOT) through organized supervised exercise training (EXE) on GWG, obstetric and neonatal outcomes throughout pregnancy. So, the primary goal of the exercise intervention was to examine and the impact of two separate exercise treatments (EXE and MOT) on moderate-to-vigorous physical activity during pregnancy compared to CON was the primary objective. Three times a week, the intervention group received one hour of moderately intense supervised exercise instruction, which included two sessions in a gym and one in a pool. Aerobics and Resistance training activities at the gym included 30 minutes of stationary cycling and 30 minutes of resistance band exercise. The participants spent 45 minutes exercising in water with plates, balls and other objects in the pool and 15 minutes of swimming. BT intervention included a weekly text message tailored to encourage increased physical activity as well four one- to two-hour motivational physical activity sessions throughout pregnancy. Leite CF et al. claim that some research on mothers and children have given inconsistent results because there is no meaningful correlation between physical activity and clinical outcomes; instead, "*lack of physical activity affects*" more than "*negative effects*" of physical activity were

observed. According to the study by Brik et al (2019), exercise during pregnancy does not reduce maternal weight gain, but promotes Postpartum weight reduction, according to research findings. The current study found that women who exercised throughout pregnancy experienced considerably greater maternal weight reduction after birth; the statistically significant finding may be explained by the increased sample size. The study of Darvall et al., (2020) observed no difference in step count each day active minutes or decrease in weight gain between groups. The results of this study suggest that pregnant obese women can use a pedometer that can sync data with their own smartphones.

According to the findings of the McDonald et al., (2019) study, aerobic capacity in the early stages of pregnancy predicted the risk of caesarean delivery, and exercise during pregnancy decreased the relative risk of caesarean birth rates, but not significantly. Prior studies have shown that fitness level reduces inflammatory markers, such as C-reactive protein, linked to metabolic phenotype, independent of BMI (Agostinis-Sobrinho et al., 2020). Roland et al.'s (2023) findings indicate that neither motivational counselling (MOT) nor supervised exercise training (EXE) had an impact on gestational weight gain (GWG) or obstetric and neonatal outcomes in healthy pregnant women when compared to the control group. These findings contradict other studies that demonstrated that, in comparison to conventional therapy (Ming et al., 2018), healthy (Díaz-Burrueco et al., 2021) and normal-weight women had decreased GWG after prenatal exercise. However, other research (Da Silva et al., 2017; Stafne et al., 2011) found no effect of exercise on prenatal GDM preeclampsia, premature birth and birth weight, which is comparable to the current study.

CONCLUSIONS

Based on the reviewed studies it is well documented that promoting a healthy weight increase throughout pregnancy, physical exercise especially in the second part of pregnancy can bring general benefits on weight management also in pregnant women overall health. Also, sustaining a moderate degree of physical exercise throughout pregnancy may aid in the foetal heart's growth and encourage postpartum weight loss. Lifestyle intervention with moderate long-term physical activity Pregnancy can reduce weight and also improve neonatal birth weight, exercise before and throughout pregnancy can reduce the chance of caesarean delivery in overweight and obese women.

Recommendations

Studies with bigger populations are needed to observe the effects of a long-term physical exercise program on the course and results of pregnancy. To better understand how does physical activity affect some outcomes during pregnancy and to identify the best strategies, including those with the optimal frequency and intensity of exercises to prevent weight gain during pregnancy is further study is needed. More review studies with a larger sample size, more specifics, and a variety of interventional exercise program types are needed to highlight more effective exercise programs (and their combinations) and improve the quality of scientific research-based information about weight gain management during pregnancy.

AUTHOR CONTRIBUTIONS

PhD(c) Elga Damo: Acted as the primary author, conducted the research, performed the literature review, and drafted the manuscript. Prof. Dr. Bardhyl Misja: Supervised the research process, provided scientific input, and reviewed the manuscript, contributing to its academic quality and final form. Both authors have reviewed and approved the final version of the manuscript prior to submission.

SUPPORTING AGENCIES

No funding agencies were reported by the authors.

DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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