

Exercise in Pregnancy: It's Effect on Maternal and Fetal Health an Evidence Based Findings

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ABSTRACT

Introduction: Exercise in pregnancy is one of the important contributors which also has a direct link between healthy mothers and healthy fetus. The purpose of this study is to review the published articles and recommend the information regarding benefit of exercise in pregnancy on maternal and fetal health.

Methods: Systematic search of peer- review publications had been done through Google Scholar, Medline, Pubmed and Scopus. Among the 32 relevant articles on this topic has been selected and reviewed ,analyzed and significant findings have been concluded. Pregnant mothers who do not have obstetric or medical contraindications should be encouraged to exercise during pregnancy. Observational studies of women who exercise during pregnancy have shown benefits such as decreased gestational diabetes mellitus, cesarean birth and operative vaginal delivery. It is related with the course of a healthy pregnancy, since it can increase physical fitness, lower the risk of excessive gestational weight gain, gestational diabetes, pre-eclampsia, macrosomia, and stillbirth. Exercises during pregnancy advances neuro-behavioral relaxation in the fetus.

Conclusion: Regular exercise is recommended for pregnant women, for overall health benefits of maternal and fetal health. Evidences supported that moderate level exercise during pregnancy is safe for the fetus during intra uterine life.

Keywords: Benefit, exercise, maternal and fetal health

INTRODUCTION

Pregnancy is a time in women's lives that is associated with considerable physiological and psychological changes which may promote sedentary behaviors and/or low levels of physical activity. Such behaviors have been associated with elevated risk of gestational diabetes, pregnancy-induced hypertension, high gestational weight gain, and the long-term risk for overweight/obesity development, Type 2 diabetes, and cardiovascular disease¹.

One of the important constituent of care to pregnant mother is exercise in pregnancy². Exercise, defined as physical activity consisting of planned, structured, and repetitive bodily movements done to improve one or more components of physical fitness, which is an essential element of a healthy lifestyle³. Exercise improves or maintains physical fitness and overall health and wellness⁴. It is important and can

help with some common discomforts of pregnancy and even help prepare body for labor and delivery⁴.

During pregnancy, there are several changes in the pregnant women's body due to effects of hormones which reduce support and increased mobility in structures to which muscles and tendons are attached. Some of them include low back pain, loss of balance, and weakness of the pelvic floor muscles, urinary incontinence and constipation. These discomforts can be relieved through appropriate exercise in pregnancy⁵.

In American Congress of Obstetrician and Gynecologist has recommended low impact moderate intensity exercise for pregnant women, which can be gradually progressed over a period of time for 30 minutes a day on most days of the

week. It recommended many water or ground-based physical activities during pregnancy. A sedentary lifestyle before or during pregnancy is frequently associated with negative maternal health impact and poor neonatal outcomes so sedentary women should increase their activities gradually and progressively. A pregnant woman without obstetric or medical problems are encouraged to engage in moderate exercise a day avoiding the risk of abdominal trauma. The strengthening of the abdominal and back muscles could minimize the risk resulting lordosis³. Exercises during pregnancy decreases adipose tissue growth, increases stress tolerance and advances neuro-behavioral relaxation in the fetus⁶.

METHODS

The review article is based on the systematic search of 32 articles in Google Scholar, Medline, Pubmed and Scopus. They were original articles, review articles and other general articles, listed in the references. After reviewing those articles following information are concluded which are categorized in terms of types of exercises in pregnancy, benefit of exercise in pregnancy on maternal health, fetal health and recommendation of exercise for pregnant mothers.

Types of Exercises in Pregnancy

The exercises which are recommended during pregnancy include breathing exercise, aerobics, pelvic floor exercise, brisk walking and indoor stationary cycling. Breathing exercise ensures a steady intake of oxygen as well as prepares the woman for the need to maintain uniform and rhythmic breathing during labor⁷. Studies also emphasize Safe and Beneficial exercise during pregnancy are Walking, Aerobic exercises, Dancing, Stretching exercises, Hydrotherapy, water aerobics which could be done throughout the week. Irrespective of the types of exercise, pregnant mothers should be under the care of an obstetrician-gynecologist or other obstetric care provider who will advise them to adjust their exercise during pregnancy and postpartum⁸. The available evidence from intervention trials combining both aerobic and muscle strengthening physical activity support the recommendation for regular strength training to be included for pregnant women⁹.

Strength training exercises are activities that strengthen muscles. They include swimming walking

uphill, yoga and even digging the garden. They will improve muscle tone and build stamina, which will help during labour¹⁰.

Benefit of Exercise in Pregnancy on Maternal Health

There is increasing evidence that Exercise during pregnancy is indeed beneficial to maternal physiological and psychological health¹¹. The general benefit of exercise for pregnant women include reducing blood pressure decreases cardiovascular such as clot formation, helping to maintain ideal body weight¹².

These kinds of Lifestyle intervention targeting physical activity have the potential to prevent Gestational Diabetes Mellitus (GDM), pre-eclampsia and excessive gestational weight gain in pregnant women¹³. The study done in Nepal reveal that 27% in among 200 pregnant women had gestational diabetes mellitus in which risk factors were obesity and lack of physical activity during

pregnancy¹⁴. The study done in the United States has observed that moderate exercises such as walking/cycling can prevent pregnancy induced hypertension. In an article emphasis was given particularly exercise in pregnancy will improve cardiovascular function, decrease risk of gestational diabetes mellitus, hypertension, and the limitation of weight gain are among the more pronounced benefits to the mother. Exercise also decreases aches and pain associated with pregnancy¹⁵. Similarly a meta-analysis study was conducted based on calculations of pooled estimates using the random-effects models which revealed that exercise during pregnancy was shown to decrease the occurrence of GDM in normal-weight women. Regarding secondary outcomes, exercise during pregnancy can decrease gestational weight gain¹⁶. In pregnancy, greater self-reported overall physical fitness and cardio respiratory fitness are associated with less bodily pain, lumbar and sciatic pain, and reduced pain disability. A 2016 systematic review and meta-analysis in normal-weight pregnant women with a single, with a significantly lower incidence of GDM and hypertensive disorders¹⁷.

A systematic review conducted in 2010 finds broad literature support of the antidepressant effects of exercise in the general population, and a small

number of observational studies reported that regular physical activities improve self-esteem and reduce the symptoms of anxiety and depression during pregnancy¹⁸. In 2012, Robledo-Colonia et al published a randomized control trial of exercise during pregnancy that involved 80 nulliparous, pregnant women. The experimental group completed a 3-month supervised exercise program, whereas the control group continued usual activities with no specific exercise program. After the 3-month intervention, the women who exercised regularly had a statistically significant decrease in depressive symptoms compared with the control group¹⁹.

Pregnant women who exercise have generally shorter labor and faster and easier deliveries¹². Exercise can also prevent early onset of labor premature rupture of membrane and can help to shorten the duration of labor¹⁵. Exercise during pregnancy reduces the risk of cesarean delivery. This is an important finding to convince women to be active during their pregnancy and should lead the physician to recommend physical exercise to pregnant women, when this is not contraindicated²⁰. Women who participated in an exercise program throughout their pregnancies had a lower percentage of cesarean section and instrumental vaginal deliveries compared with a control group²¹. A Systematic review conducted in 2016 normal-weight pregnant women with a single uncomplicated gestation showed that Exercise was associated with a significantly higher incidence of vaginal delivery and a significantly lower incidence of cesarean birth¹⁷. Women who participated in an exercise program throughout their pregnancies had a lower percentage of cesarean section and instrumental vaginal deliveries compared with a control group.²¹

Benefit of Exercise in Pregnancy on Fetal health

Evidence continues to grow in support of the notion that exercise during pregnancy is beneficial for fetal health and well-being, extending into childhood²². Different evidence based literature was analyzed here. The studies suggest benefits to the fetus that may be used to motivate women to exercise during pregnancy include decreased resting fetal heart rate, improvement in the viability of the placenta²³. Benefits for offspring are observable related to body weight and composition, cardiovascular health, and nervous system development²².

Exercise in pregnancy also showed beneficial effects for the fetus. Exercise in early pregnancy increases the umbilical blood flow and improve placental circulation as well as the fetal cardiac adaptation to the environment. It also advances neuro-behavioral relaxation in the fetus⁶.

Multiple studies have shown that blood flow to the fetus is not significantly altered by moderate intensity physical activity²⁴.

The Pubmed database was analyzed from January 1970 to January 2011 on exercise during pregnancy which indicated a significant reduction in rates of preterm labor, intrauterine growth retardation ($p < 0.003$), low birth weight ($p < 0.01$), in those who practiced exercise during pregnancy²⁵. The study also shows that exercise during pregnancy is not detrimental to the fetal cardiovascular system and neuronal function in the developing child¹¹. The review article also clarify that this makes an increase in endothelium-dependent vasodilation, it will possibly provide protection against preeclampsia²⁶.

Overall, birth weight was not significantly different between physically active women and inactive women²⁷. Another study also revealed exercise during pregnancy potentially improved neurodevelopment as benefits for the child¹⁵.

Recommendation of Exercise for Pregnant Mothers

Regular physical activity in all phases of life, including pregnancy, promotes health benefits. Pregnancy is an ideal time for maintaining or adopting a healthy lifestyle and the American College of Obstetricians and Gynecologists makes the following recommendations' Physical activity and exercise in pregnancy are associated with minimal risks and have been shown to more benefit for most women, although some modification to exercise routines may be necessary because of normal anatomic and physiologic changes and fetal requirements' A thorough clinical evaluation should be conducted before recommending an exercise program to ensure that a patient does not have a medical reason to avoid exercise. Women with uncomplicated pregnancies should be encouraged to engage in exercises before, during, and after pregnancy. Obstetrician-gynecologists and other obstetric care

providers should evaluate women with medical or obstetric complications carefully before making recommendations on physical activity participation during pregnancy. Activity restriction should not be prescribed routinely as a treatment to reduce preterm birth.²⁸

The American College of Obstetrics and Gynecology (ACOG) recommends 30 minutes or more of moderate exercise per day on most if not all days of the week, unless you have a medical or pregnancy complication²⁹. Although regular exercise is recommended during non-complicated pregnancies to promote maternal and fetal/infant health, estimates suggest that only 15% of expectant mothers achieve current exercise recommendations³⁰. The 2018 update Department of Health and Human Services Physical Activity Guidelines for Americans reinforces prior recommendations of at least 150 minutes of moderate intensity aerobic activity per week during pregnancy and the postpartum period³¹.

A 2016 systematic review and meta-analysis in normal-weight pregnant women with a single- uncomplicated gestation showed that aerobic exercise for 35–90 minutes 3–4 times per week is not associated with an increased risk of preterm birth or with a reduction in mean gestational age at delivery¹⁷. This also led to international recommendations for exercise during pregnancy³². As long as healthy pregnant women participated in exercises, their blood pressure could be

slightly regulated, while hypertension susceptible pregnant women significantly lowered blood pressure.³³

LIMITATION

Physical activity has been theoretically related to preterm birth because it increases the release of catecholamines, especially norepinephrine, which might stimulate myometrial activity. Conversely, exercise may reduce the risk of preterm birth by other mechanisms such as decreased oxidative stress or improved placenta vascularization. Therefore, the safety of exercise regarding preterm birth and its effects on gestational age at delivery remain controversial¹⁷. Exercise during pregnancy is not associated with a reduction of mean gestational age

at delivery or an increase in the odds of cesarean delivery.¹⁶

CONCLUSION

There are various benefits of regular moderate exercise during pregnancy for low risk women in terms of their physical and mental aspects and also to the fetus, so pregnant women should be encouraged to perform physical exercises if there are no contraindications.

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