

Associate Factors Contributing to Postpartum Weight Retention in Women - A Narrative Review

Nikita Madan¹, Dr. Piyush Ranjan², Dr. Archana Kumari³, Dr. Anita Malhotra¹,
Dr. Manisha Sabharwal¹

¹Department of Home Science, University of Delhi, India,

²Department of Medicine, All India Institute of Medical Sciences, New Delhi, India,

³Department of Obstetrics and Gynecology, All India Institute of Medical Sciences, New Delhi, India

Corresponding Author: Dr. Piyush Ranjan

DOI: <https://doi.org/10.52403/ijhsr.20250728>

ABSTRACT

Background and aim: This narrative review aims to synthesize the various factors that contribute to postpartum weight retention and excessive weight gain during the postpartum period.

Materials and methods: A comprehensive literature search was conducted across PubMed, ScienceDirect, and Scopus databases to identify published studies examining factors associated with postpartum weight retention and weight gain. The search covered articles published between 1995 and 2025.

Results: This narrative review identified a multifactorial interplay of determinants influencing postpartum weight retention and weight gain. The key factors were grouped into four categories: Obstetrics factors included high pre-pregnancy BMI, high gestational weight gain, primiparity, non-exclusive breastfeeding, and cesarean delivery. Behavioral factors encompassed high-calorie dietary patterns, sedentary activity, and the adoption of inadequate weight loss practices. Environmental and psychological factors comprised maternal depression, stress and anxiety, employment status, insufficient sleep, lower educational attainment, lack of partner support, and smoking. Genetic and hormonal factors involved individual genetic predisposition and postpartum hormonal fluctuations.

Conclusion: A holistic, multifaceted approach is essential for effective weight management, promoting long-term maternal health and well-being.

Keywords: Postpartum weight retention, Postpartum weight management, Postpartum obesity, Postpartum weight gain, Narrative review.

INTRODUCTION

The postpartum period signifies a pivotal phase in a woman's life, heralding not just the birth of a child but also the initiation of her journey into motherhood. However, amid the joy and wonder of new parenthood, many women also experience significant changes in their body weight. Obesity affects 12% of pregnant women nationally, while the

postpartum period sees a 13% prevalence(1). Pregnancy necessitates weight gain to support fetal development and ensure healthy birth outcomes, yet this gain can vary widely among individuals (2). While some women exceed recommended gestational weight gain, others may fall short, reflecting the diverse physiological responses to pregnancy(3).

Following childbirth, the shedding of the baby's weight, along with the expulsion of amniotic fluid and the placenta, initiates a weight loss process. However, what remains often includes surplus body fat stores and increased blood volume, contributing to postpartum weight retention (4). This retention, if excessive, can predispose women to obesity and associated health complications, such as diabetes and dyslipidemia, later in life. Notably, excessive weight gain during pregnancy emerges as a primary determinant of postpartum weight retention (5).

Several factors contribute to heightened postpartum weight retention, ranging from dietary habits and physical activity levels to sleep patterns and pre-pregnancy body mass index (BMI). Women with higher pre-pregnancy BMIs are particularly susceptible, alongside those who consume high-calorie diets, experience reduced physical activity, or opt out of breastfeeding.

A study on postpartum women in Alberta with a 12-month follow-up revealed that - more substantial trend in weight loss was observed during the first 12 months postpartum. By 24 months after delivery, some women had lost more than 5 kg, whereas some gained over 5 kg. The majority exhibited weight fluctuations within ± 5 kg. Despite these changes, some women did not return to their pre-pregnancy weight. The number of women who were classified as overweight at the start of pregnancy increased at the end of the 12-month post-delivery period. Additionally, women who were obese at baseline showed significantly smaller reductions in fat mass compared to those in other BMI categories (6).

Women's empowerment, dietary diversity intake, strong social support, adequacy of prenatal care, pre-pregnancy BMI, and gestational weight gain are positively linked with postpartum weight change. Conversely, physical activity, food insecurity, and perinatal distress are negatively associated with postpartum weight change (7).

Understanding the intricacies of postpartum weight dynamics is critical for informing

interventions to support women during this transformative period. By elucidating the interplay of biological, behavioral, and environmental factors, we can develop tailored strategies to promote healthy weight management and enhance overall well-being in the postpartum journey.

MATERIALS & METHODS

A literature search was carried out on PubMed, ScienceDirect, and Scopus databases for relevant articles published between January 1995- January 2025. A search string ("Risk factors" OR "Predictors" OR "Determinants") AND ("Postpartum weight retention" OR "Postpartum weight loss") was used to search for relevant indexing terms. A lateral search was also carried out using a reference list and cited literature for primary articles.

The inclusion criteria include studies that assess risk factors for postpartum weight retention. Out of 187 studies identified, 42 studies were included in this review, and the remaining were excluded because they were either reviews, not accessible, or irrelevant. The exclusion criteria include papers that focused on cardiovascular problems, diabetes mellitus, or other metabolic disorders.

One reviewer (NM) conducted the title and abstract screening of the selected articles retrieved through the keyword search. The remaining articles were then read completely and were categorised as included, excluded, or unclear. The disagreement was resolved by another author (PR). Full-text articles from all relevant studies were retrieved for further extraction. An extensive data extraction process was carried out, and narrative synthesis was done.

RESULT

Factors associated with weight retention in postpartum women:

Postpartum weight retention is influenced by a multifaceted interaction of obstetrics, behavioral, environmental, psychological, genetic, and hormonal factors. A thorough comprehension of these elements is crucial

for reducing long-term health complications in women.

1. **Obstetric factors** are related to pregnancy, childbirth, and delivery. These are associated with physiological characteristics and processes directly linked to an individual's body composition and metabolic function. High pre-pregnancy body mass index (BMI), high gestational weight gain, parity, breastfeeding status, and mode of delivery are among the factors related to obstetrics.

1.1 High pre-pregnancy body mass index (BMI) significantly influences postpartum weight retention (PPWR), particularly for overweight and obese women who often retain more weight after childbirth. Conversely, underweight and normal weight mothers typically experience less weight retention (8). However, a study from Vietnam presents a contrasting view, suggesting that overweight and obese women retained, on average, 1.83 kg less weight compared to those with normal pre-pregnancy BMI (9).

Moreover, being overweight and obese before pregnancy is linked to higher rates of excessive gestational weight gain (GWG), whereas underweight women tend to have lower rates of excessive GWG (10). Exceeding the Institute of Medicine (IOM) guidelines for gestational weight gain often results in difficulty returning to pre-pregnancy weight. Interestingly, despite similar BMI at the start, women exceeding these guidelines show significantly higher BMI at the postpartum check-up (11).

Furthermore, pre-pregnancy overweight women tend to lose weight at slower rates than those with a healthy pre-pregnancy weight, while those with obesity may even gain weight. Non-lactating women in the pre-pregnancy overweight category also tend to show greater increases in BMI (12). Pregestational overweight contributes to an average gain of 3.380 kg (13).

These findings underscore the intricate relationship between pre-pregnancy BMI,

gestational weight gain, and postpartum weight retention, emphasizing the necessity for targeted interventions to promote healthy weight management during and after pregnancy.

1.2 High gestational weight gain is a well-established predictor of increased postpartum weight retention. Studies consistently show that women who exceed the recommended weight gain during pregnancy are more likely to retain greater amounts of weight after childbirth. According to the Institute of Medicine (IOM) guidelines, normal weight women (BMI 18.5-24.9 kg/m²) should gain between 11.33 and 15.87 kg during pregnancy (14), while those with inadequate GWG generally retain less weight compared to those with adequate GWG (9).

Evidence from a study among Tasmanian women supports these findings, revealing that those with a BMI below 25 kg/m² gained the most weight during pregnancy, whereas women with obesity exhibited the least body weight fluctuation and retained the least weight postpartum (15). Similarly, other studies suggest that although excessive GWG leads to higher postpartum weight retention, women with greater physical activity levels during pregnancy experience lower retention, highlighting the mitigating effect of exercise (16).

Moreover, primiparous women (first-time mothers) are more likely to gain weight beyond the recommended level and consequently retain more weight compared to multiparous women (10). Interestingly, women who gain less than the recommended GWG also have less fat mass postpartum than those who exceed the guidelines, indicating a direct relationship between total GWG and postpartum fat retention (6).

Together, these findings emphasize the importance of adhering to recommended GWG guidelines and promoting physical activity during pregnancy as critical strategies to support healthier postpartum weight outcomes.

Institute of Medicine Weight gain recommendations for pregnancy(17) (Table 1)

Pre-pregnancy weight category	Body Mass Index*	Recommended range of Total Weight (lb)	Recommended Rates of Weight Gain# in the Second and Third Trimesters (lb) (Mean Range [lb/wk])
Underweight	Less than 18.5	28-40	1 (1-1.3)
Normal-weight	18.5-24.9	25-35	1 (0.8-1)
Overweight	25-29.9	15-25	0.6 (0.5-0.7)
Obese (includes all classes)	30 and greater	11-20	0.5 (0.4-0.6)

*Body Mass Index is calculated as weight in kilograms divided by height in meters squared or as weight in pounds multiplied by 703 divided by height in inches.
 #Calculations assume a 1.1-4.4 lb weight gain in the first trimester.
 Modified from Institute of Medicine (US). Weight gain during pregnancy: reexamining the guidelines. Washington, DC. National Academies Press; 2009. © 2009 National Academy of Sciences.

1.3 Primiparous/ multiparous women

Primiparous women tend to retain a greater amount of weight at three years postpartum compared to multiparous women (14). This suggests that the number of childbirth experiences may influence long-term weight retention patterns in women, with primiparity being associated with a higher likelihood of retaining excess weight over time.

1.4 Breastfeeding plays a multifaceted role in postpartum weight management, with its impact influenced by several factors, including duration, exclusivity, pre-pregnancy BMI, and physical activity levels. Several studies support the association between exclusive and longer duration breastfeeding and reduced postpartum weight retention (PPWR). For example, women who breastfed exclusively for four months or more, especially when combined with gestational weight gain (GWG) below 9 kg and moderate to high physical activity, showed negative postpartum weight retention, indicating weight loss rather than gain(18). Similarly, breastfeeding for more than 3 months has been linked to a lower risk of high postpartum weight retention, and women who exclusively breastfed for 3 months experienced greater weight reduction than those who did not exclusively breastfeed or discontinued early (19). Furthermore, higher breastfeeding scores have been associated with an average postpartum weight of 70 grams (13).

Additional evidence indicates that breastfeeding continues to support weight

loss beyond the early postpartum period. Studies have shown consistent associations between breastfeeding and weight loss at 6, 12, 18, and even 24 months postpartum (20). Moreover, longer durations of breastfeeding, between six and eleven months, are associated with improved nutritional indices, such as lower BMI, waist-to-hip ratio, arm fat area, and percentage of body fat (21).

Comparisons between breastfeeding and non-breastfeeding mothers further underscore the benefits of lactation on postpartum women. Women who breastfeed for six months or longer are less likely to experience excessive weight retention compared to non-breastfeeding mothers (22). Additionally, mothers who exclusively formula fed tend to lose weight at slower rates, regardless of their pre-pregnancy BMI (12). Among overweight women, non-lactating individuals exhibit significantly greater gains in BMI, highlighting the protective effect of breastfeeding in this group (12). The physiological mechanism behind this may be linked to the additional maternal energy expenditure required for milk production, which contributes to enhanced postpartum weight loss (13).

However, not all studies are in agreement. One study found no significant difference in PPWR between those who breastfed for 3 to 6 months compared to those who breastfed for 6 months or more (23). Furthermore, the effects of breastfeeding may vary depending on a woman's baseline body composition. For instance, breastfeeding has been found to reduce weight retention in women with less

than 30% body fat at baseline, but it shows minimal impact in those with obesity (21). While findings are not entirely uniform, the bulk of evidence supports the role of exclusive and prolonged breastfeeding as a beneficial factor in reducing postpartum weight retention, especially when combined with healthy lifestyle behaviors and appropriate gestational weight gain.

1.5 Mode of delivery: The mode of delivery, particularly cesarean section (C-section), is intricately linked with various maternal characteristics and postpartum outcomes. In women who gained more weight than the Institute of Medicine (IOM) recommended ranges during pregnancy, the prevalence of C-sections was notably high, accounting for 35% of deliveries (15). Additionally, the C-section group exhibited lower levels of physical activity, with a reduced likelihood of engaging in at least 150 minutes of exercise per week during pregnancy and at 6 months postpartum. Furthermore, postpartum weight retention was more pronounced among women who underwent C-sections, with 27.9% retaining 10 pounds or more by 12 months postpartum, compared to 22.2% of those who delivered vaginally (24). These findings stress the multifaceted relationship between mode of delivery, maternal obesity, physical activity levels, and postpartum weight outcomes, emphasizing the importance of targeted interventions to address these factors and optimize maternal health during the postpartum period.

2. Behavioral Factors: Behavioral factors related to postpartum weight retention encompass dietary patterns, physical activity habits, and weight management behaviors undertaken by individuals to regulate their body weight after birth. Some detailed behavioral factors are as below:

2.1 Dietary behavior: Diet plays a crucial role in postpartum weight management, with various dietary factors exerting significant influences on maternal weight gain and loss. Postpartum women are susceptible to a high-calorie diet to meet the demands of

breastfeeding, while traditions and family beliefs also play a crucial role in influencing their diet. The intake of galactagogues such as Gond Ladoo, Til Ladoo, panjiri, harira, and sandha, which are rich in dry fruits, edible seeds, sugar, and ghee, contributes to a high-calorie diet. These energy-dense foods can influence postpartum weight. Food items rich in sugar, oil, and fats, energy, carbohydrates, while low in protein, fiber, fruits, and vegetables, are key contributors to postpartum weight gain. Higher dietary sugar intake has been linked to increased maternal weight gain from 1 to 6 months postpartum, while an increase in soft drink consumption is associated with a substantial 1.52 kg increase in postpartum weight. Conversely, higher consumption of dietary fiber, both overall and specifically soluble fiber, is correlated with lower postpartum weight gain, with each gram per day increment associated with reductions of 0.15 kg and 0.82 kg, respectively (25). Reductions in total energy intake, alongside increases in dietary restraint scores, emerge as pivotal factors contributing to weight loss, particularly among low-income women in the early postpartum period. Notably, reducing fruit juice consumption has been linked to more significant weight loss compared to those who maintain higher consumption levels. Consumption of low-energy-dense foods is suggested to have a greater impact on weight status over longer periods, highlighting the importance of food choices in sustaining a healthy body weight (26). Additionally, positive correlations have been observed between dietary restraint and successful weight loss, with women exhibiting high restraint, low disinhibition, or low susceptibility to hunger at baseline experiencing greater percent BMI loss (27) (12). Conversely, food insecurity is associated with transitioning from normal pre-pregnancy weight to underweight 18 to 24 months postpartum (7). Furthermore, inadequate fruit and vegetable intake is significantly associated with high postpartum weight retention, underscoring the multidimensional nature of dietary and

activity influences on postpartum weight outcomes (28).

2.2 Physical activity: Sedentary behavior after childbirth is a major cause of postpartum weight gain and retention. Managing a child, bed rest, maternity leave, frequent breastfeeding, and fulfilling maternal duties are key contributors to this sedentary lifestyle. Reduced physical activity or a sedentary lifestyle increases the chances of postpartum weight retention. An increase in aerobic activities and total step count reduces body adiposity in postpartum women (29). Furthermore, lack of engagement in recreational activities with infants, infrequent walking sessions of 30 minutes or more, and limited social interactions with friends are all factors significantly associated with high postpartum weight retention (28). An increase in light physical activities at early postpartum can decrease the chances of postpartum weight retention at 6 and 12 months postpartum (30). Women doing light-vigorous physical activity in the postpartum period are less likely to experience poor sleep quality, as poor postpartum sleep quality increases, and excessive postpartum weight retention in women with excessive GWG (31). A moderate level of physical activity in the postpartum period lowers postpartum body mass index (32).

2.3 Weight loss behavior: When examined individually, weight-loss self-efficacy, weight-management skills, and discretionary energy intake emerge as significant predictors of weight loss. Specifically, mothers who demonstrate the most substantial improvements in these behavioral domains tend to achieve greater reductions in body weight. Interestingly, self-imposed restriction of food intake, often perceived as a positive weight reduction behavior, particularly among low-income women, may play a significant role in facilitating weight loss efforts (26). These findings underscore the importance of behavioral factors in successful weight management endeavors, highlighting the potential efficacy of enhancing self-efficacy, improving weight-

management skills, and moderating discretionary energy intake to promote sustainable weight loss outcomes, particularly within vulnerable populations.

3. Environmental and Psychosocial Factors: Environmental factors encompass external influences that can impact postpartum weight retention. External influences can be a person's surroundings and social context. Some detailed environmental factors are listed below:

3.1 Depression: Depression represents a multifaceted aspect of postpartum well-being, with its interactions with breastfeeding practices and weight retention warranting attention. Women experiencing lower levels of depression tend to breastfeed exclusively for longer durations, which, in turn, correlates with reduced postpartum weight retention (16). Conversely, weight-loss behaviors adopted before pregnancy have been associated with an increased risk of postpartum depression among Japanese women, suggesting a complex interplay between weight management practices and mental health outcomes (33). Furthermore, social support mechanisms, particularly from partners or family and friends, have been identified as protective factors against postpartum depressive symptoms. Women who feel supported by these social networks are less likely to experience depression during the postpartum period (34). These findings highlight the intricate relationship between depression, breastfeeding, weight management behaviors, and social support networks, highlighting the need for comprehensive approaches to maternal mental health and well-being during the postpartum phase.

3.2 Maternal employment status: Maternal employment status appears to have significant implications for postpartum weight retention patterns. Initially, weight retention among working mothers is observed to be twice as high as that of non-working mothers. However, as time progresses, this trend reverses, with weight retention in working mothers being lower

than in non-working mothers at the ninth and twelfth months postpartum. Interestingly, the body weight of non-working women exhibits minimal change over time. In contrast, working women experience weight reduction until the ninth month postpartum, followed by a slight increase in weight between the ninth and twelfth months postpartum (8). These findings underscore the dynamic relationship between maternal employment status and postpartum weight dynamics, highlighting the need for further research to elucidate the underlying mechanisms driving these observed patterns.

3.3 Stress and Anxiety: The postpartum period introduces a range of new stressors, including caregiving responsibilities, sleep deprivation, and financial or relationship challenges. Chronic stress during this time can elevate cortisol levels, promoting fat storage, particularly around the abdomen. Higher levels of life stress during the first year postpartum are significantly associated with greater weight retention (35). Elevated parenting stress, in particular, has been shown to hinder new mothers from effectively losing weight during this period. Beyond parenting-related stress, general life stress negatively impacts weight management in women (36). Anxiety further exacerbates these challenges by leading to erratic eating behaviors, such as skipping meals or consuming high-calorie comfort foods, and reducing motivation to engage in physical activity or adhere to weight management programs. The Danish National Birth Cohort study reported that women who experienced anxiety during pregnancy had a higher risk of significant weight retention at 6 months (OR 1.35) and 18 months postpartum (OR 1.34) (37).

3.4 Sleep deprivation: Sleep deprivation is a common challenge during the postpartum period and has been strongly associated with increased appetite, weight gain, and postpartum weight retention. Research indicates that mothers sleeping ≤ 5 hours per day at 6 months postpartum are significantly more likely to retain ≥ 5 kg by 1 year postpartum compared to those sleeping 7

hours per day (38). Furthermore, disturbed sleep patterns may contribute to the risk of postpartum weight retention, as short sleep duration has been linked to an increased likelihood of obesity (39). These findings underscore the critical role of adequate sleep in supporting healthy weight management during the postpartum phase. Similarly, Siega-Riz et al. reported that sleep duration of 5 hours or less was associated with weight retention at 3 months postpartum, indicating that sleep deprivation may hinder weight loss efforts in the early postpartum period (40). This aligns with findings from Taveras et al., who noted that sleeping 5 hours or less per day at 6 months postpartum was strongly associated with substantial weight retention at 1 year postpartum, with an adjusted odds ratio indicating a significant risk (41). Poor postpartum sleep quality increases excessive postpartum weight retention in women with excessive GWG (31). These studies collectively underscore the potential impact of sleep duration on postpartum weight management.

3.5 Education, having a partner, and smoking status: Factors such as education, having a partner, and smoking status also affect postpartum weight retention in women.

Women who had more than eight years of formal schooling retained the least weight (16).

Higher partner support was associated with a higher likelihood of walking regularly and healthy diet habits (34). Routine walking and healthy food intake ensure early postpartum weight and fat loss.

The maintenance of smoking abstinence during the initial 6 months postpartum emerges as a significant factor influencing postpartum weight retention, irrespective of pregravid weight or gestational weight gain (GWG). Notably, women who successfully sustain smoking abstinence during this period exhibit higher levels of weight retention compared to those who resume smoking. Despite all women retaining a significant amount of weight over time, early relapsers retain 4.7 ± 2.1 kg less weight than

smoking abstiners. Additionally, both middle-relapsers and late-relapsers retain substantial amounts of weight, although the difference in weight retention between these groups and abstiners is not deemed statistically significant (42). These findings underscore the complex relationship between smoking abstinence, postpartum weight retention, and relapse timing, highlighting the need for targeted interventions to support smoking cessation efforts and mitigate adverse postpartum weight outcomes.

4. Genetic and Hormonal Factors:

4.1 Genetic Factors: Genetic factors significantly contribute to postpartum weight gain, influencing how women respond to pregnancy-related hormonal changes, dietary habits, and metabolic conditions. The interplay between genetic predisposition and environmental factors creates a landscape where certain women may be more susceptible to retaining weight after childbirth. Genetic predisposition plays a pivotal role in the development of obesity and related conditions, which can affect how women manage their weight during and after pregnancy. This hereditary tendency can manifest as a vulnerability to rapid weight gain, often observed among women with familial histories of obesity (43). Women classified as having a higher genetic risk for obesity often present with higher pre-pregnancy BMIs, which correlate with increased retention of weight postpartum (22).

4.2 Hormonal Changes: Hormonal changes in postpartum women significantly influence weight gain and retention. Reduced estrogen levels after delivery can contribute to weight retention. Estrogen is known to play a role in fat distribution and storage, often favoring fat accumulation in the hips and thighs. After childbirth, lower estrogen levels can lead to an increase in visceral fat stored around the organs, which is associated with higher risks of metabolic disorders, including obesity and type 2 diabetes (44). Progesterone, which also declines after birth, is involved in appetite regulation. In pregnant women,

elevated progesterone levels can lead to increased appetite and cravings. Its reduction postpartum can shift appetite patterns, potentially leading women to consume more calories than they burn, particularly if combined with reduced physical activity levels due to caring for a newborn (22). Prolactin levels increase during breastfeeding, which promotes lactation and encourages mobilization of stored fats for energy. Women who breastfeed generally experience greater fat loss postpartum compared to those who do not. However, if breastfeeding is not initiated or maintained, the cessation of lactation can lead to rapid changes in hormonal balance, potentially culminating in weight gain due to caloric surplus (45). Hormones such as ghrelin, glucagon-like peptide-1 (GLP-1), and peptide YY (PYY) are involved in appetite regulation and can be affected by breastfeeding (46).

DISCUSSION

The factors associated with postpartum weight retention are complex and multifaceted, involving a combination of biological, behavioral, and environmental influences. This narrative review highlights several key factors that play significant roles in shaping postpartum weight dynamics, including pre-pregnancy body mass index (BMI), gestational weight gain (GWG), parity, diet and physical activity, breastfeeding, depression, maternal employment status, mode of delivery, and other socio-demographic factors.

Pre-pregnancy BMI emerges as a critical determinant of postpartum weight retention, with overweight and obese women being more susceptible to retaining weight after childbirth. However, the relationship between pre-pregnancy BMI and postpartum weight retention is influenced by various factors, including gestational weight gain. High GWG is consistently associated with greater weight retention postpartum, highlighting the importance of managing weight gain during pregnancy within recommended guidelines.

The role of diet and physical activity in postpartum weight management is also significant, with dietary factors such as sugar intake and food insecurity influencing maternal weight gain and loss. Behavioral factors, including weight-loss self-efficacy and weight-management skills, are predictive of postpartum weight loss, emphasizing the importance of addressing behavioral aspects in interventions aimed at promoting healthy weight management during the postpartum period.

Breastfeeding plays a multifaceted role in postpartum weight management, with longer durations of breastfeeding associated with reduced postpartum weight retention. However, the impact of breastfeeding on postpartum weight outcomes varies based on factors such as baseline body fat percentage and pre-pregnancy BMI.

Depression, maternal employment status, mode of delivery, and other socio-demographic factors also contribute to postpartum weight retention, highlighting the need for comprehensive approaches to address maternal mental health and socio-economic factors in interventions aimed at promoting healthy postpartum weight management.

CONCLUSION

Postpartum weight management represents a multifaceted process influenced by a multitude of factors encompassing obstetrics, behavioral, and environmental dimensions. These factors include pre-pregnancy body mass index (BMI), gestational weight gain, dietary patterns, physical activity levels, breastfeeding practices, maternal mental health, employment status, mode of delivery, and various environmental variables. A comprehensive understanding of these interrelated factors and their intricate interactions is imperative for the development of effective interventions tailored to support healthy weight management during the postpartum phase. Interventions targeting postpartum weight management must adopt a holistic approach, addressing both behavioral and

environmental determinants. Strategies should aim at optimizing gestational weight gain within established guidelines, promoting adoption of nutritious dietary patterns and regular physical activity routines, facilitating breastfeeding support and education, addressing maternal mental health concerns through appropriate screening and intervention measures, and acknowledging socio-economic determinants such as maternal employment status and social support networks.

By implementing multifaceted interventions encompassing these diverse dimensions, healthcare providers can play a pivotal role in assisting women to achieve favorable postpartum weight outcomes, mitigating the risks of obesity-related health complications, and enhancing overall maternal health and well-being.

Declaration by Authors

Ethical Approval: Not Applicable

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Chopra M, Kaur N, Singh KD, Maria Jacob C, Divakar H, Babu GR, et al. Population estimates, consequences, and risk factors of obesity among pregnant and postpartum women in India: Results from a national survey and policy recommendations. *Int J Gynaecol Obstet.* 2020 Sep;151(Suppl 1):57–67.
2. Weight Gain During Pregnancy: Reexamining the Guidelines - PubMed [Internet]. [cited 2024 May 8]. Available from: <https://pubmed.ncbi.nlm.nih.gov/20669500/>
3. Yong HY, Mohd Shariff Z, Appannah G, Rejali Z, Mohd Yusof BN, Bindels J, et al. Rate of gestational weight gain trajectory is associated with adverse pregnancy outcomes. *Public Health Nutr.* 23(18):3304–14.
4. McKinley MC, Allen-Walker V, McGirr C, Rooney C, Woodside JV. Weight loss after pregnancy: challenges and opportunities. *Nutr Res Rev.* 2018 Dec;31(2):225–38.

5. Gore SA, Brown DM, West DS. The role of postpartum weight retention in obesity among women: a review of the evidence. *Ann Behav Med Publ Soc Behav Med.* 2003 Oct;26(2):149–59.
6. Subhan FB, Shulman L, Yuan Y, McCargar LJ, Kong L, Bell RC, et al. Association of pre-pregnancy BMI and gestational weight gain with fat mass distribution and accretion during pregnancy and early postpartum: a prospective study of Albertan women. *BMJ Open.* 2019 Jul 27;9(7):e026908.
7. Misgina KH, Groen H, Bezabih AM, Boezen HM, van der Beek EM. Postpartum Weight Change in Relation to Pre-Pregnancy Weight and Gestational Weight Gain in Women in Low-Income Setting: Data from the KITE Cohort in the Northern Part of Ethiopia. *Nutrients.* 2021 Dec 28;14(1):131.
8. Weight Change Pattern Among Breastfeeding Mothers: One-Year Follow-Up - PubMed [Internet]. [cited 2024 May 8]. Available from: <https://pubmed.ncbi.nlm.nih.gov/34918949/>
9. Ha AVV, Zhao Y, Pham NM, Nguyen CL, Nguyen PTH, Chu TK, et al. Postpartum weight retention in relation to gestational weight gain and pre-pregnancy body mass index: A prospective cohort study in Vietnam. *Obes Res Clin Pract.* 2019;13(2):143–9.
10. Walker LO, Sterling BS. Weight Loss, Gain, or Stability from 6 Weeks to 6 Months Postpartum: Associations with Depressive Symptoms and Behavioral Habits. *J Womens Health* 2002. 2020 Apr;29(4):541–9.
11. Siegel AM, Tucker A, Adkins LD, Mitchell C, Brown HL, Dotters-Katz S. Postpartum Weight Loss in Women with Class-III Obesity: Do They Lose What They Gain? *Am J Perinatol.* 2020 Jan;37(1):53–8.
12. Smethers AD, Trabulsi JC, Stallings VA, Papas MA, Mennella JA. Factors Affecting BMI Changes in Mothers during the First Year Postpartum. *Nutrients.* 2023 Mar 11;15(6):1364.
13. Monteiro da Silva M da C, Marlúcia Oliveira A, Pereira Magalhães de Oliveira L, Silva dos Santos Fonseca DN, Portela de Santana ML, de Araújo Góes Neto E, et al. Determinants of postpartum weight variation in a cohort of adult women; a hierarchical approach. *Nutr Hosp.* 2013;28(3):660–70.
14. Maddah M, Nikooyeh B. Weight retention from early pregnancy to three years postpartum: a study in Iranian women. *Midwifery.* 2009 Dec;25(6):731–7.
15. Jayasinghe S, Herath MP, Beckett JM, Ahuja KDK, Street SJ, Byrne NM, et al. Gestational weight gain and postpartum weight retention in Tasmanian women: The Baby-bod Study. *PloS One.* 2022;17(3):e0264744.
16. Zanotti J, Capp E, Wender MCO. Factors associated with postpartum weight retention in a Brazilian cohort. *Rev Bras Ginecol E Obstet Rev Fed Bras Soc Ginecol E Obstet.* 2015 Apr;37(4):164–71.
17. Institute of Medicine (US) and National Research Council (US) Committee to Reexamine IOM Pregnancy Weight Guidelines. *Weight Gain During Pregnancy: Reexamining the Guidelines* [Internet]. Rasmussen KM, Yaktine AL, editors. Washington (DC): National Academies Press (US); 2009 [cited 2025 Jul 1]. (The National Academies Collection: Reports funded by National Institutes of Health). Available from: <http://www.ncbi.nlm.nih.gov/books/NBK32813/>
18. Dalrymple KV, Uwhubetine O, Flynn AC, Pasupathy D, Briley AL, Relph SA, et al. Modifiable Determinants of Postpartum Weight Loss in Women with Obesity: A Secondary Analysis of the UPBEAT Trial. *Nutrients.* 2021 Jun 9;13(6):1979.
19. López-Olmedo N, Hernández-Cordero S, Neufeld LM, García-Guerra A, Mejía-Rodríguez F, Méndez Gómez-Humarán I. The Associations of Maternal Weight Change with Breastfeeding, Diet and Physical Activity During the Postpartum Period. *Matern Child Health J.* 2016 Feb;20(2):270–80.
20. da Silva M da CM, Oliveira Assis AM, Pinheiro SMC, de Oliveira LPM, da Cruz TRP. Breastfeeding and maternal weight changes during 24 months post-partum: a cohort study. *Matern Child Nutr.* 2015 Oct;11(4):780–91.
21. Kac G, Benício MHDA, Velásquez-Meléndez G, Valente JG, Struchiner CJ. Breastfeeding and postpartum weight retention in a cohort of Brazilian women. *Am J Clin Nutr.* 2004 Mar;79(3):487–93.
22. Endres LK, Straub H, McKinney C, Plunkett B, Minkovitz CS, Schetter CD, et al. Postpartum weight retention risk factors and relationship to obesity at 1 year. *Obstet Gynecol.* 2015 Jan;125(1):144–52.

23. Tahir MJ, Haapala JL, Foster LP, Duncan KM, Teague AM, Kharbanda EO, et al. Association of Full Breastfeeding Duration with Postpartum Weight Retention in a Cohort of Predominantly Breastfeeding Women. *Nutrients*. 2019 Apr 25;11(4):938.
24. Legro NR, Lehman EB, Kjerulff KH. Mode of first delivery and postpartum weight retention at 1 year. *Obes Res Clin Pract*. 2020;14(3):241–8.
25. Alderete TL, Wild LE, Mierau SM, Bailey MJ, Patterson WB, Berger PK, et al. Added sugar and sugar-sweetened beverages are associated with increased postpartum weight gain and soluble fiber intake is associated with postpartum weight loss in Hispanic women from Southern California. *Am J Clin Nutr*. 2020 Sep 1;112(3):519–26.
26. Determinants of weight loss after an intervention in low-income women in early postpartum - PubMed [Internet]. [cited 2024 May 8]. Available from: <https://pubmed.ncbi.nlm.nih.gov/22855919/>
27. Foster GD, Wadden TA, Swain RM, Stunkard AJ, Platte P, Vogt RA. The Eating Inventory in obese women: clinical correlates and relationship to weight loss. *Int J Obes Relat Metab Disord J Int Assoc Study Obes*. 1998 Aug;22(8):778–85.
28. Ng SK, Cameron CM, Hills AP, McClure RJ, Scuffham PA. Socioeconomic disparities in prepregnancy BMI and impact on maternal and neonatal outcomes and postpartum weight retention: the EFHL longitudinal birth cohort study. *BMC Pregnancy Childbirth*. 2014 Sep 8; 14:314.
29. Keller C, Ainsworth B, Records K, Todd M, Belyea M, Vega-López S, et al. A comparison of a social support physical activity intervention in weight management among post-partum Latinas. *BMC Public Health*. 2014 Sep 19; 14:971.
30. Ha AVV, Zhao Y, Binns CW, Pham NM, Nguyen PTH, Nguyen CL, et al. Postpartum Physical Activity and Weight Retention within One Year: A Prospective Cohort Study in Vietnam. *Int J Environ Res Public Health*. 2020 Feb 10;17(3):1105.
31. Matenchuk BA, Davenport MH. The influence of sleep quality on weight retention in the postpartum period. *Appl Physiol Nutr Metab*. 2021 Jan;46(1):77–85.
32. Vernon MM, Young-Hyman D, Looney SW. Maternal Stress, Physical Activity, and Body Mass Index During New Mothers' First Year Postpartum. *Women Health*. 2010 Aug 31;50(6):544–62.
33. Taniguchi S, Masumoto T, Kurozawa Y. Weight-loss behaviors before pregnancy associate with increased risk of postpartum depression from the Japan Environment and Children's Study. *Sci Rep*. 2023 May 5;13(1):7363.
34. Faleschini S, Millar L, Rifas-Shiman SL, Skouteris H, Hivert MF, Oken E. Women perceived social support: associations with postpartum weight retention, health behaviors and depressive symptoms. *BMC Womens Health*. 2019 Nov 21;19(1):143.
35. Whitaker K, Young-Hyman D, Vernon M, Wilcox S. Maternal Stress Predicts Postpartum Weight Retention. *Matern Child Health J*. 2014 Nov;18(9):2209–17.
36. Torres SJ, Nowson CA. Relationship between stress, eating behavior, and obesity. *Nutrition*. 2007 Nov;23(11–12):887–94.
37. Pedersen P, Baker JL, Henriksen TB, Lissner L, Heitmann BL, Sørensen TIA, et al. Influence of Psychosocial Factors on Postpartum Weight Retention. *Obesity*. 2011 Mar;19(3):639–46.
38. Gunderson EP, Rifas-Shiman SL, Oken E, Rich-Edwards JW, Kleinman KP, Taveras EM, et al. Association of Fewer Hours of Sleep at 6 Months Postpartum with Substantial Weight Retention at 1 Year Postpartum. *Am J Epidemiol*. 2008 Jan 15;167(2):178–87.
39. Ryan JT, Day H, Egger MJ, Wu J, Depner CM, Shaw JM. Night-time sleep duration and postpartum weight retention in primiparous women. *Sleep Adv J Sleep Res Soc*. 2023 Dec 27;5(1):zpad056.
40. Siega-Riz AM, Herring AH, Carrier K, Evenson KR, Dole N, Deierlein A. Sociodemographic, Perinatal, Behavioral, and Psychosocial Predictors of Weight Retention at 3 and 12 months Postpartum. *Obes Silver Spring Md*. 2010 Oct;18(10):1996–2003.
41. Taveras EM, Rifas-Shiman SL, Rich-Edwards JW, Gunderson EP, Stuebe AM, Mantzoros CS. Association of Maternal Short Sleep Duration with Adiposity and Cardio-Metabolic Status at 3 Years Postpartum. *Obes Silver Spring Md*. 2011 Jan;19(1):171–8.
42. Levine MD, Cheng Y, Marcus MD, Kalarchian MA. Relapse to smoking and postpartum weight retention among women

- who quit smoking during pregnancy. *Obes Silver Spring Md.* 2012 Feb;20(2):457–9.
43. Sandsæter HL, Eik-Nes TT, Getz LO, Haugdahl HS, Magnussen EB, Rich-Edwards JW, et al. Weight development from childhood to motherhood—embodied experiences in women with pre-pregnancy obesity: a qualitative study. *Reprod Health.* 2024 Jan 30; 21:15.
44. Goldstein RF, Abell SK, Ranasinha S, Misso M, Boyle JA, Black MH, et al. Association of Gestational Weight Gain with Maternal and Infant Outcomes: A Systematic Review and Meta-analysis. *JAMA.* 2017 Jun 6;317(21):2207.
45. Mazariegos M, Ortiz-Panozo E, González de Cosío T, Lajous M, López-Ridaura R. Parity, lactation, and long-term weight change in Mexican women. *Matern Child Nutr.* 2020 Mar 24;16(3):e12988.
46. Larson-Meyer DE, Schueler J, Kyle E, Austin KJ, Hart AM, Alexander BM. Do Lactation-Induced Changes in Ghrelin, Glucagon-Like Peptide-1, and Peptide YY Influence Appetite and Body Weight Regulation during the First Postpartum Year? *J Obes.* 2016; 2016:7532926.
- How to cite this article: Nikita Madan, Piyush Ranjan, Archana Kumari, Anita Malhotra, Manisha Sabharwal. Associate factors contributing to postpartum weight retention in women - a narrative review. *Int J Health Sci Res.* 2025; 15(7):231-242. DOI: <https://doi.org/10.52403/ijhsr.20250728>
