

Weight loss after pregnancy – a challenging but opportune time to intervene

ASO NI Regional Meeting

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24th January 2018

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Background – maternal obesity

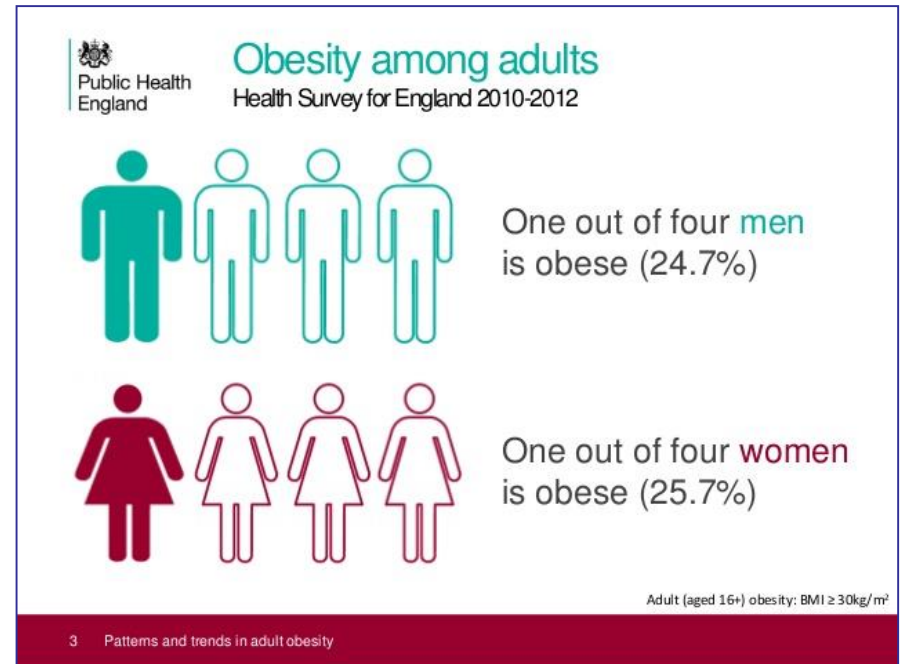
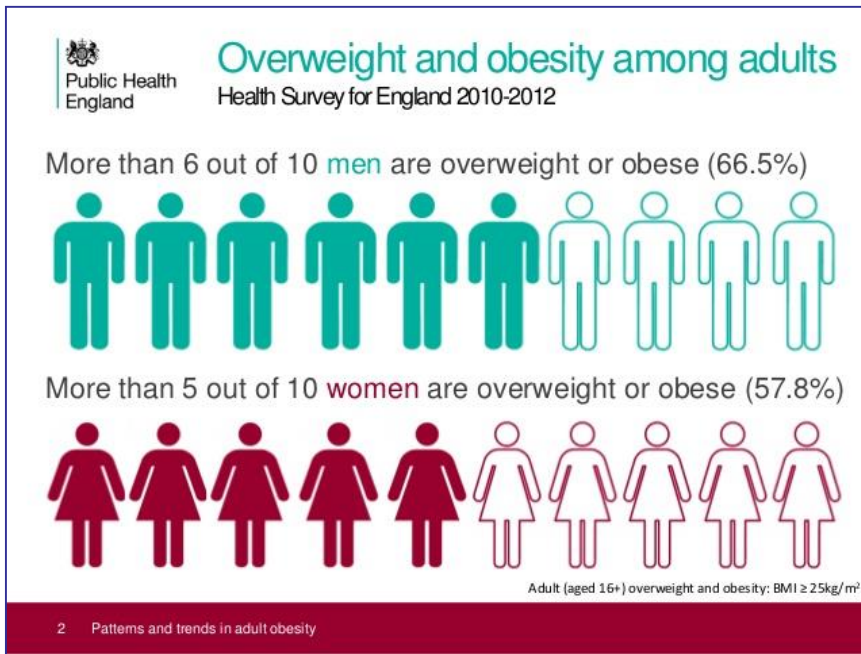
Postpartum weight loss trajectories

Postpartum (PP) period – a challenging time

Weight loss interventions in PP women

Conclusion

Background – Obesity



Source: PHE Slide set Patterns and Trend in adult obesity

Background – Maternal obesity

Prevalence maternal overweight & obesity (1st trimester):

- England -16% obese
(Heslehurst et al. Int J Obes 2010; 34: 420–428)
- Northern Ireland – 27.8% overweight; 16.8% obese
 - obese class I (11.0%)
 - obese class II (3.9%)
 - obese class III (1.9%)

(Scott-Pillai et al. BJOG. 2013;120:932-9).



Background – Maternal obesity

- Increased risks for the mother & baby - short & long term

Mother	Baby
Gestational hypertension	Inter-uterine growth restriction
GDM	Neural tube defects
Pre-eclampsia	Congenital anomalies
C-section	Small for gestational age
Miscarriage, Preterm delivery	Large for gestational age
Infections	Reduced likelihood & shorter period of exclusive breastfeeding
Postpartum haemorrhage	Overweight/Obesity
Postpartum depression	



Background – Maternal obesity

Demands on health-care services:

- Modification of obstetrics care pathway to cope with high-risk pregnancies
- More frequent & more specialized check-ups
- Additional appointments with multi-disciplinary team
- Practical issues around care of obese women (equipment, level of staffing)
- Longer stay in hospital etc.



Centre for Maternal and Child Enquiries
Improving the health of mothers, babies and children



Maternal obesity in the UK: findings from a national project

2010
United Kingdom



Department of
Health, Social Services
and Public Safety
www.hssps.gov.uk



A Strategy for Maternity Care in Northern Ireland 2012 - 2018

July 2012

NHS
National Institute for
Health and Clinical Excellence

Issue Date: July 2010

Dietary interventions and physical activity interventions for weight management before, during and after pregnancy

NICE public health guidance 27



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Postpartum weight loss trajectories

International Journal of Obesity (2001) 25, 853–862
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www.nature.com/ijo



PAPER

Does the pattern of postpartum weight change differ according to pregravid body size?

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OBJECTIVES: To examine differences in the pattern of weight changes during and after pregnancy among four pregravid body mass index (BMI) groups.



Postpartum weight loss trajectories according to BMI

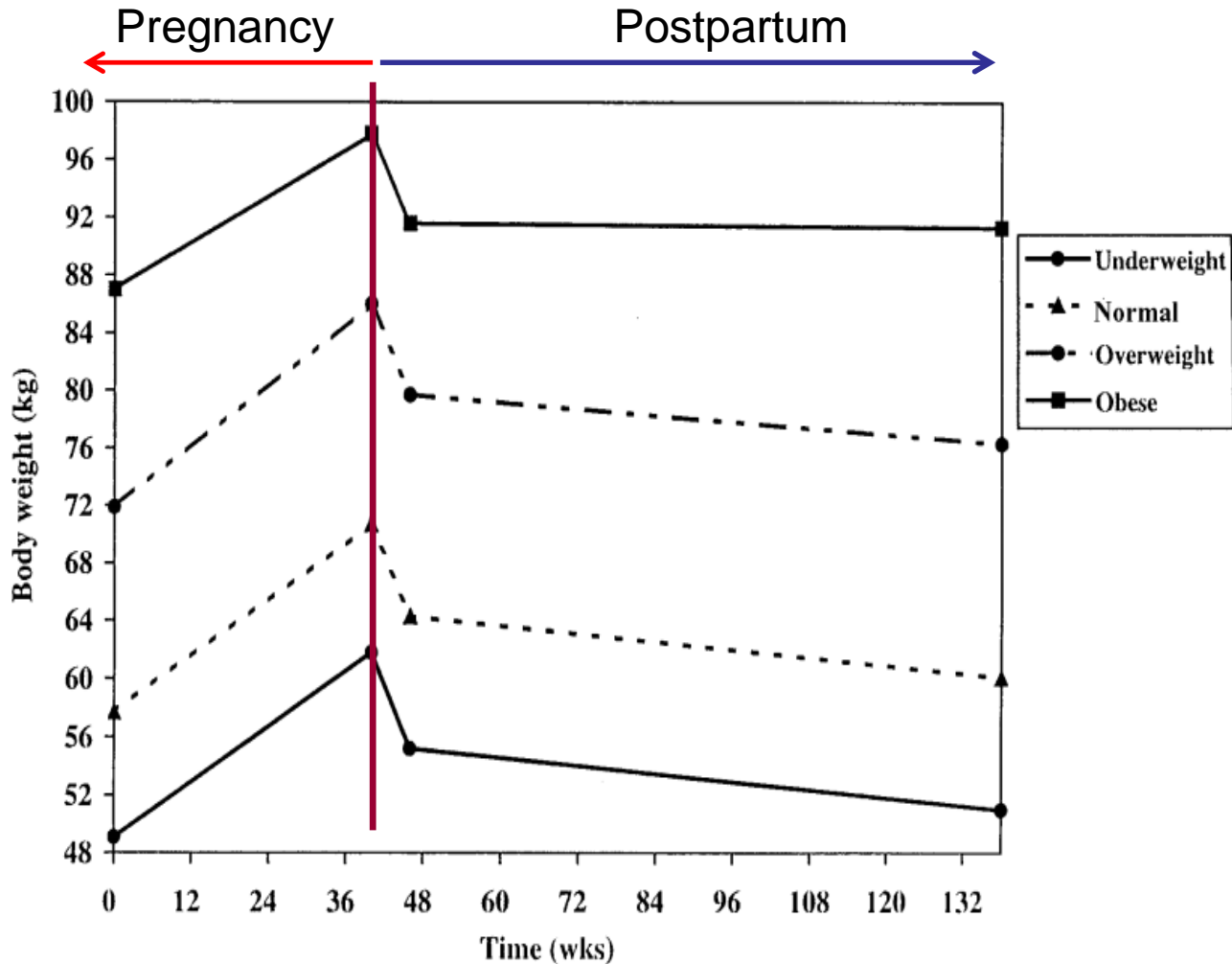


Figure 1 Patterns of maternal weight changes from preconception through gestation and early and late postpartum periods according to pregravid BMI group.

Postpartum weight loss trajectories according to BMI

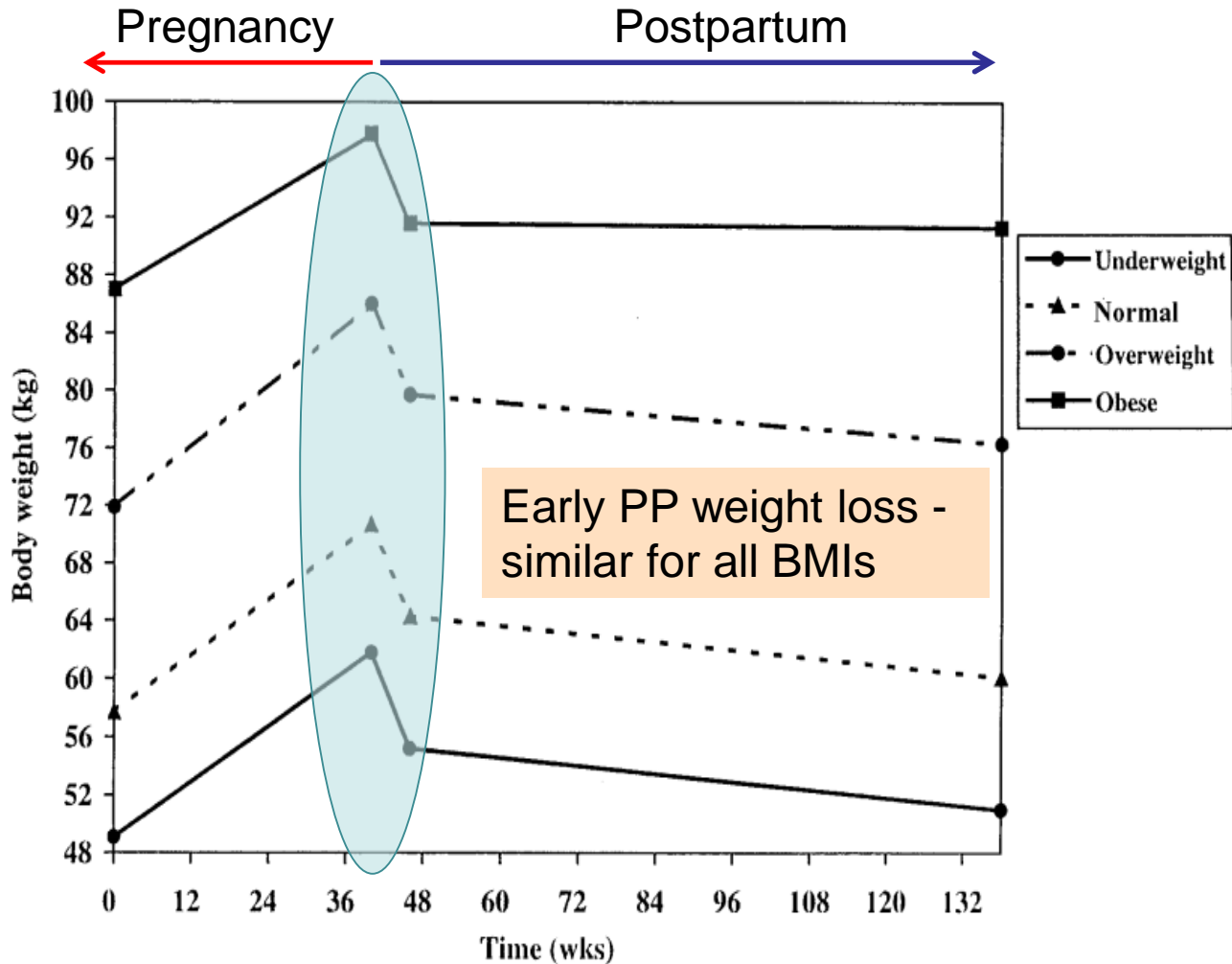


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Postpartum weight loss trajectories according to BMI

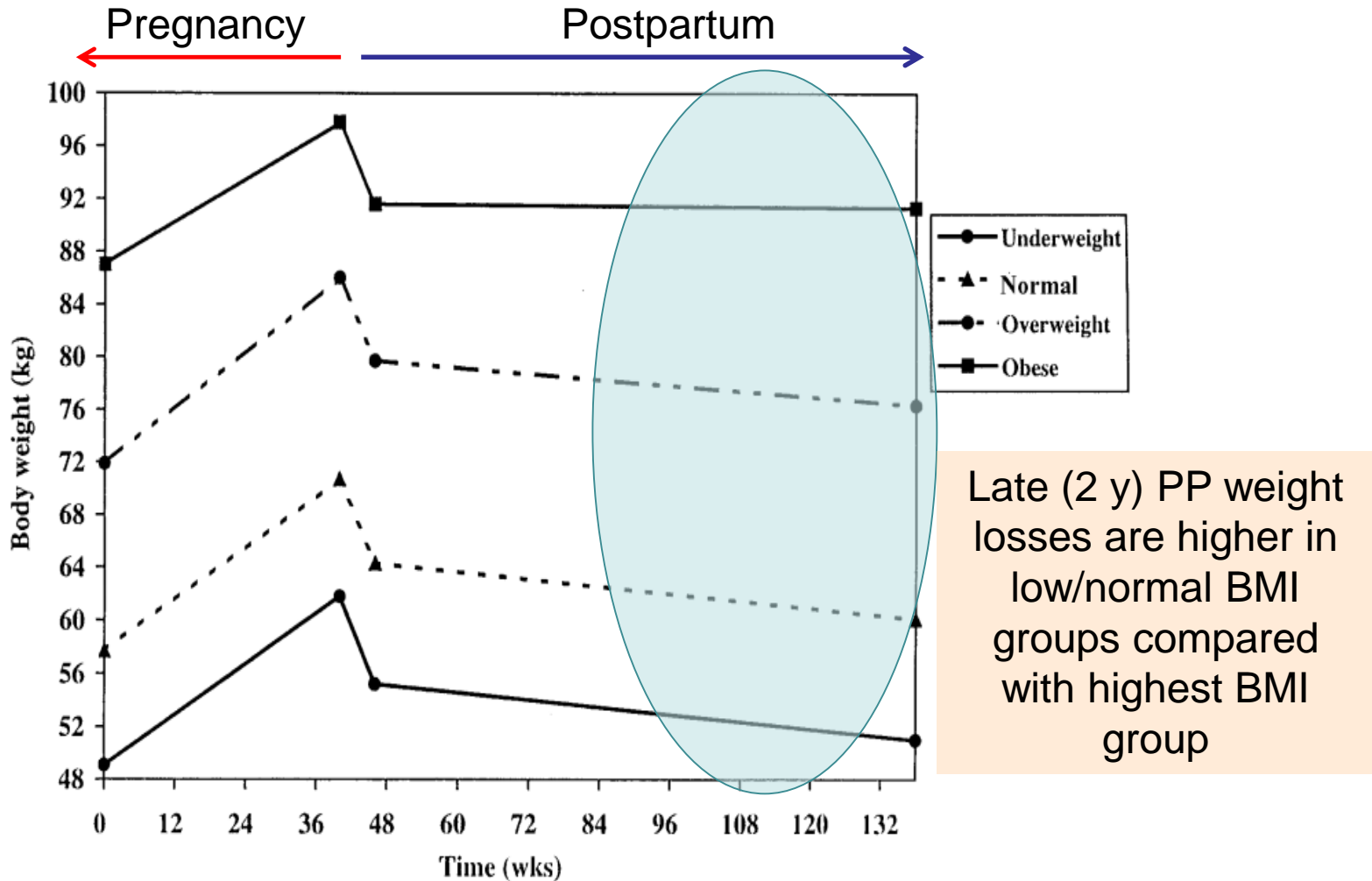


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Postpartum weight loss trajectories – retention of gestational weight

- **1 in 3** women reach pre-pregnancy weight within **6 weeks after delivery**
- Mean weight retention 6 weeks after delivery: 3-7kg
- Approx. **1 in 4** women substantial PP weight retention at **1 year** - 4-5kg (~9-11 pounds)
- Beyond 1 year postpartum..... weight change during late postpartum period?

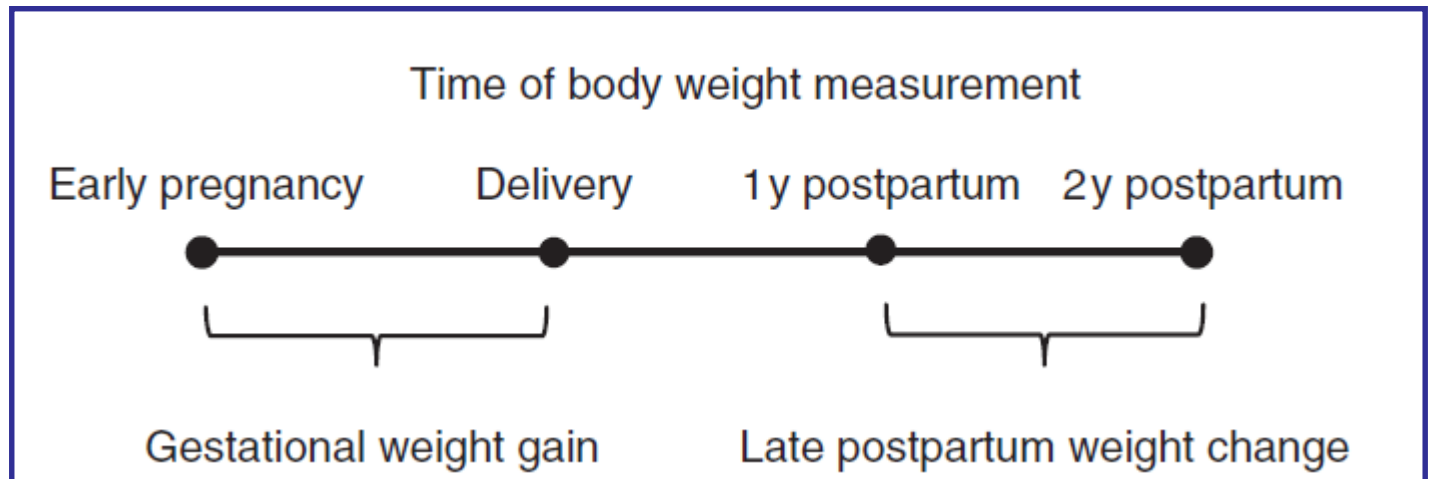


Postpartum weight loss trajectories – the late postpartum period

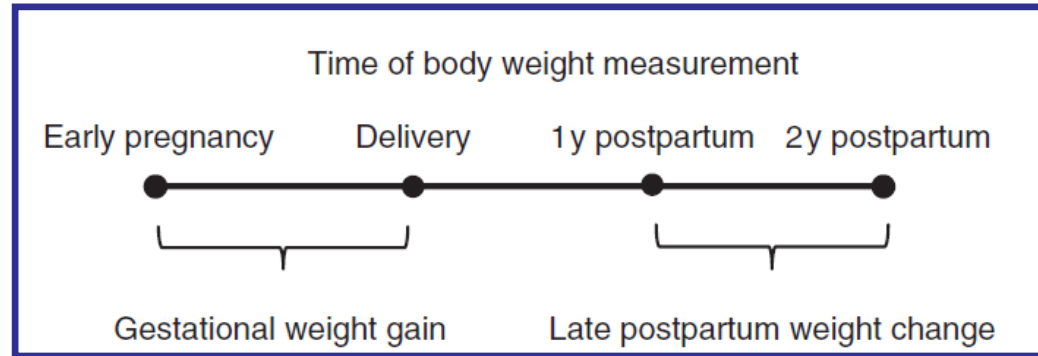
Maternal Weight Change Between 1 and 2 Years Postpartum: The Importance of 1 Year Weight Retention

Leah M. Lipsky¹, Myla S. Strawderman² and Christine M. Olson²

(Lipsky et al. Obesity 2012;20:1496-1502)



Postpartum weight loss trajectories – the late postpartum period



26% women gained >2.25 kg between 1 and 2y postpartum

98 women (24% of total sample) had major PPWR (>4.55kg) at 2 years

61 women had major PPWR at both 1 and 2 years

So – 37 women with major PPWR at 2 years had moved into that category between 1 and 2 years PP

(Lipsky et al. Obesity 2012;20:1496-1502)



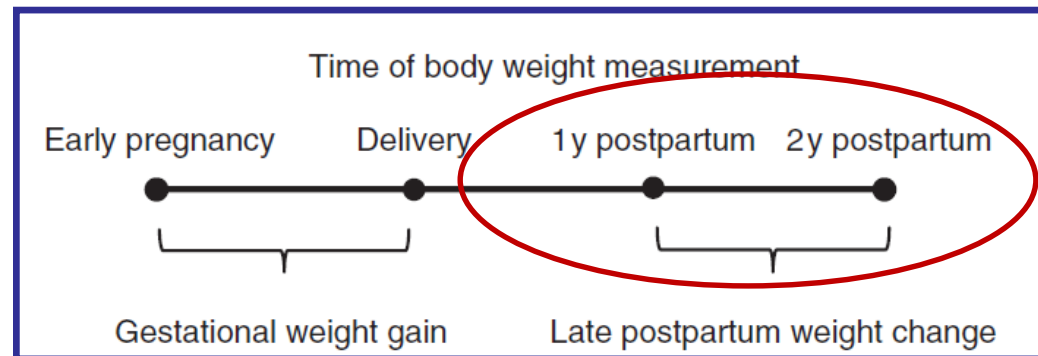
Importance of PP weight retention

Original Research

Interpregnancy Weight Change and Risk for Adverse Perinatal Outcome

Annick Bogaerts, PhD, Bea R. H. Van den Bergh, PhD, Lieveke Ameye, PhD, Ingrid Witters, PhD, Evelyne Martens, MSc, Dirk Timmerman, PhD, and Roland Devlieger, PhD

(Obstet Gynecol 2013;122:999–1009)



Inter-pregnancy period



Importance of PP weight retention

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- Belgium - Flemish Study Center for Perinatal Epidemiology routinely registers perinatal data from all deliveries in Flanders
- Database of n=200,796 births between 2009-2011
- Singleton births at first and second pregnancy n=7897



Importance of PP weight retention

- 1st pregnancy –
18% OW; 7% OB
- 2nd pregnancy –
22% OW; 10% OB

Table 1. Change of Body Mass Index Group From the First to the Second Pregnancy (N=7,897)

	n	%
Underweight to underweight	239	3.03
Underweight to normal weight	134	1.70
Underweight to overweight	2	0.03
Normal weight to underweight	123	1.56
Normal weight to normal weight	4,681	59.28
Normal weight to overweight	683	8.65
Normal weight to obese	30	0.38
Overweight to normal weight	229	2.90
Overweight to overweight	986	12.40
Overweight to obese	229	2.90
Obese to underweight	1	0.01
Obese to normal weight	7	0.09
Obese to overweight	60	0.76
Obese	493	6.24



Importance of PP weight retention

Change in pre-pregnancy BMI category between first and 2nd pregnancy

BMI ↓ by ≥ 1 unit

BMI within ± 1 (ref)

BMI ↑ 1-2 units

BMI ↑ 2-3 units

BMI ≥ units

For under-weight and normal weight women:

BMI ↑ 2 or more units between pregnancies:

↑ risk **gestational diabetes** –

OR 2.25 (95% CI 1.33–3.78; P=0.002)

BMI ↑ 3 or more units between pregnancies:

↑ risk **pregnancy induced hypertension** –

OR 3.76 (95% CI 2.16–6.57; P=0.001)

In overweight and obese women:

BMI ↑ 2 or more units between pregnancies:

↑ risk **caesarean delivery** –

OR 2.04 (95% CI 1.41–2.95; P=0.001)



Predictors of PP weight retention

- **High pre-pregnancy BMI and excess GWG** have been suggested as indicators of a general susceptibility to gaining weight
 - excessive GWG and PPWR in one pregnancy are risk factors for similar developments in subsequent pregnancies
 - **Breastfeeding** - Systematic review (37 prospective, 8 retrospective) - 63% (n= 27) reported no association between breastfeeding and postpartum weight change.
 - Among the studies of highest methodological quality (n= 5), 4 (80%) studies reported a positive association between breastfeeding and postpartum weight change, Neville et al, *Int J Obes (Lond)* **38**, 577-590.
-

Predictors of PP weight retention

- **Racial-ethnic influences**
- **Psychosocial factors** – depression, anxiety, sleep quantity and quality
- **Sociodemographic factors** - unemployment, low educational attainment, having a baby who was hospitalised, single status, age under 20 years or over 40 years at delivery, parity and smoking cessation have been significantly associated with PPWR.



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Opportune time

The postpartum period =
inter-pregnancy period or 'pre-conception
period' for subsequent pregnancies

New motivations around health

Potential to influence mother's health
AND also the wider family's health



Supporting PP weight loss: some challenges



The challenges of postpartum weight loss

- Women struggle to balance the demands of postpartum life with weight management
 - Time issues
 - Motivation issues
 - Support (partner, family, health professionals, friends, other mums) – both +ve and -ve
 - Complicating factors – postnatal depression, sleep (or lack of it)



Montgomery et al; Matern Child Health J 2011; 15:1176-84

The challenges of postpartum weight loss

Montgomery et al; Matern Child Health J 2011; 15:1176-84

It's hard to juggle everything you need to do when you work, take care of the house, take care of everyone else's needs. As a mother, I think it is typical to say that a mother's needs always come last because you put everybody else before you. So that could be another factor in taking care of yourself physically, eating, and exercising. It's hard to find the time to, because everything else is so demanding.



The challenges of postpartum weight loss

- Mum from Belfast, 2 months postpartum

But you know, your kind of like you haven't got the routine I suppose you had before ...I'm hoping as time goes on I'll get more regular pattern like at the start you know myself and Graham, you know she has this thing where she knows you're having your dinner. So I'm hoping that once that actually has settled we are able to eat together but at the start we were sort of like literally relay eating.



The challenges of postpartum weight loss

- Mum from Dublin, 9 months postpartum

Healthy eating, at the start it was hard. I wasn't cooking proper dinners and stuff because you are tired and a baby needs constant attention and stuff like that. But I have to say, over the last maybe two, three months there it's gotten a lot easier. She's more in a routine and she's sleeping more during the day and I can get dinners on and get proper stuff to eat. But before you just were grabbing whatever was in the press, if it's a chocolate bar or biscuits or something like that.



The challenges of postpartum weight loss

- Mum from Belfast, 2 months postpartum

Em, I'm probably not as conscious as like healthiness - not that I'm eating rubbish but you know I'm not, I don't have that guilt thing to eat the right thing all the time you know cause it's just me now you knowyeah I'd say I'm probably not as healthy as I was during pregnancy but again that's probably to do with the lack... you're not so guilty about it affecting her you know?



The challenges of postpartum weight loss

Montgomery et al; Matern Child Health J 2011; 15:1176-84

While I have many obstacles now, once I get past some of these I am hoping I can work on being the person I want to be.



Opportune time BUT Challenging time

The postpartum period =
inter-pregnancy period or 'pre-conception
period' for subsequent pregnancies

New motivations around health

Potential to influence mothers health AND
also the wider family's health



What has been done to date?



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Obesity Prevention

Systematic review of lifestyle interventions to limit postpartum weight retention: implications for future opportunities to prevent maternal overweight and obesity following childbirth

P. van der Pligt¹, J. Willcox¹, K. D. Hesketh¹, K. Ball¹, S. Wilkinson², D. Crawford¹ and K. Campbell¹

obesity reviews (2013) **14**, 792–805



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Trials where PP weight was a main outcome
Any combination of diet/physical activity/weight monitoring as
intervention components

Results:

- Interventions delivered by range of people – nurses, dietitian, trained counsellor, study assistant, fitness instructor
- No study used modern technology as an alternative to face-to-face delivery
- 7 out of the 11 (64%) included studies reported a decrease in PPWR - 6 of these used both diet and activity components
- Limitations – small sample sizes, short duration



Conclusions

The postpartum period presents as an important life stage to influence long-term obesity risk as well as maternal weight status for subsequent pregnancies. This review has shown that interventions that include both diet and physical activity components and include individualized support are more likely to be successful in promoting healthy postpartum weight. Despite remaining uncertainties into the ideal approach to provision of support for healthy weight attainment, interventions that have utilized modern technologies have shown promise in their capacity to limit PPWR. Future high-quality intervention studies targeting PPWR are needed.



Obesity Prevention/Pregnancy

Effective strategies for weight loss in post-partum women: a systematic review and meta-analysis

S. Lim¹, S. O'Reilly², H. Behrens³, T. Skinner⁴, I. Ellis³ and J. A Dunbar⁵

obesity reviews (2015) **16**, 972–987



Lim et al. Obesity Reviews 2015: 16: 972-87

- Aim: To determine the effect of lifestyle intervention components on weight loss in postpartum women
 - Intervention type
 - Duration
 - Delivery format
 - Delivery medium



Lim et al. Obesity Reviews 2015: 16: 972-87

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Overall:

Out of 22 studies reporting body weight:

- nine (41%) demonstrated a significant decrease in body weight compared to the control group;
- lifestyle post-partum weight interventions significantly reduced body weight by 2.3kg relative to control groups.



Intervention type: combined diet & exercise resulted in greater weight loss than physical activity alone

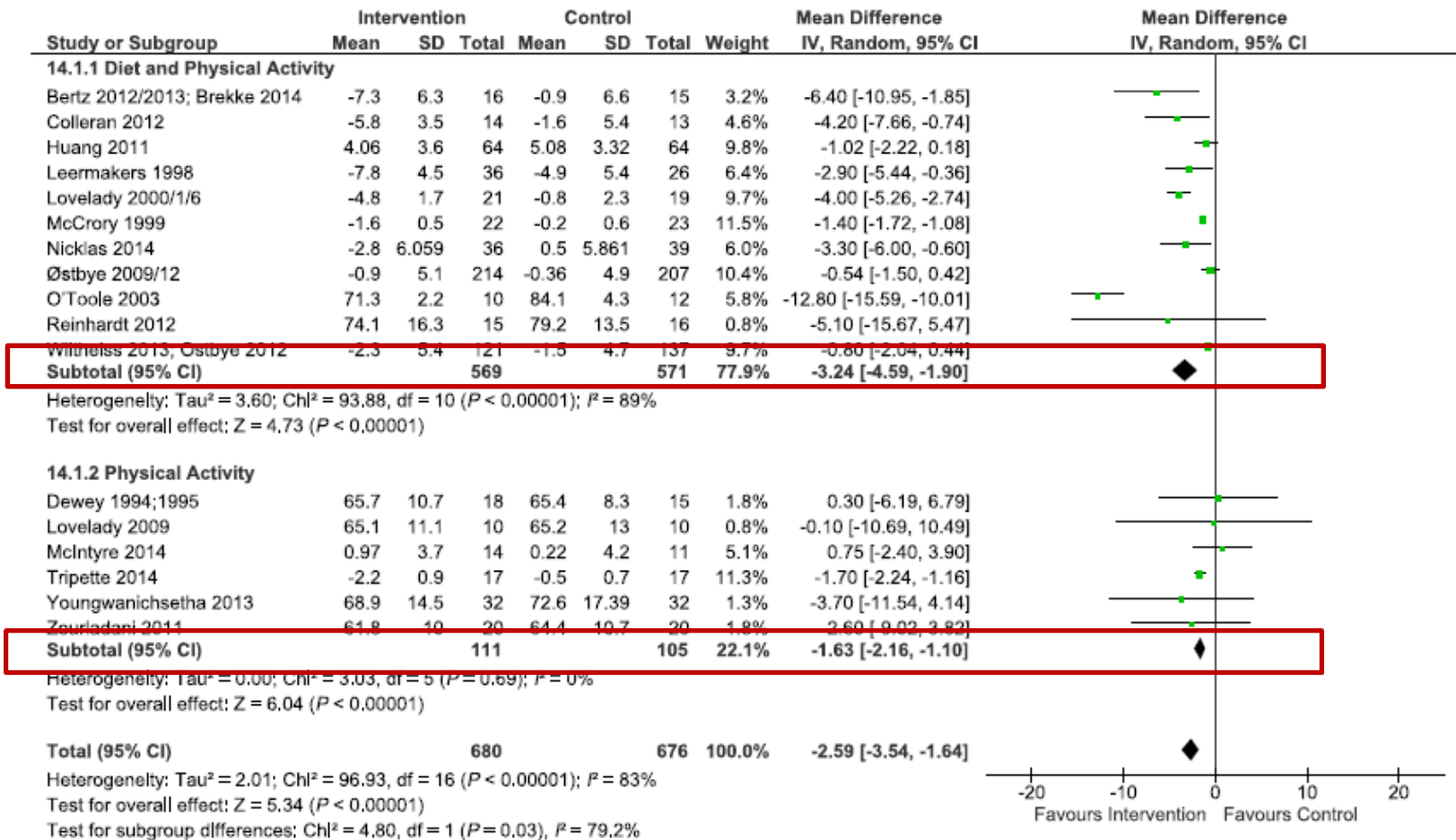


Figure 2 Forest plot of subgroup analysis of the effect of intervention type on body weight in post-partum women.

Self-monitoring: interventions including self-monitoring resulted in greater weight loss than those without

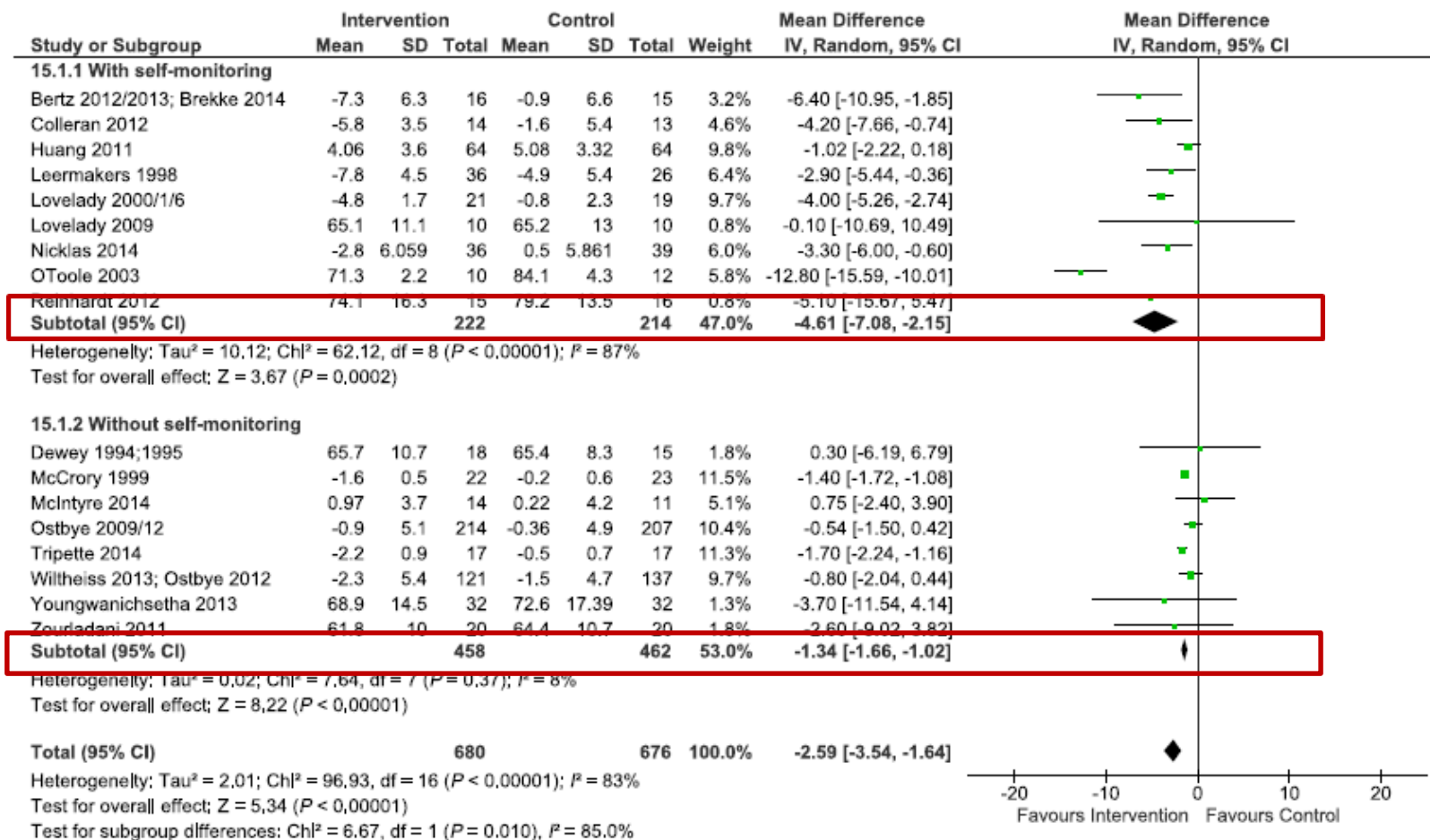


Figure 3 Forest plot of subgroup analysis of the effect of self-monitoring on body weight in post-partum women.

Lim et al. Obesity Reviews 2015; 16: 972-87

Intervention duration

6 months or less

More than 6 months

Intervention setting

Individual

Group

Intervention location

Home-based

Centre-based

Use of technology as support

In-person only

Phone support

Phone and web support

Different medium for support

Less than 3 medium

3 or more medium

No significant effect
(except for intervention duration
where greater weight loss was
associated with studies of
shorter duration but this was
driven by one (poor quality)
outlier study – no longer
significant when this study was
removed)

Active mothers postpartum

Aim

- To promote a reduction in BMI postpartum via sustainable lifestyle changes

Participants

- 450 OW/OB women; enrolled 6-weeks postpartum

Intervention

- 8 x healthy eating classes; 10 x physical activity classes; 6 x telephone counselling sessions; over 9 months

Control

- Bi-weekly newsletters, general tips for postpartum mothers

Ostbye et al Am J Prev Med 2009;37:173-180



Active mothers postpartum


Mean weight loss; P=0.25

Intervention

- 0.9kg
(± 5.1 kg)

Control

- 0.36 kg
(± 4.9 kg)



Outcomes assessed at baseline (6-wk PP) and end (12-months PP) - dietary intake, physical activity, weight

Active mothers postpartum

Engagement in the intervention components: lower than expected – attended mean 3.8 / 8 classes; completed mean of 3.3 / 6 counselling calls

Women had difficulty attending the scheduled group sessions:

Attendance was made as easy as possible by providing sessions:

- multiple times a week
- at various times during the day and evening and on weekends
- scheduling physical activity and nutrition sessions back-to-back so that with one effort, mothers could attend two classes.

“Despite these efforts, and the women’s own motivation and interest, the realities of getting to class with a baby simply over-whelmed many participants.”

Conclusion: “These results indicate that community-delivered interventions delivered outside the home are not likely to affect postpartum weight loss. More individualised programs delivered in the home via telephone, mail or Internet/e-mail may be more feasible and, potentially, more successful.”

Balance After Baby

(Nicklas et al, Obstet Gynecol 2014)

Adapted the Diabetes Prevention Program (an intensive face-to-face lifestyle intervention) into a web-based lifestyle intervention for postpartum women called 'Balance after Baby'.

- Women who had GDM in their most recent pregnancy took part in the study.

Components:

- Web-based content
 - Participants also encouraged to contact their lifestyle coach weekly for the first 12 weeks then every other week for weeks 13-24 and monthly for the last 6 months
 - 10 months membership YMCA
 - Body weight scales
 - Pedometer
- Measuring cups and spoons



Balance After Baby (Nicklas et al; Obstet Gynecol 2014)

Mean weight loss; P=0.022

Intervention

• 2.8kg loss

Control

• 0.5kg gain

- Outcomes assessed at baseline (6-wk PP) and end (12-months PP)
- N=75 (4 lost to follow-up), 57% white, 34% low income.

Web-based program for weight loss for low income PP women (Phelan et al, JAMA 2017)

Explored the addition of an internet-based weight loss program to the US Women Infant and Children (WIC) program for low-income women

- 12 month cluster RCT comparing usual care (WIC program) with the WIC program plus the 12-month web-based weight loss program.

Intervention components:

- web-program consisted of weekly lessons, self-monitoring tools, and a message board
 - monthly face-to-face visits were also held at WIC clinics.
-

Web-based program for weight loss for low income PP women (Phelan et al, JAMA 2017)

Mean weight loss; $P < 0.001$

Intervention

• 3.2kg loss

Control

• 0.9kg loss

- Outcomes assessed at baseline, 6 and 12 months
- 391 participants; 89% completed the study
- 82% were Hispanic
- 50% had a household income under 20,000 USD.





*National Institute for
Health and Clinical Excellence*

Issue Date: July 2010

**Dietary interventions and
physical activity
interventions for weight
management before, during
and after pregnancy**

NICE public health guidance 27

Gaps in knowledge about effective and appropriate weight management interventions in women during the postpartum period

Issues to consider in future randomised controlled trials

Power

- Often not reported; many small studies in the literature

Attrition

- Differential attrition – undermines trial validity

Engagement

- Recruiting hard to reach groups; retention in PP studies has often been poor

Process evaluations

- Recruitment, retention, fidelity of implementation, acceptability etc

Cost-effectiveness

Currently lacking for PP interventions – needed to inform implementation, scale-up and roll-out



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Conclusion

- There is a public health need to develop weight management interventions that fit seamlessly into the busy lives of women during the postpartum period.
- These interventions must carefully consider the difficulties in reaching this population and the specific barriers to lifestyle behaviour change that come with having a new baby.
- The evidence to date supports the use of more adaptable 'anytime, anyplace' flexible approaches with postpartum women but well-designed trials are needed and these should focus not just on weight loss but also on maintenance of weight loss.

