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Weight Concerns, Body Image, and Smoking Cessation in Pregnant Women in Rural Appalachia

Jennifer Aileen Correll
East Tennessee State University

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Weight Concerns, Body Image, and Smoking Cessation in Pregnant Women in Rural Appalachia

A dissertation
presented to
the faculty of the Department of Psychology
East Tennessee State University

In partial fulfillment
of the requirements for the degree
Doctor of Philosophy in Clinical Psychology

by
Jennifer Aileen Correll, M.A.

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William T. Dalton, Ph.D., Chair
Beth A. Bailey, Ph.D.
Andrea Clements, Ph.D.
Russ Brown, Ph.D.
Jon Webb, Ph.D.

Keywords: Weight Concerns, Body Image, Pregnancy, Smoking
ABSTRACT

Weight Concerns, Body Image, and Smoking Cessation in Pregnant Women in Rural Appalachia

by

Jennifer Aileen Correll

Smoking is the leading preventable cause of death, and smoking during pregnancy can lead to significant health complications for both the mother and developing child. In the Appalachian region of East Tennessee, pregnancy smoking rates are as high as 40% in some counties which is almost 4 times the national average. Weight and body image concerns have previously been identified as variables contributing to maintenance of smoking behavior. The current study was designed to examine the relationship between prepregnancy weight and body image concerns and smoking status at third trimester. Participants included 172 pregnant women who smoke. Women were recruited via Ob/GYN and Family Practice offices throughout East Tennessee and participating in the research arm of the Tennessee Intervention for Pregnant Smokers. Prepregnancy weight and body image concerns were assessed during first trimester via the Weight Concern Scale and Body Image Concern Inventory. Smoking status was collected at third trimester via self-report. At third trimester, 20% of participants reporting quitting since their first trimester visit. Logistic regression analyses revealed that education and weight concerns played a significant role in whether women chose to quit during pregnancy. Women with higher education were less likely to continue smoking (OR=.601, 95% CI .43-83, p=.003) and women reporting higher weight concerns were more likely to continue smoking (OR=1.67, 95% CI 1.23-2.27, p=.001). Beliefs about the weight control properties of cigarettes may play an important role in the decision to continue to smoke. These findings suggest the importance of
assessing weight concerns and discussing weight gain with pregnant women who smoke in an effort to facilitate successful cessation.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>2</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>7</td>
</tr>
<tr>
<td>Chapter</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>8</td>
</tr>
<tr>
<td>Prevalence Rates in Pregnant Women</td>
<td>9</td>
</tr>
<tr>
<td>Risk Factors for Smoking</td>
<td>9</td>
</tr>
<tr>
<td>Weight Concerns as a Risk Factor</td>
<td>10</td>
</tr>
<tr>
<td>Relevance to Rural and Pregnant Women</td>
<td>11</td>
</tr>
<tr>
<td>Consequences of Smoking</td>
<td>12</td>
</tr>
<tr>
<td>Health Consequences</td>
<td>12</td>
</tr>
<tr>
<td>Maternal and Fetal Health</td>
<td>13</td>
</tr>
<tr>
<td>Economic</td>
<td>15</td>
</tr>
<tr>
<td>Smoking Cessation Interventions</td>
<td>16</td>
</tr>
<tr>
<td>Nicotine Replacement Therapy</td>
<td>16</td>
</tr>
<tr>
<td>Pharmacological Treatment</td>
<td>17</td>
</tr>
<tr>
<td>Behavioral and Psychosocial Interventions</td>
<td>17</td>
</tr>
<tr>
<td>Interventions Tailored to Pregnant Women</td>
<td>19</td>
</tr>
<tr>
<td>Barriers to Smoking Cessation</td>
<td>20</td>
</tr>
<tr>
<td>Barriers in Pregnant Women</td>
<td>21</td>
</tr>
<tr>
<td>Weight Concerns as a Barrier Across Populations</td>
<td>22</td>
</tr>
<tr>
<td>Current Study</td>
<td>24</td>
</tr>
<tr>
<td>Hypotheses</td>
<td>25</td>
</tr>
<tr>
<td>2. METHOD</td>
<td>26</td>
</tr>
</tbody>
</table>
Participants .................................................................................................................. 26
Measures ....................................................................................................................... 26
  Demographics ............................................................................................................. 27
  BMI ............................................................................................................................... 27
  Depression ................................................................................................................... 27
  Stress ........................................................................................................................... 28
  Weight Concerns ....................................................................................................... 28
  Body Image ............................................................................................................... 29
  Indicator of Quit Status ............................................................................................ 29
Procedure ....................................................................................................................... 30
Statistical Analyses ....................................................................................................... 30
3. RESULTS ..................................................................................................................... 32
  Sample Characteristics .............................................................................................. 32
    Demographics .......................................................................................................... 32
    Depression ................................................................................................................ 32
    Stress ........................................................................................................................ 33
    Weight Concerns ..................................................................................................... 33
    Body Image .............................................................................................................. 34
    Smoking Status ....................................................................................................... 34
Correlations Among Study Variables ........................................................................... 36
  Weight Status and Third Trimester Smoking Status .................................................. 38
  Weight Status and Weight Concerns ......................................................................... 38
  Weight Status and Body Image Concerns ................................................................... 39
Logistic Regression Analyses ....................................................................................... 39
Exploratory Analyses .................................................................................................... 42
4. DISCUSSION .............................................................................................................. 45
  Weight Concerns and Third Trimester Smoking Status ............................................ 46
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sample Characteristics</td>
<td>35</td>
</tr>
<tr>
<td>2. Correlations Among Study Variables</td>
<td>36</td>
</tr>
<tr>
<td>3. Summary of Logistic Regression for Variables Predicting Third Trimester Smoking Status</td>
<td>41</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Smoking is one of the leading preventable causes of death in the United States (Center for Disease control, 2006) and much attention has been paid over the past few decades to reduce smoking rates in the United States. Currently in the United States 24% of men and 18.1% of women are smokers (American Heart Association, 2005). Although smoking rates have declined as the health consequences of smoking have become more apparent and as interventions for smoking cessation have become more efficacious and available, this decline stabilized around 2004 and smoking rates have remained stable over the past several years (Hitti, 2006; U.S. Department of Health and Human Services, 2009). Recent laws preventing people from smoking in public places such as restaurants, malls, and building common areas (Tennessee Department of Health, 2007) and increases in cigarette taxes may help play a role in the decline in smoking behavior. Additionally, incidence of smoking tends to vary depending on ethnicity, education level, and geographic area as well as gender, age, and other factors.

Smoking rates tend to be higher in Southern states and rural areas. These higher rates have been attributed to greater percentages of individuals without high school diplomas (Hitti, 2006). In addition to lower education levels, residents of rural areas generally have lower socioeconomic status (SES) and less access to medical care (Erwin, 2008); therefore, many may be less likely to receive assistance with smoking cessation. However, southern states are also the largest manufacturers of tobacco products with Kentucky and North Carolina being the highest producing states (CDC, 2009). With tobacco being a large part of the culture it is possible that smoking behavior is less stigmatized in these areas. Tennessee, which has many rural areas, has one of the highest smoking rates in the country with 26.1% of the population identifying
themselves as smokers (CDC, 2005). Furthermore, Tennessee is among four states with the lowest percentages of smokers reporting quit attempts (CDC).

**Prevalence Rates in Pregnant Women**

In the United States approximately 18% to 25% of women quit smoking when they become pregnant (Rogers, 2008). There has been a significant decrease in pregnant smoking according to the CDC, with 11.4% of women reporting smoking during pregnancy in 2002 (CDC, 2004) compared to 18.4% in 1990. However, these rates may be an underestimate in rural areas and in women of low SES. For example, over 20% of women with lower education reported continuing to smoke throughout their pregnancy compared to less than 13% of women who graduated from high school (Rogers). In Tennessee, the overall rate of smoking during pregnancy is 17%; however, rates in rural areas of Appalachia are much higher, ranging from 23% to 39% (Bailey, 2006).

**Risk Factors for Smoking**

A variety of risk factors have been identified that may be involved in the initiation and maintenance of smoking behavior. It could be hypothesized that individuals who have one or more risk factors may be less likely to quit smoking. Some risk factors include lower education and SES, peer and partner smoking, stress level, mental illness such as schizophrenia and depression, engaging in other unhealthy behaviors, and having weight concerns. Understanding these risk factors could play an important role in the development and implementation of smoking cessation programs.

Lack of formal education and low SES can be considered contributors to smoking initiation (Harrell, Bangdiwala, Deng, Webb, & Bradley, 1998). In addition, peer and parental behaviors have also been shown to be important factors in smoking behavior. Most smokers
begin smoking during adolescence, and research has shown that peer pressure and the smoking status of adolescent friends influence this decision (Hoffman, Monge, Chou, & Valente, 2007). In addition to peer smoking, parental smoking can also be a factor for initiation. Clayton (1991) reported that parental smoking is a primary factor for adolescent smoking behaviors. Otten, Engels, van de Ven, and Bricker (2007) demonstrated that children who had parents who had ever smoked were not only more likely to initiate smoking but also were more likely to begin smoking regularly. The impact of the behaviors of others in an individual’s environment carries over into adulthood where having a partner who smokes is predictive of initiation and maintenance of smoking behaviors (Daly, Lund, Harty & Ersted, 1993; Homish & Leonard, 2005). Furthermore, Daly and colleagues noted that the most significant factor in smoking initiation after the age of 17 was having a spouse or significant other who smoked.

High stress levels including economic disparity have been associated with the initiation of smoking along with a variety of other unhealthy behaviors (Krueger & Chang, 2008; Lantz et al., 1998). Smoking rates in individuals with mental disorders are found to be two to three times higher than that of the general population (Fu et al, 2007; Gallagher, Penn, Schindler, & Layne, 2007; Kotov, Guey, Bromet, & Schwartz, 2010). Smokers have also been found to engage in other unhealthy behaviors such as tanning bed use (O’Riordan et al., 2006), lower physical activity and poor diet (Kaleta & Jegier2007), and alcohol use (Batel, Pessione, Maître, & Rueff, 1995; Hertling et al., 2005).

**Weight Concerns as a Risk Factor**

A large body of research examines weight concerns as related to smoking initiation and status. Some researchers have shown that body image and weight concerns impact initiation of smoking as well as current smoking status (Pomerleau & Saules, 2007). Conversely, there is
some evidence that suggests that smoking for weight control differs between regular and experimental smokers with regular smokers being less likely to smoke to control weight (Bean et al., 2008). However, regular smokers are more likely than experimental smokers to believe that they will gain weight following cessation.

Smokers have been shown to report a preference for a thinner preferred body shape than nonsmokers (Pomerleau & Saules, 2007). Additionally, smokers have been shown to score higher on measures of disinhibited eating and overweight smokers tend to score higher on measures examining concerns about postcessation weight gain. Results from a study with male and female smokers and nonsmokers in Denmark (Pisinger & Jorgensen, 2007) showed that smokers weighed less, reported fewer concerns about weight, and were more likely to eat the types of foods that they wanted compared to nonsmokers. Clearly, concerns about weight play a part in smoking initiation and status, especially among females (Bean et al., 2008). Additionally, weight concerns can be related to relapse following cessation (Pisinger & Jorgensen; Pomerleau & Saules).

**Relevance to Rural and Pregnant Women**

Weight concerns may play an especially important role in smoking among rural and pregnant women. First, rural residents are considerably more likely to be obese or overweight than urban residents (Jackson, Doescher, Jerant, & Hart, 2005). Second, rural dwellers are more likely to be of low income and have less access to resources, two risk factors that have been associated with increased smoking rates (Adams, Melvin, & Raskind-Hood, 2008). Third, weight gain commonly occurring with pregnancy could contribute to greater weight concerns throughout pregnancy for some women. When these three components are taken together it is possible that weight concerns could impact smoking behavior in rural pregnant women because
these women may already be at higher risk because of higher rates of obesity and lower income commonly associated with rural environments.

**Consequences of Smoking**

Research has shown that smoking causes a variety of health-related consequences that can impact life span and quality of life. These health consequences may be even more critical to pregnant women who are at risk of miscarriage and of giving birth to a low birth weight infant as a result of tobacco use (Savitz & Murnane, 2010). In addition to health consequences, it is also important to consider that smoking can negatively impact or burden the individual and societal economy.

**Health Consequences**

Cigarette smoking can cause a variety of health problems for smokers. Perhaps the most well-known risks associated with smoking are lung diseases including cancer, chronic pulmonary obstructive disease (COPD), and emphysema (Mannino & Braman, 2007). In addition to chronic lung diseases, smoking even one to four cigarettes daily can cause an increased risk of heart disease and lung cancer (Bjartveit & Tverdal, 2005). Sleep apnea is a chronic sleep disorder that has been associated with several health risk behaviors including smoking (Punjabi, 2008). It has also been suggested that smoking can impact psychosocial issues. As previously noted, Krueger and Chang (2008) hypothesize that smoking behavior moderates the relationship between mortality and perceived stress, which could reduce both psychosocial and physical wellbeing.
**Maternal and Fetal Health**

Smoking in pregnant women is especially concerning because of detrimental health consequences for both the mother and developing fetus. In addition to common health consequences in adults, pregnant women are at increased risk for spontaneous abortion and ectopic pregnancy (CDC, 2001). These women are also at an increased risk for pregnancy related consequences such as placental problems, membrane rupturing, and hemorrhage during child birth (CDC).

While there is no evidence of a specific disorder that results from the use of nicotine during pregnancy, as in Fetal Alcohol Syndrome that results from alcohol abuse during pregnancy, infants exposed to smoke during maternal pregnancy are at risk for health and developmental problems. Smoking in pregnancy has been linked to low birth weight small gestational size, and preterm birth (Jaddoe et al., 2008; Orr, Newton, & Weismiller, 2007). In addition, higher rates of stillbirths and miscarriages have been associated with pregnant smoking, particularly for women smoking more than 10 cigarettes a day (Aliyu, Salihu, Wilson, & Kirby, 2007; Difranza & Lew, 1995). Sudden Infant Death Syndrome (SIDS) has been linked to maternal smoking as well (Fleming & Blair, 2007).

Smoking during pregnancy has also been linked to changes in neural development in animal and human neonates. Studies in adults have shown that exposure to nicotine inhibits monoamine oxidase (MAO) A and B (Berlin & Anthenelli, 2001), and prenatal nicotine exposure has also been linked to decreased MAO. Berlin and colleagues (2009) examined the levels of serotonin, dopamine, and norepinephrine, MAOA dependent metabolites, in the cord blood of newborns of smokers compared to nonsmokers. Results show decreased plasma metabolite levels of all three in the newborns of pregnant smokers when compared to
nonsmokers. Animal studies have revealed decreased levels of nitric oxide, increased catecholamines and catecholamine metabolites, and decreased fetal brain weight (Onal et al., 2004).

Because nicotine affects the same neurotransmitter systems as other drugs of abuse and can cross the placenta, it is possible that fetuses exposed to nicotine in utero may experience symptoms of withdrawal. Studies examining the presence of cotinine, a metabolite of nicotine, in umbilical cord blood have found that it is consistently present. Berlin, Heilbronner, Georgieu, Meier, and Spreu-Varoquaux (2010) compared levels of cotinine in maternal blood and in cord blood and found a high positive correlation between maternal and neonate levels. In another study conducted by Berlin and colleagues (2009), smokers’ newborns showed greater levels of facial discomfort than the newborns of nonsmokers. Godding and colleagues (2004) examined the relationship between heavy smoking during pregnancy and neonate nicotine withdrawal through a measure of infant neurologic and biologic functioning, the infant Finnegan withdrawal scores, and monitoring of maternal smoking behavior. Results showed that infants exposed to nicotine had decreased muscle tone, reflexes, and alertness over the course of 5 days. In addition, these infants had significantly higher Finnegan withdrawal scores than infants who were not exposed to nicotine smoke. While it does not appear that infants respond with the same intensity of nicotine withdrawal as occurs with other drugs of abuse, the presence of metabolites in cord blood and differences in behavior in infants of smokers versus nonsmokers indicates that they may experience some withdrawal.

Later in life children who were exposed to smoking prior to birth are more likely to have behavior and developmental problems (Sen & Swaminathan, 2007). Monuteaux, Blacker, Biederman, Fitzmaurice, and Buka (2006) examined the relationship between maternal smoking
and overt versus covert conduct problems. They defined covert conduct problems as behaviors such as theft and lying and overt conduct problems as behaviors such as fighting and other violence. Results demonstrated that children of mothers who smoked during pregnancy and had low SES were more likely to have overt conduct problems than those with high SES (Monuteaux et al.). Children exposed to nicotine have higher rates of attention deficit disorders, learning disabilities, impulsivity, and conduct disorder. (Cornelius & Day, 2009). Adolescents whose mothers smoked are also at greater risk of attention difficulties and addictive behaviors (Cornelius & Day).

**Economic**

Smoking impacts the individual and society economically. The CDC (2002) examined mortality and economic impact of cigarette smoking in a longitudinal study from 1995 to 1999 and determined that death resulting from cigarettes generated an economic loss of approximately 157 billion dollars through health care costs and lost productivity. Individuals are also being impacted economically with the average smoker spending about $3,391 each year on cigarettes (CDC, 2002). In a more recent study the CDC estimates that approximately $75 billion is spent each year in smoking-related health costs and another $92 billion is lost due to decreased productivity and early death due to smoking-related illness (Substance Abuse and Mental Health Services Administration [SAMHSA], 2007). Bunn, Stave, Downs, Alvir, and Dirani (2006) also reported that smokers missed work more frequently over the time period of 1 year than nonsmokers or former smokers. The economic and health care costs associated with smoking at both a macro and micro level are of particular importance given the health care and economic crises of our nation. Not only could increased levels of cessation impact the financial situation at
an individual level, a reduction in health care costs associated with illnesses caused by smoking could generate a national economic impact.

**Smoking Cessation Interventions**

The decline in smoking rates in the past 10 years could be largely attributed to increased public awareness of the consequences associated with tobacco use as well as the development of effective interventions. Although there are challenges associated with quitting smoking, cessation can positively impact a smoker’s health. Some of the immediate benefits of smoking cessation include lowered heart rate and blood pressure, decreased levels of carbon monoxide within hours, and within a few weeks there is evidence of increased circulation (National Institutes of Health [NIH], 2007). Smoking cessation has long-term benefits of reduced risk for heart disease and cancer (NIH). Interventions can include nicotine replacement therapy, prescribed medications, behavioral or psychosocial interventions, or a combination of these.

**Nicotine Replacement Therapy**

Given the health risks associated with smoking there is ongoing research examining the most effective cessation programs. When taking into account the addictive properties of nicotine it is no surprise that the use of nicotine replacement therapy (NRT) to aid in smoking cessation is highly researched and is often the preferred method of treatment. The use of NRT alone or in combination with other cessation strategies has been evaluated in randomized controlled trials (RCTs). Kornitzer, Bousten, Dramaix, Thijs, and Gustavsson (1995) examined the use of the nicotine patch and gum for smoking cessation and participants who used both tools had 50% higher cessation rates than those receiving the patch alone. The use of the patch alone has been shown to generate higher quit rates than placebo in several RCTs (Davidson et al., 1998; Hays, Ebbert, & Sood, 1999).
Pharmacological Treatment

Other pharmacological treatments include bupropion and varenicline. Clinical trials demonstrated that participants who were administered bupropion alone or in combination with other treatments had significantly higher rates of cessation even when examined in diverse populations (McCarthy et al., 2008; Tonnesen et al, 2003). Gonzales and colleagues (2006) showed that while both were more effective than placebo, varenicline was slightly more effective at controlling cravings and withdrawal than bupropion. This difference could be explained by varenicline’s specific action on the nicotinic receptor.

Quit rates in RCTs show some variance depending on the method of treatment used. For NRT, quit rates for the patch range from 12% to 19% (Davidson et al., 1998; Hays et al., 1999). Research has shown quit rates for patients administered bupropion to be as high as 46% in weeks 4 to 7 and 21% at 12 months (Tonnesen et al., 2003). Varenicline has been shown to be highly effective as well with abstinence rates of 44% in weeks 9 through 12 and 21.9% at week 52 (Gonzales et al, 2006). Quit rates for participants receiving a single telephone contact in addition to a self-help treatment protocol were 44.9%, comparable to treatment with pharmaceuticals and superior to self-help alone (Miquez & Becona, 2008). While NRT has been identified as a gold standard for the treatment of nicotine addiction repeatedly in clinical trials (Davidson et al, 1998; Hays et al, 1999; McCarthy et al., 2008; Tonnesen et al., 2003), it is important to consider that without behavioral and environmental changes it is unlikely that the person will be able to maintain abstinence (Miquez & Becona).

Behavioral and Psychosocial Interventions

Psychosocial interventions for smokers have also been shown to be effective. Self-help programs, behavioral interventions, and telephone contacts have all been found to be useful,
particularly in combination with pharmacotherapy (Miquez & Becona, 2008). Cognitive behavioral strategies generally focus on coping with decreases in mood and craving and on making behavioral or lifestyle changes geared towards changing smoking habits (Niaura, 2008). Schmelzle, Rosser, and Birtwhistle (2008) conducted a meta-analysis of studies using pharmacologic and nonpharmacologic treatments for smoking cessation where they noted that studies examining behavioral therapy for smoking cessation have consistently demonstrated that individual therapy is certainly more successful than no treatment.

The addition of a physical activity component to smoking cessation programs has been popular given that weight concerns can play a role in the initiation and maintenance of smoking. Prochaska and coworkers (2008) examined the effectiveness of a physical activity component for smoking treatment. They determined that participants receiving the physical activity component of the intervention not only increased their amount of moderate to vigorous activity but were also more likely to abstain from smoking. More support for physical activity components was uncovered in a review of 13 randomized controlled trials with adults in which Ussher, Taylor, and Faulkner (2008) reported three studies demonstrating a significant improvement in quit and relapse rates for participants who were randomized to physical activity interventions. This improvement in quit and relapse rates could be explained by several hypotheses. One possible hypothesis is that by addressing the concern over weight gain upon cessation through exercise participants could have reduced the total amount of weight gained; thereby, increasing adherence to the quit plan. Another possible hypothesis is that patients engaging in physical activity, a healthy activity, would experience cognitive dissonance upon engaging in an unhealthy behavior like smoking. The discomfort associated with engaging in incompatible behaviors could have
increased quit rates and decreased relapse particularly if the participant continued with an exercise plan following completion of the study.

**Interventions Tailored to Pregnant Women**

To date only a few studies provide directions for assisting pregnant smokers to quit. These studies are even more limited when examining participants who are not engaging in other drug or alcohol use. Fang and colleagues (2004) report that while smoking rates in pregnancy have dropped, relapse rates for those who quit during pregnancy range from 70% to 85%. Even women who receive smoking cessation counseling still have high relapse rates during pregnancy ranging from 29% to 85%. Meta-analyses examining the most effective interventions for pregnant smokers determined that cognitive therapy and the use of follow-up visits are important components in intervention (Kelley, Bond, & Abraham, 2001).

There has been an increased interested in the use of NRT in pregnant smokers, but results have been inconsistent. Gaither and colleagues (2009) examined the use of NRT for smoking cessation in pregnant smokers and noted that women given NRT were twice as likely to have low birth weight babies than nonsmokers; however, whether this was a result of NRT use or heavy smoking was unclear. Pollak and colleagues (2007), in contrast, reported that the use of NRT was highly effective in pregnant smokers. In addition, when NRT was combined with cognitive behavioral therapy (CBT) there was a three-fold increase in cessation compared to CBT alone. Bupropion and varenicline are often used to aid in smoking cessation; however, there currently has been very limited research examining the use of these medications in pregnant smokers and their safety. Because of safety issues related to NRT and pharmacotherapy during pregnancy current recommendations from The American College of Obstetricians and Gynecologists are
that NRT and other forms of pharmacotherapy only be used when the patient has not been successful with any other treatment approaches (Rodriguez-Thompson, 2009).

Self-help programs have been identified as an option for pregnant smokers who are not interested in individual counseling. In a review examining self-help interventions for smokers, Naughton, Prevost, and Sutton (2008) determined that self-help materials were more useful than usual care and increased the likelihood of cessation over usual care. Usual care was defined as general advice giving, education, and offering brief pamphlets on the risks of smoking during pregnancy. When examining studies that focused on self-help materials of various intensity, Naughton and colleagues found that more intense self-help programs were slightly superior, but not significantly so. However, they noted that a disadvantage of the self-help materials is that they are not very individualized. Therefore, providing more individualized components or options may improve the efficacy of self-help interventions.

Similar to cessation efforts with adults, those specific to pregnant women have resulted in failed attempts and high relapse. Interventions for pregnant women have primarily focused on self-help and education about the harmful effects of smoking with limited success. It is important to note that some of the treatments that have been proven to be successful in a normal population are either not recommended for use in pregnant women or are in early research stages for efficacy and safety (e.g., NRT). Further research aimed at understanding issues specific to pregnant women are needed for better tailoring interventions.

**Barriers to Smoking Cessation**

Examining barriers to smoking cessation is an important area of research because unaddressed barriers can lead to unsuccessful quit attempts and relapse. For the purpose of the current study a barrier can be defined as anything that may reduce the likelihood that a patient
will quit and that may increase the chance of relapse. As mentioned above, approximately 42.5% of adult smokers attempt to quit each year with only about 50% of those attempts being successful (CDC, 2006). Despite the believed importance the literature in this area is small.

To date studies examining barriers have primarily focused on comorbid mental health diagnoses, beliefs surrounding the risks associated with smoking, stages of motivation, and weight related issues. Smoking is a serious concern and problem among individuals with psychiatric disorders and it is likely that these individuals have unique barriers (Hall, 2007; Ludman et al., 2002). Denial or distortion of information about health risks of smoking has also been identified as a barrier to cessation and a contributor to decreased motivation to quit (Kleinjan, van den Eijnden, Dijkstra, Brug, & Engels, 2006). A strong desire to quit has been shown to predict cessation (Hymowitz et al., 1997) and those smokers who have low motivation to quit can be especially challenging to health professionals (Wynd, 2007).

**Barriers in Pregnant Women**

Similar to studies with nonpregnant adults, there is some evidence to suggest that income, lack of motivation, and weight concerns also influence quitting patterns in pregnant women. Additional barriers specific to pregnant women include uncertainty about the safety of NRT. Considering pregnant smoking rates have been shown to be even higher for pregnant women in rural Appalachia, Bailey (2006) sought to identify barriers that may contribute to poor success in this population. Those women who had previous pregnancies, little access to prenatal care, and had a more lengthy smoking history have been found to be less likely to quit (Bailey). A study by Nasman and Ortendhal (2007) found that psychological motivation to quit smoking had greater contribution to success during pregnancy than physical motivators (i.e. health of the fetus). Engaging in other health risk behaviors such as poor diet, lack of physical activity, and
other drug use and residing with a current smoker have also been shown to decrease the likelihood of cessation in pregnant women (Giglia, Binns, Alfonso, & Zhao, 2007; Lobel et al., 2008). A unique component for pregnant smokers is whether the pregnancy was wanted or not. Research has shown that women with untimed or unwanted pregnancies tend to engage in more behaviors that could potentially harm themselves and their fetus (Kost, Landry, & Darroch, 1998; Orr, James, & Reiter, 2008).

**Weight Concerns as a Barrier Across Populations**

Research has shown that smokers with weight concerns exhibit poor treatment outcomes and often relapse after cessation (Clark et al., 2006). This is especially true for female smokers who have been shown to be less likely to quit, have higher relapse rates, and poorer cessation outcomes than males (Grunberg, Winders, & Wewers, 1991). Although considerable research has shown a relationship between weight concerns and smoking initiation, work by Ludman and coworkers (2002) demonstrated a relationship between lower weight concerns and smoking in White women. They hypothesized that White women included in their sample who reported low weight concerns weighed less and smoked more; therefore, had fewer weight concerns to report than other women in the sample. However, it is also important to take into consideration individual beliefs about the relationship between smoking and weight control. Studies examining smoking in adolescents and adults have demonstrated that weight concerns play a large role in the initiation and maintenance of smoking behaviors (Fulkerson & French, 2003; Ward, Klesges, & Vender Weg, 2001; Weekly, Klesges, & Reylea, 1992). Furthermore, smokers who are overweight, have weight concerns, or believe that they are overweight are significantly more likely to smoke (Fulkerson & French).
Weight concerns have been established as a potential barrier to smoking cessation in the general population, particularly in women. Therefore, it is possible that pregnant smokers with weight concerns may be even less likely to quit because they may already be experiencing pregnancy associated weight gain. However, pregnancy is often viewed as a time where it is considered acceptable to gain weight (Duncombe, Wertheim, Skouteris, Paxton, & Kelly, 2008; Skouteris, Carr, Wertheim, Paxton, & Duncombe, 2005), and research shows that weight concerns tend to be stable across pregnancy. As may be expected, research has also demonstrated that women who report greater weight concern prior to or at the beginning of pregnancy also report greater concern at third trimester (Duncombe et al., 2008; Skouteris et al., 2005). Interestingly, Skouteris and colleagues determined that women were less likely to feel overweight during third trimester than early pregnancy or before pregnancy. It is possible that because weight gain is an unavoidable aspect of pregnancy that women feel more comfortable with their bodies at the time point where their pregnancy is obvious to others. Even with weight concerns being stable across pregnancy, women with concerns are more likely to engage in unhealthy behaviors and report poor wellbeing with some reporting smoking as a weight control method during pregnancy (Abraham, King, & Llewellyn-Jones, 1994; Duncombe et al).

To date, only one study has examined weight concerns as related to quit status in pregnant women. Berg, Park, Chang, and Rignotti (2008) examined weight concerns and smoking behavior in pregnant women and hypothesized that women who had lower body satisfaction, who were concerned with weight gain, and had used cigarettes to control weight would be less likely to quit smoking during pregnancy and more likely to relapse postpartum. Their study examined the efficacy of a telephone intervention where they used four questions to assess the relationship between weight concerns, body image, and smoking in an urban New
England population. Results supported their hypotheses and revealed that women who were more concerned about weight were less likely to make a quit attempt.

**Current Study**

Due to high percentages of pregnant smokers and the detrimental health effects on both the mother and fetus, effective smoking cessation interventions are crucial. Further, based on research documenting even higher prevalence rates in women in rural areas (Bailey, 2006) as well as less access to health care (Gamm, Hutchinson, Bellamy, & Dabney, 2002) these populations may have even greater needs.

Weight concerns have been established as a risk factor for smoking and barrier to cessation especially among women. Similar to smoking rates (Bailey, 2006) and other health risk behaviors (Jackson et al., 2005), overweight and obesity rates are higher in rural populations. These factors coupled with pregnancy associated weight gain make this topic of particular importance to this group. Implications from the findings may guide more effective interventions while also addressing additional needs.

The purpose of the current study was to examine how weight concerns and body image are related to smoking cessation attempts in pregnant women residing in rural Appalachia. The current study builds on a study conducted by Berg and colleagues (2008) by examining weight concerns and smoking behavior in a unique population of pregnant smokers in rural Appalachia. This research adds to data discovered through the Berg study by examining weight concerns in a rural population, controlling for weight via body mass index (BMI), and using psychometrically sound measures in addition to the six questions used by Berg. Whereas Berg and colleagues examined weight related issues as part of a RCT examining the effectiveness of telephone counseling for smoking cessation, the current study examined these issues as related to a cutting
edge intervention based in motivational interviewing in primary care. Primary care has been established as especially important to rural populations where medical care and prenatal care can be difficult to access and some participants travel a significant distance in order to receive care.

If hypotheses are confirmed, it is intuitive to address weight concerns as part of this ongoing intervention. There are current models for developing effective overweight intervention components (Ussher et al., 2008). Additionally, rural populations may benefit from diet and activity changes that may prevent the higher likelihood of a chronic disease documented among these populations (Weidinger et al., 2008) while improving overall health and well-being.

Hypotheses

Hypotheses for the current study are as follows:

1. Women with higher Body Mass Indexes (BMIs) will be more likely to report smoking at 3rd Trimester.
2. Women with higher BMIs will score higher on the Weight Concern Scale (WCS) and the Body Image Concern Inventory (BICI).
3. Women who report weight and body image concerns at 1st Trimester, as determined by higher scores of the WCS and BICI, will be more likely to report smoking at 3rd Trimester when controlling for age, number of pregnancies, marital status, income, education, BMI, depression, and stress.
CHAPTER 2

METHOD

Participants

Participants included 172 current smokers receiving prenatal care at Ob/GYN and Family Practice offices throughout East Tennessee. Participants were participating in the research arm of the Tennessee Intervention for Pregnant Smokers (TIPS; For additional information see Bailey, 2006). Prenatal patients at the practices were eligible for TIPS if they were current smokers, former smokers who have quit in the last 2 years, or nonsmokers exposed to significant levels of secondhand smoke. Approximately 40% of prenatal patients at the practices were eligible for TIPS and receive some level of smoking cessation services, with just over half of those (53%) having consented to participate in the project research interviews. Participating women were primarily White, of low SES, and reside in rural areas of Tennessee. The low SES status and rural environment could account for the high percentage of participants (53.3%) lost to follow-up because of transportation or other difficulties. In addition, women receiving Medicaid are overrepresented in this sample compared to the region in general.

Measures

The first and third trimester interviews included multiple assessment tools, many not directly relevant to the current investigation and so are not detailed here. Other measures included in the study serve to examine additional barriers to smoking cessation within this population and are not likely to interfere with the measures included in the current study. Of interest in the current study, basic demographic information is obtained as part of the first trimester interview, and medical information is obtained through prenatal and delivery chart reviews. Additional measures of interest here are detailed below.
Demographics

Age, number of pregnancies, marital status, ethnicity, income, and education were examined in the demographic portion of the survey materials.

BMI

Participants were asked to self-report prepregnancy weight and height at their first obstetric visit and this information is recorded in the medical chart. In addition, all women were weighed at each prenatal visit and at delivery. Of interest to the current investigation is self-reported prepregnancy BMI. An individual’s BMI is calculated by dividing weight in kilograms by height in meters squared (CDC, 2011). Then, individuals can be categorized by weight status where those with BMIs below 18.5 are underweight, those with BMIs ranging from 18.5 to 24.9 are normal weight, those with BMIs from 25.0 to 29.9 are overweight, and those with a BMI above 30.0 are classified as obese (CDC).

Depression

A short form of the Center for Epidemiologic Studies Depression Scale, the CESD-10, was used to assess the presence of depression symptoms (Andresen, Malmgren, Carter, & Patrick, 1994). Items on the CESD-10 are scored on a four-point scale where zero represents “none of the time” and three represents “all of the time.” Research shows that the CESD-10 has strong predictive value when compared to the original 20-item measure and is positively correlated with lower health status scores (Andresen et al.). Research has demonstrated test-retest reliability for the CESD-10 ranging from .21 to .84 with an average of 22 days between initial administration and retest (Andresen et al.). In addition, the CESD-10 has been used with a variety of populations such as pregnant youth (Salazar-Pousada, Arroyo, Hidalgo, Pérez-López, & Chedraui, 2010) and HIV patients (Yi et al., 2006).
Stress

In order to assess for levels of stress within the sample, data were obtained from the Prenatal Psychosocial Profile (PPP) (Curry, Campbell, & Christian, 1994). The PPP measures stress, partner support, and support from others through a compilation of several measures. For the current study only the stress scale included in the PPP was used. The stress scale includes 11 items from the Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981) that assesses stress related to financial concerns, relationships, recent relocations, recent losses, difficulties with employment, substance use, and current sexual, physical, and/or emotional abuse. The stress scale also includes one item in which women rate how “overloaded” they feel by their current stressors (Curry, Burton, & Fields, 1998). Participants were asked to rate the extent to which each item was a current stressor for them on a four-point scale ranging from one (no stress) to four (severe stress). Reliability and validity for all components of the PPP have been demonstrated across women in diverse populations (Curry et al., 1998). The stress scale, which is the focus of the current study, has internal consistency reliabilities ranging from .67 to .78 with test-retest reliabilities ranging from .52 to .57. The average timing of the first administration was 13 weeks gestation with the second administration between 24 and 28 weeks (Curry et al., 1998). The PPP stress scale is also highly correlated with other measure of life stress such as the Difficult Life Circumstances Scale (Curry et al., 1994).

Weight Concerns

The WCS (Borrelli & Mermelstein, 1998) is a six-item measure designed to assess concern about postcessation weight gain. Item responses are on a 10 point Likert scale where 10 is the highest. The WCS has been shown to have high internal consistency, is valid, and is moderately correlated with reliable measures of weight concern (Borrelli & Mermelstein).
Additionally, the WCS has been used to examine weight concerns in pregnant smokers (Berg et al., 2008) and weight concerns in the medically ill population (Sepinwall & Borrelli, 2004). Women with less than 50% of the items on the WCS completed were eliminated from the sample. Single missing items were addressed by calculating the mean for available items and using this mean to assess total WCS score.

Body Image

The BICI (Littleton, Axsom, & Pury, 2005) is a 19-item measure designed to assess dysmorphic concern. Littleton and colleagues define this construct as “intense concern about and preoccupation with, a perceived defect in appearance, excessive checking or camouflaging of the defect, social avoidance, and reassurance seeking” (p.229). Responses are scored on a five point Likert scale where 1 is “Never” and 5 is “Always.” Higher scores on the BICI are indicative of higher levels of dysmorphic concern. The BICI has high internal consistency and is moderately to highly correlated with other measures of dysmorphic concern and with measures of disordered eating (Littleton at al.). It has been shown to be a valid and reliable measure across various ethnic and SES populations (Littleton & Breitkopf, 2008). Single missing items were addressed by calculating the mean for available items and using this mean to assess total BICI score.

Indicator of Quit Status

Quit status was assessed at third trimester via self-report. Participants were asked “Which of the following best describes your smoking status now?” Response options are on a six-point scale as follows: 0 - I have NEVER smoked; 1 - I stopped smoking BEFORE I found out I was pregnant and am not smoking now; 2 - I stopped smoking AFTER I found out I was pregnant; 3 - I smoke some now but have CUT DOWN SINCE I got pregnant; 4 = I smoke regularly now - about the SAME as BEFORE I became pregnant; 5 - I smoke regularly now, but MORE than
BEFORE I became pregnant. Consistent with other literature using a single item self-report measure of smoking status (e.g., Britton, Brinthaupt, Stehle, & James, 2011), those endorsing any smoking (i.e., items 3-5) were considered smokers.

**Procedure**

Participants in the TIPS study were recruited from Ob/GYN and family medicine offices in Southern Appalachia during the first trimester of pregnancy. They are followed throughout pregnancy and until 6 months postnatally. The first and third trimester assessments were the focus of the current study. Weight concerns and body image were assessed as part of the first trimester interview. Women were asked to retrospectively rate their body satisfaction prior to pregnancy (i.e., In thinking back to before you became pregnant…). Given that many women do attempt to quit smoking during pregnancy, the third trimester was likely the best time period to examine success rates and reasons that pregnancy quit attempts were not successful. Research interviews were conducted individually by TIPS project case managers. Most interviews were conducted following a prenatal visit, although occasionally a participant chose to return at another time to complete the interview. Prior to the first trimester interview, informed consent was obtained, and participants were paid $10 for each completed interview. Quit status was assessed via self-report during third trimester.

**Statistical Analyses**

To determine an appropriate number of participants the statistical program SPSS was used to conduct the power analysis. With power of .8 and a medium effect size it was determined that a minimum sample size of 150 participants would be needed. Descriptive statistics were calculated using SPSS and marital status was collapsed into two groups: living with a partner versus not living with a partner. A one-sample t-test was conducted to examine
the differences between mean scores for the current sample and those obtained by Berg and colleagues (2008) on the following question of the WCS: How much do cigarettes help you to control your weight? In Hypothesis 1 a chi square analysis was used to examine the relationship between weight status and smoking status. In Hypothesis 2 t-tests were used to assess differences between weight status and weight and body image concerns. Finally, in Hypothesis 3 a logistic regression was used to determine the relationship between the variables of interest and smoking status at third trimester. In this analysis, demographics characteristics including weight status served as control variables and were entered into the first step of the regression.
CHAPTER 3

RESULTS

The sample consisted of 172 women who identified themselves as smokers during the first trimester of pregnancy. All women included in the current sample had complete data on weight, body image, and smoking cessation data; however, some women did not complete all demographic data.

Sample Characteristics

Demographics. As shown in Table 1, participants (N = 172) ranged from 15 to 42 years old (M=23.69; SD=5.74). The number of pregnancies women reported ranged from 1 to 10 (M=2.42; SD=1.67). Relationship status was split with 50% of participants reporting residing with a partner. Ethnic distribution of participants was 95.3% White, 2.9% Black, 1.2% Hispanic, and 0.6% Asian. The majority of participants reported an annual household income between $5,000 and $30,000 (56%). However, 32% reported an annual income less than $5,000 and 12% reported an annual household income greater than $30,000. Educational background ranged from completing the 7th grade to completing a 4-year college degree (M=12.04; SD=1.56). Prepregnancy BMI ranged from 14.47 to 68.19 (M=26.85; SD=8.30). Prepregnancy BMI was categorized for weight status into underweight, normal weight, overweight, and obese. In the current sample 9% fell into the underweight range, 43.1% fell into the normal weight category, 19.2% fell into the overweight category, and 28.7% fell into the obese category.

Depression. Participants completed the CESD-10 to assess for current levels of depression during their first and third trimester interviews. For the current study depression levels at first trimester were of interest. Research shows that scores equal to or greater than 10 on this measure indicate the presence of current symptoms of depression (Andresen et al., 1994).
Depression scores from participants ranged from 2 to 30 ($M=10.73; SD=5.06$) with 54.7% of women scoring at or above the cut-off of 10. This score is higher than those ($M = 7.7; SD = 5.2$) reported in a low-income, nonpregnant, sample (Berg et al., 2012) suggesting that women in the current sample may experience higher levels of depression.

**Stress.** Participants completed the PPP at first and third trimester interviews. The stress scale included in the PPP administered during first trimester was used in the current study. Participants reported stress scores ranging from 11 to 34 ($M= 20.24; SD= 5.03$). This is similar to stress levels reported by other low-income pregnant women (Woods, Melville, Guo, Fan, & Gavin, 2010) and indicates overall moderate to high levels of stress in this sample.

**Weight Concerns.** The Weight Concern Scale (Borrelli & Mermelstein, 1998) was used to assess prepregnancy weight concerns and smoking for weight control. Participants reported levels of weight concern ranging from 1 to 10 with a mean of 4.28 ($SD=2.36$). A previous study reported mean levels of post-smoking-cessation weight concern of 5.7 (Borrelli & Mermelstein); however, it is important to consider that the current study used a sample of pregnant smokers whereas Borrelli and Mermelstein did not. Berg and colleagues (2008) adapted the WCS and used two questions (“How much do cigarettes help you control your weight?” and “How concerned are you about gaining weight as a result of quitting?”) and reported a mean score of 1.82 for the use of cigarettes for weight control and a mean score of 4.34 for concern about postcessation weight gain. Women in the current study had a mean score of 3.15 ($SD=2.64$) for the use of cigarettes for weight control which is significantly higher than the mean score of 1.82 reported by Berg and colleagues (2008), ($t (172) =6.58, p=.000$), indicating that women in the current sample may have stronger beliefs about cigarettes’ ability to control weight. On the other
hand, the mean score for concern about postcessation weight gain was similar for women in the current study and scores found by Berg et al., (2008) ($M=4.47$, $SD=3.58$).

**Body Image.** Participants’ concern about body image and physical appearance were measured with the Body Image Concern Inventory (Littleton et al., 2005). Participants’ body image concern ranged from 19-90 with a mean of 45.98 ($SD=18.26$), similar to the mean of 50.4 found by Littleton and colleagues (2005) in a pilot sample of asymptomatic undergraduate women. A score of 72 or greater is considered the clinical cutoff for symptoms of body dysmorphia. There were few women in the current study who scored above this clinical cutoff and mean scores were similar to those found in other studies examining nonclinical samples. For example, in a larger, ethnically diverse sample Littleton and Breitkopf (2008) reported a mean for the English BICI of 42.8, similar to the mean in the current sample.

**Smoking Status.** Only current smokers at first trimester were enrolled in the study and smoking status was reassessed via a single self-report item during third trimester. At this time point only 80% reported continued smoking; however, 20% reported cessation.
Table 1

Sample Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>M (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>23.69 (5.74)</td>
<td>15-42</td>
</tr>
<tr>
<td>Number of Pregnancies</td>
<td>2.42 (1.67)</td>
<td>1-10</td>
</tr>
<tr>
<td>Relationship Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with a Partner</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Not living with a partner</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>95.3%</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>2.9%</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>0.6%</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $5,000</td>
<td>32%</td>
<td></td>
</tr>
<tr>
<td>$5,000-$30,000</td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>&gt;$30,000</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>Education (years)</td>
<td>12.04 (1.56)</td>
<td>7.0-18.0</td>
</tr>
<tr>
<td>BMI</td>
<td>26.85 (8.30)</td>
<td>14.47-68.19</td>
</tr>
<tr>
<td>Weight Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>9.0%</td>
<td></td>
</tr>
<tr>
<td>Normal Weight</td>
<td>43.1%</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>19.2%</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>28.7%</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>10.73 (5.06)</td>
<td>2-30</td>
</tr>
<tr>
<td>Stress</td>
<td>20.24 (5.03)</td>
<td>11-34</td>
</tr>
<tr>
<td>Weight Concern Scale</td>
<td>4.28 (2.36)</td>
<td>1-9.67</td>
</tr>
<tr>
<td>Body Image Concern Inventory</td>
<td>45.98 (18.26)</td>
<td></td>
</tr>
</tbody>
</table>
Correlations among Study Variables

Correlation analyses were used to assess the relationship between demographic and control variables, body image and weight concerns, and smoking status at third trimester (See Table 2). Age was positively correlated with weight concerns, \( r (172) = .17, p < .05 \) and body image concerns, \( r (172) = .17, p < .05 \). Education was positively correlated with body image concerns, \( r (172) = .18, p < .05 \), but negatively correlated with smoking status at third trimester, \( r (172) = -.27, p < .01 \). As predicted, prepregnancy BMI was positively correlated with weight concerns, \( r (172) = .27, p < .01 \) and body image concerns, \( r (172) = .24, p < .01 \). Depression was positively correlated with weight concerns, \( r (172) = .19, p < .01 \) and body image concerns, \( r (172) = .49, p < .01 \). Stress, measured by the PPP, was positively correlated with weight concerns, \( r (172) = .30, p < .01 \), body image concerns, \( r (172) = .49, p < .01 \), and third trimester smoking status, \( r (172) = .15, p < .05 \). Interestingly, despite the positive correlation between education and body image concerns, there was no significant relationship between education and weight concerns. There was also no significant relationship between income and weight concerns, body image concerns, or smoking status.

As would be expected, weight concerns and body image concerns were positively correlated, \( r (172) = .46, p < .01 \). However, the relationship between these variables and third trimester smoking status was different than hypothesized. Weight concerns, but not body image concerns, was positively correlated with smoking status, \( r (172) = .20, p < .01 \). This indicates that

<table>
<thead>
<tr>
<th>Range</th>
<th>Smoking Status 3rd Trimester</th>
</tr>
</thead>
<tbody>
<tr>
<td>19-90</td>
<td>Current Smokers</td>
</tr>
<tr>
<td>80.2%</td>
<td></td>
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</tbody>
</table>

Table 1 (continued)
other variables may play a larger role in predicting smoking cessation across pregnancy in this population than concern about body image.

Table 2

*Correlations Among Study Variables*

<table>
<thead>
<tr>
<th>Background Variables</th>
<th>Weight Concern</th>
<th>Body Image Concern</th>
<th>Smoking Status at 3rd Trimester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.17*</td>
<td>.17*</td>
<td>-.01</td>
</tr>
<tr>
<td>Number of Pregnancies</td>
<td>.05</td>
<td>.10</td>
<td>.09</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>.14</td>
<td>.11</td>
<td>-.06</td>
</tr>
<tr>
<td>Income</td>
<td>.02</td>
<td>.06</td>
<td>-.05</td>
</tr>
<tr>
<td>Education</td>
<td>.05</td>
<td>.18*</td>
<td>-.27**</td>
</tr>
<tr>
<td>BMI (Prepregnancy)</td>
<td>.27**</td>
<td>.23**</td>
<td>-.01</td>
</tr>
<tr>
<td>Depression (CESD Total)</td>
<td>.19**</td>
<td>.49**</td>
<td>.11</td>
</tr>
<tr>
<td>Stress (PPP Total)</td>
<td>.30**</td>
<td>.49**</td>
<td>.15*</td>
</tr>
</tbody>
</table>

**Predictors**

<table>
<thead>
<tr>
<th>Weight Concerns</th>
<th>--</th>
<th>.46**</th>
<th>.20**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body Image</td>
<td>.46**</td>
<td>--</td>
<td>.02</td>
</tr>
</tbody>
</table>

**Outcomes**

<table>
<thead>
<tr>
<th>3rd Trimester Smoking Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>.20**</td>
</tr>
</tbody>
</table>

* N=183  *=p<.05  **=p<.01

Spearman Rho was used to examine the relationship among marital status and smoking status and the variables of interest.
Weight Status and Third Trimester Smoking Status

Chi-square analyses were used to address the first hypothesis that women with higher BMIs would be more likely to continue smoking at third trimester. Prepregnancy weight status was divided into four groups (underweight, normal weight, overweight, and obese) according to CDC guidelines (CDC, 2011). An initial analysis revealed significant differences in smoking behavior between weight status groups, \( \chi^2 (3, N=167) = 9.573, p=.023 \). Follow-up analyses were conducted to examine differences between specific weight status groups. Results demonstrated that normal weight women were significantly more likely to report smoking at third trimester than overweight women (\( \chi^2 (1, N=104) = 3.85, p=.05 \)). Underweight women were significantly more likely than overweight women to report third trimester smoking behavior (\( \chi^2 (1, N=47) = 4.85, p=.03 \)). However, overweight women were significantly less likely than obese women to endorse smoking behavior at third trimester (\( \chi^2 (1, N=80) = 6.88, p=.009 \)). There were no significant differences in third trimester smoking between normal weight and underweight women \( \chi^2 (1, N=87) = 1.42, p=.25 \), between underweight and obese women \( \chi^2 (1, N=63) = .39, p=.53 \), and between normal weight and obese women, \( \chi^2 (1, N=120) = 1.00, p=.32 \). As expected, obese women were more likely to smoke than overweight women. However, contrary to what was hypothesized, underweight and normal weight women were more likely to smoke at third trimester than overweight or obese women.

Weight Status and Weight Concerns

A one-way analysis of variance was used to examine the second hypothesis that women with higher BMIs would score higher on measures of weight concerns. There were significant differences between scores on the WCS depending on weight status, \( F (3, 167) = 5.28, p = .002 \). Tukey’s HSD was used to conduct post-hoc analyses. There were significant differences in
WCS means between underweight and obese women ($M=3.39, SD=1.91$ vs. $M=5.27, SD=2.42$), and between normal weight and obese women ($M=3.78, SD=2.24$ vs. $M=5.27, SD=2.42$), respectively. As hypothesized, women who were underweight or normal weight had lower mean weight concerns than obese women.

**Weight Status and Body Image Concerns**

As with weight status and weight concerns, a one-way analysis of variance was used to explore the relationship between weight status and body image concerns. There were significant differences in BICI scores based on weight status, $F(3, 167) = 4.94, p = .003$. Tukey’s HSD was used to conduct post-hoc analyses. There were significant differences in mean BICI scores between underweight and overweight women ($M=37.40, SD=14.84$ vs. $M=50.72, SD=16.95$), between underweight and obese women ($M=37.40, SD=14.84$ vs. $M=51.42, SD=18.85$), and between normal weight and obese women ($M=43.21, SD=17.95$ vs. $M=51.42, SD=18.85$), respectively. As hypothesized, underweight and normal weight women scored lower on the BICI than overweight and obese women.

**Logistic Regression Analyses**

A logistic regression was used to test the main hypothesis that women who reported higher weight and body image concerns would be more likely than women with lower weight and body image concerns to continue smoking at third trimester. Demographic variables, BMI, depression, and stress were entered into Step 1 as control variables. In Step 2, weight concerns and body image concerns were entered simultaneously to predict third trimester smoking status. The overall model revealed that all of the variables taken together were important predictors of smoking status at third trimester, $\chi^2(2, N=148) = 14.39, p = .001$. As shown in Table 3, one control variable, education, significantly predicted third trimester smoking status. Women with
lower education were more likely to continue smoking at third trimester than women with higher education. For each additional year of education a participant reported, her odds of continued smoking at third trimester decreased (OR=.601, 95% CI .43-.83, p=.003). The addition of weight concerns, but not body image concerns into Step 2, accounted for significant changes in smoking status at third trimester. Women with higher mean scores on the WCS at first trimester were more likely to continue smoking than women with lower WCS scores (OR=1.67, 95% CI 1.23-2.27, p=.001).
Table 3

*Summary of Logistic Regression for Variables Predicting Third Trimester Smoking Status*

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>p</th>
<th>Exp(B)</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.003</td>
<td>.948</td>
<td>1.00</td>
<td>.91 - 1.11</td>
</tr>
<tr>
<td>Number of Pregnancies</td>
<td>.001</td>
<td>.993</td>
<td>1.00</td>
<td>.71 - 1.41</td>
</tr>
<tr>
<td>Relationship Status</td>
<td>-.587</td>
<td>.236</td>
<td>.56</td>
<td>.21 - 1.47</td>
</tr>
<tr>
<td>Income</td>
<td>.142</td>
<td>.199</td>
<td>1.15</td>
<td>.93 - 1.43</td>
</tr>
<tr>
<td>Education</td>
<td>-.509</td>
<td>.003**</td>
<td>.60</td>
<td>.43 - .84</td>
</tr>
<tr>
<td>BMI (Prepregnancy)</td>
<td>.006</td>
<td>.814</td>
<td>1.00</td>
<td>.96 - 1.06</td>
</tr>
<tr>
<td>Depression (CESD Total)</td>
<td>.065</td>
<td>.335</td>
<td>1.07</td>
<td>.94 - 1.22</td>
</tr>
<tr>
<td>Stress (PPP Total)</td>
<td>.082</td>
<td>.223</td>
<td>1.08</td>
<td>.95 - 1.24</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Concerns</td>
<td>.515</td>
<td>.001**</td>
<td>1.67</td>
<td>1.23 - 2.27</td>
</tr>
<tr>
<td>Body Image Concerns</td>
<td>-.026</td>
<td>.190</td>
<td>.97</td>
<td>.94 - 1.01</td>
</tr>
</tbody>
</table>

**p<.01**
Exploratory Analyses

In order to gain additional information about the relationship between weight, weight and body image concerns, and smoking status, several exploratory analyses were conducted. The most recent weight gain guidelines stress that women with higher BMI should gain less weight across pregnancy than women with lower BMIs (Institute of Medicine & National Research Council, 2009). However, because rural residents are more likely to be overweight or obese (Jackson et al., 2005) and because individuals with higher BMIs are more likely to engage in other unhealthy habits such consuming poor diets, even in the pregnant population (Lhila, 2011), it was hypothesized that women with higher BMIs would gain more weight during pregnancy than women with lower BMIs. Pregnancy weight gain was calculated by subtracting self-reported weight (pounds) prior to pregnancy from participant’s weight prior to delivery (medical chart). First, to examine the relationship between weight status and weight gain across pregnancy a one-way analysis of variance was conducted. There were significant differences in weight gain across pregnancy between weight status groups, $F(3, 153) = 8.13$, $p<.001$. However, the results indicated that women did gain weight according to the recommended guidelines. Tukey’s post-hoc analyses revealed that underweight women gained significantly more weight across pregnancy than obese women ($M=35.33$, $SD=12.63$ vs. $M=20.07$, $SD=14.53$), that normal weight women gained significantly more weight across pregnancy than obese women ($M=35.68$, $SD=17.87$ vs. $M=20.07$, $SD=14.53$), and that overweight women gained significantly more weight across pregnancy than obese women ($M=35.10$, $SD=21.97$ vs. $M=20.07$, $SD=14.53$), respectively.

Second, to examine the relationship between body image concerns, weight gain, and smoking status the BICI was dichotomized by classifying women at or above the clinical cutoff
of 72 (also represents those scoring greater than the 90th percentile) as having body image concerns and those below the cutoff as having no body image concerns. An independent samples t-test revealed no significant differences in weight gain across pregnancy based on the presence or absence of body image concerns, \( t (165) = -0.96, p = 0.34 \). A chi square analysis was used to examine the relationship between body image concerns and third trimester smoking status. There were no significant differences between women scoring above the cutoff and smoking status at third trimester, \( \chi^2 (1, N=172) = 0.30, p = 0.58 \).

Third, it was of interest to examine the relationship between women with weight concerns and weight gain across pregnancy as well as third trimester smoking status. There is conflicting evidence around how women perceive weight gain during pregnancy. Some research has demonstrated that women are more concerned about weight gain during pregnancy (Groth & Kearney, 2009). It was hypothesized that women with weight concerns would gain less weight during pregnancy and be more likely to continue smoking than women who did not report weight concerns. Weight concerns were assessed dichotomizing the first item on the WCS (“How important is losing weight or maintaining your current weight compared with other personal health concerns?”). Scores on this item in the current sample ranged from 1 to 10 (M=5.82, SD=2.74). Women falling at or above the 90th percentile of score responses were classified as having weight concerns and labeled as one while women below the 90th percentile were classified as having no weight concerns and labeled as zero. An independent samples t-test was used to assess the hypothesis that women with weight concerns would gain significantly less weight over their pregnancy than women with no weight concerns. Analyses revealed no differences in weight gain between women with and without weight concerns, \( t (165) = 0.048, p = 0.96 \). A chi square analysis was used to examine the relationship between weight concerns and
third trimester smoking status. There were no significant differences in third trimester smoking status between women reporting weight concerns and those who did not endorse weight concerns: \( \chi^2 (1, N=172) = .06, p=.81. \)
CHAPTER 4

DISCUSSION

Despite declines in smoking behavior in the general population, Tennessee residents continue to smoke at rates well above the national average (23.1% vs 18.3%; CDC, 2010). While modifying smoking behavior in the general population is an important public health concern, reducing the number of pregnant smokers may be an even more important issue. In rural Northeast Tennessee the pregnancy smoking rates approach an alarming 40% in some areas, and one in three births are affected by smoking (Bailey, 2006; Bailey & Cole 2009). The current study examined barriers to smoking cessation in pregnant women in the Appalachian region by building on literature. Several barriers to smoking cessation have been identified in the general and pregnant population. For both groups lower income, high levels of stress, and lower levels of motivation to quit have been cited as barriers (Hymowitz et al., 1997; Stewart, Greaves, et al., 2011). Within the Appalachian region, Bailey (2006) identified multiple pregnancies, difficulty accessing prenatal care, and lengthy smoking histories to be barriers within the pregnant population. Although weight concerns have also been identified as a barrier to smoking cessation in the general population, no research to date has examined this construct in pregnant women in a rural setting. The current study also builds upon research by Berg et al. (2008) by examining the relationship between prepregnancy weight and body image concerns and smoking cessation during pregnancy. Specifically, the current study examines weight concerns in a rural, rather than nonrural, sample and uses validated measures for weight and body image concerns.

The main hypothesis of the current study was that women reporting greater prepregnancy weight and body image concerns assessed retrospectively at first trimester would be less likely to
quit smoking by third trimester than women reporting lower prepregnancy weight and body image concerns. Additional hypotheses explored the relationship between weight status and smoking behavior as well as weight and body image concerns with the expectation that greater weight status would be associated with higher scores on the WCS and BICI.

**Weight Concerns and Third Trimester Smoking Status**

Similar to other studies examining weight concerns in smokers (Donny, Caggiula, Weaver, Levin, & Sved, 2011; Pomerleau & Saules, 2007), the current study revealed that the presence of weight concerns is related to a decreased likelihood of cessation. Interestingly, Bush and colleagues (2008) examined the prevalence of obesity and concerns about postcessation weight gain among individuals calling in to a state-sponsored smoking quit line. They reported that 63.5% of the sample fell into the overweight or obese categories and 60.6% of callers reported concerns about weight gain. These results indicate that weight issues may come up for a large majority of smokers. The current study also corroborated results demonstrated by Berg and colleagues (2008) by finding that women reporting higher levels of weight concerns were less likely to report abstinence at their third trimester interview.

It is important to note that the current study differed methodologically from the study conducted by Berg and colleagues in several ways. First, the current study used the entire WCS (Borrelli & Mermelstein, 1998) to measure prepregnancy weight concerns and smoking for weight control, while Berg and colleagues assessed weight attitude through an adaptation of the WCS and the addition of two weight satisfaction questions. Second, in order to discern the role that beliefs about physical appearance play in smoking behavior the current study examined body image concerns separately from weight concerns through the BICI developed by Littleton.
and colleagues (2005). Third, biological confirmation of smoking status was not used in the current study as by Berg and colleagues (2008).

Given the methodological differences between the study conducted by Berg and colleagues (2008) and the current study, mean weight concern scores could not be compared. However, mean scores on specific items of the WCS used in both studies were examined and women in both studies reported similar concern about gaining weight as a result of quitting (M=4.45, SD=3.57 vs. M=4.34, SD=3.48). On the other hand, women in the current study reported significantly greater belief in cigarettes’ ability to control weight (M=3.14, SD=2.635 vs M=1.82, SD=1.28).

Education was another significant predictor of smoking cessation at third trimester. This is an important finding for several reasons. Research demonstrates that lower education is a significant risk factor for the initiation and maintenance of smoking behavior in the general population (Goodwin, Pagura, Swipwak, Lemeshow, & Sareen, 2011; Harrell et al., 1998), and results of the current study suggest that it may be a significant barrier in pregnant women as well. Furthermore, it is possible that lower education around health behaviors, including the effects of smoking, may contribute to distorted beliefs about the effects of cigarettes. In fact, Kleinjan and colleagues (2006) reported that distorted beliefs about the health risks of cigarettes are a barrier to cessation. The influence of education along with findings suggesting that women in our sample report high belief in the effectiveness of cigarettes to control weight suggest that our sample may have distorted beliefs about the benefits of cigarettes (e.g., weight management) thus contributing to weight concern emerging as a significant barrier to quitting. However, when examining the first item of the WCS (How important is losing weight or maintaining your current weight compared with other personal health concerns?) that assesses more general weight
concerns (versus smoking for weight control) there was no relationship between higher scores (above 90th percentile) and third trimester smoking. Therefore, it may be that beliefs around the ability of smoking to control weight more directly impacts continued smoking during pregnancy than general weight concerns.

Interestingly, barriers to cessation identified in previous research (ex: number of pregnancies, income, and stress) were not significant predictors in this population. In a similar population, Bailey (2006) reported that women who had more prior pregnancies and/or lower incomes were less likely to quit smoking during their pregnancy than women who had fewer pregnancies or who were in their first pregnancy and/or had higher incomes. Stress has also been shown to be a significant predictor of continued smoking behavior (Guirguis et al., 2010). It may be that cultural and environmental variables specific to this population have influenced the findings of the current study. For example, research demonstrates that rural dwellers engage in more unhealthy behaviors than their urban counterparts (Jackson et al., 2005) and weight related concerns are likely to be related to health behaviors such as eating and physical activity. The influence of education has also been demonstrated in previous research (Holtrop et al., 2010) and may be especially important in this sample as rural dwellers have been characterized as being less educated (Erwin, 2008). Therefore, it is possible that education is simply a more powerful predictor within this sample of women with a mean of 12 years of education.

**Body Image Concerns and Third Trimester Smoking Status**

Contrary to the initial hypothesis, body image concerns were not a significant predictor of third trimester smoking status. This is in contrast with evidence demonstrating that women with greater concerns about their body shape or image are more likely to have difficulty quitting (Kendzor, Adams, Stewart, Baille, & Copeland, 2009) and are more likely to resume smoking.
with postcessation weight gain (Dobmeyer, Peterson, Runyan, Hunter, & Blackman, 2005). Interestingly, King, Matacin, White, and Marcus (2005) discussed the role of cognitive dissonance in a study of body image and smoking behaviors. Their hypothesis that women with a more negative body image would have more difficulty quitting was also confirmed; however, they also noted that women with poorer body image were less likely to engage in exercise and other health promoting behaviors.

It is possible that weight, but not body image, concerns were related to smoking behavior in this sample because these scales were measuring very different constructs. The BICI is designed to measure concerns with appearance and body dysmorphia within a clinical or nonclinical sample; however, the WCS is not a general measure of weight concerns but is designed to assess smoking specific weight concerns. Therefore, it is possible that women included in this sample have low levels of weight and body image concerns unrelated to smoking specific concerns. Furthermore, some research suggests that body satisfaction improves with pregnancy because it is a time of expected weight gain (Davies & Wardle, 1994). Assessing weight and body image concerns during this time point may yield lower scores due to state specific changes to how women view themselves.

**Weight Status and Third Trimester Smoking Status**

Research has been mixed on the relationship between BMI and smoking behavior. Based on studies conducted by Klesges, Robinson, and Zbikowski (1998) demonstrated that adolescent smokers had higher BMIs than nonsmokers, the current study hypothesized that women with higher BMIs would be more likely to smoke at third trimester. However, the results of the current study were mixed. In contrast to the expected results, more underweight and normal weight women reported smoking at third trimester than overweight women. Yet as expected,
obese women were more likely than overweight to report continued smoking behavior. Interestingly, there were no significant differences in smoking status between normal weight and obese women, between underweight and obese women, or between underweight and normal weight women. The relationship between weight status and smoking remains unclear. Some research suggests that regular adult smokers have lower BMIs than nonsmokers (Klesges & Klesges, 1993). Women who have stronger beliefs that smoking is helping to manage their weight may also have lower BMIs because they are engaging in other compensatory behaviors such as dietary restriction. Research suggests that women with weight and body image concerns continue to engage in compensatory behaviors such as purging even during pregnancy (Carlosh, Allen, Dalton, & Bailey, 2011; Soares et al., 2009). Therefore, women engaging in compensatory behaviors may be more likely to be normal weight or underweight. It is also possible that this relationship may be mediated by engagement in other health risk behaviors that were not assessed in the current study.

**Weight Status, Weight Concerns, and Body Image Concerns**

The current study predicted that women with higher BMIs would report higher weight and body image concerns than women with lower BMIs. Previous research documents higher BMIs to be associated with greater weight and body image concerns. For example, in a study examining the relationship between BMI and body dissatisfaction, Yates, Edman, and Aruguete (2004) reported that women with higher BMIs reported higher levels of dissatisfaction than those with lower BMIs. Additionally, Pomerleau and Saules (2007) found that overweight and obese smokers were more likely to report body dissatisfaction, concern about postcessation weight gain, and scored higher on measures of disinhibited eating. Consistent with our hypothesis, overweight and obese women reported significantly higher weight and body image concerns than
underweight and normal weight women. It is important to consider that prepregnancy BMI was used in the current study and that weight and body image concerns were assessed early enough in pregnancy that many women had not experienced pregnancy related weight gain. If weight and body image concerns were assessed later during pregnancy (at a time when weight gain is expected), it is possible that these concerns would have remained stable or decreased (Loth, Bauer, Wall, Berge, & Neumark-Sztainer, 2011).

**Exploratory Analyses**

Miles, Proescholdbell, and Puffer (2011) report that income, obesity, and the presence of joint disease significantly impacts health related quality of life in rural residents. Research also shows that access to medical care, types of employment (manual labor versus professional), and higher rates of disability and chronic disease impact the health status of rural dwellers (Jones, Parker, Ahearn, Mishra, & Variyam, 2009). Average BMIs for adults residing in Northeast Tennessee, where several counties are considered health provider shortage areas, range from 29.7 to 34.6 which fall approximately in the obese range (CDC, 2008). Institute of Medicine & National Research Council (2009) guidelines recommend that overweight and obese women gain less weight during pregnancy than underweight or normal weight women. Given the higher rates of obesity and health risk behaviors in Appalachia, it was of interest to examine whether study participants were following weight gain recommendations. In contrast to what was hypothesized, overweight and obese women had lower gestational weight gain than underweight and normal weight women. These results may indicate that, overall, women in the current study may be following weight gain recommendations.

Body dissatisfaction has been shown to impact eating behaviors (Johnson & Wardle, 2005). As cited previously, adults with higher BMIs are on average less satisfied with their
bodies than those with lower BMIs (Millstein et al., 2008). Women with higher BMIs are also more likely to engage in dieting behaviors to reduce weight and less likely to engage in physical activity (Millstein et al.). Therefore, we hypothesized that women scoring higher on the BICI and reporting weight concerns would gain less weight across pregnancy. Surprisingly, there was no difference in weight gain for women scoring highly on the BICI or reporting weight concerns. This is in contrast to evidence by Mehta, Seiga-Riz, and Herring (2011) who examined the relationship between body image concerns and gestational weight gain and determined that body image does impact pregnancy weight gain. In addition, they found that underweight and normal weight women who reported a preference for a thinner body style were more likely to experience weight gain above the recommended amount, but overweight or obese women preferring a thinner body style had a decreased risk of over-gaining. However, they note that the relationship between gestational weight gain and body image concerns is complex and that other factors, such as education level and income level may have a significant impact on whether weight gain recommendations are followed.

Similarly, in a study examining the relationship between eating behaviors and weight concerns during pregnancy, Clark and Ogden (1999) also note this complex relationship. Results demonstrated that pregnant participants reported increased food intake and body satisfaction compared to nonpregnant participants. However, engaging in compensatory behaviors prior to pregnancy appeared to impact eating behaviors during pregnancy. Clark and Ogden discovered that pregnant women who reported higher levels of restrained eating prior to pregnancy indicated lower levels of hunger and less difficulty in controlling food consumption than women who did not report restrained eating before pregnancy. It is also possible that the findings of the current
study may be explained by other findings indicating that women are often less concerned about body image and weight and view it as an acceptable time for weight gain (Loth et al., 2011).

**Stress and Smoking Status**

An additional variable that was moderately correlated with third trimester smoking status was stress. Stress, along with the challenges of weight gain and behavior change, has been identified by patients as one of the top concerns in smoking cessation (Guirgis et al., 2010). Although there is some evidence that nicotine reduces negative affect, anxiety, and stress, particularly in females, the evidence remains mixed (File, Fluck, & Leahy, 2001). In order to gain a better understanding of the relationship between smoking and stress in low-income populations, Warren, Thomas, Okuyemi, Lindgren, and Ahluwalia (2010) developed and validated a measure of stress in a sample of African American smokers. Results demonstrated that increased stress was associated with tobacco related variables. When examining barriers to smoking cessation in a sample of pregnant women on Medicaid, Holtrop and colleagues (2010) found that 53% of their sample had elevated stress scores. Furthermore, elevated stress scores, mental health history, and substance abuse significantly increased the odds of continued smoking in this population. These findings are particularly relevant to the current study given the large portion of Medicaid patients within the sample.

**Strengths**

The current study adds to the limited literature on pregnant women who smoke in several ways. First, by examining weight related issues pertinent to a rural population the current study begins to shed light on the unique ways that weight concerns can impact rural dwellers. This is important given that health disparities are greater in rural populations (Miles at al., 2011) including higher rates of smoking during pregnancy (Bailey, 2006) and overweight and obesity
(Jackson et al., 2005). Gaining a better understanding of the specific barriers to behavior change in rural populations can help inform practitioners around the most effective ways to intervene. Future studies may also examine how the degree of rurality relates to barriers to cessation. For example, it may be that more rural residents are less educated, experience more economic stress, or are more accepting of higher weights and BMIs thus offering other insights into intervention development.

Second, to date Berg and colleagues (2008) is the only study to assess smoking related weight concerns as a predictor of smoking cessation in pregnant women. The current study improved upon this method of assessing weight concerns in smokers by using the entire WCS which has been validated in other samples. Third, Berg and colleagues (2008) addressed the relationship between weight satisfaction and smoking by developing two items that were administered along with the items pulled from the WCS. However, these items have not been validated as an appropriate measure of weight satisfaction or body image concerns in pregnant women. The current study improved upon this by using the BICI that has been validated across a multiethnic sample. Furthermore, the current study helps to highlight the importance of individual beliefs about the weight control properties of cigarettes. Women in the current sample reported significantly higher beliefs about cigarettes’ ability to control weight than those cited by Berg and colleagues (2008). This may be especially important when considering study participants’ or patients’ cultural beliefs and education level.

**Limitations and Future Directions**

The limitations of the current study provide directions for future research. First, the Weight Concern Scale is designed to assess smoking for weight control specifically. While it is helpful in identifying beliefs about the importance of smoking for weight control and concerns
about postcessation weight gain, it may not adequately assess general weight concerns. Only one question in the WCS examined more general weight concerns; therefore, in future studies it may be useful to include an additional measure to examine weight concerns more broadly rather than solely smoking specific concerns.

Second, the results of the study imply that weight and body image concerns may be different constructs and it may be helpful to address them as such. Additional research is needed in order to flesh out the differences between these constructs. Questions specific to concerns about current weight satisfaction and fear of weight gain may be best suited for addressing weight concerns. When considering addressing body image concerns, it may be beneficial to use a measure similar to the BICI which addresses how participants view themselves or feel that others view them. Future studies may also examine weight and body image concern prior to and early in pregnancy through the use of figure scales rather than self-report alone. Furthermore, additional research could examine the relationship between body image and engaging in health promoting behaviors so that this discrepancy can be address in clinical interventions.

Third, participants completed the weight and body image concern measures during first trimester of pregnancy. Loth and colleagues (2011) examined body image concerns in women prior to and then during pregnancy and noted a significant increase in body satisfaction with pregnancy. Although participants in the current study were asked to reflect to before they were pregnant when completing these items, it is possible that women reported higher body image satisfaction than they would have if they had completed these measure before finding out about their pregnancy. Future studies should examine the relationship between weight and body image concerns and smoking behaviors over time beginning prior to pregnancy in order to better understand the relationship between these constructs.
A fourth limitation of the current study is the lack of an objective measure of smoking at third trimester. Validation of abstinence through the use of expired CO\textsuperscript{2} or through cotinine is considered a superior measure of smoking status because there is evidence showing that participants tend to underreport their smoking status (Gorber, Schofield-Hurwitz, Hardt, Levasseur, & Tremblay, 2009). However, due to the high levels of secondhand smoke exposure in this population, inconsistent guidelines for biologic confirmation in pregnant smokers, and missing data, we were unable to obtain reliable CO\textsuperscript{2} readings. The lack of biological validation of quit status prevents the confirmation of quit status and the relationship between report weight concerns and abstinence. Using biologic confirmation would greatly strengthen this study and is recommended for future studies.

**Clinical Implications**

Despite inconsistencies in the research regarding the relationship between weight status and smoking behavior (e.g. Klesges & Klesges, 1993; Klesges and colleagues 1998), the presence of weight concerns appear to impact female smokers desire to quit. Addressing weight concerns as part of smoking cessation protocols in clinical settings may increase success rates. Findings by Love and colleagues (2011) corroborate this by demonstrating that in a nonpregnancy population weight concerned smokers offered a weight management program as part of a smoking cessation plan were five times more likely to attend an initial session and three times more likely to remain abstinent at 6 months than those who were not offered a weight management program. Given that there appears to be an important connection between beliefs about the weight control property of cigarettes and reluctance to quit and lower education levels in the current sample, it may be important for providers to incorporate education around the weight control properties of tobacco products. For instance, it would be important to discuss the
discrepancy between the weight control and appetite suppressant benefits and the health risks of smoking. Correlational results of the current study also demonstrate that there may be a relationship between stress and smoking cessation. While further investigation is needed to shed light on the exact relationship between stress and smoking initiation and maintenance, the current results may suggest that assessing stress levels and management skills in current smokers may be an important step in helping patients move towards cessation. It may be of greater importance to discuss these psychosocial concerns during regular medical visits and providing brief recommendations about coping strategies could help improve cessation rates in a low SES population where patients may be experiencing greater levels of stress. Furthermore, addressing behavioral factors such as stress, weight concerns, and smoking as part of routine care may positively impact patients overall health and wellbeing.

Conclusions

Pregnancy smoking rates in the Appalachian region of Northeast Tennessee are significantly higher than the national average. Reducing pregnancy smoking rates in this area can impact maternal and fetal health outcomes; however, many barriers to cessation exist for this population. Postcessation weight gain is a concern even in pregnancy and providing education or incorporating diet and exercise interventions into cessation programs could be beneficial. Weight concern in addition to education is an identified barrier to smoking cessation for women. Beliefs about the positive impact that smoking can have on weight management and the use of smoking to control weight may need to be addressed as a component of intervention. Increasing education about the impact of smoking on weight, particularly when discussing cessation with mothers, could help to reduce distorted beliefs and may increase the likelihood of success in quitting. Future studies are needed to improve our understanding of the barriers to health
behavior change in rural populations so practitioners are able to incorporate information and skills related to these barriers into behavior change protocols.
REFERENCES


doi:10.1016/j.amjmed.2008.01.017


doi:10.1016/j.addbeh.2006.11.016


68


APPENDICES

Appendix A: IRB Initial Full Review for TIPS

ETSU
East Tennessee State University
Office for the Protection of Human Research Subjects • Box 70565 • Johnson City, Tennessee 37614-1707 • (423) 439-6053
Fax: (423) 439-6060

IRB APPROVAL - Initial Full Review

June 14, 2007

Beth Bailey
Family Medicine
Box 70621

Re: Tennessee Intervention for Pregnancy Smoking
IRB#: 06-117f
ORSPA #: 07-0141

The following items were reviewed at the June 5, 2007 meeting:

-Non-Minor Modification Form
-Modification Request
-Narrative (3/27/07)
-Narrative (revised 3/27/07)
-Supplemental submission Form…Pregnant Women and Fetuses
- *ICD (revised 4/27/07)
- *HIPAA Authorization
- TIPS Grant
-Pregnancy Assessments: Background Information, Pregnancy Smoking Information Questionnaire, Pregnancy Psychosocial Profile (PPP), Conflict Tactics Scale – Revised (CTS-2), Women Abuse Screening Test (WAST), HITS, Abuse Assessment Screen (AAS), CESD-10, Substance Abuse Questionnaire, T-ACE, Michigan Alcoholism Screening Test (MAST), Infant Feeding Questionnaire (done only during the second interview)
-CV (Beth Bailey)
-Previous Narrative (1/24/07)
-Previous approval Letter
The IRB voted to approve this non-minor modification pending approval of the following requested changes. The item with an asterisk(*) above needed changes requested by the convened board.

The following documents with the incorporated requested changes have been received by the IRB Office on June 11, 2007:

- ICD (rev 6/11/07)

The revised ICD (rev 6/11/07) incorporating the requested changes were reviewed and approved by an expedited process on June 14, 2007 by Kenneth Olive, M.D., Chair, ETSU/VA IRB.

On June 5, 2007 an approval was granted for a period not to exceed 12 months and will expire on 06/04/2008. Your Continuing Review is scheduled for 05/02/2008. The expedited approval of the requested changes [ICD (rev 6/11/07)], will be reported to the convened board on July 10, 2007.

The following *enclosed stamped, approved ICD* has been stamped with the approval and expiration date and this document must be copied and provided to each participant prior to participant enrollment:

- Informed Consent Document (rev 6/11/07)

Federal regulations require that the original copy of the participant’s consent be maintained in the principal investigator’s files and that a copy is given to the subject at the time of consent.

Based on the pregnancy advocate reviewer, the IRB determined that, for this study, it is scientifically appropriate to require prediabetes studies, including studies on pregnant animals, and clinical studies, including studies on non-pregnant women, to have been conducted to provide data for assessing potential risks to women and fetuses as the smoking health risks to mother and fetus are well-known. The risk to the fetus is caused solely by interventions or procedures that hold out the prospect of direct benefit for the woman or the fetus as the standard of care and smoking cessation intervention equal potential benefits for mother and fetus. The IRB determined that any risk is the least possible for achieving the objectives of the research. The IRB determined that the research holds out the prospect of direct benefit both to the pregnant woman and the fetus as the study involves standard of care and smoking cessation case management. The woman's consent will be obtained.

The IRB determined that each individual providing consent is fully informed regarding the reasonably foreseeable impact of the research on the fetus or neonate. The IRB determined that this research does not involve children as participants. The IRB determined that no inducements, monetary or otherwise, will be offered to terminate a pregnancy. The IRB determined that individuals engaged in the research will have no part in any decisions as to the timing, method, or procedures used to terminate a pregnancy. In addition, individuals engaged in the research will have no part in determining the viability of a neonate.
The waiver to alter or obtain informed consent and the HIPAA waiver of authorization was revoked as the study now utilizes informed consent and HIPAA authorization. This study status changes the study from expedite to full review.

Unanticipated Problems Involving Risks to Subjects or Others must be reported to the IRB (and VA R&D if applicable) within 10 working days.

Proposed changes in approved research can not be initiated without IRB review and approval. The only exception to this rule is that a change can be made prior to IRB approval when necessary to eliminate apparent immediate hazards to the research subjects [21 CFR 56.108 (a)(4)]. In such a case, the IRB must be promptly informed of the change following its implementation (within 10 working days) on Form 109 (www.etsu.edu/irb). The IRB will review the change to determine that it is consistent with ensuring the subject’s continued welfare.

Sincerely,

[Signature]

Kenneth Olive, M.D., Chair
ETSU/VA Medical Institutional Review Board
Appendix B: IRB Modification

PENDING APPROVAL OF NON-MINOR MODIFICATION

January 8, 2009

Beth Bailey, Ph.D.
Family Medicine
Box 70621

<table>
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<tr>
<th>RE:</th>
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<td>IRB #:</td>
<td>06-117f</td>
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The ETSU/VA IRB reviewed and approved the following items at the convened ETSU/VA IRB meeting on January 6, 2009 pending requested changes:

- Modification request to add 5 additional tools to the assessment interviews and increase compensation to $20 per interview.
- Weight concern scale
- Body Image inventory
- Adult eating patterns
- Eating attitudes test
- Pregnancy smoking- support and consequences
- Narrative (3/27/07)
- Currently approved ICD (10/17/08)
- *Proposed ICD (12/11/08)

CONTINGENT APPROVAL- REVISED ITEMS DUE: 01/16/09

The requested changes are:

1. Proposed ICD (12/11/08), page 3, last sentence of contact for questions section – correct "nay" to "any"
Please submit to the IRB Office at Box 70565. A final approval letter will be issued when the changes have been approved.

Sincerely,

George Youngberg, M.D.
Chair, ETSU/VA IRB
Appendix C: Informed Consent Document for Smokers

INFORMED CONSENT DOCUMENT (ICD)

PRINCIPAL INVESTIGATOR: Beth A. Bailey, PhD
TITLE OF PROJECT: Tennessee Intervention for Pregnancy Smoking

INTRODUCTION:

This Informed Consent Document will explain about being a research subject in an experiment. It is important that you read this material carefully and then decide if you wish to be a volunteer.

PURPOSE:

As part of your prenatal care, your health care provider and his/her staff will be providing you with information about smoking and second-hand smoke exposure, as well as general assistance with pregnancy issues. The purposes of the related research study you are being asked to participate in are as follows: First, we hope to find out how useful you find the information your provider gives you. Second, we want to look at how useful you find the information and assistance provided to you by other staff at the provider’s office. Finally, we want to look at how your life circumstances may impact the outcomes of your pregnancy and how useful you find the information and assistance you receive.

We hope that the information obtained from this research study will lead to the development of better care for pregnant women.

DURATION:

If you choose to participate in this research study you will be interviewed during four separate visits to your prenatal care provider while you are pregnant. The first interview will last approximately 30 minutes. The subsequent interviews will last 5 to 10 minutes. In addition, you will be contacted for a 10 to 20 minute interview six weeks after your baby is born, and again six to eight months after your baby is born. These interviews after your baby is born will be conducted either over the phone or in person. All eligible women who receive prenatal care here and at other locations throughout Northeast Tennessee will be invited to participate in this study.

PROCEDURES:

If you choose to participate in this research study, you will be asked to participate in four pregnancy interviews. Before the first interview begins, you will be asked to sign this informed consent document as well as other legally required paperwork. Interviews will be individual, private meetings with a project staff person. You will be asked questions about your background and medical history. You will also be given several forms to complete that include questions about smoke exposure, your feelings, and how conflict is dealt with in your home. If health-related or mental health concerns are revealed during participation in this research, you will be referred for further services. Finally, you will be asked to blow in to a carbon monoxide detector that will provide information about the level of carbon monoxide in the air you breathe out. This level is an indicator of the amount of smoke you have been exposed to.
ADDITIONAL DATA COLLECTION:

As part of the research study, project staff will need access to your medical records. By agreeing to participate (indicated by signing below), you are also agreeing to allow research project staff to access your medical records here at your health care provider’s office and at the hospital where you deliver your baby. Additionally, project staff will need to access your baby’s newborn hospital chart and discharge summary. Finally, you agree to allow us to contact you in the future, using whatever information you provide to us or that we obtain from your medical charts, for participation in a phone interview and other possible follow up studies. If you choose to participate in research interviews after delivery, you will also be asked about your baby’s health and development. You will, of course, have the right to refuse participation in any portion of the study or in any future study at that time.

ALTERNATIVE PROCEDURES/TREATMENTS:

There is currently no alternate research study. However, you may choose not to participate.

POSSIBLE RISKS/DISCOMFORTS:

The possible risks and/or discomforts of your involvement include possible discomfort with answering personal questions. Your privacy is important to us. Questions will be asked in private and answers will be kept confidential. However, you may choose not to answer any question that makes you too uncomfortable. There are not other known risks associated with participating in this research study.

POSSIBLE BENEFITS:

The possible benefits of your participation include having someone to talk with about pregnancy related issues. Information from this study may benefit pregnant women and children born to them in the future. Findings from this study will provide health care professionals with information about the effectiveness of the information they give patients, which can help them to better help their patients. Findings from this study may also lead to the development of programs to help women have healthier pregnancies.

COMPENSATION FOR MEDICAL TREATMENT:

East Tennessee State University (ETSU) will pay the cost of emergency first aid for any injury that may happen as a result of your being in this study. ETSU makes no commitment to pay for any other medical treatment. Claims against ETSU or any of its agents or employees may be submitted to the Tennessee Claims Commission. These claims will be settled to the extent allowable as provided under TCA Section 9-8-307. For more information about claims call the Chairman of the Institutional Review Board of ETSU at 423/439-6055.
PRINCIPAL INVESTIGATOR: Beth A. Bailey, PhD
TITLE OF PROJECT: Tennessee Intervention for Pregnancy Smoking

FINANCIAL COSTS:

There will be no cost to you as a result of participation in this research study. Usual charges related to you prenatal visit will still apply.

COMPENSATION FOR STUDY PARTICIPATION:

You will receive financial compensation for your involvement in this research study, should you choose to participate. You will receive $20 for the first pregnancy interview, $10 for each of the second and third pregnancy interviews, and $20 for the fourth pregnancy interview. You will also receive $20 for each of the two postnatal interviews, for a maximum compensation of $100.

VOLUNTARY PARTICIPATION:

Participation in this research study is voluntary. You may refuse to participate. You can quit at any time. If you quit or refuse to participate, the benefits or treatments to which you are otherwise entitled will not be affected. You may quit by calling Dr. Beth Bailey, whose phone number is (423) 439-6477. You will be told immediately if any of the results of the study should reasonably be expected to make you change your mind about staying in the study.

CONTACT FOR QUESTIONS:

If you have any questions, problems, or research–related medical problems at any time, you may call Dr. Beth Bailey at (423) 439-6477, or Dr. Fred Tudiver at (423) 439-6738. You may call the Chairman of the Institutional Review Board at (423) 439-6055 or at (423) 439-6002 for any questions you may have about your rights as a research subject.

CONFIDENTIALITY:

Every attempt will be made to see that information collected as part of this research study is kept confidential. A copy of the records from this study will be stored in the office space within the Research Division of the Department of Family Medicine at East Tennessee State University for at least 10 years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a subject. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the ETSU Institutional Review Board, and personnel particular to this research project have access to the study records. Your information will be kept completely confidential according to current legal requirements. It will not be revealed unless required by law, or as noted above.
PRINCIPAL INVESTIGATOR:  Beth A. Bailey, PhD
TITLE OF PROJECT:  Tennessee Intervention for Pregnancy Smoking

AUTHORIZATION TO USE AND DISCLOSE PROTECTED HEALTH INFORMATION FOR RESEARCH PURPOSES:

The privacy law, Health Insurance Portability & Accountability Act (HIPAA), protects my individually identifiable health information (protected health information). The privacy law requires me to sign an authorization (or agreement) in order for researchers to be able to use or disclose my protected health information for research purposes in the study entitled Tennessee Intervention for Pregnancy Smoking.

I authorize Dr. Beth Bailey and her research staff to use and disclose my protected health information for the purposes described below. I also permit my doctors and other health care providers to disclose my protected health information for the purposes described below.

My protected health information that may be used and disclosed includes:

- Demographic information
- Intake assessment including medical history
- Visit notes and ACOG charting
- Results of all laboratory procedures
- Delivery and newborn chart information

The Investigator, Dr. Beth Bailey, may use and share my health information with:

- The East Tennessee State University Human Research Protections Program (HRPP) Institutional Review Board Administration when the researcher or the research site is undergoing Quality Improvement Program (QIP) auditing.
- Government representatives, when required by law
- Research project staff

Once my health information has been disclosed to anyone outside of this study, the information may no longer be protected under this authorization. Dr. Beth Bailey and the State of Tennessee agree to protect my health information by using and disclosing it only as permitted by me in this Authorization and as directed by state and federal law.

I do not have to sign this Authorization. If I decide not to sign the Authorization:

- It will not affect my treatment, payment or enrollment in any health plans nor affect my eligibility for benefits.
- I may not be allowed to participate in this research study.

APPROVED
By the ETSU/VA IRB

11/11/2010

DOCUMENT VERSION EXPIRES

NOV 08 2010

ETSU/VA IRB

Subject Initials
PRINCIPAL INVESTIGATOR: Beth A. Bailey, PhD
TITLE OF PROJECT: Tennessee Intervention for Pregnancy Smoking

After signing the Authorization, I can change my mind and:

- Not let the researcher disclose or use my protected health information (revoke the Authorization).
- If I revoke the Authorization, I will send a written letter to: Dr. Beth Bailey, P.O. Box 70621, Johnson City, TN 37659 to inform her of my decision.
- If I revoke this Authorization, researchers may only use and disclose the protected health information already collected for this research study.
- If I revoke this Authorization my protected health information may still be used and disclosed should I have an adverse event (a bad effect, or experience something unanticipated).
- If I change my mind and withdraw the authorization, I may not be allowed to continue to participate in the study.

This Authorization does not have an expiration date.
If I have not already received a copy of the Privacy Notice, I may request one by contacting the Privacy Officer. If I have any questions or concerns about my privacy rights, I should contact the East Tennessee State University, James H. Quillen College of Medicine Privacy Officer, Paula Wright, at 423/433-6074 or the Compliance Manager at Phone: (423)438-9651.

I am the subject or am authorized to act on behalf of the subject. I have read this information, and I will receive a copy of this form after it is signed.

By signing below, I certify that I have read or had this document read to me. I will be given a signed copy. I have been given the chance to ask question and to discuss my participation with the investigator. I freely and voluntarily choose to be in this research project. In addition, by signing below, I am authorizing the use and disclosure of my protected health information for research purposes as described above.

______________________________
SIGNATURE OF VOLUNTARILY PARTICIPATING PATIENT

______________________________
DATE

______________________________
PRINTED NAME OF PARTICIPANT

______________________________
SIGNATURE OF INVESTIGATOR/DESIGNEE

______________________________
DATE

APPROVED
by the ETSU VA IRB

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11/11/2010

[Signature]
Chair, Coordinator

______________________________
Subject Initials

89
Appendix D: Demographic Questionnaire

Examiner:________________                   ID:________________
Date:______/_____/______

Background Information

Thank you for agreeing to participate in our study of pregnancy lifestyles. We know your time is valuable, and we appreciate you taking your time to answer our questions today. We understand that some of the questions may make some people uncomfortable, or make them consider not giving truthful information. Please be assured that we will not share what you tell us with anyone, and we are not here to judge you based on any answers you may give us. Our goal is that you be comfortable enough to openly and honestly answer our questions. It is only by everyone giving us honest answers that information from this study might be useful to health care providers working with pregnant patients in the future. Again – thank you!

First you will be asked some basic background information about yourself, your family, and your medical history. After that you will be asked questions about your relationships, your moods, and past and present alcohol and drug use. The tester will read the instructions and questions out loud. You can either answer the tester aloud and let him/her fill out the forms, or if you prefer you can fill out the forms yourself as the tester reads through them. It is your choice – whichever makes you more comfortable. And you can switch options in the middle of the session if you want too. If at any point during the session something is not clear or you need more information, please be sure to ask. We want this to be as quick and as comfortable as possible, so please just ask if there is anything you need.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>CODES</th>
<th>RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How old are you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. How many pregnancies have you had,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>including this one?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. How many live children have you given</td>
<td></td>
<td></td>
</tr>
<tr>
<td>birth to?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. What is your marital status?</td>
<td>1=Married</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2=Unmarried, living with</td>
<td></td>
</tr>
<tr>
<td></td>
<td>partner</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3=Divorced</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4=Widowed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5=Single, never married</td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>CODES</td>
<td>RESPONSE</td>
</tr>
<tr>
<td>----------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>5. What is your highest level of education?</td>
<td>Enter number of years (12=HS grad, add one year for each full year of college; college grad=16; MA=18; PhD/MD=20)</td>
<td></td>
</tr>
<tr>
<td>6. How many people currently live with you?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. How many of these people are children under 18?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. How many of the children that you live with are YOUR biological children?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>QUESTION</strong></td>
<td><strong>CODES</strong></td>
<td><strong>RESPONSE</strong></td>
</tr>
<tr>
<td>9. Circle all people you currently live with.</td>
<td>1=Spouse/partner  2=Own child(ren)  3=Others child(ren)  4=Mother/step-mother  5=Father/step-father  6=Brother(s)  7=Sister(s)  8=Other relative  9=Other non-relative</td>
<td></td>
</tr>
<tr>
<td>10. Do you work outside the home?</td>
<td>0=No  1=Did before pregnancy  2=Part-time  3=Full-time</td>
<td></td>
</tr>
<tr>
<td>11. Do you currently attend school?</td>
<td>0=No  1=Yes, part-time  2=Yes, full-time</td>
<td></td>
</tr>
<tr>
<td>12. If you work outside the home, what do you do?</td>
<td>1=menial, no occupation  2=unskilled worker  3=semiskilled worker  4=skilled manual  5=clerks, sales  6=technicians, semi-professionals  7=small business owner; teacher  8=administrators  9=executives, high level professionals</td>
<td></td>
</tr>
<tr>
<td>Write in occupation below and describe duties. Then, in right column, circle the correct code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Does anyone else in your household</td>
<td>0=No  1=Yes</td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>CODES</td>
<td>RESPONSE</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>14. If yes to 13, what is that person’s highest grade completed?</td>
<td>Enter number of years</td>
<td></td>
</tr>
<tr>
<td>15. If yes to 13, what is that person’s occupation?</td>
<td>Write occupation below and describe duties. Then in right column write the correct code (see #12 above)</td>
<td></td>
</tr>
<tr>
<td>16. What was your income last year?</td>
<td>1=&lt;$5000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2=$5,00-9,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3=$10,000-14,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4=$15,000-19,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5=$20,000-29,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6=$30,000-39,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7=$40,000-49,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8=$50,000-59,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9=$60,000-69,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10=$70,000-79,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11=$80,000-89,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12=$90,000-99,999</td>
<td></td>
</tr>
<tr>
<td></td>
<td>13=$100,000+</td>
<td></td>
</tr>
<tr>
<td>17. What was your total household income last year, from all sources?</td>
<td>Use codes from #16 above</td>
<td></td>
</tr>
<tr>
<td>18. What type of medical insurance do you have?</td>
<td>0=None</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1=Medicaid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2=Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3=TennCare</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4=Medicaid &amp; Private</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5=Unknown</td>
<td></td>
</tr>
<tr>
<td>19. What is the primary language spoken in your home?</td>
<td>1=English</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2=Spanish</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3=Other :</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20. What is your current zip code?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. How often do you attend church?</td>
<td>0=Never</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1=Holidays (few times/year)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2=About once a month</td>
<td></td>
</tr>
<tr>
<td>QUESTION</td>
<td>CODES</td>
<td>RESPONSE</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>22. What is the date of your last menstrual period?</td>
<td></td>
<td>Mm/dd/yyyy</td>
</tr>
<tr>
<td>23. What is your estimated due date?</td>
<td></td>
<td>Mm/dd/yyyy</td>
</tr>
<tr>
<td>24. What is your current gestation week?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25. What was your prepregnancy weight?</td>
<td></td>
<td>Enter in pounds</td>
</tr>
<tr>
<td>26. What is your current weight?</td>
<td></td>
<td>Enter in pounds</td>
</tr>
<tr>
<td>What is your height?</td>
<td></td>
<td>_____lb</td>
</tr>
<tr>
<td>Enter in feet and inches</td>
<td></td>
<td>_____ft _____in</td>
</tr>
<tr>
<td>27. Do you have any chronic medical or psychological conditions (developed before pregnancy)?</td>
<td></td>
<td>If yes, describe:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28. Do you have any medical or psychological conditions that developed during pregnancy?</td>
<td></td>
<td>If yes, describe:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29. Please describe your level of support from other people.</td>
<td></td>
<td>1=I know there is always someone I can turn to if I need practical (i.e. a ride, money, help with a child, etc) or emotional (i.e. someone to talk to, someone to do things with) help. 2=Most of the time there is someone I can turn to if I need</td>
</tr>
<tr>
<td>Question</td>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
</tbody>
</table>
| 30. How many people do you have that you could turn to for practical or emotional help? | 0=None  
1=1-2  
2=3-5  
3=6-10  
4=More than 10 |
| 31. Was this pregnancy planned?                                         | 0=No  
1=Yes |
| 32. How did you initially feel about your pregnancy?                    | 1=Very upset and scared  
2=Upset, but it wasn’t the end of the world  
3=Ambivalent (upset/scared and excited both)  
4=Happy  
5=Overjoyed and excited |
| 33. How do you feel about your pregnancy now?                           | Use codes in #32 above |
Appendix E: CESD-10

Examiner:________________ ID:_______________
Date:______/_____/______

CES-D-10

Below is a list of some of the ways you may have felt or behaved in the past week. Please indicate how often you have felt this way.

<table>
<thead>
<tr>
<th>During the past week….</th>
<th>Rarely or none of the time (less than 1 day)</th>
<th>Some or a little of the time (1-2 days)</th>
<th>Occasionally or a moderate amount of time (3-4 days)</th>
<th>All of the time (5-7 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that don’t normally bother me</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I had trouble keeping my mind on what I was doing</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I felt depressed</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I felt everything I did was an effort</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I felt hopeful about the future</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I felt fearful</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>7. My sleep was restless</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>8. I was happy</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>9. I felt lonely</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>10. I could not “get going”</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Appendix F: PPP Stress Scale

Examiner:________________ ID:________________

Date:______/_____/______

PPP

Below is a list of factors that might be stressful in your life right now. Please indicate the level of stress or hassle you feel each of the following causes you.

<table>
<thead>
<tr>
<th>No Stress 1</th>
<th>Some Stress 2</th>
<th>Moderate Stress 3</th>
<th>Severe Stress 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Financial worries (e.g. food, shelter, health care, transportation) 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Other money worries (bills, etc) 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Problems related to family (partner, children, etc) 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Having to move, either recently or in the future 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Recent loss of a loved one 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Current pregnancy 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Current abuse (sexual, emotional, physical) 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Problems with alcohol and/or drugs 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Work problems (e.g. being laid off, trouble with boss/co-workers, etc.) 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Problems related to friends 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Feeling generally “overloaded” 1 2 3 4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix G: Weight Concern Scale

Examiner:________________

ID:________________

Date:______/_____/______

Weight Concern Scale

Please answer the following questions based on how you felt or what you did BEFORE you found out you were pregnant. Circle one number for each question.

1. On a scale of 1 to 10, where 1 is not at all important and 10 is very important, how important is losing weight or maintaining your current weight compared with other personal health concerns?

   1  2  3  4  5  6  7  8  9  10
   Not at all important  Much more important

2. People smoke for many reasons. Compared with all of your reasons for smoking, how important is smoking to control your weight? Rate the degree of importance on a scale of 1 to 10, where 1 is not at all important and 10 is very important.

   1  2  3  4  5  6  7  8  9  10
   Not at all important  Much more important

3. How much do cigarettes help you to control your weight?

   1  2  3  4  5  6  7  8  9  10
   Not at all  Very Much

4. How concerned are you about gaining weight as a result of quitting?

   1  2  3  4  5  6  7  8  9  10
   Not at all Concerned  Very Concerned

5. How likely do you think it is that you will gain weight as a result of quitting?

   1  2  3  4  5  6  7  8  9  10
   Not at all likely  Very likely
6. How likely is it that you would go back to smoking after quitting if you gained too much weight?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not at all likely</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Very likely</td>
</tr>
</tbody>
</table>
Appendix H: Body Image Concern Inventory

Examiner:________________ ID:_______________
Date:______/_____/______

**Body Image Inventory**

Please respond to each item by circling how often you experience the described feelings or how often you perform the described behaviors.

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I am dissatisfied with some aspect of my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2. I spend a significant amount of time checking my appearance in the mirror</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3. I feel others are speaking negatively of my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4. I am reluctant to engage in social activities when my appearance does not meet my satisfaction</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5. I feel there are certain aspects of my appearance that are extremely unattractive</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6. I buy cosmetic products to try to improve my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7. I seek reassurance from others about my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8. I feel there are certain aspects of my appearance I would like to change</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9. I am ashamed of some part of my body</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10. I compare my appearance to that of fashion models or others</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11. I try to camouflage certain flaws in my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12. I examine flaws in my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13. I have bought clothing to hide a certain aspect of my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14. I feel others are more physically attractive than me</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15. I have considered consulting/consulted some sort of medical expert regarding flaws in my appearance</td>
<td></td>
<td></td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>16. I have been embarrassed to leave the house because of my appearance</td>
<td></td>
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<td>3</td>
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<td>5</td>
</tr>
<tr>
<td></td>
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<td>1</td>
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<td>3</td>
<td>4</td>
</tr>
<tr>
<td>---</td>
<td>------------------------------------------------------------------------------------------------------</td>
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<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>17.</td>
<td>I fear that others will discover my flaws in appearance</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18.</td>
<td>I have missed social activities because of my appearance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>I have avoided looking at my appearance in the mirror</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VITA

Jennifer Aileen Correll

Personal Data Education: Date of Birth: October 22, 1983
Place of Birth: Columbia, South Carolina
Marital Status: Single

Education: Heathwood Hall Episcopal School, Columbia, South Carolina
B.A., Psychology, Columbia College, Columbia, South Carolina
2005
M.A., Clinical Psychology, East Tennessee State University,
Johnson City, Tennessee 2007
Ph.D., Clinical Psychology, East Tennessee State University,
Johnson City, Tennessee 2012

Professional Experience: Graduate Assistant, East Tennessee State University, Department
of Psychology, 2005-2009
Clinical Psychology Intern, Cherokee Health Systems, Knoxville,
Tennessee, 2009-2010
Telemedicine Coordinator, East Tennessee State University,
Department of Psychology, Johnson City, Tennessee,
2010-2012

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