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of Postpartum Weight Self-Management

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Abstract

Objective: The purpose of this study was to identify women's patterns of readiness to engage in weight self-management behaviors during the postpartum period.

Design: Prospective, longitudinal design with repeated measures, guided by the Transtheoretical Model (TTM) of Behavior Change.

Setting: A tertiary perinatal center in an urban setting in the Midwestern United States with approximately 3,000 births annually.

Participants: 191 adult postpartum women

Methods: Participants were surveyed in person during their postpartum hospitalization, and by telephone at 4 weeks and 8 weeks postpartum using the Stages of Change for Weight Management (SOCWM) and the Decisional Balance for Weight Management (DBWM) tools.

Results: There was a significant effect of time on stage of change for women in the postpartum period, with women in a higher stage of change at 8 weeks than during the postpartum hospitalization. There were no significant differences in Stage of Change at any of the 3 time points by pre-pregnant weight category or by race. Nearly half of the sample was in the contemplation stage during the postpartum hospitalization and more than 80% were in action or maintenance stages by 8 weeks postpartum.

Conclusions: The early postpartum period is an opportune time to influence stage of change in women's weight management behaviors. Assessment of readiness to engage in or continue weight management behaviors will allow providers to use stage-matched interventions guided by the TTM to facilitate women's self-management of weight.

Key Words: postpartum, weight self-management, transtheoretical model

Callouts

1. Helping women achieve a healthy weight by adopting appropriate self-management behaviors is one of the identified priorities for interconceptional care (introduction section)
2. Half of the women that nurses encounter during the postpartum hospitalization are already thinking about adopting health behaviors to manage their weight. (discussion/implications section)
3. Inclusion of weight self-management support for all women will begin to normalize the topic for both women and providers. (conclusion section)

1 A woman experiences tremendous physical and psychosocial changes after she gives birth to a
2 baby (George, 2005; O'Reilly, 2004), including changes in body weight and body composition.
3 As women navigate the postpartum transition, they make many behavior choices as they assume
4 the new or expanded motherhood role. Their ability to manage weight during this time can be
5 optimized or compromised depending on the behaviors adopted (Oken, Taveras, Popoola, Rich-
6 Edwards, & Gilman, 2007; Olson, 2005).

7 The postpartum period is a particularly important time for women's lifetime health as
8 well as for future pregnancies. Women who do not lose the weight they gained during
9 pregnancy before the end of the postpartum year are at greater risk for overweight and obesity in
10 later adulthood than those who successfully lose their pregnancy weight (Rooney, Schauburger,
11 & Mathiason, 2005). There is also a cumulative effect: those who retain weight gained in
12 pregnancy carry that weight into subsequent pregnancies, irrespective of interpregnancy interval
13 (Gore, Brown & West, 2003; Linne & Rossner, 2003). Though the amount of weight retained
14 after pregnancy and the time interval measured vary widely in published reports, there is
15 consistent evidence of approximately 1.1 to 6.6 pounds (0.5 to 3 kg) of weight gain attributable
16 to pregnancy that women retain past the postpartum year (Gore et al., 2003).

17 Many personal factors place women at higher risk for retaining their gestational weight.
18 One of the most significant predictors of postpartum weight retention is a pregnancy weight gain
19 that exceeds the amounts recommended by the most recent Institute of Medicine (IOM)
20 guidelines (IOM, 2009). Other predictors include being an adolescent or over 35, of non-white
21 ethnicity, single, low-income, having less than a college education, having high depressive
22 symptomology, and having more than 2 children (Durham, 2008; Lyu, Lo, Chen, Wang, & Liu,
23 2009; Oken et al., 2007; Rubio & Montgomery, 2003; Siega-Riz et al., 2009; Sterling et al.,

24 2009; Thame, Jackson, Manswell, Osmond, & Antione, 2009; Walker, Fowles, & Sterling,
25 2011). There have been varied findings regarding whether prepregnancy weight category is
26 predictive of weight retention, with some studies finding it to be a significant predictor of
27 retention (Nohr et al., 2009), and others that have found it to not be a significant predictor
28 (Huang, Wang, & Dai, 2010; Maddah & Nikooyeh, 2009). Walker (2009) provided evidence
29 that examining the combination of a woman's prepregnancy weight status and her gestational
30 weight gain provides a stronger predictor of postpartum weight retention than looking at either
31 alone. In her study that examined women divided into clusters based on these two factors, the
32 women who retained the most weight were women who were overweight or obese prior to
33 pregnancy and who also gained more weight than was recommended.

34 Women's self-management of their postpartum weight is dependent on other factors,
35 such as adoption of weight management behaviors and body image. Women with a low income
36 and those with more than 2 children were also found to be less likely to adopt healthy behaviors
37 which would lead to successful management of postpartum weight (Olson, 2005; Pereira et al.,
38 2007; Walker et al., 2004). Cultural and social value placed on ideal weight also influences
39 body image perceptions. White and Hispanic women place a higher value on being at a healthy
40 weight than do Black women (Groth & David, 2008), and postpartum women of high
41 socioeconomic status selected a thinner figure as their desired figure than did women of medium
42 and low socioeconomic status (Shrewsbury et al., 2008).

43 In the past decade, there has been a shift in perspectives concerning women's health—
44 rather than thinking of women's health as a series of disconnected life stages, researchers and
45 providers now view women's health and weight management from a life course perspective
46 (Johnson, Gerstein, Evans, & Woodward-Lopez, 2006). What happens in one stage has

47 cumulative effects on subsequent stages, and all are interconnected (Lu & Halfon, 2003). This
48 shift in thinking has led to re-orienting the focus of care after childbirth from immediate
49 postpartum care needs to initiation of care for the interconceptional period, which begins
50 immediately after the birth of a baby, continues until a subsequent pregnancy, and throughout the
51 childbearing years (American Academy of Pediatrics and the American College of Obstetricians
52 and Gynecologists, 2007; Centers for Disease Control and Prevention [CDC], 2006).
53 Interconceptional care focuses on resolution of pregnancy-related physiologic and psychosocial
54 adjustments and continuation or establishment of health behaviors targeted at comprehensive
55 women's health. This perspective encourages providers to take advantage of episodic health care
56 contacts to impact future pregnancies and the woman's life-long health course. Helping women
57 achieve a healthy weight by adopting appropriate self-management behaviors is one of the
58 identified priorities for interconceptional care (CDC; Moos, 2010).

59 Weight management is a self-management process involving dietary and physical activity
60 choices a woman must make every day (Wing, Tate, Gorin, Raynor, & Fava, 2006). On average,
61 at 6 weeks postpartum, women retain between 3 and 7 kg of their gestational weight and 2/3 of
62 women are heavier than they were prior to pregnancy. Six weeks marks the point at which most
63 postpartum women have their follow-up visit with a provider (Walker, Sterling, & Timmerman,
64 2005). Because many women will have no further contact with a health care provider until their
65 next yearly checkup or until they are pregnant again, women are on their own to manage their
66 weight. While providers cannot make daily choices for women, they do have an opportunity to
67 influence women's values, beliefs, knowledge, and skills by arming women with the tools they
68 need to successfully self-manage their weight (Ryan, 2009). It is essential that providers take
69 into account the circumstances affecting weight and weight management choices that are unique

70 to the postpartum period of a woman's life (O'Toole, Sawicki, & Artal, 2003; Pereira et al.,
71 2007) while taking advantage of the fact that, in the perinatal period, women are more aware of
72 the impact their behaviors have on their own health and the health of their child (Lewallen,
73 2004).

74 **Transtheoretical Model**

75 The Transtheoretical Model (Prochaska, Redding, & Evers, 1997) is a model of health
76 behavior change that can be used to assess a person's readiness for initiating a new health
77 behavior. Using this model, health care providers are able to be more successful in health
78 promotion by tailoring interventions to promote movement from one stage of engagement to
79 another in adopting a desired health behavior. The 'Stage of Change' construct represents the
80 temporal component of engagement in a health behavior. Individuals progress through 4 stages
81 as they become more actively engaged in adopting the health behavior: (a) Precontemplation:
82 The person has no intention to take action in the next 6 months, (b) Contemplation: The person
83 intends to take action within the next 6 months, (c) Action: The person has changed their
84 behavior for less than 6 months, and (d) Maintenance: The person has changed their behavior
85 for more than 6 months (Prochaska, Redding, & Evers, 1997, 62).

86 Linked to engagement in a health promoting behavior is the construct of decisional
87 balance. In deciding to engage in a health behavior, individuals self-assess the pros and cons of
88 adopting the behavior of interest. In order to move from precontemplation to contemplation, the
89 pros of changing the behavior must increase. To move from contemplation to action, the cons of
90 changing the behavior must decrease. The model has been applied and tested with many
91 behaviors including weight management within the general population (Prochaska et al., 1997),
92 but not yet specifically with postpartum weight management.

93

94 Purpose Statement

95 As an initial step in identifying the optimal time for beginning postpartum weight
96 management interventions, the purpose of this project was to identify women's patterns of
97 readiness to engage in weight management behaviors during the postpartum period. To achieve
98 this purpose, the following research questions were addressed: 1) Is there a difference in
99 women's readiness to adopt health behaviors for weight management at 3 time points during the
100 first 8 weeks postpartum?, 2) Are there differences in readiness to adopt health behaviors for
101 weight management in the postpartum period by women's prepregnancy weight category or by
102 women's race?, and 3) What were the most common pros and cons for engaging in postpartum
103 weight management behaviors?

104

Methods**105 Design**

106 This study used a prospective, longitudinal design with repeated measures. Participants
107 were surveyed during their postpartum hospitalization and were contacted by telephone at 4
108 weeks and 8 weeks postpartum.

109 Sample

110 The sample included women recruited during their postpartum hospitalization at a tertiary
111 perinatal center with approximately 3,000 births annually that serves an ethnically diverse urban
112 population in the Midwestern United States. The study inclusion criteria were: at least 24 hours
113 post-birth, live born infant, no major complication of childbirth resulting in an expected length of
114 hospital stay greater than 5 days for either mother or newborn, at least 18 years of age, read and
115 spoke sufficient English to complete study consent and interview procedures, and had a

116 telephone for follow-up contact at 4 and 8 weeks postpartum. Women whose prepregnancy body
117 mass index (BMI) was in the underweight category per Centers for Disease Control and
118 Prevention guidelines (CDC, 2010) were excluded to avoid potential adverse outcomes if
119 participants interpreted weight management questions as suggesting they adopt weight loss
120 behaviors.

121 Sample size was estimated using G*Power (Erdfelder, Faul, & Buchner, 1996). To
122 compare the 4 stages of change across the 3 weight groups and race groups using a power of 0.80
123 and an effect size of 0.3, a minimum total sample size of 152 was estimated. Previous research
124 with this population in the same setting yielded a 90% participation rate and an approximately
125 20% loss-to-follow-up rate (Ryan, Weiss, Traxel, & Brondino, 2011). Using an overestimate of
126 a 30% loss-to-follow-up, the target sample was 200 participants.

127 **Measures**

128 Participants completed a demographic questionnaire during the post-birth hospitalization
129 that collected data about race/ethnicity and prepregnancy height and weight (for calculation of
130 weight classification). Additional maternal characteristics were collected for the purposes of
131 sample description (Table 1). The participants' weight category was determined by abstraction
132 of height and weight information from the medical record. Body mass index (BMI) was
133 calculated using the prepregnancy weight and height recorded on the prenatal record, and each
134 woman was assigned to the category which fit her BMI: normal weight (BMI 18.5-24.9),
135 overweight (BMI 25.0-29.9), and obese (BMI 30.0 and above) weight categories (Centers for
136 Disease Control and Prevention, 2010). When records were missing height or weight data,
137 participants were asked to recall their prepregnancy weight and height.

138 Two instruments were completed at each of the 3 time periods: the Stages of Change for
139 Weight Management (SOCWM), modified for postpartum weight management, and the
140 Decisional Balance for Weight Management (DBWM). These tools have previously been
141 adapted and tested for reliability for 12 types of behavior change, including weight management
142 in the general population (Prochaska et al., 1994). The SOCWM is a four-question tool that
143 categorizes a participant's current stage of change (precontemplation, contemplation, action,
144 maintenance). The reliability of the SOCWM has been estimated at 0.78 (kappa index over a 2-
145 week period) for weight loss in the general population (Marcus, Selby, Niaura, & Rossi 1992).

146 For the purposes of this study, the 4 stages of change were modified to reflect the specific
147 situation of perinatal weight management: women should not be engaging in weight loss
148 strategies during pregnancy, but can use appropriate weight management strategies before,
149 during, and after pregnancy:

- 150 • Precontemplation: The person has no intention to take action to engage in weight
151 management behaviors in the next 6 months
- 152 • Contemplation: The person intends to take action to manage weight within the next 6
153 months
- 154 • Action: (a) during the post-birth hospitalization, defined as ‘the person was actively
155 trying to gain only the recommended weight throughout their pregnancy;’ and (b) at 4
156 and 8 weeks: the person had begun to engage in weight management activities after
157 the birth of their baby but had not maintained a healthy weight for six months prior to
158 pregnancy.
- 159 • Maintenance: The person had been engaging in weight management activities after
160 the birth of their baby and had maintained a healthy weight for six months prior to
161 this pregnancy

162 The SOCWM tool was revised to accurately categorize a woman's SOC appropriate to
163 the childbearing experience. The ‘action’ stage question was modified in the in-hospital form to
164 reflect the fact that women would not have been engaging in weight loss behaviors during
165 pregnancy from: “In the past month, have you been actively trying to lose weight?” to: “In the

166 past month, have you been trying to gain only as much weight as you should?” The maintenance
167 stage question “Have you maintained your desired weight for more than 6 months?” was
168 modified for all 3 time points to “Did you maintain your desired weight for 6 months before you
169 were pregnant?”

170 The Decisional Balance for Weight Management (DBWM) tool is a 20-question, 5-point
171 (1-5) Likert scale that identifies the person’s current pro to con balance in regard to adopting
172 health behaviors. The response items are divided into 10 ‘pro’ questions and 10 ‘con’ questions
173 The participant is asked “Tell me how important each of these are when you are deciding
174 whether to do something to manage your weight.” The responses are added to calculate a pro
175 score and a con score. The Cronbach’s alpha reliability estimate for the general weight loss
176 population has been reported as $\alpha = 0.84$ for pros and $\alpha = 0.91$ for cons (Prochaska et al., 1994).
177 In this study, reliability of the DBWM tool was assessed for pros and cons at each time point.
178 During the post-birth hospitalization, reliability for pros was $\alpha = .87$ and for cons was $\alpha = .68$; at
179 4 weeks and at 8 weeks, $\alpha = .92$ for pros and $\alpha = .87$ for cons. Previous research has indicated
180 that, in order for an individual to move from precontemplation to action, the pros of adopting that
181 behavior must be one standard deviation (SD) higher than the cons, and to move from
182 contemplation to action, the pro score must be higher than the con score (Prochaska et al., 1997).

183 **Procedures**

184 University and study site Institutional Review Boards approved the study. The principal
185 investigator (PI) trained the research assistants (RAs) in the study procedures, HIPAA
186 compliance, and principles of informed consent. Research assistants (RA’s) visited the study
187 unit every 2 to 3 days and requested participation of all postpartum women present on the unit

188 who meet inclusion criteria. The PI made phone call attempts several times a day each day
189 during the week that a participant was 4 weeks post-delivery and 8 weeks post-delivery.

190

191 **Statistical Analysis**

192 Data analysis was performed using the Statistical Package for Social Sciences (SPSS
193 version 17.0, SPSS, Inc., Chicago, IL). For research question 1, a non-parametric Friedman test
194 with a post-hoc Wilcoxon Signed Ranks test was used to determine the trajectory of readiness to
195 engage in weight management behaviors, using time as the independent variable and Stage of
196 Change as the dependent variable. Decisional balance pro and con scores were used to determine
197 number and percent of women at each SOC who were likely to change to a more engaged SOC
198 at each time point. For research question 2, a nonparametric Kruskal-Wallis test was performed
199 to determine between-group differences in Stage of Change at each time point by weight
200 category and race. For question 3, descriptive analyses were performed to examine the pro and
201 con responses most frequently reported by participants.

202

Results

203 During the postpartum hospitalization, 237 eligible women were approached by the study
204 RA's. Of these women, 48 women declined for a 20.2% refusal rate. A total of 191 women
205 were enrolled, with a mean age of 26.7 years. The sample consisted of primarily Black (50.8%)
206 and White (39.4%) women, and most women were multiparous (65.8%), married or living with
207 the father of the baby (61.1%), and had vaginal deliveries (69.4%). The sample had a mean
208 score of 33.7, out of a maximum of 66, on the Hollingshead Four-Factor Index of Social Status
209 (Davis, Smith, Hodge, Nakao, & Treas, 1991), indicating that the sample was largely working-
210 class. By 4 weeks postpartum, 104 (54.5%) participants were retained; by 8 weeks, 67 (35.1%)

211 participants were retained. Loss to follow-up was larger among the Black women in the sample
212 and was primarily due to either failure to reach women despite multiple phone calls at varied
213 times of day or disconnected cell phones. Table 1 provides complete sample demographics at all
214 3 time points, and Figure 1 provides a loss-to-follow up analysis.

215 **Research Question 1**

216 The analysis to compare SOC across the three time points (post-birth, and 4 and 8 weeks
217 postpartum) indicated significant differences in SOC over time $\chi^2(2, 50) = 10.16, p = .006$. The
218 post-hoc analysis revealed that there was a statistically significant increase of small effect size
219 ($r = .2$) between each time point: the post-birth hospitalization to 4 weeks ($z = -3.4, p = .001$), 4 to
220 8 weeks ($z = -2.8, p = .01$), and post-birth hospitalization to 8 weeks ($z = -3.8, p < .001$).

221 Table 2 demonstrates the relationship between SOC at a given time point combined with
222 the DB at that time point, and then whether individuals actually changed in the way that would
223 be expected based on that combination. Reading across the lines of table 2, the pattern of change
224 is evident. Of the 191 women surveyed during their post-birth hospitalization, 91 were in the
225 contemplation SOC. Only 56 of those women had a DB score high enough to indicate that they
226 would be expected to move forward to the action SOC, and by 4 weeks 24 of these women in the
227 had moved forward to the action SOC. Of the women who had been in the action SOC during
228 the post-birth hospitalization, 6 moved backward to the precontemplation SOC by 4 weeks. At 4
229 weeks, 20 women were in the contemplation SOC, and 17 of those women had a DB score high
230 enough to indicate that they would be expected to move forward to the action SOC. By 8 weeks,
231 10 of these women had moved forward to the action SOC and 1 of the women had moved
232 backward to the precontemplation SOC.

233 **Research Question 2**

234 Analyses indicated that there were no differences in stage of change across the 3 different
235 weight categories at the post-birth hospitalization ($\chi^2(3, 192) = .71, p = .70$), at 4 weeks, ($\chi^2(3,$
236 $106) = .03, p = .99$), or at 8 weeks ($\chi^2(3, 69) = .90, p = .64$). Similarly, there were no differences in
237 stage of change across the 3 different race categories at the post-birth hospitalization ($\chi^2(2, 179) =$
238 $.33, p = .85$), at 4 weeks ($\chi^2(2, 101) = 1.49, p = .48$), or at 8 weeks ($\chi^2(2, 63) = .48, p = .79$).

239 Table 3 provides a complete presentation of SOC by weight and race category at all 3
240 time points. Examination of the distribution of SOC across post-birth data points by
241 prepregnancy weight and race category revealed that more overweight women (55%) were in the
242 contemplation stage than obese (46%) or normal weight (43%) women. Few (4%) of the
243 overweight women were not yet contemplating engagement in weight management, while 22%
244 of normal weight and 18% of obese women were also in pre-contemplation. Thirty-one percent
245 of overweight women and 27 percent of obese women (compared to 1% of normal weight
246 women) were already in the action phase indicating that they had engaged in managing their
247 weight gain during pregnancy. Thirty-four percent of normal weight women reported
248 maintaining their desired weight pre-pregnancy compared to only 11% of overweight women
249 and 9% of obese women,

250 At 4 weeks, normal weight women were most likely to be in the maintenance SOC (45%)
251 while overweight women (45%) and obese women (60%) women were most likely to be in the
252 action SOC. At 8 weeks, most women of all weight and race categories were in action or
253 maintenance, with normal weight women more likely to be in maintenance, as they had been pre-
254 pregnancy, and most overweight and obese women in the action SOC.

255 **Research Question 3**

256 Descriptive analyses were performed to answer the third research question, and Table 4
257 lists all items that participants rated as important on the DBWM tool at each time point. During
258 the post-birth hospitalization, the DBWM pro items that were most frequently rated as either
259 “very important” or “extremely important” to the women in the sample were 1) “I would feel
260 more energetic if I lost weight”; 2) “My health would improve if I lost weight.”; 3) “I would feel
261 sexier if I lost weight”; 4) “I could wear more attractive clothing if I lost weight.”; and 5) “I
262 would feel more optimistic if I lost weight.” The DBWM con items that were most frequently
263 rated as either “very important” or “extremely important” were 1) “I would have to cut down on
264 my favorite snacks while I was dieting” and 2) “I would not be able to eat some of my favorite
265 foods if I were trying to lose weight.”.

266 **Discussion and Implications**

267 The results of this study offer insights into women’s patterns of readiness to engage in
268 weight management behaviors after the birth of a baby. Overall, the women in the sample
269 progressed in their stage of engagement in weight management behaviors during the 8 week
270 study period. During the post-birth hospitalization, across all weight categories and race groups,
271 half of the women in the sample were in the contemplation SOC. This means that half of the
272 women that nurses encounter in the immediate postpartum period are thinking about adopting
273 health behaviors to manage their weight. These women are perfect candidates for intervention
274 during this “teachable moment,” (McBride, 2003) in which a woman might be able to see the
275 need to lose her pregnancy weight as an opportunity to set lifelong weight self-management
276 habits. Yet, women have reported that they typically do not receive information about weight
277 management after childbirth either during the birth hospitalization or during the remainder of the
278 postpartum period (Ohlendorf et al., in press).

279 Immediately post-birth, nearly 40% of the women in this sample were already actively in
280 action or maintenance stages of weight self-management. This finding is consistent with recent
281 national emphasis on obesity reduction as an essential goal of interconceptional care and
282 women's health (Atrash et al., 2008; Moos, 2004) concerns. By 8 weeks postpartum 84% of
283 women were in action or maintenance, evidence of the near universality of women's concerns
284 for weight management issues in the postpartum period. It does not, however, speak to the
285 effectiveness or ineffectiveness of the strategies they use.

286 It is encouraging that so few women who were overweight prior to pregnancy were in the
287 precontemplation phase immediately post-birth (4.0%). A large proportion of women who were
288 overweight or obese were in the action stage during the post-birth hospitalization and the
289 proportion of overweight women in action stage was higher at 4 weeks and 8 weeks than
290 immediately postpartum. For the purposes of this study, a woman who was in the action stage
291 post-birth, had indicated that she had been working to gain only the recommended amount of
292 weight during her pregnancy, but was not in maintenance regarding her weight management
293 efforts prior to pregnancy. These are women who may be new to self-management of their
294 weight, and who are an example of the potential of the perinatal period as a time to make a
295 difference for future health.

296 Of concern were 21.9% of normal weight women who were in the precontemplation
297 stage in the first days post-birth. By 8 weeks, 16.7% of normal weight women remained in
298 contemplation. These women had a healthy weight before the birth of this baby, but by retaining
299 some of their pregnancy weight, are at risk of moving into the overweight category and having
300 future health problems as a result. This lifecourse progression from normal to overweight, partly

301 affected by pregnancy weight retention, contributes to the increasing national health problem of
302 adult obesity (Rooney et al., 2005).

303 Each of the stages of change has different implications for nursing intervention. Women
304 in precontemplation and contemplation stages need different interventions to promote
305 engagement in weight management than women in action or maintenance stages, who need
306 interventions to sustain their weight management behaviors. The TTM offers tested
307 interventions (called Processes of Change) for all stages that would guide health professionals in
308 influencing women to adopt healthy weight self-management habits (Johnson et al., 2007;
309 Prochaska, Prochaska, & Johnson, 2006). For instance, women who are in the precontemplation
310 phase benefit most from consciousness raising, dramatic relief, and environmental reevaluation,
311 while those in the contemplation phase will benefit most from self-reevaluation. See Table 4 for
312 stage-matched Processes of Change.

313 In addition to the stage-matched Processes of Change, previous researchers who have
314 worked with the TTM have found that those working with individuals who are in
315 precontemplation or contemplation will be more likely to move toward action if pros are
316 emphasized for the desired health behavior. The women in this sample clearly rated certain pros
317 higher than others in regards to adopting weight loss behaviors. Providers working with women
318 could emphasize that women will feel more energetic, be healthier, and feel more attractive if
319 they are able to adopt weight management behaviors. In addition, providers can help women
320 plan to overcome some of the most important cons in this sample, such as how to cope with
321 having to make healthier food substitutions for preferred unhealthy foods, as well as how to
322 manage time to allow for weight loss activities.

323 Approximately half of the women in the precontemplation and contemplation SOC's
324 have sufficiently more pros than cons to indicate readiness to move forward in the stages,
325 meaning these women are likely to progress in adoption of these behaviors. Only half actually
326 progressed forward to a more engaged SOC. This finding raises questions about the utility of the
327 decisional balance construct in identifying likelihood of engagement in weight management
328 behaviors by postpartum women. It may be that there is a more meaningful predictor in this
329 population, or that the decisional balance items for weight loss in the general population do not
330 capture the experience of women who have just had a new baby. In the future, it will be
331 important to further investigate the DBWM and other constructs that may predict active
332 engagement in weight self-management in this population.

333 **Limitations**

334 The sample for this study was recruited from a single site in one geographic location,
335 which limits the ability to generalize to populations that are not like this sample. The sample
336 was drawn from an urban center, resulting in a fairly balanced proportion of Black and White
337 women but limited participation by Hispanic women, due primarily to use of English-language
338 consenting procedures and study instruments.

339 An additional constraint to interpretation was that, despite repeated attempts to contact
340 women, disconnected and unanswered phones resulted in substantial loss to follow up. The
341 resulting smaller sample at follow-up resulted in two limitations. First, the follow-up samples
342 included fewer participants than were needed according to the power analysis. This led to a
343 decreased ability to detect differences in SOC between weight and race groups. Additionally, the
344 sample over time included proportionately more White, married women with a higher
345 socioeconomic status, and may not adequately represent the postpartum weight self-management

346 experiences of more vulnerable women (Pereira et al., 2007; Walker et al., 2011). Alternatively,
347 women who did not prioritize weight management may not have wanted to answer the phone to
348 discuss weight management; or women who were too busy with childcare or other duties were
349 women who were likewise too busy to engage in weight management. Women with either
350 concern may have used their caller ID to screen the call from the researcher. The result
351 indicating that the sample had a high percentage of women in the action or maintenance SOC at
352 4 and 8 weeks should be interpreted thoughtfully considering the unequal loss to follow-up in
353 this sample.

354 Another limitation of this study is the fact that the tools used had not previously been
355 used in the postpartum population. The reliability of the DBWM tool was high in this sample,
356 supporting the appropriateness of its use in this population. In addition, the SOCWM questions
357 were modified to be appropriate for this population's unique health needs.

358 The study findings include self-reported weight management behaviors and are therefore
359 constrained by the limits of accuracy of self-report. In addition, the effectiveness of the weight
360 management strategies in terms of loss of gestational weight gain and non-gestational weight
361 were not measured, but should be the focus of future longitudinal intervention research.

362 **Conclusions**

363 Immediately after childbirth, most postpartum women report that they are contemplating
364 engaging in weight management or are already engaged in weight management behaviors.

365 Assessment of SOC in the immediate postpartum period is a useful tool that providers can use to
366 align appropriate strategies to facilitate each woman's weight self-management goals.

367 Decisional balance was not a useful predictor of forward movement for women who were in the

368 precontemplation or contemplation SOC during the post-birth hospitalization, but for women in
369 action or maintenance SOC's was closely associated with staying in stage over time.

370 The postpartum period is an opportune time for interventions to promote weight self-
371 management for women. Two factors contribute to the immediate postpartum period as an ideal
372 teachable moment: the normative contact with health care providers and the potential for
373 improved short and long-term health. Most of the women in this sample were contemplating
374 adopting weight management strategies or already had plans to engage in weight management
375 behaviors. Nurses working with women in hospital postpartum settings or in obstetrical
376 outpatient settings should utilize this teachable moment to influence beliefs, set goals, and
377 provide information and strategies for self-management. Interventions to facilitate women's
378 weight self-management can incorporate the pros identified by women in this study as important
379 during the postpartum period. Because of the limited encounters between health care
380 professionals and women during the interconceptional period, all contacts must be seen as a
381 chance to facilitate adoption of healthy behaviors that will influence both their general, lifelong
382 health and their health in any potential future pregnancies.

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References

- American Academy of Pediatrics & the American College of Obstetricians and Gynecologists. (2007). *Guidelines for perinatal care* (6th ed.). Elk Grove Village, IL : American Academy of Pediatrics
- Atrash, H., Jack, B. W., Johnson, K., Coonrod, D. V., Moos, M-K, Stublefield, P. G. . .& Reddy, U. M. (2008). Where is the “w”oman in MCH? *American Journal of Obstetrics & Gynecology*, S259-S265. doi: 10.1016/j.ajog.2008.08.059.
- Centers for Disease Control and Prevention (2010). *Adult BMI Calculator: English*. Retrieved from: http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/english_bmi_calculator/bmi_calculator.html
- Centers for Disease Control and Prevention/ATSDR Preconception Care Work Group and the Select Panel on Preconception Care. (2006). *Recommendations to improve preconception health and health care—United States*. (MMWR RR-6). Atlanta, GA: Coordinating Center for Health Information and Service.
- Davis, J., Smith, T., Hodge, R., Nakao, K., & Treas, J. (1991). *Occupational prestige ratings from the 1989 general social survey*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.
- Durham, H. A. (2008). Food habits and choices, physical activity, and breastfeeding among overweight and obese postpartum women. Retrieved from ProQuest Digital Dissertations. (UMI 3310409).
- Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research methods, Instruments, & Computers*, 28. 1-11.

- George, L (2005). Lack of preparedness: Experiences of first-time mothers. *MCN: The American Journal of Maternal/Child Nursing*, 30(4). 251-255.
- Gore, S. A., Brown, D. M., West, D. S. (2003). The role of postpartum weight retention in obesity among women: A review of the evidence. *Annals of Behavioral Medicine*, 26(2), 149-159.
- Groth, S. W. & David, T. (2008). New mothers' views of weight & exercise. *MCN: The American Journal of Maternal/Child Nursing*, 33(6), 364-370. doi: 10.1097/01.NMC.0000341257.26169.30
- Huang, T-T, Wang, H-S, & Dai, F-T. (2010). Effect of pre-pregnancy body size on postpartum weight retention. *Midwifery*, 26(2), 222-231. doi: 10.1016/j.midw.2008.05.001
- Institute of Medicine and National Research Council of the National Academies. (2009). *Weight gain during pregnancy: Reexamining the guidelines*. Washington, DC: The National Academies Press. Retrieved from <http://iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx>
- Johnson, D. B., Gerstein, D. E., Evans, A. E., & Woodward-Lopez, G. (2006). Preventing obesity: A life cycle perspective. *Journal of the American Dietetic Association*, 106, 97-100. doi: 10.1016/j.jada.2005.09.048
- Johnson, S. S., Paiva, A. L., Cummins, C. O., Johnson, J. L., Dymment, S. J., Wright, J. A. . . .& Sherman, K. (2007). Transtheoretical Model-based multiple behavior interventions for weight management: Effectiveness on a population basis. *Preventive Medicine*, 46, 238-246. doi: 10.1016/j.ypmed.2007.09.010

- Lewallen, L. P. (2004). Healthy behaviors and sources of health information among low-income pregnant women. *Public Health Nursing, 21*(3), 200-206. doi: 0737-1209/04
- Linne, Y. & Rossner, S. (2003). Interrelationships between weight development in subsequent pregnancies: The SPAWN study. *Acta Obstetrica et Gynecologica Scandinavica, 82*(4), 318-325. doi: 10.1034/j.1600-0412.2003.00150.x
- Lu, M. C. & Halfon, N. (2003). Racial and ethnic disparities in birth outcomes: A life-course perspective. *Maternal and Child Health Journal, 7*(1), 13-30. doi: 1092-7875/03/0300-0013/0
- Lyu, L-C, Lo, C-C, Chen, H-F, Wang, C-Y, & Liu, D-M. (2009). A prospective study of dietary intakes and influential factors from pregnancy to postpartum on maternal weight retention in Taipei, Taiwan. *British Journal of Nutrition, 102*, 1828-1837. doi: 10.1017/S0007114509991243
- Maddah, M. & Nikooyeh, B. (2009). Weight retention from early pregnancy to three years postpartum: A study in Iranian women. *Midwifery, 25*(6), 731-737. doi: 10.1016/j.midw.2008.01.004
- Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S. (1992). Self-Efficacy and the stages of exercise behavior change. *Research Quarterly for Exercise and Sport, 63*, 60-66.
- McBride, C. M., Emmons, K. M., & Lipkus, I. M. (2003). Understanding the potential of teachable moments: The case of smoking cessation. *Health Education Research, 18*(2), 156-170. doi:10.1093/her/18.2.156
- Moos, M-K. (2010). From concept to practice: Reflections on the preconception health agenda. *Journal of Women's Health, 19*(3), 561-567. doi: 10.1089/2011411.

- Moos, M-K. (2004). Preconceptional health promotion: Progress in changing a prevention paradigm. *Journal of Perinatal and Neonatal Nursing, 18*(1), 2-13.
- Nohr, E. A., Timpson, N. J., Andersen, C. S., Smith, G. D., Olsen, J., & Sorensen, T. I. A. (2009). Severe obesity in young women and reproductive health: The Danish national birth cohort. *PLoS One, 4*(12), e8444. doi: 10.1371/journal.pone.0008444
- O'Reilly, M. M. (2004). Achieving a new balance: Women's transition to second-time parenthood. *JOGNN, 33*(4), 455-462. doi: 10.1177/0884217504266911
- O'Toole, M. L., Sawicki, M. A., & Artal, R. (2003). Structured diet and physical activity prevent postpartum weight retention. *Journal of Women's Health, 12*(10), 991-999.
- Ohlendorf, J. M., Weiss, M. E., & Ryan, P. (in press). Weight-management information needs of postpartum women. *MCN: The American Journal of Maternal Child Nursing*.
- Oken, E., Taveraas, E. M., Popoola, F. A., Rich-Edwards, J. W., & Gillman, M. W. (2007). Television, walking, and diet: Associations with postpartum weight retention. *American Journal of Preventative Medicine, 32*(4), 305-311. doi:10.1016/j.amepre.2006.11.012
- Olson, C. M. (2005). Tracking of food choices across the transition to motherhood. *Journal of Nutrition Education and Behavior, 37*(3), 129-136.
- Pereira, M. A., Rifas-Shiman, S. L., Kleinman, K. P., Rich-Edwards, J. W., Peterson, K. E., & Gillman, M. W. (2007). Predictors of change in physical activity during and after pregnancy: Project Via. *American Journal of Preventive Medicine, 32*(4), 312-319. doi:10.1016/j.amepre.2006.12.017

Prochaska, J. M., Prochaska, J. O., & Johnson, S. S. (2006). Assessing readiness for adherence to treatment. In W. T. O'Donohue & E. R. Levensky (Eds.), *Promoting adherence: A practical handbook for healthcare providers* (pp. 35-46). Thousand Oaks, CA: Sage Publications.

Prochaska, J. O., Redding, C. A. & Evers, K. E. (1997). The transtheoretical model and stages of change. In K. Glanz (Ed), *Health behavior and health education: Theory, research, and practice, 2nd Ed.* (pp. 60-84). John Wiley & Sons, Inc.

Prochaska, J. O., Velicer, W. F., Rossi, J. S., Goldstein, M. G., Marcus, B. H., Rakowski, W., et al (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology, 13*(1), 39-46.

Rooney, B. L., Schauberger, C. W., & Mathiason, M. A. (2005). Impact of perinatal weight change on long-term obesity and obesity-related illnesses. *Obstetrics & Gynecology, 106*(6),1349-1356. doi: 10.1097/01.AOG.0000185480.09068.4a

Rubio, M. Montgomery, K. S. (2003). Number of live births, body weight, and Latinas. *Hispanic Health Care International, 2*(3), 103-110.

Ryan, P. (2009). Integrated theory of health behavior change: Background and intervention development. *Clinical Nurse Specialist, 23*(3), 161-170. doi: 10.1097/NUR.0b013e3181a42373

Ryan, P., Weiss, M., Traxel, N., & Brondino, M. (2011). Testing the integrated theory of health behavior change for postpartum weight self-management. *Journal of Advanced Nursing, 67*(9), 2047-2059. doi: 10.1111/j.1365-2648.2011.05648.x

- Shrewsbury, V. A., Robb, K. A., Power, C., & Wardle, J. (2009). Socioeconomic differences in weight retention, weight-related attitudes and practices in postpartum women. *Maternal Child Health Journal, 13*, 231-240. doi: 10.1007/s10995-008-0342-4
- Siega-Riz, A. M., Viswanathan, M., Moos, M-K, Deierlein, A., Mumford, S., Knaack, J. . .& Lohr, K. N. (2009). A systematic review of outcomes of maternal weight gain according to the Institute of Medicine recommendations: Birthweight, fetal growth, and postpartum weight retention. *American Journal of Obstetrics & Gynecology, 339*, e1-14. doi: 10.1016/j.ajog.2009.07.002
- Sterling, B. S., Fowles, E. R., Garcia, A. A., Jenkins, S. K., Wilkinson, S., Kim, M. . .Walker, L. O. (2009). Altered perceptions of personal control about retained weight and depressive Symptoms in low-income postpartum women. *Journal of Community Health, 26*. 143-157. doi: 10.1080/07370010903034524
- Thame, M. M., Jackson, M. D., Manswell, I. P., Osmond, C., & Antoine, M. G. (2009). Weight retention within the puerperium in adolescents: A risk factor for obesity? *Public Health Nutrition, 13*(2), 283-288. Doi: 10.1017/S1368980009991352
- Walker, L. O. (2009). Low-income women's reproductive weight patterns: Empirically based clusters of prepregnant, gestational, and postpartum weights. *Women's Health Issues, 19*, 398-405. doi: 10.1016/j.whi.2009.08.003
- Walker, L. O., Fowles, E. R., & Sterling, B. S. (2011). The distribution of weight-related risks among low-income women during the first postpartum year. *Journal of Obstetrical, Gynecological, and Neonatal Nurses, 40*(2), 198-205. doi: 10.1111/j.1552-6909.2011.01231.x

- Walker, L. O., Freeland-Graves, J. H., Milani, T., Hanss-Nuss, H., George, G., Sterling, B. S. . . & Stuijbergen, A. (2004). Weight and behavioral and psychosocial factors among ethnically diverse, low-income women after childbirth: I. Methods and context. *Women & Health, 40*(2). doi: 10.1300/J013v40n02_01
- Walker, L., Sterling, B., & Timmerman, G. (2005). Retention of Pregnancy-Related Weight in the Early Postpartum Period: Implications for Women's Health Services. *Journal of Obstetric, Gynecologic, and Neonatal Nursing, 34*(4), 418-427. doi: 10.1177/0884217505278294
- Wing, R. R., Tate, D. F., Gorin, A. A., Raynor, H. A., & Fava, J. L. (2006). A self-regulation program for maintenance of weight loss. *The New England Journal of Medicine, 355*(15), 1563-1571.

Table 1

Sample Demographics

Variable	Post-Birth	4 Weeks	8 Weeks
Maternal Age [M (\pm SD)]	26.7 (5.7)	27.7 (5.3)	27.4 (5.5)
Hollingshead Index [M (\pm SD)]‡	33.7 (17.2)	37.8 (16.6)	38.2 (16.1)
Race/ethnicity [n (%)]			
Black	98 (51.3)	50 (48.1)	25 (37.3)
White	76 (39.8)	49 (47.1)	37 (55.2)
Hispanic	5 (2.6)	2 (1.9)	1 (1.5)
Weight Category [n (%)]			
Normal	105 (55.0)	59 (56.7)	43 (64.2)
Overweight	75 (39.3)	42 (40.4)	23 (34.3)
Obese	11 (5.8)	5 (4.8)	2 (3.0)
Parity [n (%)]			
Primipara	66 (34.6)	31 (29.8)	31 (46.3)
Multipara	127 (66.5)	75 (72.1)	37 (55.2)
Type of Birth [n (%)]			
Vaginal	134 (70.2)	69 (66.3)	42 (62.7)
Cesarean	59 (30.9)	37 (35.6)	26 (38.8)
Marital Status [n (%)]			
Married/Living with Father of Baby	118 (61.8)	69 (66.3)	45 (67.2)
Single	71 (37.2)	34 (32.7)	23 (34.3)
Divorced/Separated	3 (1.6)	3 (2.9)	0

‡Hollingshead Four-Factor Index of Social Status, using updated occupation categories (Davis, Smith, Hodge, Nakao, & Treas, 1991).

Table 2

Stage of Change, Decisional Balance with Likelihood to Change Analysis

Stage of Change	Post-birth		4 Weeks				8 Weeks			
	n (%)	Likely to Change to Action+ n (%)	Changed SOC between Post-birth and 4 weeks+++		n (%)	Likely to Change to Action n (%)	Changed SOC between 4 and 8 weeks+++		n (%)	Likely to Change to Action+ n (%)
			Forward	Backward			Forward	Backward		
Precontemplation	28 (14.7)	3 (10.7)	8	N/A	15 (14.4)	0	3	N/A	7 (10.4)	0
Contemplation	91 (47.6)	56 (61.5)	24	6	20 (19.2)	17 (89.5)	10	1	4 (6.0)	3 (75.0)
Action	27 (14.1)	24 (88.9)++	N/A	2	29 (27.9)	29 (100)++	N/A	0	26 (38.8)++	24 (96.0)
Maintenance	45 (23.6)	29 (64.4)++	N/A	3	40 (38.5)	28 (70)++	N/A	1	30 (44.8)++	20 (69.0)
Total	191				104				67	

+ Likely to move to action from Precontemplation or contemplation= decisional balance pros are 1 SD higher than cons

++ Likely to stay in action or maintenance = more pros than cons

+++ Changed by 4, 8 weeks:

Forward: changed stage to action or maintenance

Backward: changed stage to precontemplation or contemplation

Table 3:

Stages of Change across 3 Time Points, Analyzed by Weight Category and Race

	Post-birth n (%)	4 Weeks n (%)	8 Weeks n (%)
Precontemplation			
Normal Weight	23 (21.9)	13 (22.4)	7 (16.7)
Overweight	3 (4.0)	2 (4.8)	0
Obese	2 (18.2)	0	0
Black	15 (15.5)	8 (16.0)	2 (8.0)
White	10 (13.2)	5 (10.2)	4 (10.8)
Hispanic	1 (20.0)	1 (50.0)	0
Contemplation			
Normal Weight	45 (42.9)	11 (19.0)	2 (4.8)
Overweight	41 (54.7)	8 (19.0)	2 (8.7)
Obese	5 (45.5)	1 (50.0)	0
Black	48 (49.5)	10 (20.0)	2 (8.0)
White	37 (48.7)	10 (20.0)	1 (2.7)
Hispanic	1 (20.0)	0	0
Action			
Normal Weight	1 (1.0)	8 (13.8)	10 (23.8)
Overweight	23 (30.7)	19 (45.2)	14 (60.9)
Obese	3 (27.3)	3 (60.0)	2 (100.0)
Black	12 (12.4)	12 (24.0)	10 (40.0)
White	11 (14.5)	15 (30.6)	14 (37.8)
Hispanic	3 (60.0)	1 (50.0)	1 (100.0)
Maintenance			
Normal Weight	36 (34.3)	26 (44.8)	23 (54.8)
Overweight	8 (10.7)	13 (31.0)	7 (30.4)
Obese	1 (9.1)	1 (50.0)	0
Black	22 (22.7)	20 (40.0)	11 (44.0)
White	18 (23.7)	19 (38.8)	18 (48.6)
Hispanic	0	0	0

Table 4:

DBWM Items Rated “Very Important” or “Extremely Important” at each Time Point

	Post-birth N (%)	4 Weeks N (%)	8 Weeks N (%)
Pro Items			
I would feel more energetic if I lost weight	137 (71.8)	72 (69.6)	45 (68.2)
My health would improve if I lost weight	121 (62.4)	68 (66.0)	38 (57.5)
I would feel sexier if I lost weight	117 (60.3)	61 (58.1)	40 (59.7)
I could wear more attractive clothing if I lost weight	113 (58.3)	63 (60.6)	42 (63.6)
I would feel more optimistic if I lost weight	108 (55.7)	53 (50.0)	32 (47.8)
I would be able to accomplish more if I carried fewer pounds	86 (44.8)	42 (40.8)	23 (34.9)
My family would be proud of me if I lost weight	77 (39.7)	39 (37.5)	26 (38.8)
I would be less self-conscious if I lost weight	70 (36.0)	45 (43.3)	26 (38.8)
My self-respect would be greater if I lost weight	60 (30.9)	36 (32.7)	20 (29.8)
Others would have more respect for me if I lost weight	18 (9.3)	15 (14.4)	12 (17.9)
Con Items			
I would have to cut down on my favorite snacks if I were dieting	93 (48.2)	40 (40.8)	26 (39.4)
I would not be able to eat some of my favorite foods if I were trying to lose weight	79 (40.7)	33 (31.7)	22 (32.8)
I would be less productive if I did weight loss activities	54 (27.8)	18 (17.0)	7 (10.1)
In order to lose weight, I would be forced to eat less appetizing foods	50 (25.8)	31 (29.6)	19 (27.9)
The exercises needed for me to lose weight would be a drudgery	48 (24.8)	18 (16.8)	9 (13.2)
Trying to lose weight could end up being expensive when everything is taken into account	40 (20.8)	39 (28.2)	15 (22.7)
Dieting would take the pleasure out of meals	36 (18.5)	21 (20.2)	7 (10.5)
My dieting could make meal planning more difficult	35 (18.0)	22 (22.4)	8 (12.0)
I would have to avoid some of my favorite places if I were trying to lose weight	24 (12.4)	12 (11.6)	6 (9.1)
I would have to cut down on some of my favorite activities if I were trying to lose weight	23 (11.9)	9 (8.7)	3 (4.5)

Table 5:

Processes of Change Matched to Stage of Change

Stage of Change	Process of Change ⁺	Definition ⁺⁺	Examples ⁺⁺
Precontemplation	Consciousness Raising	Increasing awareness and information about health behavior adherence	Print/Online resources, Behavior diary
	Dramatic Relief	Experiencing strong negative emotions that come along with not practicing healthy behaviors	Allowing time to talk about recent life changes, Personal testimonials
	Environmental Reevaluation	Realizing the impact that one's effective healthy behaviors has on other people	Empathy training, Asking others about their feelings about the person's behavior
Contemplation	Self-Reevaluation	Emotional and cognitive reappraisal of values and self-image related to adoption of healthy behaviors	Value Clarification, Self-narratives
Action and Maintenance	Reinforcement management	Increasing intrinsic and extrinsic rewards for adopting healthy behaviors	Self-rewards, Overt and covert reinforcement
	Helping Relationship	Seeking and using social support to encourage or help with health behavior adherence	Self-help groups, Buddy systems
	Counterconditioning	Substituting new behaviors and cognitions for old responses to health behavior adoption	Positive statements, relaxation
	Stimulus Control	Adding cues or reminders to adhere to the health behavior adoption	Avoiding high-risk cues, Posting notes, Planning ahead

⁺ Prochaska, Redding, & Evers, 1997

⁺⁺ Prochaska, Prochaska, & Johnson, 2006, p. 38

Figure 1:

Loss to Follow-Up

