EXAMINING THE RELATIONSHIP BETWEEN SELF-ESTEEM, SATISFACTION WITH BODY WEIGHT, AND ADHERENCE TO WEIGHT GAIN RECOMMENDATIONS IN PREGNANT WOMEN:

A PROPOSAL FOR PROSPECTIVE STUDY

By

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STATEMENT BY AUTHOR

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Dedication

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ABSTRACT

The Institute of Medicine established guidelines for weight gain in pregnant women based on current studies regarding perinatal outcomes. Both inadequate and excessive weight gains during pregnancy have been shown to result in adverse perinatal outcomes and long-term weight problems in women after having children.

A pilot study executed in 2001 as a secondary analysis concerning self-esteem, satisfaction with body weight, and adherence to weight gain recommendations in pregnant women revealed significant findings. The study was limited as a secondary analysis and by lacking any participants who scored as having low self-esteem on the Rosenberg Self-Esteem scale. The subject warranted further study with measurement tools tailored specifically to the study.

The purpose of this paper is to propose a prospective study to evaluate the relationships between self-esteem, satisfaction with body weight, and adherence to the Institute of Medicine’s recommended guidelines for weight gain in pregnant women. Demographic data, such as age, race, education, and income levels would also be collected and evaluated for relationships to the above variables. The study would use the Body-Esteem Scale for Adolescents and Adults to obtain a measure more specific to body weight satisfaction and self-esteem, in addition to other measures. Study findings would be useful for health care professionals in identifying women at risk for adverse pregnancy outcomes and weight problems related to pregnancy. Based on the findings, an intervention program could be developed to promote the best outcomes for mothers and their babies.
WEIGHT GAIN DURING PREGNANCY

Chapter One discusses the background of the problem being studied, the purpose of the study, the research questions being addressed, and the conceptual framework used to guide the investigation.

Background

Multiple studies have shown that weight gain during pregnancy is one of the strongest correlating factors to perinatal outcomes (Berenson, Wiemann, Rowe, & Rickert, 1997; Bracero & Byrne, 1998; Hickey, Cliver, McNeal, Hoffman, & Goldenberg, 1996; Muscati, Gray-Donald, & Koski, 1996; Scholl et al., 1988; To & Cheung, 1998; Tulman, Morin, & Fawcett, 1998). The Institute of Medicine (IOM) publishes guidelines that are widely used by health care professionals for weight gain during pregnancy in order to promote the best birth outcomes. Despite this encouragement, there are still many women who do not adhere to these guidelines.

Studies have shown that significant correlations exist between abnormal eating attitudes, low self-esteem, and increased weight concerns in some populations (Pastore, Fisher, & Friedman, 1996). There are increasing social pressures for women to be very thin, particularly among white women (Powell & Kahn, 1995). This is also evidenced by the increasing incidence of eating disorders particularly among females in their teens to twenties (Academy for Eating Disorders, 2006; Anred, Inc., 2006; National Eating Disorders Association (NEDA), 2002; Stice, Maxfield, & Wells, 2003) and reports of teenagers eating fewer than three meals per day or skipping meals, particularly those who are overweight (Pastore, et. al.). With an increased emphasis placed on weight and body
image, there is an increasing possibility that dissatisfaction with body weight or pressure to stay thin could contribute to non-adherence to weight gain recommendations during pregnancy. Pregnancy may be viewed by some women as an excuse to gain weight freely or without condemnation, while others may minimize weight gain in hopes of avoiding postpartum weight retention.

A secondary analysis investigating the relationship between self-esteem, satisfaction with weight gain, and adherence to weight gain recommendations in a final sample of 82 pregnant women produced significant correlations between self-esteem and actual weight gained, perceived body weight and satisfaction with body weight, as well as a significant difference between perceived and actual body weight (Cody, 2001). In the study, fewer than half of the participants adhered to weight gain recommendations, indicating that factors related to weight gain in pregnant women warrant further investigation. This study also acted as a pilot study that could help determine future research questions for a primary analysis, two of the benefits of secondary analyses (Gleit & Graham, 1989; Mainous & Hueston, 1997).

Purpose

The purpose of the proposed study is to examine whether a functional relationship exists between weight gain during pregnancy and an individual’s self-esteem and satisfaction with body weight. In light of the significant findings of the secondary analysis, a prospective study with a more focused questionnaire and larger study sample may support current findings and reveal further functional relationships between self-
esteem, satisfaction with body weight, and weight gain recommendations in pregnant women.

Research Questions

The research questions for this study are:

1. Is there a relationship between adherence to pregnancy weight gain guidelines established by the IOM and individual satisfaction with body weight and/or self-esteem, as measured by the Rosenberg Self-Esteem Scale?

2. Do women who are dissatisfied with their body weight or who have low self-esteem have a significantly lower rate of adherence to weight gain recommendations than women who are satisfied with their weight or have high self-esteem?

3. Do significant relationships exist between self-esteem, satisfaction with body weight, actual weight gain during pregnancy, perceived body weight, actual body weight, and intended weight gain?

4. Is satisfaction with body weight related to the intention to adhere or not adhere to weight gain recommendations?

5. Does a belief exist among pregnant women that pregnancy is an opportunity to lose weight by restricting weight gain antenatally or an opportunity to gain weight uninhibitedly?

6. Does global self-esteem (as measured by the Rosenberg Self Esteem scale) correlate with body image satisfaction (as measured by the Body-Esteem scale)?
Significance

Inadequate weight gain during pregnancy is associated with poor perinatal outcomes (Berenson, Wiemann, Rowe, & Rickert, 1997; Bracero & Byrne, 1998; Hickey, Cliver, McNeal, Hoffman, & Goldberg, 1996; Muscati, Gray-Donald, & Koski, 1996; Scholl, Salmon, Miller, Vasilenko, Furey, & Sister Marie Christine, 1988). Health care professionals can use information regarding factors that contribute to weight gain during pregnancy to develop proper interventions that would increase adherence to weight gain recommendations, thereby decreasing the risk of adverse perinatal outcomes associated with weight gains outside of the established guidelines. Understanding the reasons that some women have weight gains outside of the established guidelines during pregnancy can be especially useful to advanced practice nurses, who can provide preconception counseling and prenatal care to women. Nurses involved in preconception and/or prenatal care are in the ideal position to identify women who are not gaining enough weight or those who are gaining too much weight. They can provide nutritional counseling and education as an early intervention, including a discussion of how weight can affect pregnancy outcomes and postpartum weight retention, in hopes of decreasing the incidence of poor perinatal outcomes.

Conceptual Framework

The conceptual framework for this study is based on several already established self-esteem models. Various models were researched and had congruent principles. The following models were integrated for the purposes of this study in order to better address the specific population being examined in this study.
Sonstroem & Morgan defined self-esteem as “the degree to which individuals feel positive about themselves or as a ‘personal judgment of worthiness’” (1989, p. 330). Global self-esteem represents an overall judgment of self-worth and is associated with overall psychological well-being. Subdivided beneath global self-esteem are more specific domains of self-esteem. Specific self-esteem is considered to be more cognitive and is strongly associated with behavior (Pullman & Allik, 2000). The model of self-concept hierarchy depicted in Figure 1 was developed by Shavelson, Hubner, and Stanton (1976). This model illustrates the idea of global self-esteem with specific self-esteem subdivisions, placing physical self-concept as a domain under general self-concept and physical appearance as a domain under physical self-concept (Sonstroem & Morgan). Using this model, body weight would be considered under the domain of physical appearance as part of physical and general self-concept.

The Rosenberg Self-Esteem Scale (RSE) measures global self-esteem and encompasses many domains of self-esteem, rather than just physical self-concept and physical appearance. It is a commonly used tool to evaluate global self-esteem due to being user friendly and easy to understand. In addition to the RSES, this study would include questions specific to participants’ feelings about and satisfaction with body weight and body image. Using questions related to specific self-esteem domains would provide a better idea of whether low self-esteem scores in this study were related to unhappiness with physical appearance or with other factors encompassed in global self-esteem measures.
Evidence suggests that global self-esteem has the ability to influence behavior (Sonstroem & Morgan, 1989), especially when in response to feelings of failure, disappointment, or rejection (Brown & Dutton, 1995, p. 720). Sonstroem and Morgan stated, “According to Rosenberg, individuals come to value personal resources which they assess as being successful in societal interactions” (p. 331). An incredible emphasis is put on physical appearance by the media and today’s society, so much so that appearance tends to be equated with success. Movies, television, magazines, and health clubs all extend an overwhelming message that being thin equals being happy and
successful. Therefore, women who place high value on physical appearance and body weight but have negative feelings towards their own body weight may be prone to low self-esteem. As a result, this may influence body image- and weight-related behaviors. A study by Rosenberg and Rosenberg (1978) found that self-esteem had a stronger effect on male adolescent delinquency than delinquency had on self-esteem. Although this finding was not generalized to the other populations, it does suggest a strong influence of self-esteem on behaviors and actions. Williams et al. (1993) found that females with eating disorders had lower self-esteem than other females in the study. Although Williams, et.al., examined low self-esteem as a characteristic of females with eating disorders, the findings suggest that self-esteem may influence behavior. If this is true, alterations in eating behaviors may actually be a characteristic of females with low self-esteem.

In conclusion, the guiding framework for this study is an integration of Sonstroem and Morgan’s theory of global self-esteem, Shavelson, Hubner, and Stanton’s theory of self-concept hierarchy, and Rosenberg’s theory of self-esteem. It is theorized that low self-esteem scores from the Rosenberg Self-Esteem Scale combined with dissatisfaction with body weight will have a significant relationship with adherence to body weight recommendations during pregnancy.

Summary

Chapter One reviewed the background and significance of the problem to be studied, the conceptual framework, purpose of the study, and the research questions. The purpose of this study is to evaluate the relationships between self-esteem related to body
weight, satisfaction with body weight, and adherence to weight gain recommendations during pregnancy. Behavior is influenced by self-esteem, so it appears logical that negative feelings about body image and self worth may affect eating and weight-related behaviors in pregnant women that can in turn affect perinatal outcomes. By better understanding the relationships between these variables, healthcare providers can identify individuals who are at risk for adverse perinatal outcomes.
THEORETICAL UNDERPINNINGS AND LITERATURE REVIEW

Introduction

Chapter Two discusses literature on the topics of social pressures to be thin, eating and health behaviors in relationship to self-esteem and satisfaction with body weight, weight gain recommendations during pregnancy, gestational weight gain and postpartum weight retention, the timing of weight gain during pregnancy, weight gain in relationship to perinatal outcomes and in adolescent pregnancy, and maternal behaviors related to pregnancy intentional status.

Literature Review

Multiple studies suggest that weight gain during pregnancy is associated with perinatal outcomes, infant birth weight, and perinatal mortality. The review of literature also suggests that there is an optimal range of weight gain and optimal timing of weight gain during the pregnancy to increase the probability of positive perinatal outcomes and minimize the amount of postpartum weight retention. However, women are increasingly dissatisfied with their bodies and aware of pressures to be thin. Many women are concerned that they will retain weight gained during pregnancy, and many attribute being overweight to weight gained during pregnancy (Gunderson & Abrams, 2000). Attitudes and beliefs regarding body weight, satisfaction with body image, and self-esteem may affect attitudes and behaviors related to weight gain and weight control during pregnancy (Dundas & Yarbro, 2000). Levels of concern about appearance or body control are multifactorial and complex (Johnston, Reilly, & Kremer, 2004), and body image is not a static construct (Paquette & Raine, 2004).
This literature review will address 1) the effect of social pressures to be thin on women and body image dissatisfaction, 2) the relationship between satisfaction with body weight, self-esteem, and eating and health behaviors in both pregnant and non-pregnant populations, 3) weight gain recommendations for pregnant women, 4) gestational weight gain and postpartum weight retention, 5) optimal timing of weight gain during the pregnancy, 6) the relationship between weight gain and perinatal outcomes, 7) weight gain in adolescent pregnancies, and 8) the relationship between intention status of the pregnancy and maternal behaviors.

Social Pressures to be Thin. In a society where increased time is being devoted to media entertainment, young women are being exposed to more and more images that may be perceived as pressure to be very thin. Paquette & Raine (2004) concluded that body image in women was not so much influenced by the nature of others’ comments as it was by the interpretation of their meaning. Today’s ideal female body is approaching underweight, is unattainable to most women, and suggests that thin is a symbol of being attractive, beautiful, and successful (Kjaerbye-Thygesen, Munk, Ottesen, & Kjaer, 2003). Various studies have indicated correlations between media, social pressures to be thin, and thin-ideal internalization with significant increases in body dissatisfaction (Bedford & Johnson, 2006; Grover, Keel, & Mitchell, 2002; Posavac, Posavac, & Weigel, 2001; Stice & Whitenton, 2002; Stice, Maxfield, and Wells, 2003). The effects of these pressures have become widespread and may be a causal factor in the development of eating disorders (Garner & Garfinkel, 1997; Posavac, et. al.).
In 2002, the average age of mothers when they first gave birth was 25.1 years (National Vital Statistics System, 2003). Thirty eight percent of mothers were younger than 25 when they gave birth, and 60% were aged 25-39 (Pregnancy Today, 1996). One study of women aged 27-38 years indicated that dissatisfaction with body weight was largely established in childhood and adolescence, and found that body dissatisfaction decreased with age (Kjaerbye-Thygesen, Munk, & Ottesen, 2004). Similarly, another study found greater body weight dissatisfaction among younger women involved in fitness activity (Jankauskiene, Kardelis, & Pajaujiene, 2005). Thus, a significant number of women are at increased risk for feeling the pressure to be thin while in their childbearing years.

Grover, Keel, & Mitchell (2002) explored differences in weight identities between males and females. Explicit identities were determined from specific questions about attitudes toward weight, while implicit attitudes were measured using various associations between positive/negative words and key words related to weight. Females of normal weight rated themselves explicitly as being heavier than normal weight men. While no correlations were found between implicit weight identification, weight attitudes, and self-esteem in men, there were correlations in women. Implicit heavy identity did correlate with low self-esteem, as did negative implicit attitudes towards overweight with low self-esteem in women. Men implicitly identified themselves as light despite explicit weight appraisals that accorded with actual weight status. In contrast, implicit and explicit weight identity was correlated in women and reflected actual weight, and there was a great extent of association between self and bad in regards to being
heavy. This study suggests a greater tendency of women to be critical of their weights (even when they are normal weight). It supports other literature findings that weight and body concerns are more prevalent in women than in men, and that women’s negative attitudes towards being overweight are associated with lower self-esteem.

Satisfaction with Body Weight, Self-Esteem, and Eating and Health Behaviors.
Several studies have examined the correlation of self-esteem and satisfaction with body weight with eating and health behaviors. A study by Caldwell, Brownell, and Wilfley (1997) indicated that among their study sample of 7,383 African American and White women, dissatisfaction with body weight accounted for 24% of the variance in self-esteem in African American women and 21% of the variance in self-esteem in White women. In a study by Williams, et. al., (1993), one hundred fifty-seven study participants were divided into five groups: (a) anorexia nervosa, (b) bulimia nervosa, (c) obese dieters, (d) nonobese dieters, and (e) a normal control group. Each participant was given each of the following eight surveys: Eating Attitudes Test – 40; Bulimia Test; I.P.C. Sales; Rathus Assertiveness Schedule; Hostility and Direction of Hostility Questionnaire; Rosenberg Self-Esteem Scale; General Health Questionnaire – 28; and the Personal Details Form. Results showed a significantly lower self-esteem in anorexic and bulimic groups than the other three comparison groups.

In addition to these studies, several studies have examined the relationship between self-esteem, satisfaction with body weight, and eating and health behaviors among adolescent populations. Hellerstedt and Story (1998) examined adolescent satisfaction with contraception and body weight concerns. In a sample of 22 adolescent
mothers, most of the participants expressed frustration over retention of pregnancy-associated weight. Almost half of the participants who believed that their weight gain was due to use of Depo-Provera as a contraceptive indicated that they may discontinue use of the contraceptive if their weight did not decrease. This would suggest that concern over body weight is a significant factor influencing health behaviors. Pastore, et al., (1996) found a significant difference between obese and underweight adolescents in eating behaviors. Seventy-two percent of obese adolescents skipped breakfast and only 32% ate three meals per day, in comparison to 30% of underweight adolescents who skipped breakfast and 59% who ate three meals per day. These data would suggest that body weight does have a significant relationship with eating behaviors.

During pregnancy, Fox & Yamaguchi (1997) found a significant difference in change of body image after 30 weeks gestation in 76 primagravidas. Women who were overweight before pregnancy were more likely to have a positive change in body image, while women who were normal weight before pregnancy were more likely to have a negative change. However, Richardson (1990) did not have similar findings in a group of 63 women who had normal pregnancy outcomes. Using log-linear statistical procedures, the researcher analyzed 436 descriptions and evaluations of whether body experiences were changing or stable, satisfactory or worrisome, and whether the change was a gain or a loss. The study findings indicated that pregnancy was characterized by frequent and usually satisfactory body changes, and that body experiences varied in meaningful ways over the months of pregnancy.
Weight Gain Recommendations. Many research studies have examined the parameters of optimal weight gain during pregnancy. The National Academy of Sciences’ Institute of Medicine (IOM) published guidelines in 1990 for pregnancy weight gain according to individual body mass index (BMI) categories (underweight, average, overweight, and obese). The IOM recommended a weight gain of 28 – 40 pounds for underweight women, 25 – 35 pounds for normal weight women, and 15 – 25 pounds for overweight women (Lederman, et.al., 1997). Data from a more recent study (Bracero & Byrne, 1998) have suggested that the guidelines set by the IOM may be 5-10 pounds lower than the actual optimal weight gain. This may be due to the fact that when establishing guidelines, the IOM only took infant birth weight into consideration (which is only 4% accounted for by maternal weight gain) rather than overall perinatal outcomes (Bracero & Byrne, 1998). However, these recommendations have not yet been changed. While many women become concerned that pregnancy will make them fat, Lederman et al. (1997) found that women who gained within the IOM’s recommendations had minimal body fat added to their composition. In this study, body composition measurements were done at 14 and 37 weeks gestation on 200 women using a four-compartment body composition model. Fat gains in women gaining the amount of weight recommended by the Institute of Medicine were as follows: 6.0 + 2.6 kg in underweight women, 3.8 + 3.4 kg in normal weight women, 3.5 + 4.1 kg in overweight women, and -6 + 4.6 kg in obese women. Water gain was not significantly different between BMI groups. This would suggest that adhering to the recommended weight gain guidelines should not cause obesity among women of any weight group.
In a study of 1,198 women, Stotland, et. al. (2005) found that prepregnancy BMI was the strongest predictor of gaining weight outside of the IOM’s recommendations. Women who had a low prepregnancy BMI were more likely to report gaining less than recommended than women of normal prepregnancy BMI, and women with high prepregnancy BMI were more likely to report gaining more weight than recommended than women of normal prepregnancy BMI. Additional factors that were significantly correlated with low weight gain were Latina race, low educational status, provider recommendations to gain below guidelines, or lack of provider advice. Significant correlations for high weight gain included lower age, multiparity, and provider advice to gain above recommendations.

Olson & Strawderman (2003) performed a prospective cohort study on a final sample of 622 women (96% white) to determine whether modifiable psychosocial and behavioral factors were related to weight gain during singleton pregnancy. Women were followed from early pregnancy until two years postpartum. Questionnaires containing psychosocial and behavioral variables were completed midpregnancy, and biological and sociodemographic data was collected from obstetrical records. Height and weight were monitored by healthcare professionals at antenatal visits using specific measurement tools and conditions. Only 38% of women in the study gained within IOM recommendations, and 60% reported getting no advice from their health care professional on how much weight to gain during the pregnancy. Change in food intake and activity from prepregnancy as well as smoking during pregnancy were significantly and independently related to gestational weight gain. Multiple regression analysis revealed that the
combined behavioral, psychosocial, sociodemographic, and biomedical variables as a continuous variable accounted for 27% of the variance in gestational weight gain. Women with a prepregnant obese BMI gained the least amount of weight during pregnancy while those with a normal prepregnant BMI gained the most. Women with a low prepregnancy BMI were the only group to have a higher percentage of participants to gain below the IOM recommendations than those who gain more than recommended.

Dundas & Yarbro (2000) found 42% of their sample of 31 pregnant adolescents aged 16-19 were concerned about gaining excessive weight during pregnancy. A 24 hour recall interview revealed a significant improvement in caloric intake following a medical nutrition therapy intervention with a dietician, indicating the importance of education regarding weight gain and nutrition at prenatal visits.

_Gestational Weight Gain and Postpartum Weight Retention._ Gunderson & Abrams (2000) reviewed 13 studies related to gestational weight gain and postpartum weight retention. These studies revealed that between 14-20% of women had a postpartum weight increase of 5 kg or more, and black women were 3 times as likely to have a >9 kg postpartum weight increase than white women. Among women aged 25-45, those who had given birth once were at 60% and 110% increased risk of becoming moderately overweight or severely overweight respectively during a 10 year follow-up than those who were nulliparous. They found the most important determinants of weight change from preconception to postpartum were gestational weight gain, pregravid weight for height, race/ethnicity, and parity, with gestational weight gain having the strongest influence. High gestational weight gains were also reported to result in higher fat and
lean tissue gains. Walker, Sterling, & Timmerman (2005) also found gestational weight gain to be the most significant predictor of weight retention in the postpartum period, while Groth (2006) showed a greater risk of overweight/obesity in adolescents who gained above the IOM recommendations. Yet another study found a strong association between prenatal weight gain and postpartum weight retention 10-18 months after birth, with smaller weight retention in those who gained closer to the recommended weight gain guidelines (Chen-Louie, 1994). They also found a higher tendency of black women to retain weight postpartum than white women.

Several studies have identified factors that influence gestational weight gain. Palmer, Jennings, & Massey (1985) found that knowledge about weight gain and recommendations from healthcare providers significantly impacted gestational weight gain. Abraham, Taylor, & Conti (2001) studied 181 women with singleton births. Using regression analysis, they found four variables that were associated with greater postnatal distress: fear of weight gain before and during pregnancy, being distracted by thoughts of food during pregnancy, being afraid of gaining more weight than the pregnancy would explain, and vomiting more frequently during the first 3-4 months of pregnancy. They also found that low-intensity exercise for reasons of shape and weight during the third and fourth months of pregnancy accounted for significantly less postnatal distress. This indicates the great extent that body shape and weight concerns have on pregnant and postpartum women, and the potential importance of low-intensity exercise during pregnancy. Walker (1998) found similar associations with significantly more dissatisfied/distressed feelings about weight: higher prepregnancy BMI, larger gestational
weight gain, higher current postpartum BMI, less healthy lifestyle, and greater body image dissatisfaction. Jenkin & Tiggemann (1997) found actual postnatal weight to be the most important predictor of psychological well-being following birth among 115 women.

In contrast, Clark & Ogden (1999) studied the impact of pregnancy on eating behaviors and weight concern. The sample included 50 primagravidas and 50 nulliparous women who completed questionnaires regarding profile characteristics, current health and eating behaviors, and weight concerns. Pregnant women reported eating more, showed lower levels of dietary restraint, were less dissatisfied with their body shape, and showed higher eating self efficacy than the non-pregnant women. These results indicate that pregnancy may legitimatize increased food intake and remove prior self-imposed food restrictions or inhibitions. Sarwer, et. al., (2006) also suggested that pregnancy may offer some relief from the perceived pressure of a thin-obsessed society to restrict dietary intake. Similarly, Kjaerbye-Thygesen et.al. (2003) found that body dissatisfaction decreased with age and parity, and normal weight women who were satisfied with body weight were older and had more children than normal weight or underweight women who were dissatisfied with body weight. Their study also indicated that dissatisfaction with body weight was established in childhood and adolescence.

Other correlations have been found with gestational weight gain. Hilakivi-Clarke, Luoto, Huttunen, & Koskenvuo (2005) found an increased risk of breast cancer risk after menopause in women who gained an excessive amount of weight during pregnancy.
Timing of Weight Gain During Pregnancy. Certain studies have examined the relationship of weight gain during pregnancy with timing of weight gain, postpartum retention, and functional status. Muscati, Gray-Donald, and Koski (1996) indicated that weight gain during the first 20 weeks of the pregnancy was more strongly correlated with postpartum weight retention than weight gained in the second half of pregnancy. Using Pearson’s correlation coefficients and multiple regression analysis, this study found correlations between the timing of weight gain during pregnancy and postpartum weight retentions (PPWR) and infant birth weight (IBW). Any weight gain over 12 kg was retained to a large degree postpartum and weight gained during the first 20 weeks was most strongly correlated with PPWR. Eighty six percent of weight gained during the first 20 weeks of pregnancy was retained by the mother, while only 68% from weeks 21-30 and 49% after week 30 was retained postpartum. Weight gain between weeks 21-30 was most strongly correlated with higher IBW, whereas weight gain before 20 weeks was weakly associated with IBW, not associated with risk of SGA infants, and significantly related to risk of LGA infants. To and Cheung (1998) used the student’s t-test and Chi square test to determine the relationship between prepregnant BMI, birth weight, and postpartum weight retention in 292 middle class, non-smoking Chinese women. Results showed that women with a normal BMI who gained more weight than recommended by guidelines had higher postpartum weight retention without a significant increase in birth weight than women with a normal BMI who gained with the recommended guidelines. Tulman, Morin, and Fawcett (1998) used the Roy Adaptation Model to determine the relationship between weight gain during pregnancy and functional status during
pregnancy. A sample of 222 women (93% white) were classified into BMI categories by their prepregnant weight and then were given the Inventory of Functional Status—Antepartum Period questionnaire. There was no significant difference in absolute weight gain between the groups, but there was a significant difference in percentage of weight gain. Those with higher than recommended weight gain for their BMI category had a significantly lower functional status in the third trimester of pregnancy than women who gained within the recommendations for their BMI category.

Neufeld, Haas, Grajeda, & Martorell (2004) also found significance in the timing of maternal weight gain. Using ultrasound examinations in a sample of 200 women, a significant correlation was found between weight changes from the first to second trimester and linear fetal growth, but was not seen in association with weight changes between the second and third trimester. Similarly, Brown, Murtaugh, Jacobs, & Margellos (2002) used multiple regression analyses in a sample of 389 women with singleton births and found that maternal weight changes in the first trimester of pregnancy more strongly influenced newborn size than weight changes in the second or third trimesters.

Weight Gain and Perinatal Outcomes. The relationships between adherence to the IOM’s weight gain recommendations and perinatal outcomes have been examined in many studies. A study by Bracero and Byrne (1998) was undertaken to re-evaluate the weight gain recommendations of the National Academy of Sciences’ Institute of Medicine. This study compared the pregnancy weight gain of 20,971 women with their newborn outcomes according to four BMI groups (underweight, normal, overweight, and
obese). A positive correlation was found between maternal weight gain and infant birth weight, but the eta coefficient suggested that only 4% of infant birth weight variability was due to the maternal weight gain. The optimal weight gains found in this study were 5-10 pounds higher for each BMI group than the current recommendations. They concluded that women who gained less weight than recommended had significantly higher incidences of adverse perinatal outcomes, low birth weight infants (<2500 g), and perinatal mortality than those who gained within the current recommended guidelines.

A study by Ehrenberg, Dierker, Milluzzi & Mercer (2003) examined the results of low maternal weight in pregnancy in a sample of 15,196 pregnant women. In addition to associations with low weight and BMI at conception or delivery, they found an association between poor weight gain during pregnancy and low birth weight (LBW) infants, prematurity, and maternal delivery complications.

Hickey, Cliver, McNeal, Hoffman, and Goldenberg (1996) examined overall maternal weight gain and rate of weight gain in 275 black and 140 white nonobese multiparous women as compared to the Institute of Medicine recommendations. Low weight gain in the second trimester combined with low weight gain in the first or third semester was associated with significant decreases in infant birth weight (IBW). Low weight gain in only the first or second trimester was not associated with significant decrease in infant birth weight, whereas low gain during the third trimester only was associated with a significant decrease in birth weight among all women and White women, but not in Black women. This showed that low weight gains during the second trimester in combination with low weight gain during either the first or third trimester
was highly correlated with low IBW, as was low weight gain in all three trimesters. This is consistent with findings by Muscati et al. (1996), who found that weight gains during the second half of pregnancy had the greatest influence on IBW.

Fowles (2004) discussed the implications of gaining outside of the IOM recommendations. Gaining insufficient weight during pregnancy can lead to increased metabolism of energy stores, thereby increasing ketone production and possibly impairing fetal neurological development. Adding insufficient weight gain to low prepregnancy weight compounds the risks for LBW infants. Those who gain more than recommended increase the risk of hypertension, preeclampsia, gestational diabetes, prolonged labor (also found by Vahratian, Zhang, Troendle, Savitz, & Siega-Riz, 2004), and C-section, as well as being more likely to retain weight following delivery. High weight gains are also associated with large for gestational age (LGA) babies and increased incidence of birth defects.

Excessive weight gain during pregnancy is also related to multiple adverse perinatal outcomes. Gabor et.al. (2005) found obesity and excessive weight gain during pregnancy to significantly decrease to success of vaginal birth after Cesarean section. Jensen, et.al. (2005) looked at gestational weight gain and pregnancy outcomes in obese women and found gestational weight gain to be negative associated with pregestational BMI. They also found gestational weight gain to be an independent risk factor for macrosomia, hypertensive complications, induction of labor, and Cesarean section, as well as an increased rate of shoulder dystocia with increased gestational weight gain. Gunderson and Abrams (2000) reported that a review of literature consistently showed
that gestational weight gain was the strongest predictor of long-term maternal obesity and weight retention. In a literature review, Sarwer et al. (2006) reported findings that a behavioral intervention (involving monitoring of weight gain throughout the pregnancy and the provision of education about weight gain, exercise, and healthy eating during clinic visits) significantly reduced the occurrence of excessive weight gain in normal weight women. The incidence of excessive weight gain among obese women, however, was not significantly different. In another study reviewed, a mailed educational intervention for normal or obese pregnant women did not show a difference in excessive weight gain between the control and intervention groups. There was, however, a significant decrease in excessive weight gain among low socioeconomic women in both groups with the mailed intervention.

Fowles (2004) also discussed the importance of specific nutrients on fetal growth and development and perinatal outcomes. Weight gain, which has been extensively studied in relation to perinatal outcomes, does not necessarily indicate adequate nutritional intake. It is important to note that weight gain in itself can be due to increased fat or caloric intake, which does not provide the same benefits as adding extra nutritional food to intake during pregnancy. Interestingly, Aaronson & Macnee (1989) found in a study of 510 women that weight gain, not nutrition, contributed to variance in IBW. While this may minimize the importance of nutrition in pregnancy, this would support the idea that gestational weight gain may not be a valid measure of nutrition.

Weight Gain in Adolescent Pregnancy. While some studies included adolescents and adults in their samples and others examined solely adult populations, three studies
examined the correlations of pregnancy weight gain in adolescent populations. Scholl, Salmon, Miller, Vasilenko, Furey, and Sister Marie Christine (1988) examined the outcomes of adolescent pregnancies to determine if large weight gains were associated with low prepregnant weight and how weight gain in adolescents correlated with pregnancy outcomes for the mother and infant. In this study, factors found to be associated with pregnancy weight gain were ethnicity, length of gestation, parity, and diagnoses of pregnancy induced hypertension. Prepregnant weight and pregnancy weight gains were not found to be significantly associated. Adolescents gaining the recommended 10-14 kg had significantly lower risk of LBW infants and significantly increased risk of macrosomic infants compared to adolescents who gained less than recommended. Maternal weight gain improved fetal growth without increasing the risk for Cesarean section, fetal/neonatal death, or admission to the NICU. Scholl et al. concluded that adequate weight gain in adolescents is equally important to adequate weight gain in adults, since the incidence of low birth weight decreased as weight gain increased.

Berenson, Wiemann, Rowe, & Rickert (1997) used logistic regression and Chi square analyses to compare infant birth weights and characteristics of pregnant adolescents (<18 years old) who had adequate weight gain (≥ 20 pounds) and those who had inadequate weight gain (<20 pounds) to determine behavioral markers of adolescents with inadequate weight gain during pregnancy. Adolescents with inadequate weight gain were found to have infants with significantly lower birth weights and were more likely to deliver infants weighing less than 2500 grams than adolescents with adequate weight
Adolescents who had been battered, contracted a sexually transmitted disease, or had an unplanned pregnancy were found to be at a significantly higher risk for inadequate weight gain. These data suggest that these markers can help identify adolescents at high risk for inadequate weight gain early in the pregnancy when intervention is possible. Berenson et al. (1997) concluded that unplanned pregnancy, history of physical assault during the pregnancy, and contraction of a sexually transmitted disease were all positively correlated with inadequate weight gain in adolescents.

Pope, Skinner, and Carruth (1997) studied the eating habits of 97 white adolescents in their third trimester of pregnancy. Participants were interviewed to determine the motivators for changing dietary intake and their diets were compared with the diets of 125 nonpregnant adolescents of similar age, education, and socioeconomic status. Pregnant adolescents took in an average of 350 kcal/day more than nonpregnant adolescents, consuming significantly more protein and fewer carbohydrates. An increase in dairy foods was reported by about 65% of the pregnant adolescents, about 70% increased fresh fruits and juices, and more than half increased their intake of vegetables, breads, cereals, and chocolate. These changes were made primarily due to cravings, increased appetite, better taste of foods, and concern for the baby. Any decrease in food intake was reportedly due to nausea/vomiting and the altered taste of some foods.

**Pregnancy Intention Status and Maternal Behaviors.** With a significant number of unplanned pregnancies in the United States, the impact of intention status on maternal behaviors is important. Kost, Landry, and Darroch (1998) examined the correlation of maternal behavior between women with planned and unplanned pregnancies, independent
of social and demographic characteristics. In a sample of women aged 15 – 44, results showed that women with unplanned pregnancies were less likely to seek out early prenatal care and to quit smoking than those with planned pregnancies. There was not a significant difference in adherence to regular prenatal visits throughout the pregnancy, taking vitamins, reduction of alcohol use, or weight gain. Adolescent mothers were significantly less likely to adhere to weight gain recommendations than women aged 35 or older. Within this sample, pregnant adolescents were significantly less likely to adhere to weight gain recommendations, to begin prenatal check-ups within eight weeks of conception, and to take prenatal vitamins than adult women. In summary, those with intended pregnancies were more likely to recognize the pregnancy and make the first prenatal visit within eight weeks of conception, attend at least 90% of the recommended prenatal visits, quit smoking, take prenatal vitamins, and gain the recommended amount of weight.

Summary

In conclusion, satisfaction with body weight, self-esteem, and eating and health behaviors appear to be related to some degree in the general population. This relationship may extend to the pregnant population when considering satisfaction with body weight, self-esteem, and adherence to weight gain recommendations during pregnancy. Carmichael, Abrams, & Selvin confirmed the recommendation of the IOM to evaluate the underlying causes of excessively high or low weight gain during pregnancy before applying appropriate interventions (1997). While previous studies have shown the importance of adequate weight gain during pregnancy in order to promote optimal
perinatal outcomes and to reduce postpartum weight retention, few studies have
examined the psychological factors involved in adherence to weight gain
recommendations. In a society that places great emphasis on body shape and size and
with an increasing rate of eating disorders, a greater understanding of the psychological
factors (such as the relationship between self-esteem, satisfaction with body weight, and
adherence to weight gain recommendations during pregnancy) could assist health care
professionals in developing interventions aimed at maximizing adherence to guidelines.
These interventions could thereby increase the chances of optimal perinatal outcomes and
could be especially beneficial to younger women, who are more prone to concerns about
physical appearance and body shape.
DESCRIPTION OF PROPOSED PROJECT

Introduction

Significant findings were found in a secondary analysis of “Self-esteem, satisfaction with body weight, and adherence to weight gain recommendations in pregnant women” (Cody, 2001). The study was adapted to questions and information previously gathered for another study and then evaluated as a secondary analysis. The significant findings of that study and the lack of similar studies in the review of literature indicate that further research in this area is warranted. The following is a proposal for a prospective study of the relationships between self esteem, body weight satisfaction, weight gain during pregnancy, and perinatal outcomes. As a primary study, the research method, study sample, and measures can be tailored to better answer the research questions posed in this study.

Method

Study sample. The secondary analysis examined pregnant non-smoking women enrolled in a perinatal program at a university hospital in a large city in the southwestern United States. This study would be conducted in a rural area of the same state 320 miles away from the previous study, providing a different population in order to make the study findings more generalizable. Following approval from the university’s Institutional Review Board and Human Subjects Committee, participants would be recruited from the two obstetrical offices in town during their first prenatal visit.

The study would be closed following recruitment of 2,000 participants or at the end of two calendar years of active recruitment, whichever occurs first. The study would
then continue for ten months following the closing of the recruitment period to allow time to collect the postpartum questionnaires from the recruited participants. In order to maintain anonymity, each participant would be assigned a number that would be used to correlate pre- and postpartum questionnaires and data. Personal contact information would be kept on an enrollment list only, which would be housed in a secure office and destroyed within six months of study completion.

Criteria for Patient Participation. Women to be included in the prospective study would have to meet the following criteria: confirmed pregnancy, initiation of prenatal care by 10 weeks of gestation, enrollment in the study during the first trimester, ability to read and write English, completion of both initial and antepartum questionnaires used in this study, and a recorded weight upon hospital admission for delivery or at a prenatal visit within 5 days of delivery. Exclusion criteria would be as follows: tobacco or illicit drug use during pregnancy, multiple (non-singleton) birth, and inability to establish prepregnant weight via either recent medical records or participant recall. Each participant would also be required to sign a consent form providing the researcher with permission to use their answers and to access their medical records to obtain anthropometric and perinatal information.

The study questionnaires would be provided with stamped return envelopes during the first prenatal visit and the prenatal visit at the beginning of the third trimester. A one week follow-up call would be provided as a reminder to mail completed questionnaires. In addition, the provider offices would be asked to flag the prenatal visit following both the initial and third trimester questionnaire in the computerized schedule.
When the office visit reminder call is made the day prior to the following appointment, the office staff would remind participants to bring their questionnaires into the office with them if they had not yet mailed them. Collected questionnaires would be picked up weekly at each office by the researcher.

Materials. The questionnaire provided at the first prenatal visit (Appendix A) would include four categories of measurement: anthropometry, demographics, eating behaviors, and psychology. The anthropometric measures would include height and prepregnant weight (including three yes/no questions regarding accuracy of the stated weight). The demographic data would include age, gravida/parity, pregnancy intention status, race/ethnicity, marital status, income, and education level. Eating behaviors will be measured using multiple choice questions. The psychologic measure will include the Rosenberg Self-Esteem scale for global self-esteem, the Body-Esteem Scale for Adolescents and Adults as a measure of body weight satisfaction, and several multiple choice questions.

Following the anthropometric and demographic questions, participants would be given two multiple choice questions regarding how they feel about diet and weight gain during pregnancy. While this does not provide the opportunity for responses that an open-ended question would, the goal would be to pick up on individual beliefs about pregnancy as an opportunity to lose or gain weight. A second multiple choice question would address participant intentions regarding weight gain during their pregnancy. In addition, a multiple choice question will be asked regarding what weight each woman was recommended to gain by her physician at her first prenatal visit. This will ensure
that non-adherence to weight gain recommendations is due to a factor with study participants, not incorrect education by the health care provider. The three options are 15-25 pounds, 25-35 pounds, and 28-45 pounds, the recommendations made by the IOM for overweight, normal weight, and underweight women.

The Rosenberg Self-Esteem scale (RSE) has been widely used to measure global self-esteem. It was first published in 1965 and has a reproducibility of 0.93 (Pastore, et al., 1996; Curbow & Somerfield, 1991). Participants read statements, such as “I feel that I’m a person of worth, at least on an equal basis with others” (Rosenberg, 1979), and rate the statements as strongly agree, agree, disagree, or strongly disagree. A numeric rating scale is assigned to the answers, with lower scores indicating lower self-esteem. This is one of the accepted scoring scales for the Rosenberg Self-Esteem scale, with a possible range of 10-40 and a cut-off score of 20 or more indicating high self-esteem (Gottesman and Lewis, 1982; Neuling and Winefield, 1988). See Appendix B for the complete list of questions. While the secondary analysis did not reveal a significant correlation between global self-esteem (as measured by the RSE) and adherence to weight gain recommendations, there were no participants in the study who scored less than 20 on the RSE. Therefore, there were no low self-esteem participants to compare to the high self-esteem participants and no way to evaluate correlations between low self-esteem and weight gain. However, the correlation between RSE scores and actual weight gain during pregnancy in the secondary analysis did approach significance.

The Body-Esteem Scale for Adolescents and Adults (BESAA) was developed based on the view that global self-esteem is multidimensional and determined by a
combination of feelings of adequacy in particular domains and individual ratings of importance of that domain (Mendelson, Mendelson, & Andrews, 2000). The scale has three subscales that measure general feelings about appearance, weight satisfaction, and positive evaluations attributed to others about one’s body and appearance (Mendelson, Mendelson, & White, 2001). It was first developed as a tool for children in 1982, but has been refined and tested over the past 19 years to make it a valid test for adolescents and adults. The BESAA has 23 statements regarding the three subscales of body esteem using a five point Likert scale, with higher numbers indicating higher body esteem (Appendix C). The subscales may be used together or individually, and have been shown to be valid and reliable in participants 12 years and older with test-retest correlations for each subscale between .83 and .92, p < 0.001. The question numbers for each subscale are as follows: BE-Appearance (1, 6, 7*, 9*, 11*, 13*, 15, 17*, 21*, 23); BE-Weight (3, 4*, 8, 10, 16, 18*, 19*, 22); and BE-Attribution (2, 5, 12, 14, 20). The asterisk (*) connotates negative items, which must be recoded for scoring by reversing the scale (i.e., 0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0). The total score places the participant on a continuum of body esteem (scores ranging from 0 to 92), with higher scores indicating higher body-esteem.

A second questionnaire (Appendix D) would be administered at the beginning of the third trimester. This questionnaire will address participants’ satisfaction with their pregnant weight, repeat the questions about attitudes regarding eating and weight gain during pregnancy, and weight loss behaviors during the pregnancy. The RSE and BESAA will also be repeated. The purpose of the second questionnaire is to determine
whether satisfaction with body weight or weight related attitudes change during the pregnancy, possibly as a result of the changes in hormone levels that may affect mood and emotion or from positive or negative feelings that may be associated with pregnancy. Attitudes about weight gain may change throughout the pregnancy as the women actually experience the weight gain or pregnancy related symptoms, such as edema, nausea/vomiting, cravings, and feelings related to the increased crowding inside their bodies as the baby grows.

**Analysis.** Using the information gathered on the questionnaires, body mass index (BMI) would be calculated by dividing pre-pregnant weight in kilograms by the square of height in meters. They would then be classified as underweight (<19.8), normal (19.8 – 26.0), or overweight (>26.1). Gestational weight gain (GWG) would be calculated by subtracting the prepregnancy weight from the weight upon hospital admission for delivery, obtained from the medical records. If weight was not recorded upon hospital admission, the weight from the last prenatal visit would be used if recorded within 5 days of delivery. The GWG would then be classified as being below recommendations, within recommendations, or above recommendations based on the following guidelines established by the IOM: 28 – 40 pounds for underweight women, 25 – 35 pounds for normal weight women, and 15 – 25 pounds for overweight women.

For the purposes of this study, the RSE scale would be scored and results categorized as low self-esteem (less than 20) or high self-esteem (20 – 40). These ranges have been used by other studies and are considered appropriate (Curbow & Somerfield, 1991). The BESAA would also be scored using a numerical point system, as a sum of
the values assigned in the Likert scale ranging from 0 to 92. Cut off scores are not used for the BESAA, as in the RSE. Rather, the score indicates a place on the continuum of body-esteem. Therefore, body-esteem would not be assigned as “low” or “high,” but correlations would be made with “lower” or “higher” body-esteem scores. For example, the data may reveal that body dissatisfaction inversely relates to body-esteem scores (i.e. the higher the body-esteem score, the smaller the percentage of women who are dissatisfied with their bodies). This would be appropriate, as body image is best conceptualized in a continuum model (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999).

Each participant’s medical records would be accessed to gain specific information regarding perinatal outcomes. These would include delivery method (vaginal, planned Cesarean section, or Cesarean section for inability to deliver vaginally), infant birth weight, gestational age at birth, Apgar scores, presence of perinatal complications (mother, baby, or none), and procedures associated with delivery (episiotomy, vacuum assist, forcep assist).

The data collected in the questionnaires and from medical records would be analyzed using Pearson’s r, t-tests, analysis of variance (ANOVA), and chi-squared tests. Pearson’s r, t-test, and ANOVA are parametric tests, while the chi-squared test is nonparametric. Pearson’s r would be used to determine the extent of relationship between two variables measured on an interval scale, such as the RSE and BESAA. The t-test would be used to test variables for statistical differences between the means of two groups, such as body weight satisfaction between low and high self-esteem groups.
ANOVA would be used to test the significance of the mean group difference when more than two groups were compared, as in the weight gain between various levels of income or education. The chi-squared test would be used to determine whether statistically significant differences existed between variables that were classified into categories rather than as continuous variables (Polit & Hungler, 1997). For example, chi-squared test would be used in comparisons of demographic data such as marital status. All tests would be considered significant at p<0.05. Descriptive statistics would also be done using the demographic data collected.

Internal consistency for the RSE and BESAA scales would be assessed for the study sample using Crohnbach’s alpha coefficient. According to Nunnally (1994), an internal consistency of 0.80 or greater is considered acceptable for a well-developed instrument.

Summary

Pregnant women recruited from obstetrical doctor’s offices in the study city would be included in this study using specific inclusion and exclusion criteria in an attempt to limit confounding variables among the sample. Information would be gathered using an initial questionnaire with the RSE and BESAA scales administered in the first trimester, a second questionnaire with the RSE and BESAA scales administered at the beginning of the third trimester, and medical records from the delivery. Relationships between self-esteem, satisfaction with body weight, gestational weight gain, and perinatal outcomes would be examined using computerized statistical analyses (Pearson’s test, t-test, ANOVA, and chi-squared test). Correlations with demographic
data, such as education and income, would also be examined. Internal consistency would be checked for both the RSE and BESAA scales using Cronbach’s coefficient.
DISCUSSION

Introduction

Much research has been done regarding self-esteem and body satisfaction in women. It is an issue that is well documented and represents a problem that affects many women today. Often these issues are examined in light of their effects on weight-related behaviors and eating disorders. Very little research, however, has been done concerning self-esteem and body satisfaction issues in pregnant women, and how these issues affect weight-related behaviors during pregnancy. Postpartum weight retention has also been documented as a concern among many pregnant women and has been shown to correlate with long term excessive body weight. Such concerns and fears could also impact weight related behaviors during pregnancy, although current literature does not provide much information on the psychological and motivational factors that affect gestational weight gain. This study would seek to fill some of those gaps in research.

Implications for Nursing

Data from the secondary analysis revealed that less than half of the women in the study gained weight within the ranges recommended by the IOM. It is well documented in research that inadequate or excessive weight gains during pregnancy are correlated with adverse outcomes for both infants and the mothers. The adverse outcomes can range from postpartum weight retention to low birth weights and serious medical problems in neonates. It is important for nurses to have research on which to base their practice and interventions in order to promote health and optimal outcomes for the women they work with.
Some studies have been done regarding dietary and nutritional education in pregnant women, and suggest that these interventions can be effective among some populations. The information that this study could reveal about what influences weight gain during pregnancy would provide an opportunity to tailor education for women during their prenatal visits. Pregnancy is an important time to promote health because it affects not one, but two individual’s health.

Limitations

One of the limitations of this study would likely be a lack of racial diversity among the study participants. Even with recent increase in minority populations, the city in which the study would be conducted is approximately 85-89% white, with Hispanics coming in second at 9%. This puts the city at significantly below state average for minority groups. It is also expected that there will be a high percentage of low income and low education individuals. More than half of the population has household incomes of $35,000 or less, with a median female full-time income of $21,134. A striking 51% of the population over 25 years of age have only a high school diploma or less, and another 28% had some college education but no degree, leaving only 20.9% with any type of college degree (US Census Bureau, Census 2000).

Another limitation to this study is the limited reliability of stated prepregnant weights. In an attempt to minimize error, women who were unsure of their prepregnant weights and did not have recent documented weights in medical records were excluded from this study. Women often misrepresent their weights when self-reporting, and weights fluctuate several pounds throughout the menstrual cycle. In addition, even an
accurate stated prepregnant weight does not provide the most accurate basis for true gestational weight gain. Home scales used for most prepregnant weights can vary by several pounds from the scales used in the medical office. The only way to prevent this error is to have all weights done on the same scale with similar clothing and shoes, which is not realistic for most women. Many women are not aware that they are pregnant until the fourth to sixth gestational week, and most do not have office visits immediately prior to becoming pregnant.

**Strengths**

The secondary analysis served as a strength in this study, providing direction for this study. The significant findings in the secondary analysis justify the time and effort that would be put into the larger prospective study. They also guided the development of the research questions and tools to be used in this study. Using a different population in the proposed study can strengthen significant findings and make them more generalizable to the general pregnant population.

Given the length of time and goal number of participants, this study should have a large enough sample to prevent skewing of the information collected. While the secondary analysis (n=82) was limited due to a lack of having any participants with low self-esteem, the considerably larger sample expected in this study would present a greater likelihood of including women with low self-esteem for comparison to the high self-esteem group. This study would include a comprehensive evaluation of global self-esteem and body esteem using reliable and valid tools. The comparison of initial and third trimester attitudes about weight and self-esteem should also help identify whether
there is a change during pregnancy. This would be important in developing an intervention to promote healthy weight gains during pregnancy.

Recommendations for Future Research

One area that warrants further research is revising the IOM recommendations for gestational weight gain. The current standards were established in 1990 based on infant birth weight only, rather than overall perinatal outcomes. More recent studies suggest that the recommendations may be underestimated by 5 – 10 pounds. Further investigation could help researchers refine the recommendations and contribute to evidence based practice to promote the best perinatal outcomes.

Another area that should be researched is the difference in perceived and actual weight in pregnant women. Perceived weight has been shown to correlate with satisfaction with body weight, and some studies have shown perceived weight to be higher than actual weight. Thus, women may be dissatisfied with their bodies when they are actually of normal weight. Similarly, non-pregnant women have been found to view themselves as heavier than they truly are, and these beliefs have been associated with lower self-esteem and dissatisfaction with body weight. Determining what factors influence this altered perception of body weight in women (pregnant and non-pregnant) and ways to improve their self-perceptions could greatly benefit mental healthcare in women.

Postpartum weight retention is another issue that should be researched in light of gestational weight gain. It is a concern for many women, and has the potential to affect long term self-esteem, body weight satisfaction, and overall health. In light of the
research that has revealed that excessive gestational weight gain is correlated with long
term excessive body weight, preventing excessive gestational weight gain could provide
last health benefits for women.

Using the data collected from this study, an educational handout or program could
be developed to promote the right amount of weight gain during pregnancy. Prenatal
visits provide an excellent opportunity to educate women early in the pregnancy. The
information taught could include information about the weight gain recommendations,
how weight gain can influence birth outcomes and postpartum weight retention, a
breakdown of how much weight should be gained each month (more at the end), and
nutritional information about how many more calories are needed and what kind of foods
are best. Current studies are inconclusive on the effectiveness of educational
interventions on gestational weight gain. While the overall results were not significant,
certain sub-populations did reveal significant differences in weight gain. Further research
on interventions would be useful in developing the most widely effective teaching tool or
program.

Conclusion

The prospective study proposed in this paper has been developed with the
expectation that the larger study sample and tailored questionnaires would reveal
significant findings regarding correlation between self-esteem, satisfaction with body
weight, and adherence to weight gain recommendations in pregnancy. While there are a
few limitations, the study has many strengths that would result in furthering the
knowledge base about weight gain in pregnancy and providing the opportunity to develop
an intervention that could reduce adverse perinatal outcomes. This is important because pregnancy is a common experience among women and would impact many lives.
APPENDIX A: INITIAL QUESTIONNAIRE

Participant Number___________

Directions: Fill in the answer, circle “Y” for yes or “N” for no, or place an “X” in front of the statement that is most true for you.

1. Age _____ years
2. Height _____ feet _____ inches
3. Number of times I’ve been pregnant (including this pregnancy) _____
4. Number of times I’ve delivered a baby _____
5. Was this pregnancy planned? Y N
6. Pre-pregnant weight (weight at the end of your last menstrual period) _____
   Is this weight from a recent medical record? Y N
   If this is a stated weight, are you pretty sure it is accurate? Y N
   Are you estimating or guessing your pre-pregnant weight? Y N
7. I feel that my prepregnant weight is:
   _____ Too low/too thin.
   _____ Just right/average.
   _____ Too much/too heavy.
   _____ Way too much/obese.
8. Race/ethnicity: _____ White/Caucasian
   _____ Hispanic
   _____ Native American
   _____ African American
   _____ Asian
   _____ Other
9. Marital Status: _____ Single
   _____ Married
   _____ Living with significant other
10. Highest level of education completed:
   _____ Elementary (through 6th grade)   _____ Bachelor degree
   _____ High school                      _____ Graduate degree
   _____ Technical school                 _____ Doctoral degree
   _____ Associates degree                _____ Post-Doctoral degree

11. Income level:
    _____ Less than $10,000                _____ $10,000 – 20,000
    _____ $20,000 – 30,000                _____ $30,000 – 40,000
    _____ $40,000 – 50,000                _____ $50,000 – 60,000
    _____ $60,000 – 70,000                _____ $70,000 – 80,000
    _____ $80,000 – 90,000                _____ $90,000 – 100,000
    _____ More than $100,000

12. As a pregnant woman, I feel that:
    _____ I need to be more careful about what I eat, restricting myself from foods that are not healthy.
    _____ I should continue to eat normally.
    _____ I can eat whatever I want or whatever I crave, regardless of what type of food it is.

13. My doctor recommended that I gain:
    _____ 15-25 pounds
    _____ 25-35 pounds
    _____ 28-40 pounds
    _____ No recommendations were given
14. Mark which statement most closely resembles how you feel about gaining weight
during your pregnancy.
____ I don’t want to gain very much weight because I’m worried about losing it later.
____ I don’t want to gain very much weight because then I will lose weight when I have
the baby.
____ I’m not worried about gaining weight as long as I stay within the recommended
weight gain guidelines my doctor gives me.
____ I’m not worried about gaining weight because people expect me to gain weight
while I’m pregnant.
____ I want to gain a lot of weight because I will have a healthier baby.

15. Mark which statement best describes your plan during your pregnancy:
____ I am not going to gain as much weight as my doctor said I should. That’s too much.
____ I am not going to gain as much weight as my doctor said I should so that I can lose
weight when I have the baby.
____ I am going to try keep my weight gain within the recommended guidelines my
doctor gives me.
____ I am not going to worry about whether I gain more weight that recommended by my
doctor.
____ I am going to gain more weight than my doctor recommended.
____ I really don’t have a plan in regards to my weight.

16. I have used the following ways to control my weight (check all that apply):
____ Restricting my food intake.       ____ Exercise.
____ Purging (throwing up food).      ____ Diet program (Weight
____ Using laxatives.          Watchers, Atkins, South
____ None               Beach, etc.)
APPENDIX B: ROSENBERG SELF-ESTEEM SCALE

Directions: For this section, take your time and think about what each statement says. Then place an “X” in the box that most closely measures how you feel about yourself at the present time.

1. I feel that I’m a person of worth, at least on an equal basis with others.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

2. I feel that I have a number of good qualities.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

3. All in all, I feel like a failure.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

4. I am able to do things as well as most other people.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

5. I feel I do not have much to be proud of.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

6. At times I think I am no good at all.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

7. On the whole, I am satisfied with myself.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

8. I wish I could have more respect for myself.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

9. I certainly feel useless at times.
   ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree

10. I take a positive attitude toward myself.
    ___ Strongly agree ___ Agree ___ Disagree ___ Strongly disagree
APPENDIX C: BODY-ESTEEM SCALE FOR ADOLESCENTS AND ADULTS

Indicate how often you agree with the following statements ranging from "never" (0) to "always" (4). Circle the appropriate number beside each statement.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Never</th>
<th>Seldom</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I like what I look like in pictures.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Other people consider me good looking.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. I'm proud of my body.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. I am preoccupied with trying to change my body weight.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. I think my appearance would help me get a job.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. I like what I see when I look in the mirror.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. There are lots of things I'd change about my looks if I could.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. I am satisfied with my weight.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. I wish I looked better.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. I really like what I weigh.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. I wish I looked like someone else.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. People my own age like my looks.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. My looks upset me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. I'm as nice looking as most people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. I'm pretty happy about the way I look.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. I feel I weigh the right amount for my height.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. I feel ashamed of how I look.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Weighing myself depresses me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. My weight makes me unhappy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. My looks help me to get dates.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. I worry about the way I look.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22. I think I have a good body.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23. I'm looking as nice as I'd like to.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

From Mendelson, White, & Mendelson (1997), used with permission.
APPENDIX D
Third Trimester Questionnaire

Participant Number___________

Directions: Read each statement and place an “X” next to the answer that most closely fits your answer.

1. I feel that my pregnant weight is:
   ____ Too low/too thin.
   ____ Just right/average.
   ____ Too much/too heavy.
   ____ Way too much/obese.

2. As a pregnant woman, I feel that:
   ____ I need to be more careful about what I eat, restricting myself from foods that are not healthy.
   ____ I should continue to eat normally.
   ____ I can eat whatever I want or whatever I crave, regardless of what type of food it is.

3. Mark which statement most closely resembles how you feel about gaining weight during your pregnancy.
   ____ I don’t want to gain very much weight because I’m worried about losing it later.
   ____ I don’t want to gain very much weight because then I will lose weight when I have the baby.
   ____ I’m not worried about gaining weight as long as I stay within the recommended weight gain guidelines my doctor gives me.
   ____ I’m not worried about gaining weight because people expect me to gain weight while I’m pregnant.
   ____ I want to gain a lot of weight because I will have a healthier baby.
4. I have used the following ways to control my weight while pregnant (check all that apply):

____ Restricting my food intake.  ____ Exercise.
____ Purging (throwing up food).  ____ Diet program (Weight Watchers, Atkins, South Beach, etc.)
____ Using laxatives.
____ None
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