THE ASSOCIATION BETWEEN MATERNAL WEIGHT GAIN AND POSTPARTUM DEPRESSIVE SYMPTOMATOLOGY, FUNCTIONAL STATUS, AND FAMILY FUNCTIONING

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ABSTRACT

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Postpartum difficulties affect up to 20 percent of childbearing women to some degree (Affonso, 1992). The purpose of this study was to explore the relationship of weight gain in pregnancy to postpartum depressive symptomatology, family functioning, and functional status. The conceptual model used to depict this relationship was Peck's Women's Self-Definition Model. This study was a secondary analysis of data from 65 low income women. Data was analyzed using descriptive and frequency statistics. Infomation gained in this study will assist the nurse working in advanced practice with women during and after pregnancy to assess for signs of depressive symptomatology, alterations in functional status, and decreased satisfaction with family functioning related to weight gained in pregnancy. In this study there were no significant relationships between the amount of weight gained in pregnancy and postpartum depressive symptomatology, alterations in functional status or decreased satisfaction with family functioning. However, women, on average, had moderate levels of postpartum depressive symptomatology, low functional status scores, and decreased satisfaction with family functioning at six weeks postpartum. Implications for advanced nursing practice and further research include the need to assess all women, regardless of weight gain for postpartum disturbances.

For my family, in particular my son, Stephen James Schuyler, for giving me the inspiration to complete this academic pursuit, and my parents, John and Marie Kakuk for their support, encouragement, and unconditional love.

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INTRODUCTION

Background of the Problem

There is little information in the literature related to weight gain in pregnancy and how it affects postpartum difficulties such as postpartum depressive symptomatology, functional status and family functioning. A very revealing picture in Psychology Today's 1997 body image survey (Garner, 1997) found that weight gain is a common cause for negative feelings about the body and that pregnancy is increasingly being seen, not as a normal body function, but as an encumbrance to well being. Some women claim that their obsession with body image and weight gain are their sole reasons for deciding against conception (Garner, 1997). After concern for their infant's health and well being, an almost universal anxiety among new mothers is whether or not they will lose the weight they gained during pregnancy (Parker, 1994). Most women hope to return to their pre-pregnancy weight within the first few months; however, losing weight more slowly after the initial fluid readjustment is more common (Abrams & Berman, 1993; Lederman 1993). This imbalance between expectation and reality may cause new mothers to feel depressed, as they are trapped inside a body that they thought and expected would look different after child bearing. Furthermore, hopelessness may be potentiated by the media portraying unrealistic or enhanced photographs of models looking as though they were never pregnant shortly after giving birth. Professional models, our most pervasive standard of beauty, are now estimated to be 23% lighter than the average North American woman (Wolf, 1990).

There is information in the literature describing the impact of obesity on a woman's self concept, and it is widely believed that childbearing is a cause of obesity in American women (Lederman, 1993). Recent literature indicates that women with a prior history of dieting are more likely to be concerned during pregnancy and obsess about weight loss after childbirth (Garner, 1997) than women who are content with their weight

(Fairburn & Welch, 1990) . It is estimated that approximately 89% of all women have tried to diet during their childbearing years (Garner, 1997). Middleman, Vazquez, and Durant (1998) found that in a study of 3,055 students with a mean age of 16, 61.5% of females were trying to lose weight or had a negative body image, and Hall (1991) determined that overall low self concept in adolescents was related to obesity of the adolescent's mother (Hall, 1991).

Due to these factors it is reasonable to consider that those women with concerns related to weight gain prior to and during pregnancy, may be at risk for exhibiting signs of post partum depressive symptomatology, alterations in functional status and decreased family functional status. Research indicates significant increases in marital satisfaction, sexual functioning, and improvement in body image in women who have lost weight (Stunka, 1992; Werlin, 1997), and more psychological and behavioral problems in those who are overweight with body image anomalies (O'Neil, 1992). This indicates that psychological disturbances related to being overweight impact intimate relationships and personal well being. Major motivators identified to lose weight in the overweight population are: appearance, self esteem, health, and fear of loss of functional status (Brink & Ferguson, 1998). Overweight women report their health and functional ability to be poorer than those not overweight and report less positive mood states, and increased anxiety and depression (Sullivan, Bouchard, Dahlgren, Jonsson, Larsson, & Lindstedt, 1993). For many women, obesity becomes an obsession that leads to physiologic, psychological and social problems (Vicker, 1993).

Postpartum emotional problems have received increasing attention in the literature recently; however, the nature of difficulties surrounding childbirth remain clouded and overlooked (Horowitz, Damato, Solon, Von Metsch, & Gill, 1995). In the literature, postpartum depression has been studied much more in depth than women's functional status and family functioning. Studies indicate that the prevalence of postpartum depression ranges from 9 to 15 percent of women who have recently given birth (Beck,

1995), and that depressive symptomatology can affect up to 20 percent of the childbearing population to some extent (Affonso, 1992). Theories about the causes of postpartum depressive symptomatology fall into three general categories: biological (involving age and hormonal, neurotransmitter, and genetic theories); psychological (including psychoanalytic, personality, and attributional style theories); and environmental or cultural (including social support, socioeconomic status, and preparation for childbearing) (Hansen, 1991). The devastating effects of PPD are not only felt by mothers, but may also have adverse consequences on young children's general behavioral and developmental functioning (Beck, 1995). The presence of postpartum difficulties has been shown to affect future reproductive plans (Peindl, Zolnik, Wisner, & Hanusa, 1995). This makes it imperative for the Advanced Practice Nurse (APN) working in primary care to be able to identify those mothers most at risk for developing PPD, changes in functional status, and alterations in family functioning. It is estimated that 30 percent of women with an episode of postpartum depression are likely to develop a repeat episode after a subsequent birth (Peindl et al., 1995).

The primary concern of those involved with postpartum care while in the hospital is generally focused on the physical well being of the mother and child, while the psychological well-being of the mother is often viewed as secondary in importance, if it is viewed at all. In most situations women having a normal spontaneous vaginal delivery are sent home from the hospital within 24 to 48 hours after delivery. This makes it difficult, if not impossible for the health care team to assess the presence of postpartum depressive symptomatology, functional status, and family functioning as studies suggest that the great majority of postpartum difficulties have an onset of a few weeks, or more commonly, three months postpartum (Kumar, 1991). Therefore, a vast majority of cases are the responsibility of primary care providers to identify, as this is where women in the postpartum period would most likely seek help for depression, difficulties in functional capabilities and concerns with family functioning.

Primary care providers as a whole are better at identifying more depressed women than any other professional group; however, it is estimated that approximately half of all those with depressive symptomatology will be missed by their primary care provider (Hearn et al., 1998). Identification of those at a higher risk of developing postpartum depressive symptomatology, altered functional status and altered family functioning would allow more comprehensive care for mothers, and enhance the relationships they share with their new babies and other family members while promoting self esteem and increased self efficacy.

Advanced practice nurses working with mothers in the childbearing phase of life are in a key position to incorporate women's psychosocial context into counseling about weight management during pregnancy and after childbirth. Through assessment, APNs would also identify those women most at risk for developing postpartum depressive symptomatology, and alterations in family and functional status related to negative feelings about weight gain in pregnancy. The purpose of this secondary analysis was to explore the relationship of weight gain during pregnancy to postpartum depressive symptoms, functional status, and family functioning.

Statement of Problem

The phenomenon of postpartum depression has increased over the last three decades. Three to six percent of childbearing women were reported to experience postpartum depression in the 1960's whereas current prevalence rates estimate as many as 20 percent are affected to some degree by symptoms of depression (Gitlin & Pasnau, 1989; Gotlib, Wiffen, Mount, Milner, & Gordy, 1989). The literature tends to imply that role mastery occurs simultaneously with recovery in the postpartum period at about 6 weeks (McVeigh, 1998). However, findings of a retrospective study indicated resumption of some role activities did not occur until 6 months postpartum (Tulman & Fawcett, 1988). Individual psychosocial variables such as confidence in one's ability to cope with motherhood and satisfaction with motherhood rival with physical energy in the postpartum

period (Tulman, Fawcett, Groblewski, & Silverman, 1990) as important determinants of functional status. Weight gain over the recommended guidelines could be a factor which interferes with the physical energy and psychological well being required to adjust to motherhood, yet the link between weight gain and functional status remains understudied. Likewise, emotional support from one's spouse is also linked to maternal role attainment (Mercer, 1986), and psychosocial well being (Beck, 1995). Women who are happy with their weight report better relationships with their significant others (Garner, 1997), possibly indicating that excessive weight gain in pregnancy could likely affect family functional status in the postpartum period. The link between weight gain in pregnancy and family functional status is not addressed in the literature. While this secondary analysis does not address etiology specifically, variables that may be affected by weight gain in pregnancy, such as postpartum depressive symptomatology, functional status and family functioning were explored.

Despite the increased prevalence of PPD and other postpartum difficulties, we are not much closer to identifying and defining variables that would predict depressive symptoms, alterations in functional status and alterations in family functioning in the postpartum period. There is limited research on the effect of maternal weight gain in relation to depressive symptoms, functional status, and family functioning in the postnatal period. Identifying weight gain as a variable that affects depressive symptomatology, functional status, and family functioning would allow future research to focus on interventions to promote well being in the childbearing woman, and healthy acceptance of inevitable weight gain. The research questions in this study were:

1) Is there an association between weight gain in pregnancy as recommended by the Institute of Medicine (IOM) and postpartum depressive symptomatology?
2) Is there an association between weight gain in pregnancy as recommended by IOM guidelines and functional status after childbirth?

3) Is there a relationship between weight gain in pregnancy as recommended by the IOM guidelines and family functioning after childbirth?

Conceptual Framework

The Women's Self-Definition In Adulthood Model

The conceptual model used in this study is The Women's Self-Definition in Adulthood Model developed by Peck (1986). The model is appropriate as it is based on research which emphasizes the importance of relationships in women's adult experiences. This is important because a woman's self definition, or the way she sees herself, affects the relationships she has with others in her life.

Peck's model consists of three main components: Social-historical time dimension, sphere of influence, and self-definition (see Figure 1). The model is cylinder-like and encompasses several layers. The flexible outer layer represents the social-historical time dimension within which a woman lives her adult life. This outer layer is perceived as the social, emotional, and political context within which a woman is allowed to define herself at any given point in time (Peck, 1986). The impact of a woman's social background is therefore directly related to her development of self knowledge and self worth. The outer layer represents the way a woman sees herself.

The next layer of the model, the sphere of influence, consists of the sum of the relationships in which a woman is involved (Peck, 1986). The sphere of influence includes relationships of varying degrees of closeness, with significant others, children, family, friends, and work relationships. The degree of satisfaction and sense of competence a woman receives from her interactions are the focus, rather than any particular state of being. A woman's interaction with groups outside of work and home also play a central part of her self definition.

Flexibility and elasticity are two central characteristics of the sphere of influence. Flexibility means that the sphere can expand to include new relationships and, conversely, it can contract to prevent new relationships (Peck, 1986). A woman may seek support

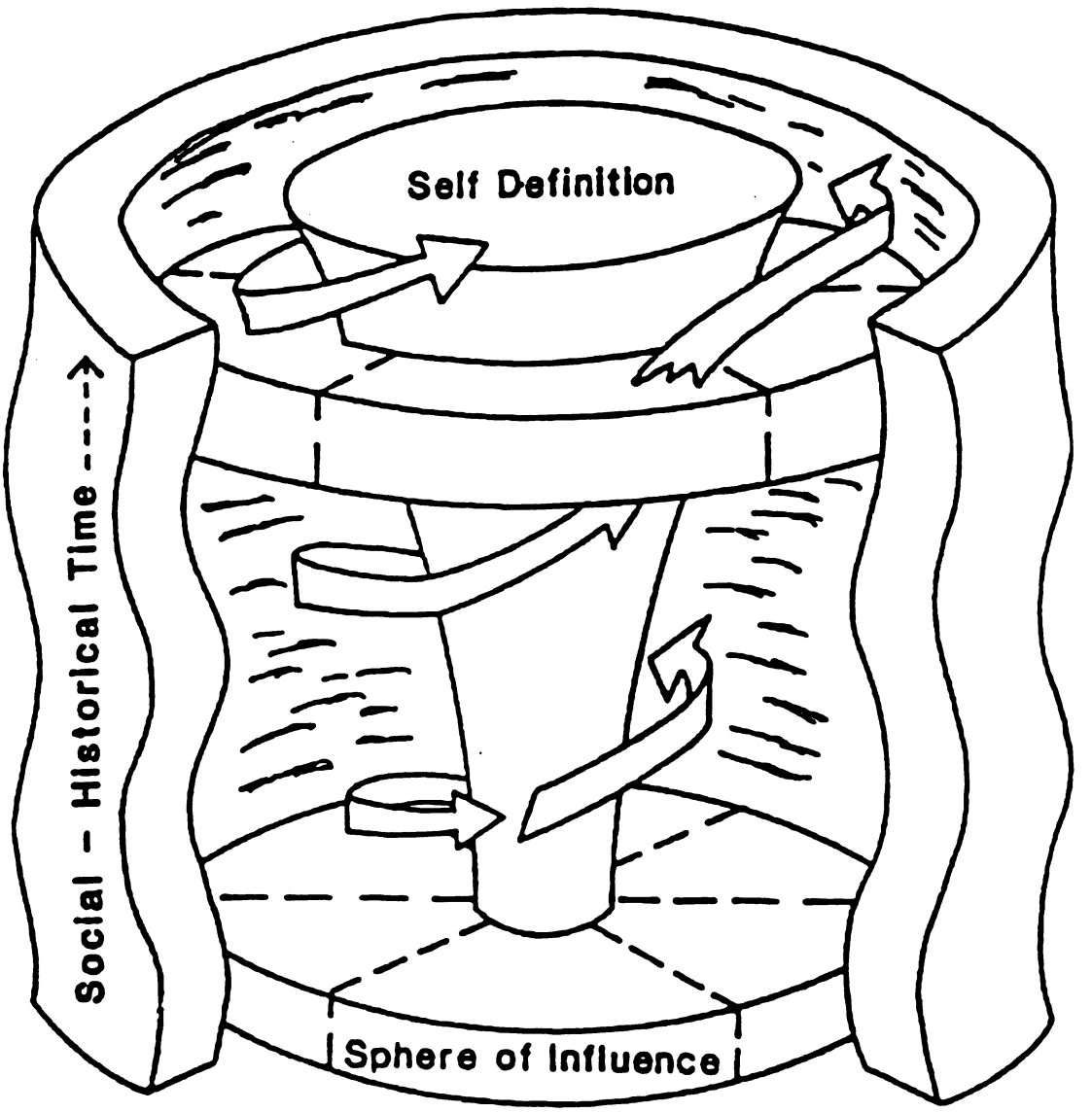

Figure 1. A model of women's self-definition in adulthood (Peck, 1986).

outside of her primary relationship for validation and self worth. The external support that a woman gets would then take up a larger part of the sphere than normal.

Elasticity refers to the degree to which particular relationships in the sphere are responsive to the woman's changing needs, motivations, and self-definition (Peck, 1986). Through elasticity, a woman can see the effects of her influence on the relationships close to her and also see herself as having some control over the extent to which others' needs and expectations affect her behavior and her ability to differentiate others' concerns from her own.

A sphere of influence that is flexible and contains key elastic interactions provides a woman with a strong sense of self worth and accomplishment. If a woman has a sphere consisting of inelastic relationships, an inflexible sphere can cause self doubt and possible emotional difficulties. An inelastic sphere of influence can then impact the relationship that a woman has with herself as well.

Emerging through the center of the sphere of influence is the woman's self definition. Self definition is directly related to the sum of the social-historical forces and on the elasticity and flexibility of the sphere of influence. The sphere of influence, therefore, is representative of the woman's self concept or self esteem.

Application of Model to Study

The concepts of this study were defined within the original model, and adapted as appropriate (see Figure 2). The concept of weight gain during pregnancy falls within the social-historical time dimension within which a woman lives her adult life. This outer layer of social historical time subsumes a measure of the impact of the woman's social background upon her development of self-knowledge. The outcome variable of family functioning is encompassed within the sphere of influence, or the sum of the relationships in which a woman is involved. Functional status and depressive symptomatology, both measured at the six week postpartum checkup, fall within the woman's self definition.

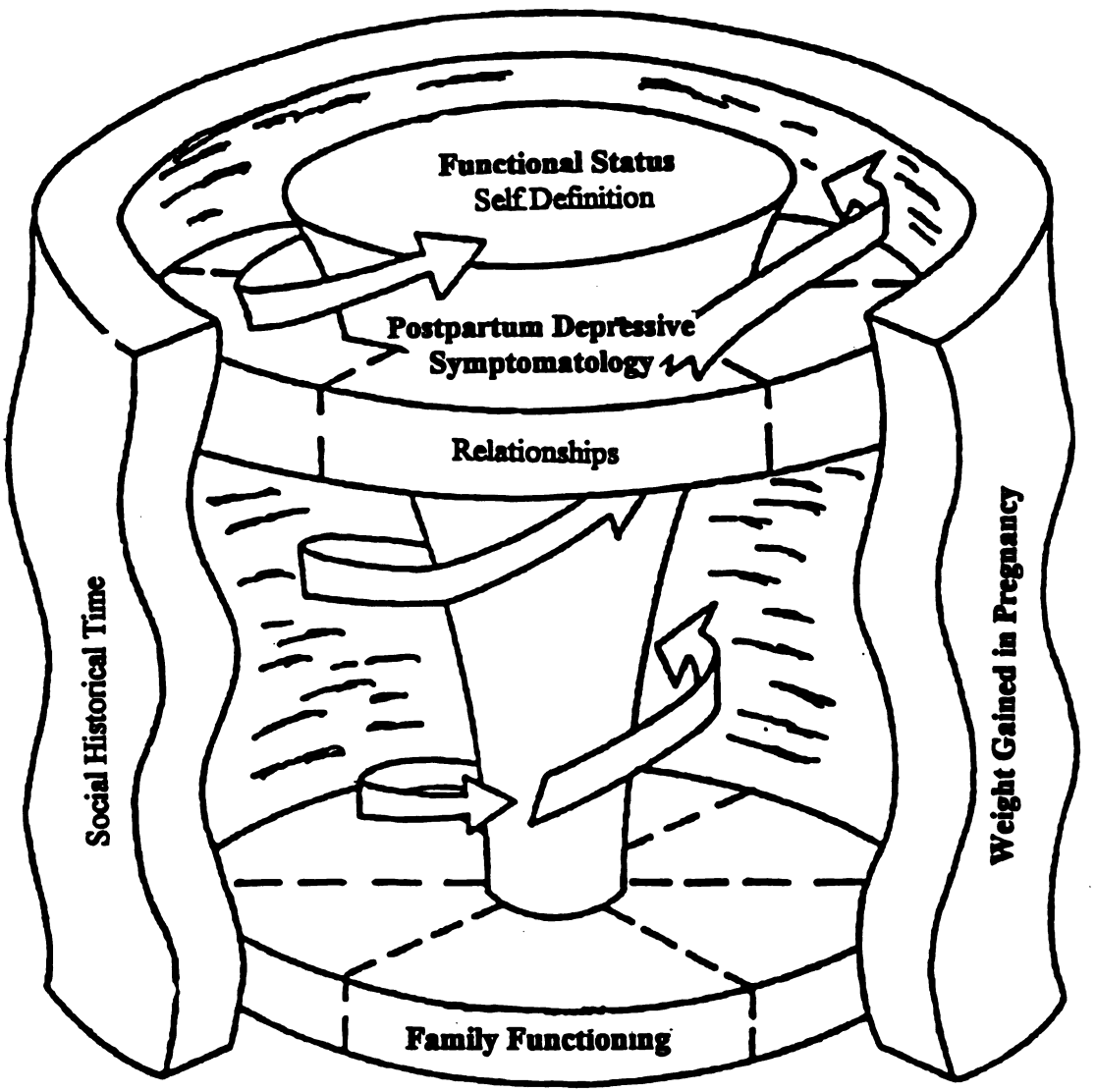

Figure 2. An adaptation of a model of women's self-definition in adulthood, using the concepts of weight gain, depressive symptomatology, functional status and family functioning (Peck, 1986).

Social - Historical Time

Weight Gain

A social-historical time dimension can be described as constraining and rigid or wide and more flexible. Timing of events has a direct impact on social development. The concept of weight gain in pregnancy during a period in history when the emphasis on physical fitness is so prominent portrays a more constraining, rigid layer, whereas in the past when there was less emphasis on aesthetic beauty and thinness a woman would have a wider, more flexible layer surrounding her self definition. Researchers indicate that body dissatisfaction is soaring among women (Garner, 1997; Walker, 1997). Body image is influenced by many factors such as mood and physical factors like body weight (Garner, 1997). The social-historical dimension subsumes chronological time, and thereby reflects Neugarten's ideas concerning the impact that the psychological experiencing of time in a social context has on development (Neugarten, 1968). Current weight gain standards as set by the IOM (1990) during pregnancy are classified according to Body Mass Index (weight in kg/meters squared). For example, underweight women (BMI < 19.8) are advised to gain 28-40 lb.; normal weight women (BMI 19.8-26), 25-35lbs; overweight women (BMI 26.1-29), 15-25lbs; and obese women (BMI >29), 15lbs (IOM, 1990).

Socially, women are pressured to be thin; however, during pregnancy, this pressure may be relaxed, but returns soon after delivery (Franko & Walton, 1993). This rigid, constraining, historical-time layer which surrounds a woman's self definition negatively affects the ability of a woman to develop self knowledge. The social historical time dimension of women experiencing postpartum difficulties can be described at constraining and constricting, allowing women fewer opportunities for role variation, (Peck, 1986) which may exaggerate postpartum depressive symptoms, slow return of functional status, and decrease satisfaction with family functioning as the woman may not be able to adapt to the role of motherhood as expected.

In this study, weight gain was defined as the social-historical piece of a physiological event which may impact roles and experiences, contributing to postpartum depressive symptomatology, alterations in functional status, and alterations in family functioning. The weight gain of pregnancy is a physiological aging process, and a woman's social development in a time when emphasis on thinness is so prominent it makes the social-historical time dimension more constraining and rigid.

Sphere of Influence

Family Functioning

The outcome variable of family functioning falls within the sphere of influence. The sphere is the sum of the relationships in which a woman is involved. Women with concerns about their weight have less marital satisfaction (Stunka, 1992) and more depression (Walker, 1997) in the postpartum period. This leads to a lack of flexibility in the sphere of influence, potentially limiting redistribution of emotional investment to people within the support system that would normally be called upon for the reaffirmation of the self in a time of need. Social support is thought to alleviate some of the difficulties experienced in the postpartum period (Crnic, Greenberg, Rugozin, Robinson, & Basham, 1983), with support from the spouse being particularity important (Wandersman, Wandersman, & Kahn, 1980).

Important areas of maternal adjustment in the postpartum related to family functioning are: quality of relationship with husband, perception of father's participation in child care, delivery experience, satisfaction with life, confidence in roles, or tasks, satisfaction with maternal role, and support in maternal role (Mercer, 1986; Smilkstein & Moore, 1988; Tulman et al., 1990). Women exhibiting depressive symptomatology related to weight gain in pregnancy experience a loss of libido, which affects their intimate relationships (Garner, 1997). Furthermore, due to the lack of flexibility, the sphere it is less likely to expand to include or gain new friendships or develop other channels of support.

Lack of elasticity in the sphere of influence causes a woman to have self doubt, and possible maladjustment (Peck, 1986). The relationships in a woman's sphere of influence are strained in the postpartum period, and are therefore, not responsive to a woman's changing needs, motivations, and self-definition. A woman's sphere that is inflexible does not allow for her to have influence or control over the extent to which others' needs and expectations affect her behavior and her ability to differentiate other's concerns from her own (Peck, 1986). The sum of an inflexible, non-elastic sphere is an alteration in a woman's self definition.

Family functioning in this study was defined as the sum of relationships in a woman's sphere of influence which are viewed as nurturing and supportive and impact self definition after pregnancy. The degree of satisfaction a woman receives from her interaction with others ultimately determines level of family functioning. Relationships that are flexible, and elastic in character will have higher levels of functioning, whereas, those relationships that are inflexible and non-elastic will have lower levels of functioning in the postnatal period.

Self Definition

The outcome variables, depressive symptomatology and functional status, fall within the woman's self definition, being heavily dependent on the sum of the social-historical forces and on the elasticity and flexibility of the sphere of influence. In a study by Walker (1997), higher depressive symptomatology in the postpartum period was shown to be present in women who historically gained more than the recommended weight for their BMI in pregnancy, which would possibly indicate difficulty in a woman's self definition.

Postpartum Depressive Symptomatology

Postpartum depressive symptomatology fits within the dimension of self definition. Self definition of the childbearing woman may be disrupted in the post partum period as

symptoms of depression affect a woman's ability to bond with the infant and develop the role of motherhood (Phillips & O'Hara, 1991).

Women's experiences with mood and emotional changes during childbearing are frequently reduced to fit an identifiable diagnostic category of depression (major or minor depression, mild moderate, or severe depression). A major depressive episode is described as an abnormal emotional state characterized by exaggerated feelings of sadness, melancholy, dejection, worthlessness, emptiness and hopelessness that are inappropriate and out of proportion to reality (American Psychiatric Association, 1994). Depressive symptoms for clinical depression are similar to those experienced by women in the post-partum period. Identified symptoms that warrant investigation by the professional are: change in appetite or weight; insomnia or hypersomnia; psychomotor agitation; loss of interest or pleasure in usual activities; decreased libido; loss of energy or fatigue; feelings of worthlessness, self-reproach, or excessive or inappropriate guilty feelings; complains or evidence of diminished ability to concentrate, such as slowed thinking or indecisiveness; and/or recurrent thoughts of death, suicidal ideation, wishes to be dead or suicide attempt (Yawn, 1996). The following cluster of symptoms are more likely to be associated with PPD than with other depressions: feeling worse in the evenings, difficulty falling asleep, irritability, phobias, and anxiety (Horowitz et al., 1995; Jermain, 1992; Pitt, 1968). Postpartum depression is distinguished from major depression by the onset after childbirth.

Classifications found in the literature in relation to post partum depressive symtomatology are most commonly classified into three separate illnesses. The three illnesses are: postpartum or maternity blues, postpartum depression, and postpartum psychosis.

"Postpartum depression" differs from "postpartum blues" in that the postpartum blues are transient emotional disturbances, typically occurring on or around the 4th or 5th day postpartum and usually last for a few hours or, at most, 1-2 days (Hansen, 1991;

Kumar, 1991). Studies estimate that as many as 75% of all women suffer from the maternity blues after delivery. By definition, the blues are dysphoric reactions, although they may be intermingled with normal feeling of happiness and achievement that follow birth (Kumar, 1991). Due to the high prevalence of the maternity blues, along with the mildness and brevity, they are considered "normal" in both the statistical and clinical sense (Kumar, 1991). Following delivery, a woman may seek support from her primary partner, or those support persons closest to her for validation. The flexibility and elasticity of the sphere of influence generally contract and expand to allow a woman to recover from the blues.

Postpartum depression is most commonly understood to be an affective disturbance characterized by dysphoric mood, anxiety, compulsive thoughts, despair, feeling of inadequacy, inability to cope, fearfulness, loss of libido, fatigue, decreased appetite, dependency, and irrational fears about the baby's or one's own health (Horowitz et al., 1995). PPD may begin within the first weeks after delivery and persist for months (Martell, 1990). Women feel inadequate and unable to cope. They do not enjoy life, tend to withdraw, and may complain of fatigue (Martell, 1990; Yawn, 1996).

Postpartum psychosis is uncommon, and most severe, affecting 1 in 500 to 1 in 1,000 pregnancies. It is more common in primiparous women and may be associated with a history of previous major psychotic illness. Onset may be as early as the first days postpartum and is almost always within the first three months postpartum. Once recognized, most postpartum psychoses require hospitalization and medications, such as major tranquilizers. Treatment may need to extend over years to a lifetime, and recurrences with future pregnancies may be as high as twenty percent (Yawn, 1996). Postpartum psychosis is characterized by extremely altered perceptions of reality and is much more severe than postpartum depression (Martell, 1990).

The self definition of a woman after childbirth can be disrupted. The flexibility characteristic of the sphere of influence contracts to prevent new relationships, preventing

a woman from seeking help for depressive symptomatology. A woman experiencing post partum blues following delivery may seek support from her primary partner, or those support persons closest to her for validation. She is able to redistribute her emotional involvement with each relationship in order to receive support and reaffirmation of the self when necessary. In contrast, women experiencing post partum depressive symtomatology may be unable to redistribute emotional investment, leading to a lack of well-being and a blurred self definition (Peck, 1986).

For this study, postpartum depressive symptomatology was defined as an affective disturbance after childbirth characterized by feelings of inadequacy, which leads to an inability to effectively cope in the post partum period. Women may feel worse in the evenings, have difficulties falling asleep, be irritable, and have unrealistic levels of anxiety. A woman with postpartum depressive symptoms is not able to go through the process of the spiraling motion characteristic of self definition, resulting in an inability to psychologically separate from relationships and see herself as a sole mean to gaining self knowledge. This results in a blurred self definition, or depressive symptomatology.

Functional Status

The process of self-definition is portrayed as occurring by means of a spiraling motion, suggesting that a woman is engaged in a consent process of monitoring her own growth and change (Peck, 1986). The need to modulate personal growth against any possible negative effects is central in a woman's self definition, and affects her ability to function on a day to day basis. The time following childbirth is crucial to the healthy development of not only the infant but the mother. This period of profound change related to the weight gain of pregnancy can be hindered if the weight affects a woman's emotional or physical well being by decreasing functional status. Demands such as housework, infant care, and taking care of the family can seem overwhelming in the postpartum period for any new mother, and devastating for those with decreased functional capabilities related to the additional weight gained during pregnancy. The

postpartum period is normally a time of adjustment, with the new mother experiencing fatigue as a common occurrence. However, for most women, fatigue is generally a temporary problem that disappears with rest. Fatigue is an overwhelming symptom for a woman with depression (Smith-Hanrahan & Deblois, 1995), and negatively affects her ability to function. Fatigue may be exacerbated by weight gained over the recommended guidelines, further decreasing functional capabilities and role attainment.

For this study, functional status was defined as the ability of a woman to function in the postpartum period related to the psychological and physiological effects of the weight gain of pregnancy. Functional status is the action component of roles, such as a woman's ability to assume infant care responsibilities and resume her normal activities, and the ability to perform behavior associated with roles. A woman who feels good about herself, and can find within herself a means of gaining self knowledge will attain higher levels of functioning, whereas a woman with emotional difficulties related to the weight gain of pregnancy will be unable to psychologically separate herself from dependence on other relationships as a sole means of self knowledge and score lower on the functional status indices.

Summary

Peck's model of Women's Self-Definition provides an appropriate framework to allow the APN to assess childbearing women for the prevalence of PPD and alterations in functional status and family functioning early in the weeks following delivery. By using this model the APN can comprehensively understand and develop interventions to treat women experiencing post-partum depressive symptomatology. The Model of Women's Adult Self-Definition can be implemented in practice by the APN as a framework for assessment, diagnosis, treatment, and intervention. By utilizing this model an understanding of the childbearing woman's social-historical time dimension (weight gain in pregnancy), sphere of influence (family functioning), and level of self-definition (functional status and postpartum depressive symptomatology) is possible in the postpartum period.

Review of the Literature

A review of the literature was done in an attempt to identify relationships between weight gain in pregnancy and postpartum depressive symptomatology, functional status, and family functioning. Much literature exists in relation to postpartum depression and post partum functional difficulties, however little attention has been given to how women feel about increased weight after childbirth (Walker, 1998). Postpartum depression was first described in the literature at least 200 years ago (Kumar, 1991). Recent literature has briefly looked at body image and weight gain in pregnancy as potential areas to focus on when attempting to describe depressive symptomatology. However, there were no studies found specifically attempting to describe the correlation between excessive weight gain to decreased functional status and/or alterations in family functioning in the postnatal period. The literature review for this paper begins with empirical studies on weight gain and its association with postpartum depressive symptomatology; studies about family functioning and personal functioning in the postpartum period are then discussed, and finally, the literature review concludes with a review of empirical studies related to overweight non-pregnant population and functional status.

Research by Walker (1997) sought to determine whether or not psychosocial context was related to weight status one year after childbirth. This was one of the few studies found in the literature that investigated weight gain and postpartum depressive symptomatology. The survey provided data on life-event stress, social support, and depressive symptoms and three weight variables: body mass index, weight gain, and weight related distress. Of the 82 women, 32 (39%) reported gains of greater than 5 kg and 50 (34%) met the criterion for high depressive symptoms. Higher weight gain was related to low social support, low income, and high depressive symptoms. Women with retention of weight greater than 5 kg reported high depressive symptoms (53% vs. 28%) more often than women with less than 5 kg. Women who reported lowered self-esteem because of weight also had higher depressive symptoms, body mass indices, and weight

gains than women with increased of unaffected self-esteem. Higher pre pregnancy body mass index, larger gestational weight gain, higher current postpartum body mass index, less healthy lifestyle, and greater body image dissatisfaction were associated with significantly more dissatisfied/distressed feelings about weight. A more recent study by Walker (1998) determined that higher pre pregnancy body mass index, larger gestational weight gain, higher current postpartum body mass index, less healthy lifestyle, and greater body image dissatisfaction were all associated significantly with more dissatisfied or distressed feelings about weight.

Affonso and Mayberry (1990) and Kline, Martin, and Deyo (1998) identified body image related to weight gain in pregnancy as one of the most frequent stressors identified in the postpartum period. Women's body attitudes tend to become more negative during pregnancy (Drake, Verhulst, Fawcett, & Barger, 1988), and shift to more positive postpartum (Drake et al., 1988; Strang & Sullivan, 1985), however, attitudes toward the body postpartum are still less favorable than before pregnancy (Drake et al., 1988; Strang & Sullivan, 1985; Walker, 1998).

Jenkin and Tiggemann (1997) did a prospective investigation of the effect of weight retained after pregnancy to weight satisfaction, self esteem, and depressive effect, using the framework provided by expectancy-value-theory. On average, the women were heavier four weeks after having the baby than they were prior to becoming pregnant, and were less satisfied with their post-natal weight and shape. They were also slightly heavier than they had anticipated, particularly in the case of younger women. Actual post-natal weight proved the most important predictor of psychological well-being following birth.

Research revealed a profound and obvious change in the form and appearance of the woman's body during pregnancy and the postpartum with a linking to a change in body image (Fisher, 1973; McConnell & Daston, 1961; Walker, 1998). Literature contains studies suggesting that women may perceive less pressure on them to maintain and achieve a thin figure while pregnant (Franko & Walton, 1993). Wiles (1992) found

overweight women to have varying changes in their body images while pregnant, although they felt their obesity was more socially acceptable while they were pregnant.

Women who are overweight before pregnancy are more likely to have a positive change in body image when they are at more than 30 weeks' gestation, while women who are normal weight before pregnancy are more likely to have a negative change (Fox & Yamaguchi, 1997). However, overweight women have more negative body shape concerns than normal weight women (Copper, DuBard, Goldenberg, & Oweis, 1995; Fox & Yamaguchi 1997). Thinner women tend to have a positive attitude toward gaining weight, while obese women have a negative attitude. However, a positive attitude about weight gain does not necessarily predict appropriate weight gain across BMI groups (Copper et al.,1995). In a similar investigation, Davies and Wardle (1994) evaluated body image, body satisfaction, and dieting practices in pregnancy, expecting that social pressures for thinness might be relaxed due to the pregnancy. They found that pregnant women had lower scores on the drive for thinness subscale of the eating disorder inventory and, when body mass index was controlled, they had significantly lower body dissatisfaction scale scores than non-pregnant women. They also rated themselves as less overweight (in terms of body size), used less dietary restraint, and had less frequent attempts to lose weight than the non pregnant group (Davies & Wardle, 1994).

Abraham, King, and Llewellyn-Jones (1994) studied the eating behavior and attitudes to body weight of 100 primiparous women 3 days postpartum and found that 41% reported weight control problems, while 20% considered their weight and eating problems to be greater during pregnancy than at any previous time in their lives. The researchers used an "eating behavior" questionnaire which sought out information about the women's eating behavior, body image, and concern about weight before and during pregnancy. Fairburn and Welch (1990) similarly found that out of 50 women they included in their study attempting to investigate body image and pregnancy that 6% dieted

through pregnancy, with 26% overeating; and that 24% felt distressed about weight gain in pregnancy.

Women who gained more than 35 pounds were more than twice as likely to retain 20 or more pounds postpartum than were those whose weight gains were within the Institute of Medicine (IOM) guideline of 25-35 pounds (Parker & Abrams, 1992). A study by Keppel and Taffel (1993) specifically examined the relationship between the IOM prenatal weight-gain guidelines and post partum weight retention for underweight, normal weight, and overweight mothers. Women who gained more than the BMI-specific IOM weight-gain recommendations retained a median of 5.6 pounds postpartum, and had more depressive symptomatology (Parker, 1994) whereas those whose gains were within the recommended range retained only 2.2 pounds and had less depressive symptomatology (Keppel & Taffel, 1993), indicating that there is some sort of protection against retained weight after pregnancy if women gain within their BMI specific guidelines.

Richardson (1996) found a correlation between women with preterm labor and body image disorganization. She found that women with preterm labor have a greater difficulty assimilating and accommodating to the body changes of pregnancy, with preterm women being significantly worried with or distressed about their body changes. The tolerance for body adjustments for the first 26 weeks of pregnancy was constrained and women had a less flexible comfort zone related to tolerable alterations of body change (Richardson, 1996).

In a large survey by Garner (1997), of 3,452 women and 548 men, it was found that body dissatisfaction is higher among women and men than it ever has been before. Sixty two percent of women between the ages of 13-19 were unhappy with their weight and 67% of women over age 30 were unhappy with their weight. Fifteen percent of all women surveyed would give up 5 years or more of their lives to be at their ideal weight. Middleman et al. (1988) similarly found that in a study of 3,055 students with a mean age of 16, 61.5% of females were trying to lose weight or had a low body image. Likewise,

Stevens and Tiggemann (1998) used Fallon and Rozlin's set of 9 silhouette drawings to assess body figure preferences in a non pregnant population. Women of all ages (18 -59) rated their current figure as significantly larger than their ideal figure, indicating the presence of body dissatisfaction across the life span. Stowers and Durm (1996) found positive correlations between self concept and body image, with more obese people having a lower self concept, and women being significantly less satisfied with their body image as a whole.

There was limited research found describing the impact of weight gain in the postpartum population to alterations in family and/or personal functioning. In general, mothers frequently report the period after giving birth as a time of great personal and family stress, however, functional status after childbirth has been investigated only recently in the literature (McVeigh, 1997), with no studies identified that specifically look at weight gain and how it affects functional status in the postpartum period. Tulman et al. (1990) indicate that women are not fully recovered from childbirth until three to six months after delivery. At one month postpartum, mothers are not yet functioning at their pre-pregnant levels, with as many as 83% sitting most of the day, 38% not getting dressed, and 65% not accomplishing as much as usual (Fishbein & Burggraf, 1998; McVeigh, 1998; Tulman et al., 1990). At one month postpartum women participate in social activities with family (82%), and friends (66%), but few had resumed community service involvement (15%), or other professional organizations (7%), religious activities (27%), and/or social events/clubs (25%) (Fishbein & Burggraf, 1998). Activities most commonly consuming the time of new mothers were feeding, giving baths, changing diapers and clothes, and playing (Fishbein & Burggraf, 1998; Mcveigh, 1998; Tulman et al., 1990). Studies in the literature measuring functional status most commonly use the Inventory of Functional Status After Childbirth (IFSAC). Researchers found that by using this scale to assess functional status, the subscales of household activities, social activities, self care activities, and return to work activities increase when measured at 6 weeks, 3

months, an 6 months postpartum (Fishbein & Burggraf, 1997; McVeigh, 1997; 1998; Mercer & Ferketich, 1995; Tulman et al., 1990). The subscale of infant care has been reported to decrease within the same time frame (McVeigh, 1997).

Smith-Hanrahan and Deblois (1995) found the most common complaint affecting postpartum functional ability was fatigue (25% at discharge, 31% at 1 week, and 19% at 6 weeks postpartum). In a recent study by Sampselle (1999) new mothers who began exercising in the postpartum period were found to lose more weight, be more socially active, experience less fatigue and feel better about themselves than women who did not exercise after delivery. Women exercising in the postpartum period retained 8.6 pounds compared to 11.3 pounds retained by non exercising women 6 weeks after delivery. Exercise, and less weight retention was associated with increased functional status and psychosocial well being.

Midmer (1995) found that prenatal parenting education significantly decreased anxiety, increased martial satisfaction, and facilitated greater postpartum adjustment in 70 primiparous couples. Prenatal parenting education included information on body image changes and weight loss expectations in the postpartum period

As evidenced by review of the literature, many variables have been analyzed and identified to predict the prevalence of postpartum depression in childbearing women. It is unlikely that one single variable exists that would definitively predict postpartum depressive symptomatology, as human beings are multidimensional in nature. To date, no studies have specifically examined the weight gain of pregnancy to depressive symptomatology, altered functional status, and/or altered family functioning. This weight gain, although natural and expected, may cause body image changes that can be profound and unsettling for some women. Therefore, it is imperative to investigate the relationship between the weight gain of pregnancy and postpartum depression.

Critique of the Literature

As indicated in the literature review, studies exploring the weight changes of pregnancy exist, however, there is a lack of literature describing the effect of weight gain to postpartum depressive symptomatology, functional status and family functioning. The studies investigating the relationship between various aspects of maternal body change and weight gain in pregnancy employ a large number of different instruments, some developed specifically by the researcher. The figure rating scale, and the perceived size of body and body parts scale (Davies & Wardle, 1994); the eating behavior scale (Abraham et al., 1994) and the pregnancy and weight gain attitude scale (Copper et al., 1995) are examples of these single-use measurement tools which may account for variability in findings between weight gain and body image to depressive symptoms in the postpartum population. Studies investigating the relationship between weight gain and postpartum depressive symptomatology also employ single measurement tools or questionnaires addressing emotional reactions to weight (Walker, 1997, 1998), making it difficult to generalize findings. Studies of body image and depression in the non-pregnant, non-postpartum population tended to use scales with established validity and reliability such as the Beck Depression Inventory and the Tennessee Self-Concept Scale (Stowers & Durm,1996).

Most studies use questionnaires or interviews, however, the authors usually did not include a copy of the tool used, which prevents the reader from easily duplicating the study, and there was a general lack of information regarding the questions and the reliability and validity of the instruments (Abraham et al., 1994; Davies & Wardle, 1994: Walker, 1997, 1998). Most studies included complete information regarding statistical analysis in the data analysis sections.

Many studies did not indicate demographic makeup of the population that might be crucial to control for when investigating weight distress to depressive symptomatology . Variables thought to contribute to postpartum depressive symptomatology commonly not

addressed in the studies were marital status (Fox & Yamaguchi, 1997; Kline et al., 1998; Walker, 1998), educational level (Copper et al., 1995), socio-economical status (Abraham et al., 1994), number of previous pregnancies (Abraham et al., 1994), and whether or not the pregnancy was planned (Davies & Wardle, 1994; Walker, 1997, 1998). Previous history of eating disorders and/or depression was usually not assessed (Garner, 1997; Middleman et al., 1988; Richardson, 1996; Walker, 1997, 1988). Studies mostly employed convenience sampling (Davies & Wardle, 1994; Fox & Yamaguchi, 1997; Richardson, 1996; Walker, 1997, 1998) which lacks ethnic and demographic diversity to limit the generalization of the results to a larger population.

There is also a wide variation to when body image and depressive symptomatology were assessed. This ranges from prenatal (Davies & Wardle, 1994; Fox & Yamaguchi, 1997) to 3 days postpartum (Abraham et al., 1994), to 6 weeks postpartum (Sampselle, 1999) to 1 year postpartum (Walker, 1997). Inconsistencies in timing of assessment of body image and depression make it difficult to generalize findings, as body image changes drastically throughout the childbearing experience, and some depressive symptomatology is expected in the postpartum period, manifested as maternity blues which typically occur 4-5 days postpartum, usually last for a few hours or, at most, 1-2 days (Hansen, 1991; Kumar, 1991), effect as many as 75% of all women, and are considered "normal" in both the statistical and clinical sense (Kumar, 1991).

Most studies had an adequate sample size, with a wide range in variability from 30 to 2,245 subjects (Abraham et al., 1994) which were adequate for the variables discussed. Larger sample size studies tended to use questionnaires and chart review during prenatal and/or postpartum periods (Affonso & Mayberry, 1990), while the smaller studies most commonly used personal interviews (Richardson, 1996; Walker, 1997). Large studies in the non pregnant population tended to use questionnaires or surveys (Garner, 1997; Middleman et al., 1988).

Literature addressing functional status in the postpartum period tended to use measures with established reliability and validity (Fishbein & Burggraf, 1997; McVeigh, 1997, 1998; Mercer & Ferketich, 1995; Tulman et al., 1990), and adequate sample size (79 to several hundred subjects) (Fishbein & Burggraf, 1997; McVeigh, 1997, 1998; Smith-Hanrahan & Deblois, 1998). However, most samples were convenience samples (Fishbein & Burggraf, 1997; McVeigh, 1997, 1998), which lack ethnic diversity. Functional status was not viewed specifically within the realm of postpartum weight gain in any of the studies found, however one large study of 1,003 women (Sampselle, 1999) briefly discussed the impact of exercise on postpartum functioning and well being. This study was a convenience sample, utilizing a questionnaire developed by the researcher without established reliability or validity, and was not included in the description of the study.

As evidenced by the literature review further research related to weight gain in pregnancy is needed to provide women with sound information regarding their journey through pregnancy and the effects of weight gain on depressive symptoms, functional status and family functioning. This study adds to the knowledge about weight gain and its relationship to postpartum depressive symptomatology, functional status and family functioning in the period following childbirth which may lead to the development of PPD, and alterations in functional status and family functioning.

Methods

Design

This study was a secondary analysis and descriptive study of low-income pregnant women. It was designed to describe how varying degrees of weight gain during pregnancy affect postpartum symptomatology, family functioning and personal functioning after childbirth. The data were obtained from a study originally done by Schiffman and Omar (1994) which examined factors related to the adequacy of prenatal care and pregnancy outcomes in a not-for-profit center serving low-income women in a

southeastern Michigan community (Schiffman & Omar, 1994). The original study utilized prospective surveys and chart reviews. Instruments were administered at the first or second prenatal visit and at the six week postpartum checkup.

Sample

The sample consisted of 65 pregnant female subjects who completed the instruments for the original study at the postnatal visit. In the original study there were 172 subjects: 132 from the Center and 40 from other provider sources in the community offering pre-natal and post-natal care.

Subjects were very similar in demographic characteristics. Generally the subjects were in their early twenties, single, Caucasian, with very few having greater than a high school education. Most had one previous pregnancy, with a mean of 2.5.

Operational Definitions

The variables in this study include weight gain, postpartum depressive symptomatology, functional status, and family functioning.

Weight gain

Maternal BMI was calculated from information obtained at the first prenatal visit (BMI = weight in kg/meters squared). Body Mass Index calculations were possible for 62 women. Women were classified into weight gain categories defined by the IOM (1990), as follows: underweight (<19.8), normal weight (19.8-26), overweight (26.1-29), or obese (>29). In this population (N = 62), 14 were underweight (22.6%), 24 normal weight (38.7), 7 overweight (11.3), and 17 obese (27.4).

Once BMI was calculated, women were placed into recommended weight gain categories, according to guidelines proposed by the IOM (1990): 28-40lb, 25-35lb, 15-25lb, and 15lb., for each BMI category respectively. Women were then further defined by adequacy groups as gaining below, within, or above the recommended guidelines. Data describing the adequacy groups was available for 59 women (n = 59). In this sample 7

women were below recommended (11.9%), 15 within recommended (25.4%), and 37 above recommended (62.7%).

Depressive Symptomatology in the Postpartum Period

Depressive symptoms in the postpartum period were operationalized by the CES-D (Radloff, 1977; Radloff & Locke, 1986) (see Appendix A). Subjects were asked to identify depressive symptoms at the first postpartum visit. Reverse scoring of the four positive affect questions was done in order to minimize bias tendencies towards response sets. The range, or possible scores are 0-60 with higher scores reflecting greater depressive symptomatology.

Family Functioning

Family functioning was operationalized by the Family APGAR (Smilkstein, 1978) (see Appendix B). Respondents were asked to rate their satisfaction with five items (adaptation, partnership, growth, affection, and resolve) ranging from 0 to 4. This self report instrument was administered at the postpartum visit. The total mean score from these five items is calculated, and satisfaction with family functioning is determined with lower scores indicating low satisfaction and higher scores indicating higher satisfaction.

Functional Status Postpartum

Functional status in the period after childbirth was operationalized by the Inventory of Functional Status after Childbirth (IFSAC) (Fawcett et al., 1988) (see Appendix C). Respondents were asked to complete the 36-item self report questionnaire regarding household activities, social and community activities, infant care responsibilities, self-care activities, and occupational activities at the postnatal visit. The possible range of scores for each subscale and total IFSAC is 1 to 4 with the higher score demonstrating greater functioning after childbirth. This study focused on the total mean IFSAC score rather than the subscale scores.

Data Collection Instruments

Center for Epidemiological Studies Depression (CES-D) Scale

The Center for Epidemiological Studies Depression Scale (CES-D) is a 20 item self-report scale used to assess depressive symptomatology in the general population (Rabkin & Klein, 1987). There are sixteen items assessing the following areas of depressive symptomatology: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance. Possible responses range from (0) rarely to (3) most of the time and assess current depression, as well as how often symptoms occurred within the last week prior to administration . Average scores range from 7.8 to 9.9 (Radloff & Locke, 1986), with a score of 16 or greater generally considered as evidence of possible depression (Horowitz et al., 1995). Researchers using the CES-D with samples of pregnant and postpartum women have reported means of 8.5 and 8.8 (Horowitz et al., 1995) and 5.3 and 6.3 respectively (Weissman, Sholomskas, Pottenger, Prusoff & Locke, 1977).

Evidence of content, concurrent, and discriminate validity of the tool have been demonstrated (Weissman et al,1977). Internal consistency reliability coefficients have been reported (alpha >.85) across varying age, sex, and racial groups (Barnes & Prosen, 1984; Hall, Gurley, Sachs, & Kryscio, 1991; Jones-Webb & Snowden, 1993; Radloff, 1977; Radloff & Locke, 1986). Cronbach's alpha coefficients for the original study were .87 prenatally, and .92 postnatally (Schiffman & Omar, 1994).

Family APGAR Questionnaire

The Family APGAR Questionnaire is a five item screening measure designed to reflect an individual's view of the functional state of his or her family. Degree of functioning is represented by self-report of satisfaction with family relationships. Respondents rate their satisfaction with family as (5) always satisfied, (4) almost always, (3) some of the time, (2) hardly ever, or (1) never. The total score is the sum of the five items with higher scores reflecting more satisfaction (Smilkstein, 1978).

The five dimensions of family functioning measured are: adaptation (satisfaction with family as a resource), partnership (satisfaction with communication style), growth (satisfaction with the family's response to change), affection (satisfaction with the emotional response), and resolve (satisfaction with the way time is shared) (Smilkstein & Moore, 1988).

Construct validity was established by comparison of APGAR to the Family Function Index (Pless & Satterwhite, 1973). There was a strong correlation of $r = .80$ between the APGAR and the Family Function Index and a moderate correlation of $r = .64$ between the APGAR and family evaluation by clinical therapists (Good, Smilkstein, Good, Shafer, & Aaron, 1979).

The Family APGAR Questionnaire has been used successfully in general medical clinics, with children, college students, and psychiatric patient groups and across different cultural groups. Reliability testing for internal consistency was reported as a Cronbach's alpha coefficient of .86 (Smilkstein, Ashworth, & Montano 1982). For the original project the Cronbach's alpha for the prenatal administration was .88 and for the postpartum administration was .91 (Schiffman & Omar, 1994). Total adjusted score on the APGAR can be one to five, with higher scores indicating higher levels of family satisfaction.

Inventory of Functional Status After Childbirth (IFSAC)

The IFSAC was developed by Fawcett, Tulman, and Meyers (1988) to measure women's. functioning level following childbirth and comprises a 36-item self report questionnaire which includes the following five subscales: household activities, social and community activities, infant care responsibilities, self care activities, and occupational activities. Each item is rated on a four-point scale. For items on self-care activities and occupational activities, response choices range from (1) never to (4) all the time while responses to items on the infant care responsibilities, household activities, and social and community activities subscales are rated from (1) not at all to (4) fully. Some items are

reversed scored to avoid response bias, with answered item responses calculated into a mean for each subscale and a total score. The possible range of scores for each subscale and total IFSAC is 1 to 4 with the higher score demonstrating greater functioning after childbirth. Several studies of women, ranging from 3 weeks to six months postpartum have demonstrated the sound psychometric properties of the IFSAC (Fawcett et al., 1988; Tulman et al., 1990).

Internal consistency was determined by Fawcett et al. (1988) in a sample of 76 women completing the IFSAC at the six and ten weeks postpartum. Cronbach's alpha internal consistency reliability coefficients ranged from .56 to .98. Using a sample of 18 women over a four to seven day interval, test-retest reliability was .86 for the total IFSAC while the subscales ranged from .48 to .93. Cronbach's alpha coefficients for the original project were: .90 for household activities, .76 for social and community activities, .95 for infant care activities, .67 for self-care activities, .85 for occupational activities, and .88 for the total scale (Schiffman & Omar, 1994). Scores could be one to five, with a higher score indicating higher levels of functioning.

Validity was established by Fawcett et al., (1988) using Popham's (1978) average congruency procedure. A panel of women who were professionally educated and experienced childbirth within one year prior to questionnaire rating, served as judges in two rounds. The first round achieved 84.4 percent level of agreement. Revision of some items in the second round achieved 96.7 percent level of agreement for all questionnaire items.

Protection of Human Rights

Approval was obtained from Michigan State University Committee on Research Involving Human Subjects for the original study and for this secondary analysis (see Appendix E). Confidentiality was maintained by allowing only the researcher and the thesis chair to review the data. Subjects were identified by code numbers only, preventing access to distinguishing information.

Data Analysis

The data was analyzed using the Statistical SPSS Program. The sample population was described demographically. Women were placed into three adequacy groups for weight gain according to BMI group. Women were described as gaining below recommended, within recommended, or above recommended, defined by the IOM (1990).

Each of the three research questions were answered using a one way analysis of the variance (ANOVA) with weight gain as the independent variable to depressive symptomatology, functional status, and family functioning, as separate dependent variables.

Limitations of the study

The following limitations were identified.

1. The use of previously collected data limits the interpretation of the variables in this study. Additional data on how women felt about their weight and body image change in pregnancy in relation to postpartum depressive symptomatology would add depth to the association between weight gain and postpartum depressive symptomatology. Also needed would be information about history of previous eating disorders in the subjects.
2. The use of convenience sampling and lack of ethnic and demographic diversity limits the generalization of the results to a larger population. The majority of the sample population were young, single mothers with socio-economical difficulties, and limited post high school education.
3. The small size of the sample population limits generalization to the population.
4. Women who did not return for the follow up visit may have different results than the women who did. Self selected individuals who did not return for follow up may have exhibited post partum depressive symptomatology, or an alteration in functional status, preventing them from returning for the postpartum visit.

Assumptions

1. It is assumed that the answers to the questionnaires are truthful, without input from others.
2. It is assumed that there were no errors in data recording.

Results

Sample

The sample consisted of 65 women who returned for their follow up visit. However, data in relation to BMI categories was only available for 59 subjects. On average, the subjects (n = 65) were in their early twenties (M=21.67, SD=4.92), were single, Caucasian with only a few having more than a high school education. About half of the sample had at least one prior pregnancy, with a mean of approximately 2 pregnancies (SD = 1.35). Most of the women were in the above recommended weight gain by BMI category (Table 1).

Answers to Research Questions

Research Question 1. Is there an association between weight gain in pregnancy and postpartum depressive symptomatology?

The first question was analyzed by using analysis of the variance to determine if there was any significant effect of weight gain by adequacy group on total score for depressive symptomatology in the postpartum period. The means and standard deviations for the three groups are represented in Table 2. The three groups all had mean scores above 16, which is the cutoff score to indicate depressive symptomatology. The group exhibiting the most depressive symptomatology was the group within the recommended weight guidelines. Those gaining below the recommended guidelines exhibited the least depressive symptomatology. There were no significant differences between the groups (Table 3) indicating that there were moderate levels of depressive symptomatology regardless of weight gain.

Table 1.

Frequency and Percent of Sample Characteristics

Characteristic	Frequency	Valid Percent
Age		
<19	22	34.8
20-30	35	55.6
>30	6	9.6
Educational Level		
Less Than High School	27	43.5
High School Diploma/GED	28	45.2
Some College	7	11.3
Marital Status		
Single	44	69.8
Married/Cohabiting	11	17.5
Separated/Divorce	8	12.7
Race		
Caucasian	50	79.4
African American	12	19
Hispanic	1	1.6
Parity		
One	31	49.2
Two or more	32	50.8
Weight gain by BMI		
Below Recommended	7	11.9
Within Recommended	15	25.4
Over Recommended	37	62.7

Note. Valid percents were calculated for those groups with missing variables (weight gain to BMI, n=59; parity, n=63; race, n=64; marital status, n=63; education level, n=62; age, n=63).

Table 2.

Means, Standard Deviations, and Ranges for Depressive Symptomatology by Adequacy Groups

Adequacy Group	No.	M	SD	Range
Below	7	16.08	15.72	3-49
Within	15	24.14	12.58	3-48
Above	37	18.61	12.18	0-48

Table 3.

Analysis of the Variance for Depressive Symptomatology in the Postpartum Period by Adequacy Groups

Source	df	M Square	F
Between Groups	2	215.82	1.34
Within Groups	56	161.49	
Total	58		

Research Question 2. Is there an association between weight gain in pregnancy and functional status?

The second question was analyzed by analysis of the variance to determine if there was any significant effect of weight gain by adequacy group on mean total score for the Inventory of Functional Status after Childbirth (IFSAC). The means and standard deviations for the three groups are represented in Table 4. Overall, women in this sample had low functional status scores at the postpartum visit. There were no significant differences between the groups in the measurement of functional status after childbirth (Table 5). All groups scored below 3 (on a 1 to 5 scale) indicating an overall low functional status across groups, regardless of weight gain.

Table 4.

Means, Standard Deviations, and Ranges for Functional Status by Adequacy Groups

Adequacy	No.	M	SD	Range
Below	7	2.22	0.42	1.86-2.85
Within	15	2.2	0.68	0-2.86
Above	37	2.36	0.28	1.80-2.77

Table 5.

Analysis of Variance for Functional Status in the Postpartum Period by Adequacy Groups

Source	df	M Square	F
Between Groups	2	0.16	0.85
Within Groups	56	0.19	
Total	58		

Research Question 3. Is there an association between weight gain in pregnancy and family functioning?

The third question was analyzed by analysis of the variance to determine if there was any significant effect of weight gain by adequacy group on total mean score of the Family Apgar. The means and standard deviations for the three groups are represented in Table 6. There were no significant differences in the measurement of family functioning between the groups (Table 7). All groups had a mean score of three or below (on a 0-10 scale), indicating a low satisfaction with family functioning across all groups, regardless of weight gain.

Table 6.

Means, Standard Deviations, and Ranges for Family Functioning by Adequacy Groups

Adequacy Group	No.	M	SD	Range
Below	7	2.94	1.11	1.4-4
Within	15	3.03	1.11	.40-4
Above	37	2.96	0.95	.4-4

Table 7.

Analysis of Variance for Family Functioning by Adequacy Groups

Source	df	M Square	F
Between Groups	2	2.97	0.29
Within Groups	56	1.02	
Total	58		

Discussion

Sample

Sample characteristics from studies in the literature were compared. Studies that addressed postpartum depressive symptomatology, functional status, and family functioning to weight gain in pregnancy identified a positive relationship between weight related distress and PPD, alterations in functional status and alterations in family functioning (Garner, 1997; Walker, 1997, 1998). However, studies in the literature consisted of primarily Caucasian, married, middle income women with the majority having some form of college education, as compared to the young (early twenties), single, uneducated, Caucasian women in this study. Literature looking specifically at weight related distress in the postpartum period were typically done between 6 and 12 months postpartum, while the variables in this study, were assessed at 6 weeks postpartum. However, the results of this study are inconsistent with other documented studies evaluating weight related distress to PPD, functional status, and family functioning.

In this study there was no identifiable association between weight gain for specific categories and postpartum depressive symptomatology, functional status, or family functioning. However, over fifty percent of this population gained over the recommended weight per BMI category. In this study, women's depressive scores were, on average, above the score of 16 for CES-D indicating moderate levels of depressive symptomatology over all weight categories. The standard deviations and ranges for CES-D scores for each adequacy group are large, indicating that women could fall anywhere along the classification for depressive symptomatology, regardless of weight gain.

Functional status scores were typically about 2.2 for this population over all weight gain categories indicating lower than average scores for return of functional status at six weeks postpartum. In the literature, at six weeks postpartum, women average 3.2 when functional status is assessed using the IFSAC (McVeigh, 1998). The standard deviations and ranges were moderate in each adequacy group, indicating that there was an overlap across groups in assessing return of functional status, regardless of weight gain.

Family APGAR scores were generally below 3, indicating low levels of satisfaction with family functioning across all adequacy groups. However, the standard deviations and ranges (Table 6) were large for all adequacy groups, indicating a large variability between groups. The results of the APGAR in this population are significantly lower than average scores for well women ($\underline{M}$=8.24) (Smilkstein & Moore, 1988; Smilkstein et al., 1982, respectively).

In order to investigate and explain why this study did not yield statistically significant results, the sample, statistical methods, and conceptual framework were examined in relation to each research question.

Weight Gain and Postpartum Depressive Symptomatology in the Postpartum Period

There was not a statistically significant relationship found between weight gain by category and postpartum depressive symptomatology. In this study, all of the groups had

moderately high scores on total CES-D, regardless of amount of weight gained in relation to BMI, which was expected.

Low income, single women were investigated in this study. Studies investigating low income women identify various independent variables associated with low income status (Campbell & Cohn 1991; Walker, 1998) that may or may not be related to weight gain. Social-historical factors, such as low social support and low income, have been linked to higher than recommended weight gain in pregnancy (Walker, 1997), which would explain why PPD is more prominent in women with lower social support and low income (Campbell & Cohn, 1991). Over fifty percent of this sample population gained above the recommended weight gain by BMI category, which was not expected. Women in all adequacy groups had moderate levels of depressive symptomatology, however, the standard deviation for each adequacy group was large, indicating that women could have various scores for depressive symptomatology, regardless of the amount of weight gained. Literature describing depressive symptomatology in low income women indicates that depressive symptoms vary greatly in this population, so the moderately high scores in this sample population can not be attributed to low economical status alone.

Studies that looked primarily at weight gain in relation to postpartum depressive symptomatology were done primarily on middle income women (Walker, 1997, 1998), thus decreasing the stressors associated with financial concerns. Socioeconomic status is an important factor to assess while comparing literature in relation to this study focused primarily on low income women. Comparing this studies sample demographics to other studies may provide indicators of the impact of economical status on the outcome of depressive symptomatology in the postpartum period.

This study consisted of primarily young, single women. Although single women may receive support from other avenues, such as boyfriends, friends, or extended family members, the buffer of having a spouse to protect against postpartum depressive symptomatology appeared to be lacking with this population. Younger women who

encounter pregnancy before self-definition is achieved may experience negative outcomes, such as postpartum depression. In unexpected pregnancies, the normal psychosocial development of the young mother may be disrupted, leading to possible negative outcomes for both mother and child. Literature examining age and its relation to depressive symptoms postpartum varies. Studies identify younger women to be more at risk (O'Hara & Swain, 1996; Troutman & Cutrona, 1990), while others indicate older women to be more at risk (Kumar & Robson, 1984). Most research, however, acknowledges that the age of the mother does not have an effect on the development of depressive symptomatology (Kemp, Sibley, & Pond, 1990; Stemp, Turner, & Noh, 1986; Stowe & Numeroff, 1994). Regardless of weight gain, this sample population of young, single mothers had moderate depressive scores.

The conceptual framework for this study provides a framework which emphasizes the importance of life experiences. Women may experience varying emotions in the postpartum period, which can be attributed to many factors. The conceptual framework describes the impact that weight gain in pregnancy would have on a woman's self definition in a time period when physical fitness is emphasized. In this study, it was not assessed how the women felt about weight gain in general, a woman may experience emotional difficulties depending on how welcomed the weight gained in pregnancy was, and this was not assessed.

Weight Gain and Functional Status in the Postpartum Period

There was not a statistically significant relationship found among adequacy gain categories and assessment of functional status in the postpartum period in this study. Overall functional status scores were low, however, this was somewhat anticipated, as women may not have adjusted for the role of motherhood effectively at 6 weeks postpartum. Likewise, few women return to work by 6 weeks postpartum so it is difficult to assess the functional status component related to occupational activities. Research indicates that there is significant changes in functional status taking place over the six

months following childbirth (McVeigh, 1997; Tulman, et al., 1990), so a one time assessment at 6 weeks may not indicate what functional status will be at six months to a year, regardless of the weight gained in pregnancy.

The study population consisted of primarily young, single, women which also may account for low functional status scores across weight gain categories. Although the IFSAC is an excellent tool for measuring functional status after childbirth in the general population, it may be limited in this population, simply due to the definition of functional status after childbirth and what it implies. The IFSAC was developed with a sample of women who were older than this sample population (26-30); were almost equally divided in number of pregnancies, primiparous (41%), multiparous (59%); and had some college education (94%) (Fawcett et al., 1988). Young, single, women who are attaining self-definition and the role of motherhood at the same time may not fit into the rigid definition assigned to functional status. The IFSAC is limited to assessment of the status of role function and does not measure feelings about roles, role conflict, overload, or ambiguity (Fawcett et al., 1988).

Most women in this study had one previous pregnancy (mean = 2.5), however, few had more than a high school education, indicating that overall, they were not established in careers. When viewed through the conceptual model, younger women may have difficulties adapting to the role of motherhood, as they may not have achieved self-definition yet. The time frame required to modulate personal growth against possible negative effects, which is central to self definition, my be lacking. This may be compounded in this sample population, as the majority are multiparous, and may struggling to return to previous functional status with the demands of having more than one child in the home.

Weight Gain and Family Functioning in the Postpartum Period

There was not a statistically significant relationship found among weight gain categories and assessment of family functioning in the postpartum period. Scores of the

family APGAR were generally low across all weight gain categories, with standard deviations and ranges being large, indicating that this group of women was a homogenous sample, consisting of primarily young, single women. Research indicates that social support, with support from a spouse being of particular importance (Crnic, et al., 1983; Wandersman, et al. 1980) essential to buffer some of the negativity's associated with decreased satisfaction after childbirth. It is not surprising, then, that the women in this sample had low satisfaction with family functioning after childbirth. Low income, single woman, regardless of weight gained in pregnancy may have low satisfaction with family functioning simply because they have a lack of resources to buffer against the stresses of childbirth. Literature assessing family functioning in the postpartum period indicates that married mothers tend to report higher satisfaction with family functioning in the postpartum period than single mothers (McCain, 1990) when the APGAR is used to assess satisfaction. The APGAR is useful in assessing satisfaction in families, however, it may be limited in assessing the single parent household.

Summary

Literature on the subject of weight gain in pregnancy and how it relates to depressive symptomatology, functional status, and family functioning is limited. Previous studies focused primarily on weight gain in relation to postpartum depressive symptomatology, with most studies indicating higher depressive symptomatology with more weight gain (Abraham, King, Llewellyn-Jones, 1994; Walker, 1997, 1998). Studies specifically analyzing functional status and family functioning in relation to weight gain in pregnancy were not found in the literature.

The conceptual model used for this study, Women's Self-definition in Adulthood Model (Peck, 1986) provided a flexible framework to investigate the relationship of weight gain to postpartum depressive symptomatology, functional status, and family functioning. Weight gain is an important issue to women (Garner, 1997; Parker; Walker, 1998), and the framework was suitable because it represented the multiple roles,

responsibilities, and relationships of women's lives in the period following childbirth. Although the conceptual framework was not supported by the results of the study, it provided a guide to discuss weight gain in the childbearing woman.

The variable of weight gain, based on the findings of the study, was not associated with postpartum depressive symptomatology, functional status and family functioning. Although the conceptual model was suitable, there was not a fit between the operational and conceptual definition of weight gain. Weight gain in pregnancy should be operationally defined in a manner that would be more reflective of the life experiences of women. Perhaps more subjective data in relation to feelings about weight gain, body image, and role identity in relation to weight gain in pregnancy and during the postpartum period are required to evaluate the concept of body image in the childbearing woman. More subjective information evaluating the concepts of weight gain and feelings about weight gain, body image, and role identity in relation to weight gain may provide the missing links in this study.

Implications

In this study, no statistically significant relationship was found for depressive symptoms, decreased functional status, or decreased family functioning for weight gain categories by BMI. Therefore, it appears as though the variable of weight gain in this study is limited in its ability to predict postpartum depressive symptomatology, alterations in functional status and alterations in family functioning. However, while there was not a significant relationship between adequacy groups and the variables measured, the APN must be aware of the prevalence of moderate postpartum depressive symptomatology, low functional status scores, and low satisfaction with family functioning scores found in this study, regardless of weight gain.

When examining the variable of depressive symptomatology to weight gain, it is important to emphasize that in this population, about fifty percent gained over the amounts recommended by the IOM (1990). Although there was no significant correlation

between adequacy groups and depressive symptomatology, women in this population were overall, moderately depressed. Furthermore, the large standard deviations and ranges of the CES-D scores indicate that this was a homogenous group of women, both in weight gain and depressive symptomatology.

It is also important to acknowledge that the weight gain guidelines issued by the IOM in 1990 exceed previous guidelines by fifty percent, in some cases (Johnson & Yancey, 1996). Guidelines were developed by review of epidemiological data on fetal death, prematurity, and low birth weight (Johnson & Yancey, 1996) and a determination was made based on a correlation between low maternal weight gain and adverse obstetrical outcomes. Guidelines were developed advising women to gain more weight than what was previously recommended. However, relationships between maternal weight gain and pregnancy outcome are much more complicated than the IOM suggested (Johnson & Yancey, 1996). When providing prenatal and postpartum care, it is essential for the APN to assess each woman individually for appropriate weight gain in pregnancy and then provide nutritional counseling specific to each woman's needs.

Given the large amount of women in this population gaining more than recommended amounts of weight, the APN must consider maternal and fetal adverse effects associated with greater maternal weight gains such as predisposition to postpartum obesity (Smith et al., 1994), and the complications associated with obesity such as coronary vascular disease, diabetes, hypertension, and cholelithiasis, difficult labor and delivery, and postpartum hemorrhage (Johnson & Yancey, 1996). Fetal adverse effects associated with excessive weight gain include fetal macrosomia, prolonged labor resulting in fetal trauma, abnormalities in fetal heart rate, and meconium staining (Johnson, Longmate, & Frentzen, 1992; Johnson & Yancey, 1996; Parrish, Holt, Easterling, Connell, & LoGerfo, 1994).

In all weight gain categories, depressive symptomatology in the postpartum period was evident, indicating the need for the APN to assess all women, regardless of amount of

weight gained, for depressive symptomatology in the postpartum period. Long term consequences of obesity, as discussed previously, must be addressed in order to provide women with comprehensive and cost effective care. Women should be provided with individualized care upon conception, and individualized care should continue over the 12 months following delivery, as it is essential for the APN to recognize and treat depressive symptomatology to assist in supporting not only the psychosocial and physical well being of the childbearing women, but also to establish and maintain functional relationships with the child, family members, and significant others.

Overall functional status across the weight groups was low, and could not be statistically predicted by individual weight gain categories. Given this information, it is essential for the APN to assess functional status prior to delivery to evaluate pre-existing problems with functional capabilities, and to provide counseling in the postpartum period about expectations and norms of role mastery and functional status in the postpartum period. Although literature tends to imply that role performance occurs simultaneously with the physical healing of childbirth, at about six weeks postpartum, studies have found that resumption of some role activities do not occur until six months postpartum (Tulman, et. al, 1990).

When addressing weight gain to functional status, it is important for the APN to consider the consequences previously mentioned that are associated with weight gain and obesity when providing care. The APN plays an essential role not only in promoting optimal functional status by assisting women in preventing complications associated with obesity, such as hypertension, but also contributes to cost containment by counseling women about activities that assist in preventing illness resulting in low functional status.

Data shows that women have a marked weight increase between the ages of 18-50 (Lederman, 1993), regardless of parity. By assessing functional activities prior to and during pregnancy, the APN can counsel and guide women on healthy lifestyle choices, that promote optimal functional status, such as exercise programs, which have been shown to

increase satisfaction with the role of motherhood, parenting abilities, and increase socialization after childbirth (Sampselle, 1999). When compared to women who have sedentary lifestyles, women who exercise regularly report a greater satisfaction with their lives in general (Sampselle, 1999). When working with childbearing population, the APN has the ability to develop a data base of resources for women, such as facilitating postpartum support groups that assist in socialization by offering women the opportunity to share experiences and help one another after childbirth. The APN could also identify resources that would enable women participate in physical activities, such as identifying gyms that provide daycare. By introducing new mothers to one another and opening avenues that encourage return of functional activities to women, the APN promotes self efficacy.

The APN counsels women and their families about expected emotional and functional changes associated with childbirth, and utilizes problem solving skills to address the concerns women and their families face throughout prenatal and postpartum periods. The APN assists in educating women's primary support systems about postpartum fatigue, and encourages participation in care, as they can provide the support essential to achieve optimal functional status. By educating women's support systems, the APN facilitates a strong base of support in which women can rely on to achieve mastery of functional activities such as household, occupational, social, self-care, and infant care responsibilities. The resumption of these activities is a process, occurring at six months after childbirth or longer. A strong support system promotes well being and positive functional adjustment throughout the childbearing phase. Those resources closest to women may need guidance on how to support women throughout pregnancy and in the postpartum period when role mastery is crucial.

Satisfaction with family functioning scores assessed with the family APGAR were also low across weight gain adequacy groups when compared to APGAR scores in the literature (Smilkstein, 1978). It is important for the APN to assess the childbearing

woman's individual support systems, ideally, prior to delivery, and then continue to assess for alterations in satisfaction with family functioning throughout 12 months postpartum, as roles and expectations change, especially when women return to work, which may not take place for several months after delivery. When a relationship of trust is established with the childbearing family, women are more likely to return for postpartum follow up.

The APGAR serves as a screening test for family functional disability, and provides the APN with a means to assess overall patterns of functioning. It is crucial to assess disability prenatally, and to reassess at the postpartum visit. Families with functional disability can be identified and the APN can utilize family counseling to promote optimal satisfaction with family functioning. To some extent, in this population, nonmarried mothers might have been less satisfied with family relationships owing to the financial strains of single parenthood (McCain, 1990), however, it is important to consider the large number of women in this population who gained above recommended weight guidelines, and be cognizant of the possibility that decreased satisfaction may be influenced by feelings related to the weight gain of pregnancy, even though this study did not show a significant relationship between these variables. Although not supported by the findings of this study, unwelcome weight gain may affect marital satisfaction (Stunka, 1992), leading to a lack of flexibility in the relationships, potentially limiting redistribution of emotional investment to people within the support system. Significant others need to be counseled about the impact of weight gain on a woman's body image, and how to be supportive as she adjusts to changes in body satisfaction in the postpartum period.

By assessing family satisfaction, the APN identifies families that may be having difficulties, and supports and promotes functional relationships within a woman's support system. The transition to parenthood is a stressful time, as various demands are made on the family to adapt to a new situation (Martell, 1990), whether the transition be becoming a new mother, or adjusting to life with a second child.

Regardless of weight gain in pregnancy, the APN has the opportunity to establish a positive relationship with women in the childbearing phases of their lives. The APN establishes a partnership with women, facilitating a working relationship which aids in understanding the changes that take place in the postpartum period. By gaining subjective information about depressive symptomatology, functional capabilities, and family functioning, the APN monitors for difficulties women may encounter during the postpartum period. By developing a relationship with the childbearing woman, the APN may provide anticipatory guidance specific to the individual needs of each woman, assisting in individualized treatment, and facilitating an understanding of life experiences and changes that are expected in the childbearing phase of life.

Some women may not have symptoms of depression, alterations in functional status, or alterations in family functioning, however, by using a clinically based knowledge of risk factors that may indicate problems in the postpartum period, the APN may initiate interventions geared towards helping women should symptoms of depression, changes in functional status, or decreased satisfaction of family functioning occur. By establishing a clinically focused working partnership with women in the postpartum period, the APN in primary care has opportunities to establish connections that will facilitate access to appropriate avenues to increase quality of life and well being in the postpartum period.

The role of the APN working with the childbearing woman begins with assessment, the APN continually assesses for difficulties once a woman presents for prenatal care. The tools utilized in this study can provide the APN with a base line to screen for and predict difficulties. The tools should be administered at six weeks, three months, six months, and one year following childbirth to assess for the presence of depressive symptomatology, alterations in functional status and decreased satisfaction in family functioning. A data base of subjective and objective information identifies the needs of women, and their families, and allows the APN to provide individualized care women and their families.

Finally, the APN acts as a case manager who coordinates the identification of specific health needs of the childbearing woman, and provides information and referrals to support groups and collaborates with other health care professionals to assist women in attaining the highest level of functioning possible throughout the childbearing experience.

Recommendations for Further Research

It is important to recognize the limitations of this study. The results of this study indicate a need to further investigate the impact of weight gain in pregnancy to depressive symptomatology, functional status, and family functioning because of the inability to establish statistical significance in this sample population. The sample size for this population was adequate, however sample characteristics such as race, socio-economical status, and marital status should be more representative of the general population of women who may present with postpartum difficulties (depressive symptomatology, alterations in functional status, decreased satisfaction with family functioning).

This study was designed to assess how weight gain would effect postpartum difficulties. There was not a statistically significant relationship between the variables of this study and the adequacy groups. However, since fifty percent of this population gained over the recommended weight per adequacy group, and depression was moderate, functional status low, and satisfaction with family functioning low, the next step would be to conduct a study, more generalizable to the general population, where women could be asked about subjective feeling related to the weight gain of pregnancy. It would also be beneficial to screen for prior history of depression, marital problems, psychological problems including eating disorders, substance abuse, physical/sexual abuse, and co-existing medical problems to focus more specifically on feelings related to weight gain and how these feeling effect postpartum difficulties.

Data were collected at approximately six weeks postpartum in this sample population. Collection of data from subjects at six weeks, three months, six months, and

one year would provide a more descriptive evaluation of the effects of weight gain, loss, or failure to lose weight over time on depressive symptoms, functional status, and family functioning. It would be beneficial to assess the variables of this study, and weight fluctuations over these periods of time as well, to assess incidence of postpartum difficulties related to patterns of weight changes over time.

Weight gain, described as a social-historical time dimension, and operationalized by categories related to body mass index by adequacy group did not have the ability to predict depressive symptomatology, decreased functional status, or decreased satisfaction with family functioning in the postpartum period. The weight gain of this sample group is a reasonable representation of a sample population that may develop weight related distress. Future research using the variable of weight gain should include subjective feelings about weight gain, body image, and self concept in pregnancy, as those women who have more negative feelings about weight gain may present with more weight related distress in the postpartum period.

Summary

Depressive symptoms, functional status, and family functioning are important issues for not only the childbearing woman, but also for the infant and family. Current literature supports the need for early identification, preventative measures, and treatment of depressive symptoms, alterations in functional status, and alterations in family functioning. By identifying difficulties in the postpartum period, healthy adaptation to the physiological process of childbearing can take place.

This study focused on weight gain as a variable to determine the occurrence of postpartum depressive smptomatology, alterations in functional status, and decreased family functioning. Women in this study, on average, had moderate levels of depressive symptoms, low functional status scores, and low satisfaction with family functioning, despite the weight gained in pregnancy. The results of this study indicate the need to assess for other factors that could contribute to depressive symptomatology, low

functional status and decreased satisfaction with family functioning. All women should be assessed at six weeks, three months, six months, and one year for psychosocial difficulties in the postpartum period, regardless of weight gain category, to facilitate early detection of problems, and promote well being in this transition of life.

Further research is needed to determine the impact that weight gain in pregnancy has on the well being of women in the postpartum period. The development of strategies to assess subjective feelings about weight gain during pregnancy are required to further investigate the connection between weight gain and distress in the postpartum period.

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APPENDICES

APPENDIX A

APPENDIX A

PATID 12 ___ 12 45

CES-D Scale (P)

Circle the number for each statement which best describes how often you felt or behaved this way — DURING THE PAST WEEK.

DURING THE PAST WEEK:	Rarely or None of the Time (Less than 1 Day)	Some or a Little of the Time (1-2 Days)	Occasionally or a Moderate Amount of Time (3-4 Days)	Most or All of the Time (5-7 Days)	
1. I was bothered by things that usually don't bother me	0	1	2	3	(6)
2. I did not feel like eating; my appetite was poor	0	1	2	3	(7)
3. I felt that I could not shake off the blues even with the help from my family and friends	0	1	2	3	(8)
4. I felt that I was just as good as other people	0	1	2	3	(9)
5. I had trouble keeping my mind on what I was doing	0	1	2	3	(10)
6. I felt depressed	0	1	2	3	(11)
7. I felt that everything I did was an effort	0	1	2	3	(12)
8. I felt hopeful about the future	0	1	2	3	(13)
9. I thought my life had been a failure	0	1	2	3	(14)
10. I felt fearful	0	1	2	3	(15)
11. My sleep was restless	0	1	2	3	(16)
12. I was happy	0	1	2	3	(17)
13. I talked less than usual	0	1	2	3	(18)
14. I felt lonely	0	1	2	3	(19)
15. People were unfriendly	0	1	2	3	(20)
16. I enjoyed life	0	1	2	3	(21)
17. I had crying spells	0	1	2	3	(22)
18. I felt sad	0	1	2	3	(23)
19. I felt that people disliked me	0	1	2	3	(24)
20. I could not get "going"	0	1	2	3	(25)

APPENDIX B

APPENDIX B

PATID 13 ___ (4) (5)

INVENTORY OF FUNCTIONAL STATUS AFTER CHILDBIRTH

PLEASE THINK ABOUT THE TIME SINCE THE BIRTH OF YOUR BABY, AND THEN RESPOND TO THE FOLLOWING ITEMS.

PART I:
Please check all the usual household responsibilities you had prior to the baby's birth and then indicate to what extent you have resumed these responsibilities since the baby was born.

Prior to the baby's birth, my usual responsibilities included:	I have resumed this activity:			
	NOT AT ALL	JUST BEGINNING	PARTIALLY	FULLY
1. __Care of family member	1	2	3	4 (6)
2. __Cleaning the house	1	2	3	4 (7)
3. __Tidying the house (making beds, picking up things, etc.)	1	2	3	4 (8)
4. __Laundry	1	2	3	4 (9)
5. __Doing dishes	1	2	3	4(10)
6. __Cooking	1	2	3	4(11)
7. __Household business (paying bills, banking, etc.)	1	2	3	4(12)
8. __Grocery shopping	1	2	3	4(13)
9. __Shopping, other than groceries	1	2	3	4(14)
10.__Doing errands	1	2	3	4(15)
11.__Heavy housework, maintenance work (seasonal cleaning, painting, etc.)	1	2	3	4(16)
12.__Caring for pets	1	2	3	4(17)

Comments:

PART II:
Please check all the usual social and community activities you did prior to the baby's birth and then indicate to what extent you have resumed these responsibilities since the baby was born.

Prior to the baby's birth, my usual responsibilities included:	I have resumed this activity:			
	NOT AT ALL	JUST BEGINNING	PARTIALLY	FULLY
13.__Community service organizations	1	2	3	4(18)
14.__Professional organizations	1	2	3	4(19)
15.__Religious organizations	1	2	3	4(20)
16.__Socializing with friends	1	2	3	4(21)
17.__Socializing with relatives	1	2	3	4(22)
18.__Social clubs	1	2	3	4(23)

Comments:

PART III:
Please circle the number that indicates to what extend you have assumed your part of the following aspects of the baby's care.

	NOT AT ALL	JUST BEGINNING	PARTIALLY	FULLY
19. Daytime feedings	1	2	3	4(24)
20. Night feedings	1	2	3	4(25)
21. Bathe the baby	1	2	3	4(26)
22. Change diapers	1	2	3	4(27)
23. Change the baby's clothes	1	2	3	4(28)
24. Play with the baby	1	2	3	4(29)

Comments:

PART IV:
Please respond to the following phases based on how your life has been during the past week or two.

	NEVER	SOMETIMES	MOST OF THE TIME	ALWAYS	
25. Spend much of the day lying down	1	2	3	4	(30)
26. Sit during much of the day	1	2	3	4	(31)
27. Spend much of the day sleeping or dozing	1	2	3	4	(32)
28. Stand for only short periods of time	1	2	3	4	(33)
29. Spend most of the day in my nightgown/bathrobe	1	2	3	4	(34)
30. Take walks	1	2	3	4	(35)
31. Go up and down stairs	1	2	3	4	(36)
32. Walk slowly	1	2	3	4	(37)

Comments:

PART V:
If you are currently employed, please respond to the following items.

Please respond to the following phases based on how your life at work has been during the past week or two.

	NEVER	SOMETIMES	MOST OF THE TIME	ALWAYS	
33. Am accomplishing as much as usual in my job	1	2	3	4	(38)
34. Act irritable toward my work associates (give sharp answers, snap at them, criticize easily, etc.)	1	2	3	4	(39)
35. Am working shorter hours	1	2	3	4	(40)
36. Am doing my job as carefully and accurately as usual	1	2	3	4	(41)

Comments:

RS:kja/2-17-92

APPENDIX C

APPENDIX C

PATID 11 _ _ _
11

Family APGAR (P)

The following questions have been designed to help us better understand you and your family. You should feel free to ask questions about any item in the questionnaire.

The space for comments should be used when you wish to give additional information or if you wish to discuss the way the question is applied to your family. Please try to answer all questions.

Family is defined as the individual(s) with whom you usually live. If you live alone, your "family" consists of persons with whom you now have the strongest emotional ties.

For each question, circle only one number:

	Almost Always	Always	Some of the Time	Hardly Ever	Never	
I am satisfied that I can turn to my family for help when something is troubling me	4	3	2	1	0	(12)
Comments:						
I am satisfied with the way my family talks over things with me and shares problems with me.	4	3	2	1	0	(13)
Comments:						
I am satisfied that my family accepts and supports my wishes to take on new activities or direction.	4	3	2	1	0	(14)
Comments:						
I am satisfied with the way my family expresses affection and responds to my emotions, such as anger, sorrow, and love.	4	3	2	1	0	(15)
Comments:						
I am satisfied with the way my family and I share time together.	4	3	2	1	0	(16)
Comments:						

MO:kja\famapgar.m92

APPENDIX D

APPENDIX D

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

March 2, 1993

TO: Rachel Schiffman, Ph.D.
Mildred Omar, Ph.D.
A230 Life Sciences

RE: IRB #: 92-115
TITLE: FACTORS INFLUENCING PREGNANCY OUTCOME
CATEGORY: 1-C
REVISION REQUESTED: February 23, 1993
APPROVAL DATE: March 1, 1993

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete. I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project including any revision listed above.

UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Investigators planning to continue a project beyond one year must seek updated certification. Request for renewed approval must be accompanied by all four of the following mandatory assurances.

1. The human subjects protocol is the same as in previous studies.
2. There have been no ill effects suffered by the subjects due to their participation in the study.
3. There have been no complaints by the subjects or their representatives related to their participation in the study.
4. There has not been a change in the research environment nor new information which would indicate greater risk to human subjects than that assumed when the protocol was initially reviewed and approved.

There is a maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for complete review.

UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. Investigators must notify UCRIHS promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

If we can be of any future help, please do not hesitate to contact us at (517) 355-2180 or FAX (517) 336-1171.

Sincerely,

David E. Wright, Ph.D.
UCRIHS Chair

DEW:pjm

MICHIGAN STATE UNIVERSITY

OFFICE OF VICE PRESIDENT FOR RESEARCH
AND DEAN OF THE GRADUATE SCHOOL

EAST LANSING • MICHIGAN • 48824-1046

March 19, 1992

Mildred A. Omar, Ph.D.
Rachel F. Schiffman, Ph.D.
A-230 Life Sciences Bldg.

RE: FACTORS INFLUENCING PREGNANCY OUTCOME, IRB #92-115

Dear Drs. Omar and Schiffman:

The above project is exempt from full UCRIHS review. One of the Committee's members has reviewed the proposed research protocol and finds that the rights and welfare of human subjects appear to be protected. You have approval to conduct the research.

You are reminded that UCRIHS approval is valid for one calendar year. If you plan to continue this project beyond one year, please make provisions for obtaining appropriate UCRIHS approval one month prior to March 16, 1993.

Any changes in procedures involving human subjects must be reviewed by the UCRIHS prior to initiation of the change. UCRIHS must also be notified promptly of any problems (unexpected side effects, complaints, etc.) involving human subjects during the course of the work.

Thank you for bringing this project to our attention. If we can be of any future help, please do not hesitate to let us know.

Sincerely,

David E. Wright, Ph.D.
Chair, UCRIHS

DEW/pjm

APPENDIX E

APPENDIX E

MICHIGAN STATE
UNIVERSITY

April 22, 1999

TO: Dr.Rachel SCHIFFMAN

RE: IRB# 99247 CATEGORY: 1-E

APPROVAL DATE:April 22, 1999

TITLE:THE ASSOCIATION BETWEEN MATERNAL WEIGHT GAIN AND POSTPARTUM DEPRESSIVE SYMPTOMATOLOGY, FUNCTIONAL STATUS AND FAMILY FUNCTIONING

The University Committee on Research Involving Human Subjects' (UCRIHS) review of this project is complete and I am pleased to advise that the rights and welfare of the human subjects appear to be adequately protected and methods to obtain informed consent are appropriate. Therefore, the UCRIHS approved this project.

RENEWALS: UCRIHS approval is valid for one calendar year, beginning with the approval date shown above. Projects continuing beyond one year must be renewed with the green renewal form. A maximum of four such expedited renewals possible. Investigators wishing to continue a project beyond that time need to submit it again for a complete review.
REVISIONS: UCRIHS must review any changes in procedures involving human subjects, prior to initiation of the change. If this is done at the time of renewal, please use the green renewal form. To revise an approved protocol at any other time during the year, send your written request to the UCRIHS Chair, requesting revised approval and referencing the project's IRB# and title. Include in your request a description of the change and any revised instruments, consent forms or advertisements that are applicable.
PROBLEMS/CHANGES: Should either of the following arise during the course of the work, notify UCRIHS promptly: 1) problems (unexpected side effects, complaints, etc.) involving human subjects or 2) changes in the research environment or new information indicating greater risk to the human subjects than existed when the protocol was previously reviewed and approved.

If we can be of further assistance, please contact us at 517 355-2180 or via email: UCRIHS@pilot.msu.edu. Please note that all UCRIHS forms are located on the web: http://www.msu.edu/unit/vprgs/UCRIHS/

Sincerely,

David E. Wright

David E. Wright, Ph. D.
UCRIHS Chair

DEW: bd

cc: Aymee Schuyler Kakuk

OFFICE OF
RESEARCH
AND
GRADUATE
STUDIES

University Committee on
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