

Physical Activity during Pregnancy and Its Positive Effects on Physical and Mental Outcomes in the Postpartum Period in the Context of a Sedentary Digital Age

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Abstract: Pregnancy is a critical period marked by profound physiological and psychological changes. While physical activity has been widely recognized as beneficial during pregnancy, the growing prevalence of sedentary behavior in the digital age poses new challenges to maternal health. Increased screen time, reduced mobility, and technology-driven lifestyles have contributed to decreased physical activity levels among pregnant women. This article explores the impact of antenatal physical activity on postpartum physical and mental outcomes while emphasizing the risks associated with sedentary behavior. Evidence from a systematic review of literature suggests that regular moderate exercise during pregnancy significantly improves postpartum recovery, reduces complications, and enhances psychological well-being. Conversely, sedentary lifestyles are associated with poorer outcomes, including delayed recovery and increased risk of postpartum depression. The findings highlight the urgent need to address sedentary behavior and promote active lifestyles during pregnancy.

Keywords: Physical activity during pregnancy, Sedentary lifestyle pregnancy, Screentime , pregnancy outcome ,Postpartum depression, exercise

INTRODUCTION

Pregnancy is one of the most profound and transformative experiences in a woman's life. It is a period marked not only by anticipation and emotional fulfillment but also by extensive physiological, biomechanical, and psychological changes. From the early stages of conception to the postpartum period, a woman's body undergoes continuous adaptation to support fetal growth and prepare for childbirth. These changes include hormonal fluctuations, weight gain, altered posture, increased cardiovascular demand, and musculoskeletal adjustments. While these transformations are natural, they can pose significant challenges to a woman's overall health and well-being, particularly during the postpartum period when the body must recover and restore its pre-pregnancy state.

Historically, pregnancy was often associated with rest and reduced physical exertion. Women were advised to limit activity to avoid complications, and this belief became deeply ingrained in many cultures and societies. However, advancements in medical science and research over the past few decades have significantly shifted this perspective. Current evidence strongly supports the notion that, for most women, engaging in regular, moderate physical activity during pregnancy is not only safe but highly beneficial. Exercise has been shown to improve cardiovascular fitness, maintain healthy weight gain, enhance musculoskeletal strength, and prepare the body for labor and delivery.

Despite these well-documented benefits, modern lifestyles have introduced new challenges that influence physical activity patterns during pregnancy. The rapid advancement of technology and the widespread adoption of digital devices have led to a significant increase in sedentary behavior across populations. In today's digital age, individuals spend a considerable portion of their day sitting—working on computers, using smartphones, watching television, or engaging in online activities. Pregnant women are no exception to this trend. In fact, they may be even more susceptible due to factors such as fatigue, discomfort, work-from-home arrangements, and concerns about safety during physical exertion.

Sedentary behavior, defined as any waking activity characterized by low energy expenditure while in a sitting or reclining posture, has emerged as an independent risk factor for various health conditions. Prolonged periods of inactivity can negatively impact cardiovascular health, metabolic function, and musculoskeletal integrity. During pregnancy, these effects can be more pronounced, contributing to excessive weight gain, reduced muscle strength, poor posture, and increased fatigue. Furthermore, sedentary habits may extend into the postpartum period, delaying recovery and increasing the risk of long-term health complications.

The postpartum period, often referred to as the “fourth trimester,” is a critical phase that involves physical healing, hormonal adjustment, and psychological adaptation. Following childbirth, a woman's body must recover from the stresses of pregnancy and delivery, which may include tissue healing, restoration of muscle tone, and normalization of physiological functions. At the same time, new mothers face the demands of infant care, sleep deprivation, and changes in daily routines. This combination of physical and emotional challenges makes the postpartum period particularly vulnerable to complications such as fatigue, musculoskeletal pain, urinary incontinence, and mental health disorders, including postpartum depression and anxiety.

In this context, the role of physical activity during pregnancy becomes highly significant. Engaging in regular exercise not only prepares the body for childbirth but also builds a foundation for smoother postpartum recovery. Women who remain active during pregnancy are more likely to experience better physical endurance, quicker return to pre-pregnancy fitness levels, and reduced risk of complications. Exercise also has a profound impact on mental health, as it promotes the release of endorphins and other neurotransmitters that enhance mood and reduce stress. These psychological benefits are particularly important in preventing or mitigating postpartum depression, which is a common yet often under recognized condition.

On the other hand, the increasing prevalence of sedentary lifestyles in the digital era poses a significant threat to maternal health. Excessive screen time and reduced physical movement can contribute to both physical and psychological challenges during and after pregnancy. For instance, prolonged sitting can lead to decreased blood circulation, muscle stiffness, and back pain, all of which can hinder postpartum recovery. Additionally, high levels of digital engagement, particularly on social media platforms, may lead to increased stress, anxiety, and feelings of inadequacy, especially when women compare themselves to idealized portrayals of motherhood.

The interplay between physical activity and sedentary behavior is therefore crucial in determining maternal outcomes. While physical activity offers protective benefits, sedentary behavior can negate these effects and contribute to adverse outcomes. It is important to recognize that being physically active for a short duration each day does not completely offset the risks associated with prolonged inactivity. Therefore, both increasing physical activity and reducing sedentary time are essential components of a healthy lifestyle during pregnancy.

Another important aspect to consider is the role of awareness and education. Many pregnant women remain uncertain about the type, intensity, and safety of physical activity during pregnancy. Misconceptions and lack of guidance often lead to avoidance of exercise altogether. In some cultural contexts, there may also be social or familial pressures that discourage physical activity, further contributing to sedentary behavior. Addressing these barriers requires a multidisciplinary approach involving healthcare providers, physiotherapists, and public health initiatives.

Healthcare professionals play a pivotal role in promoting physical activity and reducing sedentary behavior among pregnant women. By providing evidence-based guidance,

individualized exercise plans, and continuous support, they can empower women to adopt healthier lifestyles. Additionally, integrating physical activity counseling into routine antenatal care can help normalize exercise as an essential component of pregnancy rather than an optional activity.

In recent years, there has also been growing interest in leveraging digital platforms to promote physical activity. Mobile applications, online fitness programs, and virtual support groups offer convenient and accessible ways for pregnant women to stay active. When used appropriately, technology can serve as a powerful tool to counteract sedentary behavior rather than contribute to it. However, it is important to ensure that these resources are evidence-based and tailored to the specific needs of pregnant women.

In conclusion, pregnancy and the postpartum period represent critical windows of opportunity for promoting long-term health and well-being. Physical activity during pregnancy has far-reaching benefits that extend beyond childbirth, influencing both physical recovery and mental health in the postpartum period. At the same time, the challenges posed by sedentary lifestyles in the digital age must be addressed to optimize maternal outcomes. Understanding this balance is essential for developing effective interventions and promoting healthier lifestyles among pregnant women.

NEED OF THE STUDY

Despite growing awareness about exercise benefits, sedentary lifestyles have become increasingly common, particularly among urban populations. Pregnant women are especially vulnerable due to:

1. Increased reliance on digital devices for work and leisure
2. Reduced outdoor activity
3. Misconceptions about safety of exercise
4. Lack of structured guidance
5. Sedentary behavior during pregnancy is associated with:
6. Excessive weight gain
7. Poor cardiovascular health

8. Increased fatigue
9. Higher risk of mental health issues

At the same time, postpartum complications such as depression, delayed recovery, and reduced physical fitness are rising.

Therefore, this study is necessary to:

1. Highlight the impact of sedentary digital lifestyles on maternal health
2. Reinforce the importance of physical activity during pregnancy
3. Establish a link between antenatal behavior and postpartum outcomes
4. Promote preventive healthcare strategies

METHODOLOGY

Study Design-A systematic review of literature was conducted.

Data Sources-Relevant data were collected from:

PubMed

- Google Scholar
- Cochrane Library
- Search Strategy

Inclusion Criteria

- Studies published between 2010–2023
- Studies evaluating physical activity or sedentary behavior during pregnancy
- Studies assessing postpartum physical or mental outcomes

Exclusion Criteria

- High-risk pregnancies with contraindications to exercise
- Studies lacking postpartum outcome data
- Non-English studies

Data Analysis

- Data were extracted and categorized into:
- Active vs sedentary groups
- Physical outcomes
- Mental health outcomes

Procedure

1. The study followed a structured review process:
2. Identification of studies through database search
3. Screening for relevance
4. Application of inclusion and exclusion criteria
5. Extraction of data related to physical activity and sedentary behavior
6. Comparative analysis of outcomes
7. Synthesis of findings

Results

1. Impact of Physical Activity on Postpartum Physical Outcomes

- Women who engaged in regular moderate exercise during pregnancy showed:
- Faster return to pre-pregnancy weight
- Improved cardiovascular endurance
- Reduced musculoskeletal pain
- Better pelvic floor strength
- Lower incidence of complications such as gestational diabetes

2. Impact of Sedentary Lifestyle in the Digital Age

Women with high levels of sedentary behavior (e.g., prolonged sitting, excessive screen time) showed:

- Increased weight retention postpartum
- Reduced muscle strength and endurance
- Higher levels of fatigue
- Poor posture and back pain

- Delayed physical recovery

3. Mental Health Outcomes

- Active Women
- Lower risk of postpartum depression
- Reduced anxiety and stress
- Better emotional resilience
- Improved sleep quality
- Sedentary Women
- Increased risk of postpartum depression
- Higher stress levels
- Sleep disturbances
- Reduced quality of life

DISCUSSION

The findings of this review strongly reinforce the growing body of evidence that physical activity during pregnancy plays a crucial role in shaping both physical and mental outcomes in the postpartum period. At the same time, the influence of sedentary behavior—particularly in the context of the modern digital age—has emerged as an important factor that cannot be overlooked. The contrast between active and sedentary lifestyles during pregnancy highlights a significant public health concern and offers valuable insights into maternal care practices.

One of the most striking observations across the reviewed studies is the clear association between antenatal physical activity and improved postpartum physical recovery. Women who maintained regular moderate exercise during pregnancy demonstrated better cardiovascular fitness, enhanced muscular strength, and greater endurance. These physiological adaptations appear to facilitate a smoother transition into the postpartum phase, where physical demands are substantial. Activities such as lifting the baby, breastfeeding, and managing daily tasks require strength and stamina, which physically active women are better equipped to handle.

In addition, exercise during pregnancy contributes to improved metabolic regulation. Women who remain active are less likely to experience excessive gestational weight gain, which is a known risk factor for postpartum weight retention. Maintaining a healthy weight trajectory during pregnancy makes it easier to return to pre-pregnancy weight after delivery. This is

particularly important in preventing long-term health complications such as obesity, cardiovascular disease, and metabolic syndrome. Conversely, sedentary behavior, characterized by prolonged sitting and minimal physical movement, is associated with poor metabolic outcomes. In the digital age, where many women spend extended hours on electronic devices, the risk of such complications is significantly amplified.

Musculoskeletal health is another area where the benefits of physical activity are clearly evident. Pregnancy places considerable strain on the musculoskeletal system due to changes in posture, increased body weight, and hormonal influences such as the release of relaxin, which increases ligament laxity. Regular exercise helps strengthen the core and pelvic floor muscles, improve posture, and enhance flexibility. As a result, women who engage in physical activity experience less back pain, better spinal alignment, and improved pelvic stability. These benefits extend into the postpartum period, reducing the likelihood of complications such as urinary incontinence and chronic musculoskeletal pain.

On the other hand, sedentary lifestyles contribute to muscle deconditioning and poor posture. Prolonged sitting, especially in improper ergonomic positions while using digital devices, can exacerbate back pain and lead to musculoskeletal imbalances. These issues not only affect comfort during pregnancy but also hinder recovery after childbirth. The lack of movement reduces blood circulation and muscle activation, further delaying the healing process in the postpartum period.

Beyond physical health, the psychological impact of physical activity during pregnancy is equally significant. The postpartum period is often accompanied by emotional challenges, including mood swings, anxiety, and depression. Hormonal fluctuations, sleep deprivation, and the demands of caring for a newborn can contribute to psychological stress. The review findings consistently indicate that women who engage in regular physical activity during pregnancy have a lower risk of developing postpartum depression.

The underlying mechanisms for this protective effect are multifactorial. Exercise stimulates the release of endorphins, often referred to as “feel-good hormones,” which help improve mood and reduce stress. It also promotes better regulation of neurotransmitters such as serotonin and dopamine, which play key roles in emotional well-being. Furthermore, physical activity enhances self-esteem and body image, which can be particularly beneficial during a time when women may feel vulnerable about changes in their bodies.

In contrast, sedentary behavior has been linked to increased risk of mental health issues. Excessive screen time, especially on social media platforms, can contribute to feelings of inadequacy, social comparison, and isolation. Pregnant women who spend long hours in passive digital engagement may experience reduced social interaction and limited opportunities for physical movement, both of which are important for mental well-being. Additionally, sedentary habits are often associated with disrupted sleep patterns, which further exacerbate stress and anxiety in the postpartum period.

Sleep quality is another important factor influenced by physical activity. Women who remain active during pregnancy tend to report better sleep patterns, both during pregnancy and after childbirth. Improved sleep contributes to better physical recovery, enhanced cognitive function, and emotional stability. In contrast, sedentary lifestyles, particularly those involving late-night screen exposure, can disrupt circadian rhythms and lead to poor sleep quality. This creates a cycle of fatigue and stress that can negatively impact postpartum recovery.

The digital age has introduced a paradox in maternal health. While technology provides access to valuable information and support networks, it also promotes inactivity and prolonged sitting. Remote work, online shopping, virtual communication, and digital entertainment have reduced the need for physical movement in daily life. For pregnant women, this can lead to a significant reduction in overall activity levels. The convenience of technology, while beneficial in many ways, inadvertently contributes to a sedentary lifestyle that poses risks to both maternal and postpartum health.

Another important aspect highlighted in the discussion is the role of healthcare professionals in addressing this issue. Despite clear evidence supporting the benefits of physical activity, many women remain inactive due to fear, misconceptions, or lack of guidance. Some may believe that exercise could harm the fetus, while others may be unsure about the type and intensity of activity that is safe. In such cases, physiotherapists, obstetricians, and other healthcare providers play a crucial role in educating and guiding pregnant women.

Healthcare professionals should actively promote physical activity as a routine part of antenatal care. This includes providing individualized exercise prescriptions based on the woman's health status, fitness level, and pregnancy progression. Simple interventions, such as encouraging daily walking, prenatal yoga, or light strength training, can make a significant difference. Additionally, counseling on reducing sedentary behavior—such as taking frequent

breaks from sitting, limiting screen time, and incorporating movement into daily routines—is equally important.

Public health strategies also need to adapt to the realities of the digital age. Awareness campaigns should emphasize not only the benefits of exercise but also the risks associated with prolonged inactivity. Community-based programs, online exercise classes, and mobile health applications can be leveraged to promote physical activity among pregnant women. Ironically, the same digital platforms that contribute to sedentary behavior can also be used as tools for promoting active lifestyles when used appropriately.

It is also important to consider the socio-cultural context, particularly in countries like India. Cultural beliefs, family influences, and traditional practices may discourage physical activity during pregnancy. In some cases, women are advised to rest excessively, which can lead to inactivity. Addressing these cultural barriers requires a sensitive and informed approach, involving both education and community engagement. Family members should also be included in counseling sessions to ensure support for the pregnant woman's active lifestyle.

While the benefits of physical activity are well-established, it is essential to acknowledge certain limitations. Not all women may be able to engage in exercise due to medical conditions or high-risk pregnancies. In such cases, activity levels should be carefully monitored and guided by healthcare professionals. Additionally, more research is needed to understand the long-term impact of sedentary behavior in the digital age on maternal and child health outcomes.

Overall, the discussion highlights a clear and compelling message: maintaining an active lifestyle during pregnancy is not just beneficial but essential for optimal postpartum recovery. At the same time, the risks associated with sedentary behavior—particularly in the context of modern digital lifestyles—must be addressed proactively. The balance between technology use and physical activity is crucial in ensuring positive maternal health outcomes.

CONCLUSION

In the modern digital era, sedentary lifestyles have become a major concern, particularly during pregnancy. While technology offers convenience, excessive inactivity can negatively impact both physical and mental postpartum outcomes.

Physical activity during pregnancy emerges as a powerful intervention that not only enhances recovery but also protects against mental health issues encouraging an active lifestyle while minimizing sedentary behavior is essential for improving maternal health.

Integrating structured exercise programs and promoting awareness about digital sedentary risks should be a priority in antenatal care.

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