

## Alarming Rate of Maternal Obesity during Pregnancy: Refitting by Exercise

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### Abstract

Obesity is a common implication during pregnancy and childbirth. The objective of this review is to provide a comprehensive overview of the effect of physical exercise on pregnancy outcomes, the change of physical activity during pregnancy, with a particular focus on women who are obese. Obese women and their infant are at increased risk of adverse perinatal outcomes, which may be improved by regular physical exercise. Obese women are usually less physically active and tend to further reduce activity levels during pregnancy. This review highlights the potential short- and long-term benefits of exercise in obese pregnant women and their child. Current guidelines recommended that all obese pregnant women without medical complications should engage in low to moderate-intensity exercise on a daily basis. Available literature revealed that there are very few studies supporting the evidence so there is need of more randomized controlled trials to strengthen its evidence.

**Keywords:** Obesity; Maternal Health; Physical Activity; Pregnancy.

### Introduction

The World Health Organization (WHO) has identified obesity as one of the most neglected public health problem of global importance, contributing to the increased risk of cardio-vascular disease, diabetes

and other complications [1]. Obesity is defined as abnormal or excessive fat accumulation that presents a risk to health [2].

A widely used tool to assess obesity is BMI (Body Mass Index), which is calculated by a person's weight divided by square of height. A person with BMI  $\geq 30$  is considered as obese [3].

**Table 1:** Classification of obesity by who

Classification	BMI (kg/m <sup>2</sup> )	Risk of Co-morbidities
Normal	18.5- 24.9	Limited
Overweight	$\geq 25$	Medium
Pre- Obese	25- 29.9	Increased
Obese Class I	30 - 34.9	Moderate
Obese Class II	35- 39.9	Severe
Obese Class III	$\geq 40$	Very Severe

Obesity incidence is three times higher in urban areas from rural area, probably due to less physical activity. Prevalence of obesity is more in women as compared to men. The percentage of obese women is highest in Punjab (37.5%), followed by Kerala (34%) [1].

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Received on 23.06.2017, Accepted on 28.06.2017

**Table 2:** Based on the data from National Family Health Survey, Ranking of Obese women with percentage among top 10 States of India as follows

State	Female (%)	Female Rank
Punjab	37.5	1
Kerala	34	2
Goa	27	3
Tamil Naidu	24.4	4
Andhra Pradesh	22.7	5
Sikkim	21	6
Gujarat	17.7	7
Haryana	17.6	8
Karnataka	17.3	9
Jammu & Kashmir	11.1	10

Obesity in women is commonly encountered during pregnancy with an increasing BMI, its measure is tremendously increased in developed countries and the similar trend is observed in developing countries nowadays [4]. Maternal obesity during pregnancy is associated with adverse outcomes on mother's health such as high risk of gestational diabetes, pre-eclampsia (hypertension disorder), cesarean delivery, perinatal mortality and excessive birth weight [5]. Moreover, obese women tend to experience central adiposity after delivery, which may further cause long term health risks [6].

Maternal obesity is also the source of long term

health problems to the infant which include greater risk of mortality, congenital malformations such as neural tube defects [7]. Other complications to infant at the time of delivery are birth injuries, perinatal asphyxia, hypoglycemia and respiratory distress [8]. Catalano postulates that maternal obesity leads to fetal overgrowth which subsequently cause post natal obesity. Thus, obese children often tend to become obese adult and among them, the females when get pregnant will give excess nutrient supply to their fetus leading to transference of obesity to the next generation [9].

**Table 3:** Complications associated with maternal obesity during gestation period [10]

Maternal Risks	
Pregnancy	Gestational diabetes, hypertensive disorders, difficulty with ultrasound scanning
Labor & Birth	Preterm birth, cesarean delivery, induction of labor, anesthetic complication
Post Delivery	Infection, Prolonged hospital stay
Infant Risks	Perinatal death, congenital anomalies, birth trauma, hypoglycemia, jaundice

#### *Impact of Exercise on Maternal and Infant Health*

According to Caspersen et al, Exercise is defined as physical activity that is planned, structured & repetitive whose final objective is the improvement or maintenance of physical fitness [11]. Exercises play a vital role in reducing the complications during gestation period and also aid in improving both short & long term health benefits of mother and child. Exercise during pregnancy also reduces the probability of cesarean delivery and decreases the length of hospital stay post delivery [12]. Other exercise benefits may include maintenance &

improvement of aerobic capacity, quick return to daily living activities and occupation as well as also helps in weight loss which was gained during pregnancy [13].

Thus, Maternity health care providers should create awareness and encourage obese pregnant women to exercise with proper expert advice during their subsequent hospital visits. It is the duty of health care providers to educate the pregnant women about the absolute & relative contra-indications of exercise which are summarized in Table 4 [12].

**Table 4:** Contraindications to Exercise during Pregnancy

Absolute	Relative
• Restrictive Lung disease	• Anemia
• Hemo dynamically significant heart disease	• Chronic bronchitis
• Persistant second or third trimester bleeding	• Poorly controlled type 1 diabetes
• Severe anemia	• Orthopedic limitations
• Premature labor during the current pregnancy	• Extreme underweight
• Ruptured membranes	• Heavy smoker
• Pregnancy induced hypertension	• Poorly controlled hypertension
	• Poorly controlled hyperthyroidism
	• History of extremely sedentary lifestyle

It is also important that women should receive adequate supervision about suitable types of exercise, with appropriate intensity, frequency and duration. Therefore, There are evidence based proposed steps from recent studies regarding the exercise prescription among obese pregnant women are tabulated in a Table 5 [14].

#### *Barriers to Exercise among Pregnant Women in India*

In Indian population, most of the women are unaware about the role of exercise in pregnancy, while fewer women who are aware could not meet the daily exercise recommendations. There are

**Table 5:** Exercise Prescription in Obese Pregnant women [14]

Frequency of Exercise	If women is previously sedentary, start at 3 sessions per week on nonconsecutive days and increase up to 4 sessions per week.
Type of Exercise	Recommend low-impact aerobic exercises. Avoid activities that involve a risk of loss of balance, falls, or abdominal trauma.
Intensity of Exercise	Avoid vigorous exercise. If already active, maintain moderate-intensity activities; if sedentary, start at low intensity and gradually increase to moderate intensity. Use validated heart rate ranges for obese pregnant women: Low intensity: 102-124 beats/min (20-29 years of age); 101-120 beats/min (30-39 years of age) Moderate intensity: 125-147 beats/min (20-29 years of age); 121-142 beats/min (30-39 years of age)
Duration of Exercise	If previously sedentary, Include low-intensity warm-up and cool-down Periods. Start with 15 minutes of moderate-intensity exercise and increase in 5-minute increments up to 30 minutes.
Timing of Exercise	If previously sedentary, the second trimester seems to be the best time to commence an exercise program, once morning sickness has subsided.
Contraindication to Exercise	Exclude the women which come under the category of contraindications.

several social and health factors which may hinder the implementation of exercise among pregnant women. These factors are discussed in following steps:

- There are several physiological changes during pregnancy that makes exercise difficult for pregnant women such as increased breathlessness, fear of fall due to change in centre of gravity with alterations of posture and balance [15, 16].
- Increased level of obesity during pregnancy may require more cardio-respiratory effort to meet the demands of exercise [17].
- Some social factors which cause hindrance are time constraints, lack of child care, overly protective family members, lack of outdoor spaces and cost of exercise facilities [18].
- Other common hurdle among obese pregnant women is the perception of their poor self image which hinder them to exercise in public or in groups and they prefer to postpone their weight control after child birth [19].
- Obese women in some areas reported that they receive limited advice about exercise from health care providers; this may suspect their outdated medical knowledge of appropriate exercise during pregnancy. So some modifiable updated knowledge needs to be addressed among medical professionals [20].

## Discussion

The aim of this review was to highlight the complications of maternal obesity, benefits of exercise on maternal as well as fetal health and

barriers to exercise among obese pregnant women. Available literature from very few studies and a systematic review reported that apart from reducing maternal weight gain, the importance of exercise on maternal and fetal outcome remain unproved. However, till now there are no negative effects have been found. Although there are several studies conducted on normal weight pregnant women, but their findings cannot be directly implicated to obese pregnant women.

Hopkins et al [21] reported that exercise during second half of gestation period may reduce birth weight of infant and provide protection against future obesity. Some recent studies revealed that exercises can also be beneficial in improving glucose tolerance rate as well as increase flexibility in obese pregnant women [22, 23]. Clapp [24] demonstrated that exercise during pregnancy results in reduction of infant birth weight and these changes may persist up to 5 years of age. Although this is the only published report so far on the long term infant outcomes.

Currie et al [25] concluded that health care providers should guide pregnant women to stay physically active and provide guidance about appropriate form of exercise while focusing on planning & personal goals. Moreover, understanding the attitudes and cultural acceptability of exercise among pregnant women from diverse backgrounds should also be improved.

## Conclusion

The present review concluded that all obese

pregnant women without medical complications should participate in low to moderate intensity exercise during pregnancy. As a result of limited evidence, there is a need of high quality randomized controlled trials to show the limelight on the importance of exercise on short term and long term benefits for mother as well as child health.

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