

# Reducing Postpartum Weight Retention

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Contributor: Maureen Makama

Postpartum weight retention (PPWR) is a strong predictor of obesity in later life with long term health consequences in women. Suboptimal lifestyle behaviours (e.g. diet and physical activity) contribute to PPWR. Postpartum lifestyle interventions are known to be efficacious in reducing PPWR, however there are challenges to their successful implementation.

postpartum weight retention

postpartum lifestyle interventions

intervention components

implementation

## 1. Introduction

The prevalence of overweight and obesity is on the rise globally, presenting a challenge to public health <sup>[1]</sup>. In 2016, 44% (>2 billion) of adults worldwide had overweight or obesity <sup>[1]</sup>. In particular, women of reproductive age are at an increased risk of having overweight or obesity <sup>[2]</sup>. Global data reports that among women, the prevalence of having overweight and obesity was 39% and 15% respectively in 2016, compared to around 23% and 6%, respectively, in 1975 <sup>[3]</sup>. Weight gain associated with childbirth contributes to obesity risks in women <sup>[2][4]</sup>, with excessive gestational weight gain (weight gain above the Institute of Medicine (IOM) recommendations during pregnancy) and postpartum weight retention (PPWR) (retention of the weight gained during pregnancy) being significant contributors to parity-related weight gain <sup>[5][6]</sup>. Excessive gestational weight gain is also a major predictor of PPWR both in the short and long term <sup>[5][6][7][8][9][10]</sup>. On average PPWR ranges from 0.5 to 3 kg; however, this is highly variable, with up to 20% of women retaining >4 kg at 1 year postpartum <sup>[5][6][11]</sup>. PPWR is therefore a strong predictor of obesity in later life and also predisposes women to an increased risk of chronic diseases such as cardiovascular disease, diabetes, osteoarthritis and some cancers <sup>[6][7][11][12]</sup>.

Most maternal health guidelines around the world do not address postpartum weight or lifestyle <sup>[13]</sup>. There is need for clear implementation strategies to guide evidence translation into practice to deliver public health impact.

## 2. Predictors of Postpartum Weight Retention

Lifestyle behaviours, sociodemographic and psychosocial factors may contribute to PPWR <sup>[14]</sup>. There is generally a decline in healthy dietary behaviours from pregnancy through to postpartum <sup>[15][16][17]</sup>. Diet quality was reported to be higher in the first postpartum year compared to subsequent years indicating that the decline in diet quality continues even after the first postpartum year <sup>[17]</sup>. Lee et al.'s review reported less adherence to healthier dietary

patterns, specifically decreased fruit and vegetable intake and increased intake of energy-dense and nutrient-poor food during the transition from pregnancy to postpartum [16]. This worsening of lifestyle behaviours in the postpartum period could be due to the demands associated with caring for a child [18].

Irregular sleep and meal times during the postpartum period could also interfere with body weight. A recent study reported that greater caloric intake at night was independently associated with PPWR [19]. A positive association between short sleep duration and PPWR has also been reported in a previous review [20].

Physical activity levels are generally inadequate in postpartum women [21]. The decline commences in late pregnancy and although there is a progressive improvement 3 to 12 months postpartum, it still remains lower than pre-pregnancy levels [22][23][24][25][26][27]. The decline in physical activity is observed in leisure-time physical activity [25] and moderate to vigorous physical activity but not in walking [26][27]. Postpartum physical activity is beneficial for the improvement of aerobic fitness, insulin sensitivity and psychological wellbeing [28][29][30]. Physical activity may also be beneficial for postpartum weight loss [31][32]; however, the evidence on its effect is limited [28][29][30]. In postpartum women, the maintenance of light physical activity such as walking, with a decline in moderate to vigorous physical activity may be insufficient by itself for weight control [26][27]. Therefore, physical activity may need to be combined with dietary interventions to obtain maximum benefits in weight management, as per the general population [33].

Psychosocial factors such as depression and anxiety are also predictors of PPWR. Previous systematic reviews reported the prevalence of depression and anxiety in the postpartum period as 17% and 15%, respectively [34][35]. A positive association between postpartum depression and PPWR or maternal obesity [36][20][37][38] but no association between anxiety [36][39] or stress and PPWR [20] were reported in previous reviews.

There is inconsistency in the literature on the effect of breastfeeding on postpartum weight with systematic reviews reporting beneficial [40], negative [41] or inconclusive [42] effects of breastfeeding on PPWR. Jiang et al. reported a beneficial effect of breastfeeding for 6–12 months which was more pronounced in women younger than 30 years old, primipara or having normal pre-pregnancy BMI [40], while He et al. reported a negative effect of breastfeeding ≤6 months and no effect of breastfeeding >6 months [41][42]. Neville et al.'s systematic review concluded that there was insufficient evidence to suggest that breastfeeding was directly associated with postpartum weight change [42] with 63% of the observational studies included in the review reporting no significant differences in postpartum weight change between breastfeeding and non-breastfeeding mothers [42]. The energy cost of breastfeeding is up to 500 kcal per day, and therefore, lactation may help mobilize fat stores built up during pregnancy leading to weight loss provided there is no compensatory increase in energy intake [43]. The provision of breastfeeding support is a potentially effective strategy that has not been explored in postpartum lifestyle interventions for weight management [44].

### 3. Efficacy of lifestyle interventions in postpartum women

Diet and physical activity behaviours are modifiable lifestyle behaviours that can be targeted for postpartum weight loss. Postpartum interventions including a combination of diet and physical activity components are efficacious for postpartum weight loss and improvement of body composition<sup>[45][46]</sup> with mean difference (MD) in body weight of -2.33 kg (95% confidence interval (CI), -3.10 to -1.56) reported<sup>[45]</sup> and sustained at 12 months postpartum<sup>[47]</sup>.

## 4. Implementation of postpartum lifestyle interventions

Implementation is critical to the effective translation of existing evidence on the efficacy of postpartum lifestyle interventions into practice and to allow delivery of sustainable health impact on a large scale. Lim et al. reported that postpartum weight management interventions had greater efficacy when delivered by health professionals and when combining diet and physical activity components<sup>[48]</sup>. The ideal setting and delivery format of postpartum lifestyle interventions should seek to address the barriers of childcare, time constraints and social support in order to maximize engagement while tailoring to the contextual needs of the target population. The total number of BCTs and including the BCTs 'goal setting' and 'self-monitoring of behaviour' was associated with a greater reduction in energy intake and greater efficacy of physical activity interventions<sup>[49][50]</sup>. Although the efficacy of lifestyle interventions in postpartum women has been established, their impact at the population level is determined by the program reach (penetration) and engagement (participation)<sup>[51][52]</sup>. Lifestyle interventions targeting postpartum women rarely address penetration, implementation and participation, focusing instead only on the intervention effects<sup>[45]</sup>. This leads to a lack of data to inform intervention strategies that are associated with better penetration or participation. This may contribute to the lack of translation from efficacy studies to real-world solutions in postpartum lifestyle management. It is important that interventions for postpartum women address the specific barriers to lifestyle management in this group. These barriers could hinder participation in lifestyle interventions and contribute to high attrition rates of up to 42% as reported in previous systematic reviews<sup>[53][54][55][56]</sup>. The influence of the family on postpartum women's willingness to engage in lifestyle modification has previously been reported<sup>[57][58][59]</sup>. The support and involvement of partners in postpartum lifestyle interventions is particularly crucial for lasting behaviour change especially in high-risk women who have experienced gestational diabetes or preeclampsia<sup>[60][59][61][62][63]</sup>. Cultural values and norms can also impact on postpartum lifestyle choices<sup>[58]</sup>.

Support from health professionals play a key role in facilitating behaviour change in postpartum women. Health professionals are valued as a credible source of information for the new mother, therefore health professionals should use this opportunity to not only provide support in terms of breastfeeding and care of the newborn but also for lifestyle behaviour counselling and support. Comprehensive clinical guidelines for routine postpartum care are limited and do not include recommendations for lifestyle or behavioural counselling<sup>[64][65]</sup>. Guidelines for weight management in the postpartum period are similarly limited with a general lack of guidance on how to implement the evidence into clinical practice<sup>[66][67][68]</sup>. There is a need for health care policies to incorporate lifestyle counselling into routine care for postpartum women. This could be through the integration of postpartum care with child immunization clinics.

## 5. Recommendations for research and practice

The core components associated with efficacy of postpartum lifestyle interventions are: inclusion of both diet and physical activity components, delivery by healthcare professionals, use of electronic health technology, including more BCTs (especially self-monitoring and goal setting) and embedding interventions in existing services. It is also important to train health professionals in time management and counselling skills to equip them to adequately support postpartum women. Including these components in the design while tailoring interventions to postpartum women's specific needs and addressing barriers may be effective strategies to improve penetration and participation and reduce attrition rate<sup>[69][58]</sup>. One strategy to do this is to co-design lifestyle interventions and include postpartum women and their partner in the planning, development and implementation processes<sup>[69][59]</sup>. This is necessary to improve implementation by improving program feasibility for adoption and acceptability among women leading to increased program effectiveness. Considering the high prevalence of postpartum weight retention and the lack of translation of research evidence to practice on this topic, this review is an imperative for action to address implementation challenges through pragmatic, real-world trials for the effective translation of evidence into clinical practice to reduce postpartum weight retention.

## References

1. Shekar, M.; Popkin, B. Obesity: Health and Economic Consequences of an Impending Global Challenge; Human Development Perspectives; World Bank: Washington, DC, USA, 2020.
2. Gunderson, E.P.; Sternfeld, B.; Wellons, M.F.; Whitmer, R.A.; Chiang, V.; Quesenberry, C.P., Jr.; Lewis, C.E.; Sidney, S. Childbearing may increase visceral adipose tissue independent of overall increase in body fat. *Obesity* 2008, 16, 1078–1084.
3. WHO. Global Health Observatory (GHO) Data: Overweight and Obesity. Available online: (accessed on 4 June 2020).
4. Smith, D.E.; Lewis, C.E.; Caveny, J.L.; Perkins, L.L.; Burke, G.L.; Bild, D.E. Longitudinal changes in adiposity associated with pregnancy: The CARDIA study. *JAMA* 1994, 271, 1747–1751.
5. Gore, S.A.; Brown, D.M.; West, D.S. The role of postpartum weight retention in obesity among women: A review of the evidence. *Ann. Behav. Med.* 2003, 26, 149–159.
6. Mannan, M.; Doi, S.A.; Mamun, A.A. Association between weight gain during pregnancy and postpartum weight retention and obesity: A bias-adjusted meta-analysis. *Nutr. Rev.* 2013, 71, 343–352.
7. Nehring, I.; Schmoll, S.; Beyerlein, A.; Hauner, H.; von Kries, R. Gestational weight gain and long-term postpartum weight retention: A meta-analysis. *Am. J. Clin. Nutr.* 2011, 94, 1225–1231.
8. Siega-Riz, A.M.; Viswanathan, M.; Moos, M.-K.; Deierlein, A.; Mumford, S.; Knaack, J.; Thieda, P.; Lux, L.J.; Lohr, K.N. A systematic review of outcomes of maternal weight gain according to the

- Institute of Medicine recommendations: Birthweight, fetal growth, and postpartum weight retention. *Am. J. Obstet. Gynecol.* 2009, 201, 339.e1–339.e14.
9. Gunderson, E.P.; Abrams, B. Epidemiology of gestational weight gain and body weight changes after pregnancy. *Epidemiol. Rev.* 2000, 22, 261–274.
  10. McDowell, M.; Cain, M.A.; Brumley, J. Excessive gestational weight gain. *J. Midwifery Women's Health* 2019, 64, 46–54.
  11. McKinley, M.C.; Allen-Walker, V.; McGirr, C.; Rooney, C.; Woodside, J.V. Weight loss after pregnancy: Challenges and opportunities. *Nutr. Res. Rev.* 2018, 31, 225–238.
  12. Linné, Y.; Dye, L.; Barkeling, B.; Rössner, S. Long-term weight development in women: A 15-year follow-up of the effects of pregnancy. *Obes. Res.* 2004, 12, 1166–1178.
  13. Scott, C.; Andersen, C.T.; Valdez, N.; Mardones, F.; Nohr, E.A.; Poston, L.; Loetscher, K.C.; Abrams, B. No global consensus: A cross-sectional survey of maternal weight policies. *BMC Pregnancy Childbirth* 2014, 14, 167.
  14. Siega-Riz, A.M.; Herring, A.H.; Carrier, K.; Evenson, K.R.; Dole, N.; Deierlein, A. Sociodemographic, perinatal, behavioral, and psychosocial predictors of weight retention at 3 and 12 months postpartum. *Obesity* 2010, 18, 1996–2003.
  15. Faria-Schützer, D.B.; Surita, F.G.; Rodrigues, L.; Turato, E.R. Eating Behaviors in Postpartum: A Qualitative Study of Women with Obesity. *Nutrients* 2018, 10, 885.
  16. Lee, Y.Q.; Loh, J.; Ang, R.S.E.; Chong, M.F.-F. Tracking of Maternal Diet from Pregnancy to Postpregnancy: A Systematic Review of Observational Studies. *Curr. Dev. Nutr.* 2020, 4, nzaa118.
  17. Martin, J.C.; Joham, A.E.; Mishra, G.D.; Hodge, A.M.; Moran, L.J.; Harrison, C.L. Postpartum diet quality: A cross-sectional analysis from the Australian Longitudinal Study on Women's Health. *J. Clin. Med.* 2020, 9, 446.
  18. Fowles, E.R.; Cheng, H.-R.; Mills, S. Postpartum health promotion interventions: A systematic review. *Nurs. Res.* 2012, 61, 269–282.
  19. Loy, S.L.; Cheung, Y.B.; Colega, M.T.; Chia, A.; Han, C.Y.; Godfrey, K.M.; Chong, Y.-S.; Shek, L.P.-C.; Tan, K.H.; Lek, N. Associations of Circadian Eating Pattern and Diet Quality with Substantial Postpartum Weight Retention. *Nutrients* 2019, 11, 2686.
  20. Xiao, R.S.; Kroll-Desrosiers, A.R.; Goldberg, R.J.; Pagoto, S.L.; Person, S.D.; Waring, M.E. The impact of sleep, stress, and depression on postpartum weight retention: A systematic review. *J. Psychosom. Res.* 2014, 77, 351–358.
  21. van der Pligt, P.; Olander, E.K.; Ball, K.; Crawford, D.; Hesketh, K.D.; Teychenne, M.; Campbell, K. Maternal dietary intake and physical activity habits during the postpartum period: Associations

- with clinician advice in a sample of Australian first time mothers. *BMC Pregnancy Childbirth* 2016, 16, 27.
22. Borodulin, K.; Evenson, K.R.; Herring, A.H. Physical activity patterns during pregnancy through postpartum. *BMC Women's Health* 2009, 9, 32.
  23. Evenson, K.R.; Brouwer, R.J.; Østbye, T. Changes in physical activity among postpartum overweight and obese women: Results from the KAN-DO study. *Women Health* 2013, 53, 317–334.
  24. Evenson, K.R.; Herring, A.H.; Wen, F. Self-reported and objectively measured physical activity among a cohort of postpartum women: The PIN postpartum study. *J. Phys. Act. Health* 2012, 9, 5–20.
  25. Coll, C.; Domingues, M.; Santos, I.; Matijasevich, A.; Horta, B.L.; Hallal, P.C. Changes in leisure-time physical activity from the prepregnancy to the postpartum period: 2004 Pelotas (Brazil) Birth Cohort Study. *J. Phys. Act. Health* 2016, 13, 361–365.
  26. Hesketh, K.R.; Evenson, K.R.; Stroo, M.; Clancy, S.M.; Østbye, T.; Benjamin-Neelon, S.E. Physical activity and sedentary behavior during pregnancy and postpartum, measured using hip and wrist-worn accelerometers. *Prev. Med. Rep.* 2018, 10, 337–345.
  27. Pereira, M.A.; Rifas-Shiman, S.L.; Kleinman, K.P.; Rich-Edwards, J.W.; Peterson, K.E.; Gillman, M.W. Predictors of change in physical activity during and after pregnancy: Project Viva. *Am. J. Prev. Med.* 2007, 32, 312–319.
  28. Larson-Meyer, D.E. Effect of postpartum exercise on mothers and their offspring: A review of the literature. *Obes. Res.* 2002, 10, 841–853.
  29. Saligheh, M.; Hackett, D.; Boyce, P.; Cobley, S. Can exercise or physical activity help improve postnatal depression and weight loss? A systematic review. *Arch. Women's Ment. Health* 2017, 20, 595–611.
  30. DiPietro, L.; Evenson, K.R.; Bloodgood, B.; Sprow, K.; Troiano, R.P.; Piercy, K.L.; Vaux-Bjerke, A.; Powell, K.E. Benefits of Physical Activity during Pregnancy and Postpartum: An Umbrella Review. *Med. Sci. Sports Exerc.* 2019, 51, 1292–1302.
  31. Ha, A.V.V.; Zhao, Y.; Binns, C.W.; Pham, N.M.; Nguyen, P.T.H.; Nguyen, C.L.; Chu, T.K.; Lee, A.H. Postpartum Physical Activity and Weight Retention within One Year: A Prospective Cohort Study in Vietnam. *Int. J. Environ. Res. Public Health* 2020, 17, 1105.
  32. Öhlin, A.; Rössner, S. Trends in eating patterns, physical activity and socio-demographic factors in relation to postpartum body weight development. *Br. J. Nutr.* 1994, 71, 457–470.
  33. Jakicic, J.M. The effect of physical activity on body weight. *Obesity* 2009, 17, S34–S38.

34. Dennis, C.-L.; Falah-Hassani, K.; Shiri, R. Prevalence of antenatal and postnatal anxiety: Systematic review and meta-analysis. *Br. J. Psychiatry* 2017, 210, 315–323.
35. Shorey, S.; Chee, C.Y.I.; Ng, E.D.; Chan, Y.H.; Tam, W.W.S.; Chong, Y.S. Prevalence and incidence of postpartum depression among healthy mothers: A systematic review and meta-analysis. *J. Psychiatr. Res.* 2018, 104, 235–248.
36. Hartley, E.; Hill, B.; McPhie, S.; Skouteris, H. The associations between depressive and anxiety symptoms, body image, and weight in the first year postpartum: A rapid systematic review. *J. Reprod. Infant Psychol.* 2018, 36, 81–101.
37. Milgrom, J.; Skouteris, H.; Worotniuk, T.; Henwood, A.; Bruce, L. The association between ante- and postnatal depressive symptoms and obesity in both mother and child: A systematic review of the literature. *Women's Health Issues* 2012, 22, e319–e328.
38. Slomian, J.; Honvo, G.; Emonts, P.; Reginster, J.-Y.; Bruyère, O. Consequences of maternal postpartum depression: A systematic review of maternal and infant outcomes. *Women's Health* 2019, 15, 1745506519844044.
39. Nagl, M.; Linde, K.; Stepan, H.; Kersting, A. Obesity and anxiety during pregnancy and postpartum: A systematic review. *J. Affect. Disord.* 2015, 186, 293–305.
40. Jiang, M.; Gao, H.; Vinyes-Pares, G.; Yu, K.; Ma, D.; Qin, X.; Wang, P. Association between breastfeeding duration and postpartum weight retention of lactating mothers: A meta-analysis of cohort studies. *Clin. Nutr.* 2018, 37, 1224–1231.
41. He, X.; Zhu, M.; Hu, C.; Tao, X.; Li, Y.; Wang, Q.; Liu, Y. Breast-feeding and postpartum weight retention: A systematic review and meta-analysis. *Public Health Nutr.* 2015, 18, 3308–3316.
42. Neville, C.; McKinley, M.; Holmes, V.; Spence, D.; Woodside, J. The relationship between breastfeeding and postpartum weight change—a systematic review and critical evaluation. *Int. J. Obes.* 2014, 38, 577–590.
43. Van Raaij, J.; Schonk, C.M.; Vermaat-Miedema, S.H.; Peek, M.; Hautvast, J. Energy cost of lactation, and energy balances of well-nourished Dutch lactating women: Reappraisal of the extra energy requirements of lactation. *Am. J. Clin. Nutr.* 1991, 53, 612–619.
44. Vincze, L.; Rollo, M.; Hutchesson, M.; Hauck, Y.; MacDonald-Wicks, L.; Wood, L.; Callister, R.; Collins, C. Interventions including a nutrition component aimed at managing gestational weight gain or postpartum weight retention: A systematic review and meta-analysis. *JBI Database Syst. Rev. Implement. Rep.* 2019, 17, 297–364.
45. Lim, S., B. Hill, H.J. Teede, L.J. Moran, and S. O'Reilly, An evaluation of the impact of lifestyle interventions on body weight in postpartum women: A systematic review and meta-analysis. *Obesity Reviews*, 2020.

46. Neville, C.E., M.C. McKinley, V.A. Holmes, D. Spence, and J.V. Woodside, The effectiveness of weight management interventions in breastfeeding women—A systematic review and critical evaluation. *Birth*, 2014. 41(3): p. 223-236.
47. Dodd, J.M., A.R. Deussen, C.M. O'Brien, D.A. Schoenaker, A. Poprzeczny, A. Gordon, and S. Phelan, Targeting the post-partum period to promote weight loss: a systematic review and meta-analysis. *Nutrition reviews*, 2018. 76(8): p. 639-654.
48. Lim, S., X. Liang, B. Hill, H. Teede, L.J. Moran, and S. O'Reilly, A systematic review and meta-analysis of intervention characteristics in postpartum weight management using the TIDieR framework: A summary of evidence to inform implementation. *Obesity Reviews*, 2019. 20(7): p. 1045-1056.
49. Lim, S., B. Hill, S. Pirotta, S. O'Reilly, and L. Moran, What Are the Most Effective Behavioural Strategies in Changing Postpartum Women's Physical Activity and Healthy Eating Behaviours? A Systematic Review and Meta-Analysis. *Journal of clinical medicine*, 2020. 9(1): p. 237.
50. Gilinsky, A.S., H. Dale, C. Robinson, A.R. Hughes, R. McInnes, and D. Lavalley, Efficacy of physical activity interventions in post-natal populations: systematic review, meta-analysis and content coding of behaviour change techniques. *Health Psychology Review*, 2015. 9(2): p. 244-263.
51. Pronk, N.P., Designing and evaluating health promotion programs. *Disease Management & Health Outcomes*, 2003. 11(3): p. 149-157.
52. Aziz, Z., P. Absetz, J. Oldroyd, N.P. Pronk, and B. Oldenburg, A systematic review of real-world diabetes prevention programs: learnings from the last 15 years. *Implementation science*, 2015. 10(1): p. 172.
53. Dalrymple, K.V., A.C. Flynn, S.A. Relph, M. O'Keeffe, and L. Poston, Lifestyle Interventions in overweight and obese pregnant or postpartum women for postpartum weight management: a systematic review of the literature. *Nutrients*, 2018. 10(11): p. 1704.
54. Kuhlmann, A.K.S., P.M. Dietz, C. Galavotti, and L.J. England, Weight-management interventions for pregnant or postpartum women. *American Journal of Preventive Medicine*, 2008. 34(6): p. 523-528.
55. Lim, S., S. O'Reilly, H. Behrens, T. Skinner, I. Ellis, and J. Dunbar, Effective strategies for weight loss in post-partum women: a systematic review and meta-analysis. *Obesity reviews*, 2015. 16(11): p. 972-987.
56. O'Reilly, S.L., J.A. Dunbar, V. Versace, E. Janus, J.D. Best, R. Carter, J.J. Oats, T. Skinner, M. Ackland, and P.A. Phillips, Mothers after Gestational Diabetes in Australia (MAGDA): a randomised controlled trial of a postnatal diabetes prevention program. *PLoS medicine*, 2016. 13(7): p. e1002092.



57. Buelo, A., A. Kirk, R. Lindsay, and R. Jepson, Exploring the effectiveness of physical activity interventions in women with previous gestational diabetes: A systematic review of quantitative and qualitative studies. *Preventive medicine reports*, 2019: p. 100877.
58. Makama, M., M.A. Awoke, H. Skouteris, L.J. Moran, and S. Lim, Barriers and facilitators to a healthy lifestyle in postpartum women: A systematic review of qualitative and quantitative studies in postpartum women and healthcare providers. *Obes Rev*, 2021. 22(4): p. e13167.
59. Kragelund Nielsen, K., L. Groth Grunnet, H. Terkildsen Maindal, D.D.A. Workshop, and W. Speakers, Prevention of Type 2 diabetes after gestational diabetes directed at the family context: a narrative review from the Danish Diabetes Academy symposium. *Diabetic Medicine*, 2018. 35(6): p. 714-720.
60. Dasgupta, K., H.T. Maindal, K.K. Nielsen, and S. O'Reilly, Achieving penetration and participation in diabetes after pregnancy prevention interventions following gestational diabetes: A health promotion challenge. *Diabetes research and clinical practice*, 2018. 145: p. 200-213.
61. Almli, I., H.S. Haugdahl, H.L. Sandsæter, J.W. Rich-Edwards, and J. Horn, Implementing a healthy postpartum lifestyle after gestational diabetes or preeclampsia: a qualitative study of the partner's role. *BMC pregnancy and childbirth*, 2020. 20(1): p. 66.
62. Faleschini, S., L. Millar, S.L. Rifas-Shiman, H. Skouteris, M.-F. Hivert, and E. Oken, Women's perceived social support: associations with postpartum weight retention, health behaviors and depressive symptoms. *BMC women's health*, 2019. 19(1): p. 143.
63. McManus, R., D. Miller, M. Mottola, I. Giroux, and L. Donovan, Translating healthy living messages to postpartum women and their partners after gestational diabetes (GDM): body habitus, a1c, lifestyle habits, and program engagement results from the families defeating diabetes (fdd) randomized trial. *American Journal of Health Promotion*, 2018. 32(6): p. 1438-1446.
64. World Health Organisation, WHO recommendations on postnatal care of the mother and newborn. 2014: World Health Organization.
65. Haran, C., M. Van Driel, B.L. Mitchell, and W.E. Brodribb, Clinical guidelines for postpartum women and infants in primary care—a systematic review. *BMC pregnancy and childbirth*, 2014. 14(1): p. 1-9.
66. Riley, H., Weight management before, during and after pregnancy—what are the 'rules'? *Nutrition Bulletin*, 2011. 36(2): p. 212-215.
67. Scott, C., C.T. Andersen, N. Valdez, F. Mardones, E.A. Nohr, L. Poston, K.C.Q. Loetscher, and B. Abrams, No global con-sensus: a cross-sectional survey of maternal weight policies. *BMC pregnancy and childbirth*, 2014. 14(1): p. 1-10.
68. McAuliffe, F.M., S.L. Killeen, C.M. Jacob, M.A. Hanson, E. Hadar, H.D. McIntyre, A. Kapur, A.B. Kihara, R.C. Ma, and H. Divakar, Management of prepregnancy, pregnancy, and postpartum

obesity from the FIGO Pregnancy and Non-Communicable Diseases Committee: A FIGO (International Federation of Gynecology and Obstetrics) guideline. *International Journal of Gynecology & Obstetrics*, 2020. 151: p. 16-36.

69. Keller, C., K. Records, B. Ainsworth, P. Permana, and D.V. Coonrod, Interventions for weight management in postpartum women. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 2008. 37(1): p. 71-79.

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