HHS Public Access

Author manuscript

*Obesity (Silver Spring)*. Author manuscript; available in PMC 2017 January 01.

Published in final edited form as:

*Obesity (Silver Spring)*. 2016 January ; 24(1): 23–25. doi:10.1002/oby.21368.

# Effects of maternal lifestyle intervention during pregnancy on untreated partner weight: Results from Fit for Delivery Study

**Todd A. Hagobian**[1], **Suzanne Phelan**[1,2], **Amy A. Gorin**[3], **Maureen G. Phipps**[4], **Barbara Abrams**[5], and **Rena R. Wing**[2]

[1]Kinesiology Department, California Polytechnic State University, San Luis Obispo, CA

[2]Weight Control and Diabetes Research Center, Miriam Hospital, Providence, RI

[3]Department of Psychology, University of Connecticut, Storrs, CT

[4]Department of Obstetrics and Gynecology, Warren Alpert Medical School, Brown University Women & Infants Hospital of Rhode Island, Providence, RI

[5]School of Public Health, University of California, Berkeley, Berkeley, CA

## Abstract

**Objective—**To test the hypothesis that untreated partners of pregnant women receiving a prenatal lifestyle intervention (vs. standard care) would lose more weight during pregnancy and postpartum.

**Design and Methods—**Fit for Delivery was a study of 401 overweight/obese (OW/OB) and normal-weight [NW] pregnant women randomized to prenatal lifestyle intervention or standard care. Mother's self-report of partners' weight was obtained at study entry (<16 weeks gestation), 30 weeks gestation, and 6 and 12 months postpartum.

**Results—**At study entry, 157 of 200 (78%) of intervention mothers and 144 of 201 (72%) of standard care mothers reported having a partner. In intent-to-treat analyses, there was no significant treatment × time effects on partner weight (P=0.67). In secondary analyses, partners of OW/OB intervention women lost weight from study entry to 6 and 12 months postpartum (−0.5 ± 9.5 kg, −1.0 ± 9.3 kg;P<0.05), while partners of standard care women gained weight during the same timeframe (+2.5 ± 6.7 kg, +2.9 ± 7.4 kg;P<0.05);adjusting for partner study entry BMI removed these effects.

**Conclusion—**Lifestyle intervention delivered to pregnant women did not significantly reduce weight of untreated partners. Future research is needed testing prenatal interventions that engage partners and using objective measures of weight.

### Keywords

pregnancy; weight loss; fathers; lifestyle intervention

Corresponding Author Contact Info: Todd Hagobian, PhD, Kinesiology Department, California Polytechnic State University, 1 Grand Avenue, San Luis Obispo, CA 93407, 805.756.7511 ph; 805.756.7273 fax; thagobia@calpoly.edu.

Conflicts of interest statement

The authors report no conflict of interests

## Introduction

The direct effects of standard behavioral weight loss interventions have been extensively documented (1). Often overlooked, however, are the potential "indirect" benefits of such interventions to others in the home. Emergent research has found that standard behavioral weight loss interventions targeting overweight/obese individuals have positive "ripple" effects on weight of untreated partners in the home (2, 3). Whether such effects occur in response to lifestyle interventions delivered during pregnancy remain unclear. Since partners of pregnant women typically gain weight during pregnancy and the postpartum period (~2 kg on average) (4, 5), it's important to examine potential indirect benefits of prenatal lifestyle interventions on the weight of untreated partners in the home.

The current study examined the "ripple" effect of the "Fit for Delivery" lifestyle intervention. Fit for Delivery was a randomized-controlled trial testing the efficacy of a behavioral lifestyle intervention to reduce excessive gestational weight gain and postpartum weight retention in normal weight (NW; N = 201) and overweight/obese (OW/OB; N =200) mothers (6, 7). The Fit for Delivery intervention significantly reduced excessive gestational weight gain in normal weight mothers and prevented high postpartum weight retention in both normal weight and overweight/obese mothers (6, 7). Here, we test the hypothesis that untreated partners of women in the Fit for Delivery intervention, relative to standard care, would lose more weight during pregnancy and through 6 months and 12 months postpartum.

## Methods and Procedures

As previously reported (6, 7), Fit for Delivery was a study of 401 multiethnic pregnant women randomized by within prepregnancy weight status (OW/OB vs. NW) to standard care or a low-intensity behavioral intervention to prevent excessive weight gain in pregnancy. Women in the standard care group attended regularly scheduled visits with their prenatal care providers and received one face-to-face visit at study entry and bi-monthly newsletters on pregnancy related issues. Women randomized to the intervention received all aspects of standard care plus an individualized, 4-session prenatal behavioral lifestyle intervention designed to prevent excessive gestational weight gain. At the first visit, women were provided with a "Just for Partners" handout to give to their partner. The handout encouraged the partner to help the mother eat healthy and exercise. No other information or direct intervention was given to partners to change their weight or behaviors.

As part of Fit for Delivery, we asked women at study entry to indicate whether or not they lived with a "spouse, partner, or significant other;" and, if yes, to indicate this person's height and weight. This was repeated at 30 weeks gestation, 6-months and 12-months postpartum. No other information about the partner was collected. Previous studies have shown that self-reported weight has a strong correlation with measured weight (7, 8, 9). One study found that women tend to underestimate their partners weight particularly if they are overweight (10), but data are noticeably scant on maternal reports of partner weight.

This study was approved by the Institutional Review Boards at Miriam Hospital (Providence, RI), California Polytechnic State University (San Luis Obispo, CA), and

Women, Infants', and Children's Hospital of Rhode Island (Providence RI), and all mothers gave written and verbal consent.

### Statistics

An intent-to-treat (ITT) approach was used and study entry weight was carried forward in partners who were lost to follow-up, as we were concerned that excluding partners with missing data may have biased results. Repeated Measures Analysis of Variance (RMANOVA) was used to examine the effect of treatment group (Intervention vs. Standard Care) on partner weight status over time – both with and without adjusting for covariates (partner initial BMI, maternal initial BMI, multiparity, and clinical site). Since "Fit for Delivery" found differential treatment effects across maternal pre-pregnancy BMI weight status (6, 7), secondary analyses were also conducted analyzing treatment × time effects in partners of NW and partners of OW/OB women separately. Linear regression was used to determine relationships between maternal and partner weight changes, with and without adjusting for the same covariates.

## Results

At study entry, 157 of 200 (78%) of intervention mothers and 144 of 201 (72%) standard care mothers reported having a partner, and 146 of 200 (73%) OW/OB and 155 of 201 (77%) NW mothers reported having a partner, with no significant difference between treatments or weight groups. Among those reporting partner weight at study entry (N = 303), 90% (N=273), 79% (N=240), and 70% (N=212) provided partner weight data at 30 weeks gestation, 6 and 12-months postpartum, respectively; and follow-up data completeness did not significantly differ by treatment group.

In ITT analyses, there were no significant treatment × time effects on partner weight both with (P=0.77; Table 1) and without adjusting (P=0.14) for partner initial BMI, maternal BMI, multiparity, and clinical site. Secondary analyses examining intervention vs. standard care differences in BMI within each weight group indicated that study entry BMI was significantly higher in intervention vs. standard care partners of OW/OB women (29.6 ± 5.5 $kg/m^2$ vs. 27.9 ± 5.1 $kg/m^2$; P=0.031), but not in partners of NW (27.6 ± 3.5 $kg/m^2$ vs. 26.7 ± 3.8 $kg/m^2$; P=0.64).

Among partners of OW/OB women, a significant treatment × time effect was observed (F=2.9; P=0.03). While partners of OW/OB intervention women lost weight from study entry to 6 months postpartum (−0.5 ± 9.5 kg; P=0.026;F=5.1) and from study entry to 12 months postpartum (−1.0 ± 9.3 kg; P=0.02;F=5.6), partners of standard care women gained weight at the same time points (+2.5 ± 6.7 kg, +2.9 ± 7.4 kg respectively). However, adjustment for partner BMI as study entry removed these effects. In analyses of partners of NW women, no significant treatment × time interaction was observed. There were no significant differences in proportion of partners of intervention vs. standard care with weight losses ≥10% or ≥5% overall and across maternal weight groups (data not shown). Partner and maternal weight changes were not significantly related at any time points, both with and without adjustment for covariates.

## Discussion

Given the costs of lifestyle interventions (11), it's important to fully document their reach and potential effects beyond those directly receiving treatment. This study examined "ripple" effects of the Fit for Delivery prenatal lifestyle intervention on weight of untreated partners in the home. Findings indicated the prenatal lifestyle intervention did not significantly reduce partner weight. Secondary analyses suggested intervention ripple effects might be more likely among partners of OW/OB than among partners of NW women, but future studies are needed to confirm this association.

Prior research in non-pregnant populations has shown that treating only one member of a couple can have a positive weight and health benefit on the other partner (2, 3, 12, 13, 14). Several aspects of the present study may have limited the "ripple" effect. The intervention used indirect self-reported partner weight, occurred during the woman's pregnancy only, and did not directly engage partners with intervention content. Thus, future studies utilizing measured weight with a higher intensity lifestyle intervention and better targeted partner information are required to further evaluate intervention "ripple" effects.

## Acknowledgments

We thank Theresa Scholl and Naomi Stotland for serving as the data safety officers on this project.

The authors' responsibilities were as follows—SP, RRW, MGP, BA, and AA conceived and carried out the experiment; SP conducted the research; TH and SP analyzed data; TH, SP, AA, RRW, MGP, and BA: wrote the manuscript; and TH had primary responsibility for the final content. All authors read and approved the final manuscript.

This trial was registered at clinicaltrials.gov as NCT01117961. The National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health under Award Number DK071667 supported research reported in this publication.

## References

1. Butryn ML, Webb V, Wadden TA. Behavioral treatment of obesity. Psychiatr Clin North Am. 2011; 34:841–859. [PubMed: 22098808]
2. Gorin AA, Wing RR, Fava JL, Jakicic JM, Jeffery R, West DS, et al. Weight loss treatment influences untreated spouses and the home environment: evidence of a ripple effect. Int J Obes (Lond). 2008; 32:1678–1684. [PubMed: 18762804]
3. Golan R, Schwarzfuchs D, Stampfer MJ, Shai I. Halo effect of a weight-loss trial on spouses: the DIRECT-Spouse study. Public health nutrition. 2010; 13:544–549. [PubMed: 19706214]
4. Condon JT, Boyce P, Corkindale CJ. The First-Time Fathers Study: a prospective study of the mental health and wellbeing of men during the transition to parenthood. The Australian and New Zealand journal of psychiatry. 2004; 38:56–64. [PubMed: 14731195]
5. Garfield CF, Duncan G, Gutina A, Rutsohn J, McDade TW, Adam EK, et al. Longitudinal Study of Body Mass Index in Young Males and the Transition to Fatherhood. Am J Mens Health. 2015
6. Phelan S, Phipps MG, Abrams B, Darroch F, Grantham K, Schaffner A, et al. Does behavioral intervention in pregnancy reduce postpartum weight retention? Twelve-month outcomes of the Fit for Delivery randomized trial. The American journal of clinical nutrition. 2014; 99:302–311. [PubMed: 24284438]
7. Phelan S, Phipps MG, Abrams B, Darroch F, Schaffner A, Wing RR. Randomized trial of a behavioral intervention to prevent excessive gestational weight gain: the Fit for Delivery Study. The American journal of clinical nutrition. 2011; 93:772–779. [PubMed: 21310836]

8. Rimm EB, Stampfer MJ, Colditz GA, Chute CG, Litin LB, Willett WC. Validity of self-reported waist and hip circumferences in men and women. Epidemiology. 1990; 1:466–473. [PubMed: 2090285]

9. Weaver TW, Kushi LH, McGovern PG, Potter JD, Rich SS, King RA, et al. Validation study of self-reported measures of fat distribution. International journal of obesity and related metabolic disorders : journal of the International Association for the Study of Obesity. 1996; 20:644–650.

10. Christensen VT. Gendered perceptions of own and partner weight-level. Health. 2012; 16:382–399. [PubMed: 22067916]

11. Perri MG, Limacher MC, von Castel-Roberts K, Daniels MJ, Durning PE, Janicke DM, et al. Comparative effectiveness of three doses of weight-loss counseling: two-year findings from the rural LITE trial. Obesity (Silver Spring). 2014; 22:2293–2300. [PubMed: 25376396]

12. Shattuck AL, White E, Kristal AR. How women's adopted low-fat diets affect their husbands. American journal of public health. 1992; 82:1244–1250. [PubMed: 1503166]

13. Gorin A, Phelan S, Tate D, Sherwood N, Jeffery R, Wing R. Involving support partners in obesity treatment. Journal of consulting and clinical psychology. 2005; 73:341–343. [PubMed: 15796642]

14. Wing RR, Jeffery RW. Benefits of recruiting participants with friends and increasing social support for weight loss and maintenance. Journal of consulting and clinical psychology. 1999; 67:132–138. [PubMed: 10028217]

**What is already known about this subject**

- Lifestyle interventions can significantly lower the weight of untreated partners living in the home
- Lifestyle interventions delivered to pregnant women may decrease excessive gestational weight gain.

**What this study adds**

- There were no significant ripple effects of a low-intensity prenatal lifestyle intervention on weight of untreated partners.
- Future research is needed testing more intensive lifestyle interventions and using objective measures of partner weight.

**Table 1**

Untreated partner weight of intervention mothers and standard care mothers at study entry, 30 weeks gestation, and 6 months and 12 months postpartum. Values are mean ± SD.

| | Study Entry | 30 Weeks Gestation | 6 Months Postpartum | 12 Months Postpartum |
|---|---|---|---|---|
| Partner Weight (kg) of Intervention Mothers | 90.8 ± 17.4 | 90.6 ± 16.8 | 91.3 ± 16.8 | 91.1 ± 16.0 |
| Partners Weight (kg) of Standard Care Mothers | 87.4 ± 14.8 | 88.4 ± 14.3 | 88.7 ± 15.1 | 88.5 ± 15.3 |