

BODY DISSATISFACTION, DISORDERED EATING BEHAVIORS AND
BODY IMAGE QUALITY OF LIFE IN AFRICAN AMERICAN
WOMEN WITH HIV

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Thesis Prepared for the Degree of
MASTER OF SCIENCE

UNIVERSITY OF NORTH TEXAS

December 2012

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Hammon, Sarah A. Body dissatisfaction, disordered eating behaviors and body image quality of life in African American women with HIV. Master of Science (Psychology), December 2012, 81 pp., 17 tables, references, 87 titles.

The purpose of the current study was to further our understanding of the subjective experience of middle-age African American women who are HIV+ and on highly active antiretroviral therapy, particularly how self-reported lipodystrophy (LD), levels of body dissatisfaction, body image quality of life, and engagement in disordered eating behaviors are related. Multiple regression, MANOVA, MANCOVA, ANOVA, and chi-square were utilized to test hypotheses. Results revealed that HIV+ and HIV- women did not differ significantly on their levels of body dissatisfaction or drive for thinness. When HIV+ women were examined in more detail a pattern emerged: women who self-reported fat hypertrophy had significantly higher levels of body dissatisfaction, bingeing, but not purging, and dietary restriction and fear of weight gain compared to women who did not self-report LD. About 75% of the sample was overweight or obese, and when BMI was controlled for, these differences persisted for body dissatisfaction and disordered eating behaviors for fat hypertrophy, but not fat atrophy. Overall, the findings indicate that the type of LD, specifically hypertrophy, is more related to body dissatisfaction and disordered eating behaviors, than LD in general. Clinical implications and limitations of these findings are discussed.

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ACKNOWLEDGMENTS

I would first like to acknowledge the support and insight of my major professor, Dr. Patricia Kaminski, throughout this endeavor, and my committee members, Dr. Timothy Lane and Dr. Ed Watkins. I would also like to thank my family, friends, and partner. Many of my family and friends were a thousand miles away, but the distance did not diminish their ability to love and support me. Thank you to my partner Matt for loving and supporting me throughout this process, always believing in me, and encouraging me to pursue my passions.

Lastly, I would like to thank Dr. Michael Plankey and the Women's Interagency HIV Study (WIHS). Data in this thesis were collected by the Women's Interagency HIV Study (WIHS) Collaborative Study Group with centers (Principal Investigators) at New York City/Bronx Consortium (Kathryn Anastos); Brooklyn, NY (Howard Minkoff); Washington, DC, Metropolitan Consortium (Mary Young); the Connie Wofsy Study Consortium of Northern California (Ruth Greenblatt); Los Angeles County/Southern California Consortium (Alexandra Levine); Chicago Consortium (Mardge Cohen); Data Coordinating Center (Stephen Gange). The WIHS is funded by the National Institute of Allergy and Infectious Diseases (U01-AI-35004, U01-AI-31834, U01-AI-34994, U01-AI-34989, U01-AI-34993, and U01-AI-42590) and by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (U01-HD-32632). The study is co-funded by the National Cancer Institute, the National Institute on Drug Abuse, and the National Institute on Deafness and Other Communication Disorders. Funding is also provided by the National Center for Research Resources (UCSF-CTSI Grant Number UL1 RR024131). The contents of this publication are solely the responsibility of the author and do not necessarily represent the official views of the National Institutes of Health.

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CHAPTER 1

INTRODUCTION

In the mid-1980s, during the initial stages of the human immunodeficiency virus (HIV) epidemic, the contraction of HIV was often viewed as a death sentence (Centers for Disease Control and Prevention, 2010). The introduction of highly active antiretroviral therapy (HAART) in the mid-1990s, however, resulted in improved disease management so that people with HIV were less likely to progress to full-blown acquired immune deficiency syndrome (AIDS); as people with HIV were able to live longer and longer lives, some HIV/AIDS research began to focus on quality of life issues (e.g., issues with pain and fatigue, stigma and the effects on one's social life) (Hawkins, 2006). Body dissatisfaction is a construct that is often related to quality of life issues and HIV/AIDS, but has not been studied sufficiently among people with HIV/AIDS, particularly within ethnically diverse samples. Thus, the aim of the current study is to examine the unique experience of middle-aged African American women who are HIV+ with regard to body dissatisfaction, body image quality of life, and engagement in disordered eating behaviors. After defining body dissatisfaction and explaining it as a risk factor for other problems, the limited literature on body dissatisfaction and disordered eating among middle-aged women in general and middle-aged African American women in particular is reviewed. Following this review, lipodystrophy (LD) is defined and described and the few quantitative and qualitative studies specifically examining body dissatisfaction in HIV+ women is reviewed.

African American Women, Body Dissatisfaction, and Disordered Eating

Body dissatisfaction is defined as an individuals' negative evaluation of his or her figure or specific body parts (Stice & Bearman, 2001). The negative effect of body dissatisfaction on the psychological well-being of girls and women is well established (e.g., Attie, & Brooks-Gunn,

1989; Gordon, Castro, Sitnikov, & Holm-Denoma, 2010; Holsen, Kraft, & Roysamb, 2001). For instance, the relationship between depressed mood and body image was demonstrated in a five-year study of female adolescents (Holsen et al., 2001). Further, in a longitudinal study of adolescent girls, those who reported the highest levels of body dissatisfaction were more likely to develop eating problems two years later (Attie & Brooks-Gunn, 1989).

In addition to adolescent girls, the relationship between a lack of body satisfaction and the development of disordered eating has been demonstrated in adolescent girls, college women, and community samples of women (e.g., Corning, Krum, & Smitham, 2006; Stice & Agras, 1998; Stice & Shaw, 2002; Tylka & Subich, 2004; Wood & Petrie, 2010). Eating disorders typically have three facets- disordered eating behaviors, compensatory behaviors, and cognitive distortions and/or preoccupations (American Psychiatric Association, 2000). Disordered eating behaviors include unhealthy dietary restriction, fasting, and binge eating. Problematic compensatory behaviors include misuse of laxatives, excessive exercise, and self-induced vomiting. Preoccupation or excessive distress with one's shape, weight, and/or eating are potential cognitive correlates (American Psychiatric Association, 2000). Body dissatisfaction and disordered eating have been studied in predominantly European American women (Wood & Petrie, 2010), and to date, no literature exists examining disordered eating behaviors in HIV+ women, and more specifically, middle-aged, HIV+, African American women.

For more than a decade after anorexia nervosa was added to the *Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III)* (APA, 1980) researchers and clinicians believed that ethnic minority women, such as African American women, rarely experienced body dissatisfaction or engaged in disordered eating behaviors. This assumption perpetuated the misinformation because researchers conducted studies of European American

girls and women with little concern about the exclusion of other ethnicities (Grabe & Hyde, 2006). The relative absence of research on body dissatisfaction and disordered eating among ethnic minority girls and women likely contributes to major health risks for members of ethnic minority groups (O'Neill, 2003). Two major health risks women of ethnic minority groups face are misdiagnosis and inadequate intervention (O'Neill, 2003; Striegel-Moore & Bulik, 2007). For instance, Gordon, Brattole, Wingate, Wingate, and Joiner (2006) conducted an experiment in which 91 clinicians read one of three descriptions of disturbed eating patterns and were asked to rate the girl's anxiety, depression, and eating disorder symptoms. The three vignettes were identical except for mentioning that the patient was African American, Hispanic, or White. When the patient was portrayed as African American, clinicians were significantly less likely to identify an eating disorder syndrome than when she was portrayed as Hispanic or White (Gordon et al., 2006). It is imperative that further research includes ethnic minority groups, such as African American women, to enhance the scientific understanding of their unique and common experiences regarding body dissatisfaction and disordered eating behaviors.

Middle-aged Women, Body Dissatisfaction, and Disordered Eating

Women in mid-life are another group about which limited research exists regarding their experience of body dissatisfaction and disordered eating behaviors. Middle-age can be defined in a number of ways. For instance, middle adulthood is described as the period from 40 to 65 years old (Levinson, 1986). Others define middle adulthood as 40 to 55 years old, 55 to 60 years old as a transitional period that depends on the person, and 60 to 65 years old as late middle age and early later life (Hayslip, Hicks-Patrick, & Panek, 2011). Middle-age can also be defined as about 35 to 55 years old (Hockey & James, 2003). Currently, no consensus exists regarding the definition of middle-age (Hayslip et al., 2011).

Many of the factors associated with body dissatisfaction and disordered eating in younger women, however, are similar to those of middle-aged women (e.g., high body mass index [BMI], sociocultural pressure from family and peers) (Slevec & Tiggemann, 2011). In addition to these common factors, middle-aged women also experience normal developmental changes that may affect their body satisfaction. These changes include menopause and aging of their physical features, and may also be accompanied by increases in weight and anxiety related to aging (Slevec & Tiggemann, 2011). In fact, evidence suggests that the rates of “disordered eating” for middle-aged and young women are similar (Gordon, & Joiner, 2006; McKinley, 1999; Perez, Hernandez, Clarke, & Joiner, 2007; Pliner, Chaiken, & Flett, 1990; Procopio, Holm-Denoma, Gordon, & Joiner, 2006). For instance, in a community sample of 1,809 young women (18 to 39 years old) and middle-aged women (40-64 years old), no differences were found in bulimic symptomatology (Perez et al., 2007). In addition, undergraduates and their mothers did not differ significantly on rates of dieting and restricted eating (McKinley, 1999). The common finding that young women engage in disordered eating behaviors at high rates coupled with the finding women in mid-life engage in these behaviors at similar rates is cause for concern (Slevec & Tiggeman, 2011). These findings about middle-aged women are particularly concerning given the scarcity of research on such a potentially high-risk population.

Middle-aged African American Women, Body Dissatisfaction, Disordered Eating

When examining middle-aged African American women, the extant literature on body dissatisfaction and/or disordered eating is even more limited, though the findings regarding BMI are consistent. BMI is an important variable to consider when investigating correlates of body satisfaction and disordered eating behaviors among this group. With regard to weight, a large percentage of this population is overweight or obese. For example, in a community sample of

African American women in mid-life ($N = 67$), 78% of the women were either overweight or obese (Hrabosky & Grilo, 2007). Middle-aged African American women have significantly higher BMIs compared to European American women (Fitzgibbon, Spring, Avellone, Blackman, Pingitore, & Stolley 1998; Wilfley et al., 1996). Furthermore, in a community sample, African American women had a significantly higher average BMI compared to White women, but African American and Hispanic women did not differ significantly from one another on BMI (Marcus, Bromberg, Wei, Brown, & Kravitz, 2007). Similarly, in a community sample of only middle-aged African American and Hispanic women, they did not significantly differ on BMI (Hrabosky & Grilo, 2007). When considering differences in BMI according to ethnicity, research findings are consistent.

To date, only four published studies have investigated the relationship between body dissatisfaction, disordered eating behaviors, and BMI among middle-aged African American women. Moreover, the little literature that exists in this area is equivocal. For instance, when examining ethnicity and disordered eating behaviors (e.g., attitudes about dieting, beliefs about weight gain, compensatory behaviors) some researchers have found differences by ethnicity (Fitzgibbon et al., 1996) and others have failed to find these differences (Hrabosky & Grilo, 2007; Wilfley et al., 1996). Further, conflicting findings exist regarding the factors that correlate with and predict body dissatisfaction for middle-age African American women (e.g. Hrabosky & Grilo, 2007; Wilfley et al., 1996).

Marcus et al. (2007) investigated the relationship between BMI, body dissatisfaction and disordered eating behaviors in a community sample of African American, Hispanic and White women ($N = 589$, $Mean = 45.80$ years, $SD = 2.70$). Initial bivariate analyses identified differences by ethnicity in eating disordered symptoms, but later multivariate models were not

significant. In fact, the initial ethnic differences in the bivariate analyses were accounted for by BMI differences across the groups (Marcus et al., 2007), providing further support for the importance of including BMI in analyses when comparing African American, Hispanic, and White women on levels of disordered eating symptoms.

In addition, to examining ethnic differences, rates of disordered eating behaviors and levels of body dissatisfaction were reported. Self-reported disordered eating symptoms indicative of syndromal level of disturbance in midlife were 2.4%, but behaviors and attitudes consistent with disordered eating were reported by 11% of the women (Marcus et al., 2007), a rate that is comparable to a community sample of women in their late 20s (Striegel-Moore, Wilfley, Pike, Dohm, & Fairburn, 2000). With regard to inappropriate dieting behaviors, 13.4% of these women reported eating little or nothing for more than a day to lose weight (Marcus et al., 2007). Similarly, 29.7% reported dissatisfaction with their eating patterns and 13% reported that they were “probably” binge eaters. Overall, about 30% of these middle-aged women were dissatisfied with their bodies.

The second study in the area of body dissatisfaction and disordered eating in middle-aged African American women examined these constructs in a community sample by comparing middle-aged African American and European American women ($N = 538$, $Age = 37.30$ years, $SD = 5.2$) (Wilfley et al., 1996). For both groups, being overweight was associated with increases in body dissatisfaction. Even though European American women experienced significantly greater body dissatisfaction than African American women when BMI was statistically controlled, more than one-third of women in each group (38% and 34%, respectively) scored above the clinical cut off for body dissatisfaction. These highly dissatisfied women also reported higher mean scores than normative means for female college students

(Wilfley et al., 1996). These findings indicate that women may become increasingly dissatisfied with their bodies due to factors associated with aging (e.g., changes in body composition), however older women seem to be less inclined to pursue thinness to the same degree as their younger peers. Therefore, body dissatisfaction may be less associated with severe eating pathology in this population. Moreover, less preoccupation with weight loss was particularly pronounced for African American women. Specifically, when BMI was controlled, middle-aged African American women were significantly less likely than European American women to endorse an extreme desire to be thinner, a strong concern with dieting, a severe preoccupation with weight, and/or an intense fear of weight gain (Wilfley et al., 1996), this difference by ethnicity is consistent with studies of college women (Rosen et al., 1991).

The third and fourth studies examined body dissatisfaction and disordered eating in samples of African American women for which the majority of women, but not all of the women, were middle-aged. Fitzgibbon, et al. (1998) examined the severity and correlates of binge eating in a community sample of African American, Hispanic, and White women ($N = 351$, $M_{age} = 35.20$ years, $SD = 9.20$). Despite Hispanic women reporting significantly more binge eating symptoms than African American or White women, after controlling for education, depression, and ideal body image using a figure rating scale, women in all three ethnic group who binged more severely weighed more, were more depressed, and expressed preference for a slimmer body ideal using a figure rating scale (Fitzgibbon et al., 1998). For the overall sample, the three proposed causal factors (i.e. BMI, depression, ideal body image) all explained unique variance in the outcome of binge eating severity; the final model accounted for 17% of the variance in binge eating severity. When examining African American women specifically, no single variable (i.e., age, education, BMI, BDI, ideal body image) was a significant predictor of

binge eating severity. The final cumulative model for Black women only explained 7% of the variance in binge eating symptoms (Fitzgibbon et al., 1998). These findings suggest that the factors associated with binge eating severity for African American women may differ from those that predict binge eating severity in Hispanic and White women.

The fourth study on this specific group examined body dissatisfaction and disordered eating in a community sample of African American and Hispanic women ($N = 120$, $Mage = 34.80$ years, $SD = 9.7$) (Hrabosky & Grilo, 2007). Similar to women in college, depressive affect and eating concerns appear to be related to body dissatisfaction in middle-aged women. For instance, for both African American and Hispanic women, eating concerns and depressive affect predicted scores on a measure of preoccupation with and distress about one's body shape and scores on an assessment of state body image anxiety, after controlling for BMI. For African American women, increasing weight was associated with a general pattern of increasing body dissatisfaction and eating pathology. In addition, the mean body dissatisfaction score for the overweight and obese women in this community sample (Hrabosky & Grilo, 2007) was comparable to the mean score for a sample of African American and European American women who were overweight and obese and seeking behavioral weight loss treatment (Matz, Foster, Faith & Wadden, 2002). These findings suggest that the level of body dissatisfaction for overweight African American and Hispanic women in a community sample is comparable to the level in sample of overweight women seeking behavioral weight loss treatment (Hrabosky & Grilo, 2007).

Although the findings regarding middle-aged African American women, body dissatisfaction, and disordered eating behaviors are preliminary, when examining these studies a few important themes emerge. First, middle-aged African American women experience

considerable body dissatisfaction (Fitzgibbon et al., 1998; Hrbosky & Grilo, 2007; Marcus et al., 2007; Wilfley et al., 1996). Second, unlike early stereotypes about African American women, they are at-risk for disordered eating behaviors (Marcus et al., 2007). Third, the findings about the role of BMI are consistent, and it seems clear that this is an important characteristic to consider. Lastly, there appear to be fewer differences in body dissatisfaction and disordered eating behaviors for middle-aged African American, European American, and Hispanic women than originally anticipated (Fitzgibbon et al., 1998; Hrbosky & Grilo, 2007; Marcus et al., 2007; Wilfley et al., 1996).

HIV Status, Body Dissatisfaction, and Disordered Eating Behavior

In addition to middle-aged African American women, other groups of people who are at increased risk for developing decreased body satisfaction and increased disordered eating symptomatology are those with medical or psychiatric conditions whose effects and/or treatments result in changes in body weight or shape (Fobair et al., 2006; Weiden et al., 2004). One understudied population, who experience bodily changes associated with illness and medication side effects, are men and women who are HIV+ (Corless, Nicholas, McGibbon, & Wilson, 2002). Not only is progression of HIV to AIDS accompanied by significant changes in physical appearance, but effective treatments designed to minimize the deleterious effects of HIV/AIDS, such as highly active anti-retroviral therapy (HAART), can themselves cause dramatic changes in body shape, such as LD (Kotler, Rosenbaum, Wang & Pierson, 1999; Martinez et al., 2001). For HIV+ men, a majority of the findings suggest HIV status and self-reported changes in body fat distribution negatively affect one's body image (Burgoyne et al., 2005; Guaraldi et al., 2008). Compared to men with HIV, even fewer studies exist examining

the relationship between HIV status and body dissatisfaction for HIV+ women and no studies exist that examine disordered eating behaviors in men or women with HIV.

Although HAART has tremendous benefits, there are a number of side effects to the treatment. One of the side effects that can occur is LD. LD, also known as fat redistribution, is a metabolic disorder characterized by a disturbance in the way the body produces, uses, and stores fat (National Institute of Health and Human Services, 2005). LD does not follow the typical patterns of fat accumulation and loss. Instead, LD can present as an enlarged abdomen and/or the addition of a fat pad to the posterior of the neck (i.e., buffalo hump) and/or thinning of the extremities and facial atrophy (e.g., sunken cheeks) (Hadigan et al., 2001).

Currently, LD is categorized in a number of ways, although there is no agreed upon best method to measure LD (Guaraldi et al., 2008). For instance, LD has been described in terms of fat wasting (lipoatrophy), fat accumulation (lipohypertrophy), or a combination of fat changes (“combined form”) (Ammassari et al., 2002) without clarifying the body areas affected. Other descriptions of lipodystrophy include both the body area (central or peripheral) and the type of fat change that occurred (lipoatrophy or lipohypertrophy) (Plankey et al., 2009).

Whether bodily changes are physician-diagnosed or self-reported is another way that descriptions of LD differ. Self-report and physician diagnosis are highly correlated (Guaraldi et al. 2008; Huang et al., 2006), but when predicting HAART adherence and other outcome variables, the patient’s perception is more valuable than the physician’s diagnosis (Duran et al., 2001). Adherence is typically defined as taking HAART greater than or equal to 95% of the time during the past 6 months (Plankey et al., 2009). Consistent adherence to HAART is imperative for effective suppression of HIV and continued potency of the drugs (Hawkins, 2006). A major barrier to HAART adherence is that consistently taking HAART increases one’s

risk of developing LD (Ammassari, et al., 2002; Duran et al., 2001). When patients with HIV skip doses or fail to follow their HAART regimens because of concerns about LD or other side effects, serious physiological consequences may result. For instance, incomplete viral suppression due to suboptimal drug levels may speed the progression of HIV to full-blown AIDS and/or lead to the development of drug resistance, limiting future therapeutic options (Hawkins, 2006).

In past studies, the prevalence of LD varied depending on the categorization of LD used (e.g., type of fat change, body parts assessed, self-report vs. physician-diagnosed) and the characteristics of the sample (e.g., sex). For instance, in a sample of 250 patients with HIV (14% women) who were asked to self-report LD symptoms, 76 patients (30%) reported *lipoatrophy* and 128 (51%) reported *lipohypertrophy* (Crane et al., 2008). In contrast, when 956 patients with HIV (26% women) and their physicians were asked to report LD symptoms 46% and 49% reported *lipoatrophy*, respectively, whereas 29% and 25% reported *lipohypertrophy*, respectively (Cabrero, Griffa, & Burgos, 2010). In a sample of 1,671 women from the Women's Interagency HIV Study (WIHS) who reported HAART use between April 1999 and March 2006, 28% women reported *central lipohypertrophy*, 13% reported *central lipoatrophy*, and 64% reported no central fat change (Plankey et al., 2009). For peripheral change, 25% of women reported any *peripheral lipohypertrophy*, 20% reported *peripheral lipoatrophy*, and 55% reported no peripheral fat change (Plankey et al., 2009). Clearly, the rates of LD vary depending on the characteristics of the sample and the description of LD employed by the researcher.

Although self-report and physician diagnosis are highly correlated (Guaraldi et al., 2008; Huang et al., 2006), patients' perceptions can give more insight into the type of psychological impact their LD may be having on them (Duran et al., 2001). "The association between HAART

adherence and patient's self-reported fat redistribution, regardless of medical diagnosis of LD, suggests that the pathway in which LD may interfere with adherence behavior is the patient's perception of disfiguring alterations in body shape and its psychological repercussions rather than objective morphological change" (Plankey et al., 2009, p.143). One route in which the perception of LD may result in negative psychological outcomes is through decreased body satisfaction. More specifically, the *meaning* an individual ascribes to the changes in appearance as a result of LD will influence the psychological effect it has on the individual (Kaminski & Plankey, 2008). This *meaning* is affected by one's culture and ultimately created through the "filter" of one's body satisfaction (Kaminski & Plankey, 2008).

For women with HIV, the lack of research on LD is particularly concerning because these women have not been given a voice on this issue and, in general, continue to be underrepresented in HIV/AIDS research (Gagnon & Holmes, 2010). Two qualitative studies exist that examine LD in HIV+ women. Power, Tate, and Taylor (2003) conducted a qualitative study of the psychosocial implications of LD on HIV+ men and women. The sample was composed of 12 men and two women ($M_{age} = 42.00$, no SD was reported). For women, one area affected in particular by the bodily changes was their view of their body, which influenced their experience in social situations. For instance, these women reported that their clothes did not fit due to the changes in body shape, which resulted in them socializing less; one woman stated that, "...I can't go out. Whatever dress I put on I do not look good in it because I am too huge in the top half and down here I do not have any" (Power et al., 2003, p.139). Further, when in public these women reported receiving casual remarks about changes in their body shape and weight, which had a negative effect on their self-confidence. For example, one woman indicated that many of her friends commented on her bodily changes and asked if they were due to pregnancy. These

women also described the effect these changes had on their view of self. For example, one woman commented, "... you are just in front of a mirror and you say no this is not me. It's someone else" (Power et al., 2003).

Similar to Power et al. (2003), Gagnon and Holmes (2010) conducted a qualitative study that explored the transformation process women, specifically, experience from the development of LD. The sample was composed of 12 Caucasian, five African American, and two Hispanic women ($M_{age} = 45$ years, $SD = 1.50$). Overall, the women reported that LD affects every aspect of their lives by drastically changing their identities and bodies. Stigma and visibility were identified as two specific concerns. The former resulted in being fearful of disclosure of one's HIV/AIDS status, but, as important as that was, the women were much more worried about the questions and thoughts that were triggered by the "unusualness" of their physical appearance (Gagnon & Holmes, 2010).

LD was identified as the largest obstacle in their daily life, similar to Power et al (2003), "because it was taking away their power to influence what they looked like and how their body was interpreted in social situations" (Gagnon & Holmes, 2010, p. 11). With regard to how these women viewed their bodies, they reported feeling "estranged from their body and disgusted by the image projected in the mirror" (Gagnon & Holmes, 2010, p. 10). Further, they described the feeling of discouragement they experienced when each strategy they attempted to improve their physical appearance failed. The researchers did not explicitly state the strategies these women engaged in to modify their physical appearance, but some potential strategies these women attempted may be related to disordered eating and/or compensatory behaviors. This latter hypothesis is speculative, as the literature on disordered eating behaviors and women with HIV is nonexistent.

Power et al. (2003) and Gagnon and Holmes (2010) provide qualitative evidence that women with HIV who self-report LD experience decreased body satisfaction. The two quantitative studies specifically focused on women with HIV also suggest that these women have lower body satisfaction than women who are HIV-. Sharma, Howard, Schoenbaum, Buono, and Webber (2006) conducted a study that included 225 HIV+ and 207 HIV- women and assessed their body satisfaction by presenting the forced-choice (yes or no) “Overall, I feel satisfied with the shape of my body.” The sample was composed of women that self-identified as Hispanic (44%), African American (37%), Caucasian (15%), and ‘Other’ (2%). Overall, 47% of the sample reported body dissatisfaction by responding ‘no’ to the body satisfaction item. HIV+ women were significantly less satisfied with their body shape than were HIV- women, despite HIV+ women having a lower BMI. In a model tested only with HIV+ women, higher BMI and depression scores were independently associated with body dissatisfaction (Sharma et al., 2006). With regard to self-perception of weight, both African American and Hispanic women were significantly less likely to perceive themselves as heavy compared to White women.

While Sharma et al. (2006) suggest that HIV and/or HAART contribute to body dissatisfaction in women; this study’s findings are severely limited by the use of a single item to assess body satisfaction. In addition, the researchers failed to statistically control for potentially confounding variables that varied across the groups (e.g., BMI, ethnicity) and to assess HAART and LD status among the HIV+ women. Additional research using a reliable measure to assess body satisfaction while considering HAART and LD status is necessary to gain a clearer understanding of HIV+ women’s experience.

In a sample of 116 women (45% self-identified as White, 34% Hispanic, 10% African American, 8% Asian, and 3% as ‘Other Ethnicity’), the HIV+ women ($n = 62$) self-reported

significantly worse body image related quality of life- the negative effects of one's body image on various self-experiences and life contexts (Cash & Fleming, 2002)- compared to HIV-negative women ($n = 54$) (Huang et al., 2006). Women who were HIV-positive and self-reported LD also reported significantly worse body image related quality of life and more frequent body-image distress than HIV-positive women who did not self-report LD. Among women with HIV who self-reported LD, fat changes in the face (both hypertrophy and atrophy), fat atrophy of the neck and arms, and fat hypertrophy of the breast and abdomen were significantly related to greater body image dysphoria. In addition, fat hypertrophy of the breast and abdomen was also significantly associated with lower body image related quality of life (Huang et al., 2006).

One weakness of Huang et al. (2006) is that ethnicity as white vs. non-white for the statistical analyses was dichotomized. The act of combining multiple ethnicities into a single category has been cited as a problematic practice in the body satisfaction research (Grabe & Hyde, 2006). In addition, the researchers failed to score the psychometrically sound body image measure in the manner described by the test designers (Kaminski & Plankey, 2008). Further, a number of errors were made during interpretation of the scores. For instance, the researchers discussed higher median values on the Situational Inventory of Body-Image Dysphoria-Short Form (SIBID-S; Cash 2002) indicating improvements in body image when higher scores on the SIBID-S actually represent more frequent experiences of negative affect about one's body (Cash, 2002). It is clear that further research on HIV and body dissatisfaction that correctly scores and interprets the body dissatisfaction measures while also examining each ethnicity's experience individually is needed.

According to the Centers for Disease Control and Prevention (2010) African Americans must overcome the largest burden of HIV in the U.S. For instance, in 2005, Blacks composed less than 13% of the U.S. population, but accounted for 49% of the new HIV/AIDS diagnoses (CDC, 2010). Among African American women specifically, 1 in 30 will be diagnosed with HIV in her lifetime (CDC). Furthermore, in 2006, the rate of contraction of new HIV infections in Black women was 15 times higher than in White women and 4 times higher than in Hispanic women (CDC, 2010). Despite their level of risk, compared to Black men, White (non-Hispanic) men and women and Hispanic men and women, African American women are least likely to obtain the most effective treatment, such as HAART (Stone, 2012; Turner & Fleishman, 2006).

The Current Study

It is imperative that more research is conducted with HIV+ African American women, to develop a clearer understanding of their experiences of body dissatisfaction, disordered eating, and body image quality of life. As research has progressed over the years, it appears that a shift has occurred: “body dissatisfaction may not be *the golden girl* problem promoted in the literature” (Grabe & Hyde, 2006, p.622). Today, body dissatisfaction is recognized as not only affecting American college women of European descent, but also middle-aged women and women from various ethnic groups. First, African American women are already at-risk for being overlooked as having body dissatisfaction or disordered eating due to stereotypes that these are only problems of European American women. Second, women who are HIV+ on HAART often experience LD as a side effect of their treatment, placing this group at an increased risk for body dissatisfaction and possibly engagement in disordered eating behaviors. Third, African American women have the highest rates of new HIV infection, but the lowest rates of health care utilization compared to European American or Hispanic women. Fourth, the little research that

has been conducted on women with HIV and body dissatisfaction has significant methodological errors and no research exists examining disordered eating behaviors and this group. The purpose of the current study is to further our understanding of the subjective experience of African American women who are HIV+ and on HAART, particularly as related to levels of body dissatisfaction, body image quality of life, and engagement in disordered eating behavior.

The current study's sample is composed of HIV+, middle-aged African American women from the Women's Interagency HIV Study (WIHS). For the purpose of the current study, the operational definition of LD is that of Crane et al. (2008) and Plankey et al. (2009): self-reported peripheral lipohypertrophy or lipoatrophy (i.e., face, cheeks, neck, arms, legs, or buttocks) or central lipohypertrophy or lipoatrophy (i.e., breasts, abdomen, waist, or upper back) that occurred in the last six months.

Hypotheses

Hypothesis 1:

African American women who are HIV+ and on HAART score significantly higher on the body dissatisfaction (BD) and bulimia (BN) subscales of the Eating Disorder Inventory-3-Referral Form (EDI-3-RF) compared to African American women who are HIV- and not on HAART.

Hypothesis 2:

African American women with HIV and on HAART who self-report any type of LD score significantly higher on the BD, Drive for Thinness (DT), and BN subscales of the EDI-3-RF compared to African American women who are HIV-positive on HAART who self-report no LD symptoms.

Hypothesis 3:

Self-reported LD symptoms are significantly and positively correlated to scores on the BD and BN subscales of the EDI-3-RF for African American women on HAART.

Hypothesis 4:

African American women with HIV who self-report central fat hypertrophy (CFH) score significantly higher on the BD, DT, and BN subscales of the EDI-3-RF compared to African American women with HIV who self-report no change.

Hypothesis 5:

African American women with HIV who self-report peripheral fat hypertrophy (PFH) score significantly higher on the BD, DT, and BN subscales of the EDI-3-RF compared to African American women with HIV who self-report no change.

Hypothesis 6:

African American women with HIV who self-report central fat atrophy (CFA) score significantly higher on the BD subscale of the EDI-3-RF compared to African American women with HIV who self-report no change.

Hypothesis 7:

African American women with HIV who self-report peripheral fat atrophy (PFA) score significantly higher on the BD subscale of the EDI-3-RF than African American women with HIV who self-report no change.

Hypothesis 8:

African American women with HIV and on HAART who self-report any type of LD score significantly higher on the BIQLI compared to African American women who are HIV+ on HAART who self-report no LD symptoms.

CHAPTER 2

METHOD

Participants and Procedures

The Women's Interagency HIV Study (WIHS) is a prospective study established in 1993 to examine the natural and treated histories of HIV infection among women in the United States. To date, 3,766 women have participated in four U.S. cities including Chicago, Los Angeles, San Francisco, and Washington, D.C, and two boroughs of New York City, Bronx and Brooklyn (Barkan et al., 1998). Overall, with regard to exposure categories among HIV+ women in the 2001/2002 cohort, 10% endorsed intravenous drug use, 41% endorsed heterosexual sex, and 63% endorsed no identified risk. Participants provided written informed consent before participating in the cross-sectional study. A wide range of instruments and/or questions have been included in a particular wave or waves so that hundreds of research questions have been investigated over the years. Additional details on the WIHS recruitment methods, baseline characteristics, and study design have been described elsewhere (see Bacon et al., 2005; Barkan et al., 1998) and only information relevant to the current study is presented here.

Every six months, participants in the WIHS complete a comprehensive interview that includes socio-demographic, medical, obstetric, gynecological, and contraceptive history as well as questions about alcohol, tobacco, and other drug use and sexual behaviors. In addition, height, weight and other physical (e.g., arm circumference) and physiological (e.g., blood pressure) measurements are recorded. The collection of data on body image occurred between WIHS visits 26 and 30. One hundred fifty-seven African American women ($N_{HIV-seropositive} = 116$, $N_{HIV-seronegative} = 41$) from Washington, D.C. compose the current sample.

Materials

Demographics

Participants reported their age, actual height, actual weight, employment status, income, education, and relationship status. Relevant exercise and body monitoring items (e.g., “How often do you measure parts of your body?”) were also included. Body mass index (BMI) was computed using the participant’s measured height and weight. The following formula was used to calculate BMI (weight in lbs/height in inches²) x 703). HIV status was determined through enzyme-linked immunosorbent assays (ELISA) of the blood to count HIV antibodies. In the WIHS, a CD4 count below 200 is classified as full-blown AIDS (Castro et al., 1992).

Body Dissatisfaction and Disordered Eating Behaviors

The Eating Disorders Inventory-3-Referral Form (EDI-3-RF; Garner, 2004) is a 25-item self-report instrument composed of questions on a 5-point Likert-type scale that includes 4 = *always*, 3 = *usually*, 2 = *often*, 1 = *sometimes*, 0 = *rarely* and *never*. The EDI-3-RF is a shortened version of the EDI-3 (Garner, 2004). The purpose of the EDI-3-RF is to assess risk of an eating disorder typically in clinical populations. The different forms of the EDI have been used by clinicians and researchers whose work focuses on people suffering from body dissatisfaction and/or disordered eating behaviors. It is composed of three subscales: Body Dissatisfaction (BD), Bulimia (BN), and Drive for Thinness (DT).

The current as well as the past versions of the EDI have demonstrated excellent validity and reliability with samples of college women and girls and women with eating disorders (see Cumella, 2006 for review). For instance, in a clinical sample of U.S. adult women with an eating disorder not otherwise specified (EDNOS), the EDI-3 demonstrated adequate internal consistency for the BD, BN, and DT subscales with scores ranging from $\alpha = .89$ to $.92$ (Garner,

2004). Further, the EDI-3 demonstrated adequate convergent validity with six valid and reliable measures of eating disorder behaviors and issues, such as the Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) and the Bulimia Test-Revised (BULIT-R; Thelan, Farmer, Wonderlich & Smith, 1991). Internal consistency reliability with the current sample was established for these scales (see Table 1 for alphas).

Body Image Quality of Life

The Body Image Quality of Life Inventory (BIQLI) (Cash & Fleming, 2002) is a 19-item self-report measure composed of questions on a 7-point Likert scale that includes -3 = *very negative effect*, -2 = *moderate negative effect*, -1 = *slight negative effect*, 0 = *no effect*, +1 = *slight positive effect*, +2 = *moderate positive effect*, and +3 = *very positive effect*. Participants were presented statements and asked to rate on the 7-point Likert scale “how much your feelings about your body image affect that aspect of your life in the past 6 months.” The BIQLI does not focus on symptoms, instead it focuses on the negative and positive effects a person’s body image has in a number of domains (e.g., self-worth, interpersonal relationships, sexuality, mood). A single composite score is calculated using the mean score of the 19 items.

Adequate reliability and validity has been established for the BIQLI. For instance, the BIQLI demonstrated high internal consistency ($\alpha = .95$) at each of two administrations and good test-retest reliability over a two to three week period ($r = .79$) (Cash & Fleming, 2002). Internal consistency reliability with the current sample was established for this scale with an alpha coefficient for the composite score of $\alpha = .92$. The BIQLI was compared to the Multidimensional Body-Self Relations Questionnaire (MBSRQ; Brown, Cash, & Mikulka, 1990; Cash 2000), investment in appearance on the Appearance Schemas Inventory (ASI; Cash & Labarge, 1996), areas of objectified body consciousness on the Objectified Body Consciousness

Scale (OBCS; McKinley & Hyde, 1996) and internalization of cultural standards of beauty on the Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999) to assess construct validity. The BIQLI's construct validity was overall supported by the expected correlations with the other scales. For instance, a more positive body image quality of life was significantly related to higher body satisfaction ($r = -.66$, $p < .001$), less body shame ($r = -.33$, $p < .001$), and less preoccupation with becoming fat ($r = -.31$, $p < .002$).

Lipodystrophy Status

LD status was determined by an answer of 'yes' to the question "Since your last visit, have you noticed any changes in the shape of your body or in the amount of your body fat (either loss or gain)?" Central fat change was defined as self-reported changes that occurred in the breasts, abdomen, waist, and upper back in the last six months. Peripheral fat change was defined as self-reported changes that occurred in the face, cheeks, neck, arms, legs, and buttocks in the last six months. If the respondent answered 'yes' to fat change in a particular body part and reported that it was an increase, the change was coded as hypertrophy. If the respondent answered 'yes' to fat change in a specific body part and reported that it was a decrease, the change was coded as atrophy. The participant then rated the severity of the bodily change on a 3-point scale where 1 = *mild*, 2 = *moderate*, 3 = *severe*. Participants were then asked "how much are you bothered by this change these days?" and responded on a 4-point likert scale 1 = *not really*, 2 = *a little*, 3 = *a lot*, 4 = *extremely*.

The types of bodily change(s) each woman experienced in the last six months were categorized into central fat hypertrophy (CFH), central fat atrophy (CFA), peripheral fat hypertrophy (PFH) and peripheral fat atrophy (PFA). The types of LD were not mutually

exclusive (e.g., a woman could report CFH and PFA). Based on these categories, 29 women self-reported CFH and nine reported CFA in the last six months. In regards to peripheral fat changes, 24 women reported PFH and 11 reported PFA in the last six months.

Impact of Lipodystrophy on Quality of Life

For a measure of the effects of LD on their quality of life, participants who self-reported LD were asked if the changes in their appearance had a negative impact on their life and participants responded with “yes” or “no.” Participants stated if the bodily change affecting a particular aspect of their quality of life was an “increase” or “decrease” in the amount of body fat (either loss or gain) and whether the bodily change was “mild,” “moderate,” or “severe” for each visit. Quality of life questions pertained to sexual activity, relationship status, health concerns, view of self and social stigmatization. For instance, a question that assessed social stigmatization was “Have these changes in your appearance had a negative impact on your life such as: experienced prejudice or discrimination because changes make my HIV status ‘visible’ to others.” The question “Have these changes in your appearance had a negative impact on your life such as: lowered self-esteem or confidence” is an example of a question to gauge their view of self.

Proposed Data Analyses

Data Preparation

Prior to conducting the statistical analyses, all independent and dependent variables will be examined to assess whether assumptions are met. The assumptions for multiple regressions are non-collinearity and non-singularity between predictors, normality, linearity, and homoscedasticity. The assumptions for MANOVA are normality, linearity, non-multicollinearity and non-singularity, and homogeneity of variance-covariance matrices. The

assumptions for chi-squares are random samples and independent observations. Data will be examined for missing data and appropriate measures will be taken to remedy any missing data.

Descriptive Data Analyses

Frequencies and/or measures of central tendency of all demographic variables (e.g., age, actual height and weight, ideal weight, and BMI) and relevant exercise and body monitoring items (e.g., “What is the #1 motivation for your workouts?”) were conducted for the overall sample of HIV+ participants, HIV- participants, and participants on HAART who self-reported any LD symptoms. For these three groups’ scores on the DT subscale of the EDI-3-RF, frequencies and/or measures of central tendency were also calculated. In addition, frequencies and/or measures of central tendency were calculated for participants who self-report CFA and/or PFA and their scores on the BN and DT subscales of the EDI-3-RF.

For the BIQLI, frequencies and measures of central tendency were reported for the different types of LD (i.e., CFH, PFH, CFA, and PFA) and their scores on the BIQLI. The same analyses were run for the question about how “bothersome” the participant rated the changes by type of LD. For the impact of LD on quality of life questions, means, standard deviations, and ranges were computed for the overall sample of women self-reporting LD and for each type of LD.

Test of Hypotheses

For all applicable hypotheses, potential confounds (e.g., BMI) were statistically controlled for by being added as covariates. For example, if there is a significant difference in BMI across groups a multivariate analysis of covariance (MANCOVA) versus a multivariate analysis of variance (MANOVA) was used.

To test the first hypothesis that participants who are HIV+ and on HAART score significantly higher on BD and BN subscales of the EDI-3-RF compared to participants who are HIV- and not on HAART a MANOVA was conducted with HIV status as the independent variable and EDI-3-RF subscale scores as the dependent variables.

A MANOVA was be conducted to test the second hypothesis that participants on HAART who self-report any type of LD score significantly higher on the BD, DT, and BN subscales of the EDI-3-RF compared to participants who are HIV+ on HAART who self-reported no LD symptoms. The independent variable is LD status and the EDI-3-RF subscale scores are the dependent variables.

To test the third hypothesis that self-reported LD symptoms are significantly and positively correlated to scores on the BD and BN subscales of the EDI-3-RF, two multiple regressions were conducted. For the first multiple regression, number of self-reported LD symptoms is the predictor variable and the BD subscale is the dependent variable. Number of self-reported LD symptoms is also the predictor variable for the second multiple regression, but the BN subscale is the dependent variable.

For the hypotheses related to type of LD compared to no LD, MANOVAs and chi-squares were conducted depending on the group sizes. Two MANOVAs were run to test the hypotheses that: 1) participants who self-report central fat hypertrophy (CFH) will score significantly higher on the BD, DT, and BN subscales of the EDI-3-RF compared to participants who self-report no change and; 2) participants who self-report peripheral fat hypertrophy (PFH) will score significantly higher on the BD, DT, and BN subscales of the EDI-3-RF compared to participants who self-report no change. If possible, matched samples based on relevant characteristics (e.g., BMI and age) were created for the self-reported CFH group and the no self-

reported change group and the PFH group and the no self-reported change group. If a matched sample is not possible, potential confounds will be statistically controlled by being added as covariates.

Two chi-squares will be conducted to examine the hypotheses that participants who self-report central fat atrophy (CFA) will score significantly higher on the BD subscale of the EDI-3-RF compared to participants who self-report no change and; 2) participants who self-report peripheral fat atrophy (PFA) will score significantly higher on the BD subscale of the EDI-3-RF than participants who self-report no change. A median-split will be run to make the BD subscale of the EDI-3-RF a categorical variable, which means that a score of 20 or higher on the BD subscale is equivalent to “more distressed than not.”

An ANOVA will be conducted to test the final hypothesis that participants on HAART who self-report any type of LD score significantly higher on the BIQLI compared to participants who are HIV+ on HAART who self-reported no LD symptoms. The independent variable will be LD status and the dependent variable will be the total BIQLI score.

CHAPTER 3

RESULTS

Data Preparation

Prior to conducting analyses, screening procedures were used to check for missing values and outliers, and to test the assumptions of MANCOVA, MANOVA, multiple regression, ANOVA, and chi-square. Frequency tables were examined to identify missing values and data entry errors. Ten participants had one missing data point on different questions of the BIQLI and two participants had one or two different items missing on the EDI-3-RF. Each participant's mean score on the respective scale was imputed in place of the missing data. Only one participant was missing more than 5% of the items for a given subscale, the case was deleted for the analysis in which that specific subscale was used, and one participant was deleted from all analyses because they did not complete the dependent variables (Field, 2009).

Each hypothesis uses a different subsample except for Hypotheses 2 and 8; thus, assumptions for each subsample were tested separately. Data were screened for univariate and multivariate outliers. Standardized values (i.e., z -scores) were calculated to determine univariate outliers on variables relevant to hypothesis testing; z -scores above 3.3 that were disconnected from the distribution were labeled univariate outliers (Tabachnick & Fidell, 2007). The EDI-3-RF-BN had three univariate outliers; it was the only subscale with univariate outliers. The univariate outliers' z -scores were adjusted and their raw scores were computed accordingly (Tabachnick & Fidell, 2007). To screen for multivariate outliers, Mahalanobis distances were calculated. Three multivariate outliers were found in the sample for Hypothesis 1 (i.e., HIV-positive and HIV-negative women) and one multivariate outlier was found in the sample for

hypothesis 2 (i.e., women on HAART who self-report and do not self-report LD). These four women were removed from their respective analysis.

The assumption of normality was tested by examining skewness and kurtosis values, and histograms for each hypothesis. In addition, means and standard deviations were examined. For the EDI-3-RF-BN the standard deviation was larger than the mean and for the EDI-3-RF-DT the standard deviation and mean were nearly equal (see Table 1), suggesting that there is considerable variability in the scores and the mean may be less representative of the sample. Because each of the hypotheses tested with a MANCOVA, MANOVA, or ANOVA were composed of more than 20 participants, these analyses were robust for violations of normality, despite the large standard deviation compared to the means (Tabachnick & Fidell, 2007). For hypotheses utilizing regression, violations of normality were handled through transformation. Initially, the BN subscale was both positively skewed and kurtotic. After a log transformation and the addition of a constant the BN subscale for this sample met the assumption of normality (Tabachnick & Fidell, 2007).

All subsamples for each hypothesis met the assumption of sample size. For MANCOVA and MANOVA, each cell included over 20 participants (Tabachnick & Fidell, 2007). Hypotheses 3a and 3b met the sample size assumption of multiple regression because they included more than 20 participants per independent variable (Tabachnick & Fidell, 2007). Hypothesis 8 met the sample size assumption for ANOVA because there were more than 20 degrees of freedom and the group sizes were similar (Donaldson, 1968). Hypotheses 6 and 7 met the assumption for sample size because for each analysis more than 80% of the cells included five participants (Pallant, 2010).

The other assumptions of MANCOVA and MANOVA (i.e., linearity, multicollinearity and singularity, homogeneity of variance-covariance matrices, and equality of error variances) were tested for each of the subsamples for Hypotheses 1, 2, 4, and 5 for both the independent and dependent variables. Generating a matrix of scatterplots between each pair of independent and dependent variables tested the assumption of linearity. For Hypothesis 2 that included the subsample of women who are on HAART, the EDI-3-RF-BN graph suggested a curvilinear relationship between EDI-3-RF-BN and LD status, so it was removed from the MANOVA. All other variables across the different subsamples met the assumption of linearity. None of the hypotheses utilizing MANCOVAs or MANOVAs demonstrated multicollinearity or singularity. Further, the assumption of equality of covariances matrix was met for each hypothesis. Because this assumption was not violated, it was not necessary to create matched samples for the hypotheses in which there were unequal sample sizes (Tabachnick & Fidell, 2007). The last assumption for MANCOVA and MANOVA, equality of error variances, was met for Hypotheses 1 and 2, but was violated for Hypothesis 4 and 5; thus, the corrected model was interpreted for Hypotheses 4 and 5.

The assumptions remaining for multiple regression were linearity, multicollinearity and singularity, homoscedasticity, and independence of residuals for Hypotheses 3a and 3b. Because each of these tests demonstrated no correlation between the independent and dependent variables the assumption of linearity was not met and the multiple regressions could not be run. Hypothesis 8 used an ANOVA and the remaining assumptions were independence of observations and homogeneity of variance. Independence of observations was met because each observation was not influenced by any other observation (Tabachnick and Fidell, 2007) and the assumption of homogeneity of variance was met through Levene's test for equality of variances.

Lastly, the remaining assumption for Chi-Square (hypotheses 6 and 7) was independence of observations and none of the subsamples violated this assumption.

Hypothesis Testing

Hypothesis 1

A one-way between-groups multivariate analysis of covariance (MANCOVA) was run to test the first hypothesis that levels of body dissatisfaction and bulimic symptoms would differ by HIV status. The independent variable was HIV status and the dependent variables were EDI-3-RF-BD and EDI-3-RF-BN. Of the demographic variables tested across groups, HIV+ and HIV- women differed significantly in their age and employment status (see Table 2). Age met the assumptions for a continuous covariate and was included in the analysis, whereas employment status did not meet the assumptions for a categorical covariate and was not included in further analysis.

Despite controlling for age, overall, the main effect of HIV status, was not statistically significant at the multivariate level $F(2, 147) = 1.78, p = .172$, partial eta square = .024. When examining the dependent variables at the univariate level, HIV+ women ($M = 14.85, SD = 9.91$) and HIV- women ($M = 17.49, SD = 9.45$) did not differ on their levels of body satisfaction ($p = .062$), though body satisfaction explained a small amount of the variance (partial eta square = .02). HIV+ women ($M = 2.35, SD = 3.87$) and HIV- women ($M = 3.05, SD = 4.25$) also did not differ significantly on their levels of binge eating and purging ($p = .346$). Age was not a statistically significant covariate $F(2, 147) = 2.90, p = .058$, partial eta square = .04, but accounted for a notable amount of variance in the dependent variables. These results do not provide support for Hypothesis 1 that HIV+ women report higher levels of body dissatisfaction and bulimic symptoms compared HIV-women.

Hypothesis 2

A one-way between-groups MANOVA was conducted to examine how lipodystrophy status is related to levels of body dissatisfaction and drive for thinness. Employment status was included as a covariate because the two groups differed significantly on this variable (see Table 3) and it met the assumptions for a categorical covariate. It did not have a significant effect on the subsequent MANCOVA, however, and was removed from the analysis.

Results of the MANOVA showed that the main effect of LD status was statistically significant at the multivariate level, $F(2, 76) = 6.21, p = .003$, partial eta square = .14 (see Table 4). When evaluating dependent variables separately at the univariate level, women with LD ($M = 19.12, SD = 10.29$) reported significantly greater levels of body dissatisfaction $F(1, 77) = 11.07, p = .001$, partial eta square = .13 than their non-LD peers ($M = 11.73, SD = 9.45$). Further, women with LD ($M = 8.05, SD = 6.33$) reported significantly higher levels of drive for thinness $F(1, 77) = 6.43, p = .013$, partial eta square = .08 than women who did not self-report LD ($M = 4.78, SD = 5.10$). These findings provide support for the second hypothesis that women who self-report lipodystrophy report more dissatisfaction with their bodies and stronger restriction and dieting practices.

Hypotheses 3a and 3b

As stated previously, because each of these analyses violated the assumption of a linear correlation between the number of LD symptoms and the EDI-3-RF-BD and the EDI-3-RF-BN, the analyses were not run.

Hypothesis 4

A one-way between-groups MANCOVA was run to test the fourth hypothesis, comparing

women on HAART who self-report CFH and women on HAART, who did not report LD symptoms. The dependent variables were the EDI-3-RF-BD, the EDI-3-RF-DT, and the EDI-3-RF-BN. The two groups differed significantly on BMI and because BMI met the assumptions for a continuous covariate, it was included in the MANCOVA. The main effect of CFH compared to no LD was statistically significant at the multivariate level $F(3, 64) = 4.50, p = .006$, partial eta square = .17 (see Table 6).

Because the assumption of Levene's Test of Equality of Error Variances was violated for EDI-3-RF-BN ($p = .010$), the corrected model was used. When examining dependent variables at the univariate level, CFH compared to no LD differed significantly and in the hypothesized direction on EDI-3-RF-BD $F(2, 66) = 14.90, p < .001$, EDI-3-RF-DT $F(2, 66) = 12.25, p < .001$, and EDI-3-RF-BN $F(2, 66) = 5.35, p = .007$ (see Table 5 for means and standard deviations). The effect sizes were .31, .27, and .14, respectively and accounted for a meaningful amount of variance. These findings suggest that women with CFH display higher levels of body dissatisfaction and more restrictive eating and bingeing behaviors compared to their non-LD peers, providing support for Hypothesis 4.

In addition, there was a significant relationship between the EDI-3-RF subscales and BMI across LD groups $F(3, 64) = 6.61, p = .001$, partial eta square = .24. This relationship was strongest for the EDI-3-RF-DT (partial eta square = .19) and weaker for the EDI-3-RF-BD and the EDI-3-RF-BN (partial eta square = .14 and partial eta square = .06, respectively) with all effect sizes suggesting that BMI explains a meaningful amount of the variance, and thus, emphasizing the importance of including BMI in examinations of body dissatisfaction and disordered eating behaviors with women with and without LD.

Hypothesis 5

To test hypothesis 5 that compared women who self-report PFH to women who report no LD symptoms a one-way between-groups MANCOVA was run. The dependent variables were the EDI-3-RF BD, DT, and BN subscales. Similar to hypothesis 4, the two groups differed significantly on BMI. BMI met the assumptions for a continuous covariate and was included in the MANCOVA.

Results of the MANCOVA for hypothesis 5 showed that the main effect of PFH compared to no LD was statistically significant at the multivariate level $F(3, 59) = 3.21, p = .029$, partial eta square = .14 (see Table 8). Because the subscale BN violated Levene's Test of Equality of Error Variances ($p = .011$) the corrected model was used. When evaluating the dependent variables at the univariate level, PFH compared to no LD differed significantly on EDI-3-RF-BD $F(2, 61) = 15.49, p < .001$, partial eta square = .34, EDI-3-RF-DT $F(2, 61) = 7.69, p = .001$, partial eta square = .20 and EDI-3-RF-BN $F(2, 61) = 5.43, p = .007$, partial eta square = .15 (see Table 7 for means and standard deviations). An inspection of the mean scores indicated that women with PFH reported significantly higher levels of body dissatisfaction ($M = 21.65, SD = 10.91$) than women who reported no LD ($M = 11.73, SD = 9.45$). Further, women with PFH reported more dieting and a greater concern with their weight ($M = 9.33, SD = 7.07$) than women with no self-reported LD ($M = 4.78, SD = 5.10$), and women with PFH also endorsed more bingeing behaviors ($M = 4.53, SD = 6.02$) than their non-LD peers ($M = 1.65, SD = 3.47$).

There was a significant relationship between the EDI-3-RF subscales and BMI, while controlling for PFH compared to No LD, $F(3, 59) = 5.50, p = .002$, partial eta square = .22. This relationship was strongest for BD (partial eta square = .18) and weaker for DT and BN (partial eta square = .09 and partial eta square = .07, respectively). Overall, these results provide support

for hypothesis 5 and add further evidence of the importance of BMI in studies of body dissatisfaction and disordered eating.

Hypotheses 6 and 7

To test hypothesis 6 a Chi-square test (with Yates Continuity Correction) was run that compared the levels of body dissatisfaction for women who reported CFA and women who reported no LD. The proportion of women who reported symptomatic levels of body dissatisfaction with CFA (37.5%) was not significantly different, $\chi^2(1, n = 48) = .000, p = 1.00, phi = -.04$ compared to women who reported no LD (42.5%). A similar Chi-square test (with Yates Continuity Correction) was run to test hypothesis 7. The results indicated no significant differences between women with PFA compared to women with no LD and their levels of body dissatisfaction, $\chi^2(1, n = 52) = .000, p = 1.00, phi = -.01$. More specifically, the proportion of women who reported symptomatic levels of body dissatisfaction with PFA (41.7%) did not significantly differ from the proportion of the women who self-reported symptomatic levels of body dissatisfaction who did not report LD (42.5%).

Hypothesis 8

A one-way between groups analysis of variance (ANOVA) was conducted to compare body image quality of life for women who are HIV-positive and who did and did not self-report LD. Participant's employment status was included as a covariate because the two groups differed significantly on this variable and it met the assumptions for a categorical covariate. It did not have a significant effect on the subsequent ANCOVA ($p = .238$), however, and was removed from the analysis. For the ANOVA there was no statistically significant difference between women who reported LD ($M = 1.46, SD = .96$) and women who reported no LD ($M = 1.85, SD = .97$) on their BIQLI scores, $F(1, 79) = 3.34, p = .071$.

Exploratory Descriptive Analyses

The main goal of the current study was to describe the subjective experience of middle-aged, African American women on HAART who report LD, thus a number of descriptive analyses were run. Frequencies and measures of central tendency for demographic variables (e.g., age, BMI, employment status) (see Tables 2 and 3) and relevant exercise and body monitoring items (e.g., “How often do you measure various parts of you body?”, “What is the most important physical goal of your workouts?”) (see Tables 9 and 10) were conducted for the overall sample of HIV+ participants, HIV- participants, and participants on HAART who self-reported any LD symptoms.

Two Chi-squares tests were run to examine differences in body monitoring behaviors. A Chi-square test was run to compare the amount of body monitoring behaviors for HIV+ and HIV- women. There were no significant differences in amount of body monitoring behaviors by HIV status $\chi^2(2, n = 156) = 1.81, p = .404, phi = .11$. Similarly, a Chi-square test was conducted to examine differences in body monitoring behaviors for women who did and did not self-report LD. There were no significant differences in the amount of body monitoring behaviors by LD status $\chi^2(2, n = 81) = 1.03, p = .596, phi = .11$.

Frequencies and measures of central tendency on the EDI-3-RF-DT were calculated for HIV+ women, HIV- women, and women on HAART who reported LD (see Table 11). In addition, frequencies and measures of central tendency were calculated for participants who self-reported CFA and/or PFA and their scores on the EDI-3-RF-BN and EDI-3-RF-DT (see Table 12). For the BIQLI, frequencies and measures of central tendency were reported for the different types of LD (i.e., CFH, PFH, CFA, and PFA) and their average score on the BIQLI (see Table

13). Similar descriptive analyses were run for the question about how “bothersome” the participant rated the changes by the body part affected by LD (see Table 14).

For the negative impact of LD on quality of life questions, means, standard deviations, and ranges were computed for the overall sample of women self-reporting LD (see Table 15). Objective measurements of LD were determined through bodily measurements and frequencies were reported (See Table 16). Based on their calculated BMI, women were also grouped into the categories of under-weight (i.e., 18.4 or below), normal weight (i.e., 18.5 to 24.9), overweight (i.e., 25 to 29.9), or obese (i.e., 30 and above). To examine the clinical significance of these women’s BD, BN, and DT subscale scores, frequencies were computed for each clinical range (i.e., low clinical, typical clinical, elevated clinical) for HIV+ and HIV- women and for women who did and did not report LD symptoms.

To test potential explanations for conflicting findings between the current study and past research when examining HIV status and body dissatisfaction, overall body dissatisfaction was assessed through a single item from the EDI-3-RF (i.e., “Overall, I feel satisfied with the shape of my body.”) and an ANOVA was run. There was no statistically significant difference between HIV+ ($M = 1.82, SD = 1.62$) and HIV- ($M = 2.03, SD = 1.44$) women on their BIQLI scores, $F(1, 151) = 1.27, p = .261$. In addition, this single item body dissatisfaction measurement approach was also employed to test potential explanations regarding comparisons between women who self-reported PFA and women who reported no LD. When comparing women with PFA ($M = 2.17, SD = 1.34$) and women with no LD ($M = 1.43, SD = 1.57$) on a single item of body dissatisfaction, there were no significant differences $t(20.93) = 1.62, p = .121$.

CHAPTER 4

DISCUSSION

The purpose of the current study was to test specific hypotheses regarding the subjective experience of middle-aged, African American women who are HIV+ and on HAART. Specifically, their levels of body dissatisfaction, body image quality of life (BIQL), and engagement in disordered eating behaviors were examined. It is important to describe the experience of these women because they are at an increased risk for being overlooked as having body dissatisfaction or engaging in disordered eating behaviors, simply because of their ethnicity (Gordon et al., 2006). This oversight, in part, is due to stereotypes that these are only problems European American women experience. Further, the small amount of research conducted on women with HIV and body dissatisfaction has significant methodological errors and no research exists that examines disordered eating behaviors in this specific population. It is therefore important to simply describe how middle-aged, HIV+, African American women experience their bodies.

One of the first characteristics to consider when thinking about this population and the way in which they experience their bodies is how their weight is related to body dissatisfaction and disorder eating behaviors. As expected, based on BMI, 24% of the current study's sample was over-weight and 50% were obese. This finding is consistent with past research on middle-aged African American women (Hrabosky & Grilo, 2007) and reflects the rapidly increasing rate of overweight and obesity in the United States, particularly in ethnic minority groups (Flegel, Carroll, Ogden, & Johnson, 1998). The negative health effects associated with overweight or obese are well documented. For instance, women who are obese are at a higher risk for cardiovascular disease, hypertension, Type II diabetes, stroke, and dyslipidemia (Kopelman,

2007). In addition, HIV+ women who are receiving HAART often experience metabolic complications such as dyslipidemia and insulin resistance, which may increase their risk of developing cardiovascular disease (Grinspoon & Carr, 2005). The combination of these women being overweight or obese and being treated with HAART for HIV may serve as a double-edged sword that adversely shapes their experiences.

These women may encounter another challenge in how their weight and health is related to their ability to keep and maintain a job. Within the current study, middle-aged, HIV+, African American women were significantly less likely to be employed compared to their HIV- peers. More specifically, about 80% of HIV- women were employed, whereas only about 50% of HIV+ women were employed.

One potential explanation for these findings is that HIV+ women may experience HIV-related discrimination in the workplace that may be related to their comfort level at work and/or productivity level, both of which may be associated with a woman's ability to maintain employment. Further, HAART is time consuming and HIV+ women may experience difficulty at work due to the number of medical visits. In addition, BMI is related to many health conditions, which also may require more medical appointments. Frequent medical appointments can affect productivity and/or their ability to take days off when needed because they need to "save" their sick time and vacation time for visits to the doctor. One potential implication of HIV+ women being more likely to be unemployed than HIV- women is that they may be more likely to have limited financial resources and thus experience stress about finances. The current study did not assess the reason for a woman's unemployment. For future research, when a woman reports she is unemployed, it could be helpful to include follow up questions to determine the reason she is not employed. If a woman chose to not work (e.g., stay-at-home

mother), her unemployment status would likely have a different meaning to her than if she was fired from her job and is attempting to find work.

In addition to examining BMI and employment status, the relationship between HIV status and how women experience their bodies was explored. Women who were HIV+ did not report significantly higher levels of body dissatisfaction or binge eating symptomatology compared to HIV- women, when accounting for age. More specifically, HIV+ and HIV- women did not differ significantly on their level of discontentment with their overall shape and size of regions of their body (i.e., stomach, hips, thighs, and buttocks) or their tendency to think about or engage in binge eating or eating in response to emotional upset.

These findings regarding body dissatisfaction differ from the findings of Sharma et al. (2006) who found that HIV+ women were significantly less satisfied with their bodies compared to HIV- women. Sharma et al. (2006) used a single item to assess body dissatisfaction (i.e., “Overall, I feel satisfied with the shape of my body.”), whereas the current study used a reliable and valid measure of body dissatisfaction that assessed overall satisfaction with one’s shape and size of regions of the body (e.g., stomach, hips). In order to determine if the results of Sharma et al. (2006) could be replicated with the current study, the analysis was rerun using the same single item. Specifically, the item from the EDI-3-RF-BD (i.e., I feel satisfied with the shape of my body) was used to assess body dissatisfaction. After rerunning the analysis with this single item, there were still no significant differences between HIV+ and HIV- women suggesting that the type of body dissatisfaction measure utilized does not explain the conflicting results.

Perhaps a better explanation for the conflicting findings between Sharma et al. (2006) and the current study pertain to differences in the composition of the samples. The current study’s sample was composed solely of middle-aged African American women, whereas middle-aged

African American, White and Hispanic women were included in the sample for Sharma et al. (2006). In addition, BMI, another a potential confound, was not accounted for in Sharma et al. (2006), but was controlled for in the current study. The combination of grouping ethnicities together and failing to control for BMI may have resulted in inflated body dissatisfaction scores. As a result, they were able to find a difference between HIV+ and HIV- women in body dissatisfaction. Whereas, within the current study, after controlling for BMI and in only looking at African American women, this difference does not appear to exist.

Finally, Sharma et al. (2006) did not take into account the influence that drug use may have on the way a woman views her body. Specifically, within Sharma et al. (2006), 94.6% of HIV+ women and 88.9% of HIV- women reported that they were either a former or current user of heroin and/or cocaine. A woman who either abused drugs in the past or is currently abusing drugs may place a diminished value on her body when compared to a woman who was never a drug user. This is consistent with research on body image and substance use (e.g., Palmqvist & Santavirta, 2006) that suggests that poorer self-image is related to increased drug use.

With regard to binge eating symptomatology, the dual pathway of bulimic pathology model (Stice & Agras, 1998) synthesizes sociocultural, dietary, and emotional regulation accounts of disordered eating (Stice, 2001). This model offers a potential explanation for the findings that women who are HIV+ and HIV- did not differ in their level of binge eating symptomatology. According to this model, which explains the development of disordered eating behaviors, body dissatisfaction precedes disordered eating behaviors (Stice & Agras, 1998). Therefore, if HIV+ women are not body dissatisfied in general, as found in the current study, it is likely that they will not engage in behaviors that emanate from body dissatisfaction (e.g., restriction-related bingeing). Consequently, it was important that the current study examined

women with HIV more thoroughly to determine if differences exist in body dissatisfaction and engagement in disordered eating behaviors across subgroups of HIV+ women who may or may not experience bodily changes.

One type of bodily change that plays a role in the relationship between HIV status and body dissatisfaction and disordered eating behaviors is LD status. Consistent with hypotheses and past research, LD status was related to body dissatisfaction. Specifically, African American women who self-reported LD were less satisfied with their bodies compared to African American women who reported no LD symptoms. Women who self-reported LD were also more preoccupied with their weight and reported engaging in more behaviors designed to manage weight gain than their peers who did not report LD. These findings regarding body dissatisfaction corroborate previous empirical research (Huang et al., 2006), which found that women who are HIV+ and self-reported LD experienced more frequent body image distress than HIV+ women who did not self-report LD. One way the current study extends past research such as Huang et al. (2006) is by describing the unique experience of African American women as opposed to dichotomizing ethnicity (i.e., white vs. non-white), which has been cited as problematic in the body satisfaction research (Grabe & Hyde, 2006).

With regard to body monitoring behaviors (i.e., how often do you measure various parts of your body) 14 HIV+ women and two HIV- women were in the “very regular body monitoring” category (i.e., measuring body parts multiple times per day to monthly). Interestingly, of the HIV+ women in the “very regular body monitoring” category, there was nearly an equal number of women who did and did not report LD. These findings suggest that middle-aged, African American women with LD may measure themselves frequently due to the bodily changes that are occurring. For middle-aged African American women who are HIV+,

but do not report LD, it is possible that these women frequently measure themselves because of a fear of developing LD. It could be helpful for future researchers to explore whether women who are HIV+ and on HAART, but do not self-report LD, experience excessive concern about developing LD, and if so, how these concerns affect their daily life.

Hypotheses about how the specific characteristics of LD, such as the number of LD changes, the type of LD (i.e., hypertrophy or atrophy), the location of the changes (i.e., central or peripheral), or a combination, affect body dissatisfaction and engagement in disordered eating behaviors were designed. Contradictory to hypotheses, there was no relationship between number of self-reported LD symptoms and body dissatisfaction or binge eating symptoms. Based on these findings it seems that it is not simply the number of LD symptoms that is related to increases in body dissatisfaction and disordered eating behaviors among middle-aged, African American women.

When examining specific types and locations of LD, as hypothesized, women with CFH compared to women who reported no LD (while accounting for BMI) self-reported significantly higher levels of body dissatisfaction, binge eating symptomatology, and drive for thinness. That is, women who experienced fat gain in their abdomen, breasts, buttocks, and/or upper back demonstrated greater concerns about binge eating and higher rates of eating in response to emotional upset, a more extreme desire to be thinner and intense fear about weight gain, and less satisfaction with their body shape compared to their peers who self-reported no LD. Further, African American women in this study who reported LD indicated that the most common and most “bothersome” type of LD was fat gain in their abdomen. These findings are supported by the results of previous qualitative research (Power et al., 2003) that women who self-reported LD

described experiencing discomfort and shame regarding LD that was often mistaken for pregnancy (e.g., enlarged abdomen and breasts).

Similar to CFH, when controlling for BMI, a statistically significant relationship was found between levels of body dissatisfaction and disordered eating behaviors and women who reported PFH compared to those who reported no LD. More specifically, women who self-reported PFH as opposed to women who reported no LD had significantly higher levels of body dissatisfaction, endorsed a stronger tendency to think about and engage in bouts of uncontrollable eating, and displayed a greater preoccupation with their weight and concern with dieting. Based on the confirmation of hypotheses regarding CFH and PFH, body dissatisfaction and disordered eating appear to be linked to lipodystrophy syndrome among middle-aged, African American women.

To explore the clinical meaning of these findings it is important to consider factors such as, BMI, clinical ranges for the EDI-3-RF subscales, and the items most commonly endorsed. In the current study, women with CFH and/or PFH scored in the “typical clinical range” on the body dissatisfaction and bulimia subscales. Scores in the “typical clinical range” are common among women with diagnosed eating disorders, but can occur for women in non-clinical populations (Garner, 2004). Further, it is important to consider the role of BMI when interpreting the clinical meaning of the current study’s results because body dissatisfaction and BMI are correlated. Because the majority of the women in this study who self-reported CFH and/or PFH were overweight or obese, it is expected that there is a certain level of “normal” body discontent. Therefore, although the women in the sample are experiencing significantly distressing levels of body dissatisfaction, which can lead to disordered eating behaviors, it is unlikely that any of these women have an eating disorder.

With regard to binge eating symptomatology, in addition to considering BMI, it is also important to consider which items they endorse and their severity, because doing so can provide further insight into the specific bulimia symptoms these women may face. For the current study, the majority of the items commonly endorsed were less severe in nature (e.g., “I eat when I am upset”) compared to items that may more fully capture severe bulimia and/or binge eating symptomatology (e.g., “I have gone on eating binges where I felt I could not stop.” Analysis of the specific items also revealed that these women tended to endorse items related to binge eating, but not purging. Similar to body dissatisfaction, it appears that women with CFH and/or PFH are engaging in distressing levels of binge eating behaviors that might meet some criteria for binge eating disorder, but they likely do not have an eating disorder.

To examine the relationship between localized fat loss and decreased levels of body satisfaction, subsamples of women with CFA and PFA were examined. Contrary to expectations, there were no significant differences on levels of body dissatisfaction between women with CFA and women who reported no LD. In addition, no significant differences on body dissatisfaction were found between women who self-reported PFA and women who reported no LD.

One potential implication of these findings is that LD leading to fat loss does not have the same negative effects on women’s body satisfaction as LD leading to fat gain. This finding, in part, is supported by Huang et al. (2006) that found when compared to women who reported “no change” on a measure of body image dysphoria, women who experienced central fat (i.e., breasts, abdomen) hypertrophy experienced higher levels of body image distress in social and nonsocial contexts (e.g., exercise, physical intimacy). In line with current findings, women who experienced CFA did not differ from the comparison group (Huang et al., 2006). One way in

which the current study is different than past research is that the no change group in the current study is clearly defined as women who are HIV+ and on HAART, but report no LD, whereas Huang et al. (2006) did not identify who was in the no change group. The previous study's failure to clarify which women were included in the "no change" group make it difficult to draw comparisons between the current study and past research.

In contrast to CFA, the current findings for PFA were not supported by previous research (Huang et al., 2006) that found significantly higher levels of body dysphoria for women who reported fat atrophy in their face, neck, legs, and/or arms compared to women in the no change group. To assess whether these conflicting findings could be explained by the emphasis the EDI-3-RF-BD places on size of the regions of the body being distressing because they are too "large" or "big" (e.g., "I think my buttocks are too large.") the current study assessed body satisfaction in another manner. More specifically, women with PFA and women with no LD were compared on a single item from the EDI-3-RF-BD that assesses overall body satisfaction (i.e., "I feel satisfied with the shape of my body"). There were no significant differences in body dissatisfaction between the groups, providing further support for the current study's original findings, and the idea that these differences between past and current research are not due to the measure used to assess body dissatisfaction.

Another potential explanation for the differing findings between the current study and past research regarding PFA pertains to the creation of the peripheral fat group. In the current study, instead of comparing different types of LD by body part, women with LD were grouped into central or peripheral fat changes because of the small sample size; thus, LD in the face, cheeks, neck, arms, legs, and buttocks were grouped as "peripheral." The act of grouping these body parts into a single type of LD may have attenuated findings that actually exist. For

instance, Huang et al. (2006) reported that fat atrophy of the face, neck, and arms is associated with an increase in body image distress, but fat atrophy in the legs and buttocks were not. In addition, two of the top three most distressing types of self-reported LD for women in the current study were atrophy of the cheeks and atrophy of the buttocks, both of which are types of PFA. Neither of these findings were common (e.g., three women reported atrophy of the cheeks), thus it appears that though these two types of LD are not common, when they are present, they are very distressing.

Atrophy of the cheeks and buttocks may be particularly distressing to middle-aged African American women with HIV for different reasons. With regard to atrophy of the cheeks, this bodily change is reminiscent of AIDS wasting syndrome. Despite these women not having AIDS, the appearance of similar bodily changes may place these women at increased risk for identification that they are HIV+. For African American women who self-report fat atrophy in their buttocks, these changes might be highly distressing because of the emphasis sometimes placed on the attractiveness of round buttocks for women in African American culture, particularly by African American men (Jackson & McGill, 1996). Atrophy of the fat in their buttocks may contribute to these women feeling less attractive to the opposite sex, which may lead to them feeling distressed by the changes.

One way in which the current study extended past research was the inclusion of more body parts (i.e., central fat: breasts, abdomen, waist, upper back) than previous research (i.e., central fat: breasts and abdomen) (Huang et al., 2006). The inclusion of additional body parts that are often affected by not only LD, but also HIV and AIDS provided a more complete picture of the bodily changes middle-aged, HIV+, African American experienced. For instance, similar to fat atrophy of the cheeks, an examination of changes of upper back fat is important because

this unusual type of fat redistribution is known as a side effect of HAART and therefore, may “identify” the person as HIV+.

Overall, the current study’s findings indicate that with regard to self-reported LD, the type of LD (i.e., hypertrophy but not atrophy), the location of the LD (i.e., central fat but not peripheral fat change), but not the number of LD changes was related to body dissatisfaction and disordered eating behaviors. When women with LD were asked about different areas of their life that LD negatively impacted (e.g., relationships, sexual activity, prejudice) the most commonly affected area was physical appearance. This finding provides further confirmation of the importance of examining body satisfaction and engagement in disordered eating behaviors.

Interestingly, the objective and self-report data did not match for this study. More specifically, according to physician measurement 19 women had LD, whereas according to self-report 40 women reported at least one type of LD. There are a number of potential explanations for this finding. First, the initial self-report item that assesses whether each woman reports any LD is based on the last six months (i.e., “Since your last study visit, have you noticed changes in the shape of your body or in the amount of your body fat [either loss or gain]?”). If the woman answered yes, they were directed to a list of body parts and for each body part they were asked if they experienced a change (i.e., yes or no) and whether this change was an increase or a decrease. If the question was not carefully read women may have not limited their responses to the past six months and instead were reporting any LD they developed, whereas the physician’s measurements only pertain to the last six months.

Second, these women may have experienced difficulty recalling exactly when the changes began and thus, underestimated the time frame in which the changes occurred. Third, the majority of these women, particularly women who reported increases in fat, were overweight

or obese and reported clinically significant levels of body dissatisfaction. As a result, these women may have a heightened sensitivity to any potential fat gain. Fourth, if many of these women have become steadily larger over time resulting in them becoming overweight or obese, they may have attributed the steady, long-term changes to the last six months. But in reality, the “noticeable” increase in fat may have occurred over a much longer period of time. Lastly, women may be self-reporting weight changes that are more consistent with weight gain that often occurs in middle adulthood that is not due to HAART, though it may be similar to LD in some respects (e.g., fat gain in the abdomen).

With regard to BIQL and LD status, contrary to expectations and past research (Huang et al., 2006), there were no differences in BIQL for African American women who did and did not report LD. For example, women who self-reported LD also reported significantly worse BIQL compared to HIV+ women who did not self-report LD (Huang et al., 2006). Based on the current study’s findings, it appears that it is not as much about LD in general as it is about the type of LD, specifically hypertrophy.

Therefore, women with CFH and PFH were compared to women who did not report LD to determine if there were group differences when only examining fat gain. Similar to body dissatisfaction and disordered eating behaviors, women who self-reported CFH reported significantly worse BIQL compared to women who reported no LD. In contrast, there were no differences in BIQL between African American women who self-reported PFH and their non-LD peers. Despite different findings when women with CFH and PFH were compared separately to women with no LD, the areas of life most negatively affected by their body image all related to physical activity, weight (e.g., “My ability to control my weight.”), and appearance (e.g., “My willingness to call attention to my appearance.”). These findings affirm the importance of

exploring body dissatisfaction and disordered eating behaviors in middle-aged, HIV+, African American women.

Clinical Implications

A number of clinical implications can be gained from the current study. First, these findings provide support for importance of implementing routine, standardized body satisfaction and disordered eating behavior screens by physicians for women with HIV, particularly those women who self-reported hypertrophy. These screens will ideally help increase communication between patients and physicians. For instance, the screens could identify patients who fail to inform their physician about these body image concerns and/or symptoms of disordered eating due to shame or embarrassment. Further, previous studies have emphasized the detrimental effects of minimizing the impact of LD and simply regarding it as a “just” a side effect of HAART (Collins, Wagner, & Waimsley, 2000; Gagnon & Holmes, 2010), an unfortunate cosmetic consequence (Varas-Diaz, Toro-Alfonso, & Serrano-Garcia, 2005). The screens send the message to the patient that health care professionals recognize that LD is more than “just” a side effect and may normalize the experience. If a woman is identified as experiencing distressing levels of body dissatisfaction or disordered eating behaviors it is important for the physician to provide the necessary referral to a mental health professional.

In addition to implications for physicians, the current findings are important for clinicians working with this population. The current study indicates that LD, but particularly hypertrophy, was associated with increased body dissatisfaction, binge eating symptomatology, and increased desire to be thin and monitor one’s weight; therefore, it is important for clinician’s conducting therapy with HIV+ women to screen for self-reported LD symptoms. For instance, if a client presents with CFH and/or PFH it may be important for the clinician to ask questions such as,

“how often do you eat why you are upset?” or “how often do you feel extremely guilty after overeating.” When clinician’s are discussing these behaviors with clients, it is important to consider BMI and also the severity of the questions asked.

Clinicians also need to be cognizant of clients who report an increase in fat gain due to LD. Since this type of fat gain is not likely to be reduced through disordered eating behaviors; this relationship has the potential to result in a woman resorting to more extreme disordered eating behaviors each time one behavior does not work, particularly if the fat gains continue to progress. Clinicians may have the opportunity to intervene through education about the nature of LD, particularly related fat gain, and the potential negative consequences of engaging in disordered eating behaviors. For instance, disordered eating behaviors have been found to be associated with psychological disturbances, such as depression, anxiety, and substance abuse (Beals, 2004). It may be particularly important to discuss these relationships with middle-aged, HIV+, African American women because their HIV status potentially may interact with any feelings of body dissatisfaction or engagement in disordered eating behaviors to increase their chances of experiencing a psychological disturbance.

Limitations and Future Directions

There were limitations to the current study that warrant discussion. Self-report measures were utilized to collect data, which may result in under-reporting, over-reporting, or other self-presentational biases. For instance, the questionnaire included many items that women might consider personal (e.g., “What impact does your body image have on your sex life?”, “Have these changes in physical appearance resulted in you experiencing prejudice or discrimination?”), which might result in these women underreporting these effects. Future researchers may want utilize a variety of types of measures to corroborate the participant’s

experiences of HIV and LD, like measures completed by the participants' significant others and interviews with the participants.

Similarly, LD status was assessed through self-report and was not confirmed by a physician diagnosis. Future research might benefit from examining the relationships between self-reported LD and physician diagnosed LD. Obtaining objective measurements will provide health care professionals more information as they try to help these women cope with the diagnosis of HIV. Further, based on the current study's findings it appears that many women experience weight gain that they attribute to LD, but may actually be "typical" weight gain, potentially related to physical changes in middle age. It might be important for future research to focus on examining the relationship between middle age and LD as the HIV population ages.

Another limitation to the current study was the small sample size. The sample size limited the types of analyses that could be run. For instance, inferential statistics could not be run that examined LD on specific body parts because these analyses would have violated the assumption of independence of observation, partially due to many women reporting multiple types of LD. Instead, to increase group sizes, LD changes were clustered by central and peripheral changes. Grouping LD based on their location may have attenuated some of the findings. For example, fat atrophy of the face and buttocks, which were both included in peripheral fat, were the second and third most distressing types of LD, but when women with PFA and women who report no LD were compared on levels of body dissatisfaction there were no differences. Because these changes were not common and atrophy of other body parts included in the peripheral fat group (e.g., neck, arms) were not very distressing, differences in body dissatisfaction were likely minimized. In addition, due to the small sample size, differences by age were not able to be examined. In the future, recruiting a larger sample will

allow researchers to tease apart more of the intricacies of LD and also how age might relate to LD, body dissatisfaction, and disordered eating behaviors.

Two potential areas that may be related to LD, body dissatisfaction, and disordered eating behaviors in middle-aged, African American women with HIV are discrimination and acculturation. The current study included only two items that assessed discrimination. A measure solely designed to measure discrimination could explore both potential racial discrimination and discrimination due to HIV status and LD.

Further, the current study did not include a measure of acculturation. Past research has demonstrated the relationship between acculturation, body satisfaction, and disordered eating behaviors among African American women (Smolak & Striegel-Moore, 2001). It may be helpful to determine if a similar relationship exists among African American women with HIV. Lastly, the EDI-3-RF was designed to measure body satisfaction and disordered eating behaviors in a clinical population. The majority of the current study's sample did not endorse levels of body dissatisfaction, binge eating symptomatology, or drive for thinness in the "elevated clinical range" or "typical clinical range" for the EDI-3-RF. Further, many of most commonly endorsed disordered eating behavior items were the least severe in nature (e.g., "I think about dieting" compared to "I am terrified of gaining weight"). Utilizing a measure designed to assess disordered eating behaviors in a non-clinical population might provide a more in-depth picture of middle-age, HIV+, African American women's experiences.

Finally, the current study is also limited by the cross-sectional design. Due to this design, it was not possible to determine whether self-reported LD directly affects body satisfaction and the likelihood of engaging in disordered eating behaviors. Further, the item about the development of LD only pertained to the last six months, which limits the information attained.

In addition, because this item pertained to only the last six months there is the potential that a woman who developed LD a year ago, but experienced no new LD changes in the last six months, would be included in the no LD group. Future research that is cross-sectional in nature could alter this question to ask about any self-reported LD and not limit it to a specific time period. Another option for future research is to employ a longitudinal design which allows the researcher to assess body dissatisfaction and disordered eating behaviors potentially prior to a diagnosis of HIV, following a diagnosis of HIV, and after a woman self-reports the development of LD.

Table 1
Eating Disorder Inventory-3-RF Descriptives (N = 155)

Subscale	α	Actual Range (Possible Range)	M	SD	Clinical Cutoff
Body Dissatisfaction (10 items) Assesses displeasure with the overall shape and size of regions of the body (i.e., stomach, hips, thighs, buttocks) “I think that my stomach is too big.”	.86	0 – 39 (0 – 40)	15.64	9.81	≥ 21
Bulimia (8 items) Assesses the tendency to think about, and engage in, bouts of uncontrollable overeating and eating in response to upset “I have gone on eating binges where I felt that I could not stop.”	.84	0 – 19.60 (0 – 32)	2.83	4.51	≥ 4
Drive for Thinness (7 items) Assesses an extreme desire to be thinner, concern with dieting, preoccupation with weight, and an intense fear of weight gain “I am terrified of gaining weight.”	.79	0 – 28 (0 – 28)	6.71	6.28	≥ 16

*Clinical Cutoff Scores represent the “Low Clinical Range.” A score in this range suggest that the individual does not have significant problems in this area relative to other patients diagnosed with *clinical eating disorders*.

Table 2
Demographic Characteristics by HIV Status

	<i>N</i>	Total Sample	HIV+ Women		Comparison Women		<i>t</i>	<i>p</i>
		<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>		
Age (years)	155	43.63 (9.34)	115	44.65 (8.93)	40	40.71 (9.98)	-2.33	.021*
BMI Current	156	31.70 (10.08)	115	30.75 (9.93)	41	34.37 (11.52)	1.81	.075
	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%	χ^2	<i>p</i>
Employment Status	154							
Yes	96	62.3%	64	56.1%	32	80.0%	7.18	.007**
No	58	37.7%	50	43.9%	8	20.0%		
Income	141							
\$6000 or less to \$18,000	77	54.6%	60	58.3%	17	44.7%	4.29	.231
\$18,000 to \$36,000	27	19.1%	18	17.5%	9	23.7%		
\$36,001 to \$75,000	25	17.7%	15	14.6%	10	26.3%		
Do Not Know	12	8.5%	10	9.7%	2	5.3%		
Education	155							
Not Completed High School	40	25.8%	32	27.8%	8	20.0%	3.00	.558
Completed High School	55	35.3%	39	33.9%	16	40.0%		
Some College	41	26.5%	32	27.8%	9	22.5%		
Complete Four Years of College	15	9.7%	10	8.7%	5	12.5%		
Graduate School	4	2.6%	2	1.7%	2	5.0%		
Relationship Status	140							
Divorced/Annulled/Separated/Widow	39	27.9%	30	26.5%	9	18.4%	2.20	.534
Never Married	51	36.4%	34	29.4%	17	23.7%		
Legally/Common Law Marriage/Not Married But Living With Partner	34	24.3%	27	33.3%	7	44.7%		
Other	16	11.4%	11	10.8%	5	13.2%		

Note: ** Coefficients are significant at $p < .01$.

* Coefficients are significant at $p < .05$.

Table 3
Demographic Characteristics by Lipodystrophy (LD) Status

	<i>N</i>	LD		No LD		χ^2	<i>p</i>
		<i>n</i>	<i>M (SD)</i>	<i>n</i>	<i>M (SD)</i>		
Age (years)	81	40	45.20 (8.89)	41	44.69 (9.94)	0.25	.807
BMI Current	81	40	32.82 (12.81)	41	28.95 (5.92)	1.74	.087
	<i>N</i>	<i>n</i>	%	<i>n</i>	%	χ^2	<i>p</i>
Employment Status							
Yes		64	56.1%	32	80.0%	4.07	.044*
No		50	43.9%	8	20.0%		
Income	73					3.32	.345
\$6000 or less to \$18,000		23	60.5%	21	60.0%		
\$18,000 to \$36,000		5	13.2%	9	25.7%		
\$36,001 to \$75,000		6	15.8%	4	11.4%		
Do Not Know		4	10.5%	1	2.9%		
Education	81					2.54	.637
Not Completed High School		11	27.5%	13	31.7%		
Completed High School		14	35.0%	11	26.8%		
Some College		11	27.5%	14	34.1%		
Complete Four Years of College		4	10.0%	2	4.9%		
Graduate School		0	0.0%	1	2.4%		
Relationship Status	72					4.91	.179
Divorced/Annulled/Separated/Widow		12	32.4%	9	25.7%		
Never Married		12	32.4%	11	31.4%		
Legally/Common Law Marriage/Not Married But Living With Partner		11	29.7%	7	20.0%		
Other		2	5.4%	8	22.9%		

Table 4

MANOVA Comparing LD Status on the Body Dissatisfaction and Drive for Thinness Subscales of the EDI-3-RF

Source Variance	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	Partial Eta Square
Multivariate group effects						
Group (Lipodystrophy status)	2, 76			6.21	.003	0.14
Univariate group effects						
Body Dissatisfaction	1, 77	1078.53	1078.53	11.07	.001	0.13
Drive for Thinness	1, 77	211.97	211.96	6.43	.013	0.08
Error	77	10040.58	10040.58			
Total	78	11331.08	11331.08			

Table 5

Mean Scores and Standard Deviations for EDI - 3- RF Subscales as a Function of CFH compared to No LD (N = 69)

	BD	DT	BN	BMI
CFH vs. No LD	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
CFH (<i>n</i> = 29)	21.53 (10.10)	8.45 (5.80)	4.23 (5.20)	34.83 (14.11)
No LD (<i>n</i> = 40)	11.73 (9.45)	4.78 (5.10)	1.65 (3.47)	28.95 (5.92)

Table 6

MANCOVA Comparing CFH and No LD on the EDI-3-RF Subscales

Source Variance	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	Partial Eta Square
Multivariate group effects						
Covariate (BMI status)	3, 64			6.61	0.001	0.24
Group (CFH vs. No LD)	3, 64			4.50	0.006	0.17
Univariate group effects						
Body Dissatisfaction	2, 66	2474.75	1237.38	14.90	0.001	0.31
Drive for Thinness	2, 66	591.02	295.51	12.25	0.001	0.27
Bulimia	2, 66	186.44	93.22	5.35	0.007	0.14
Error	66	8224.78	124.62			
Total	68	11476.99	1750.73			

Table 7

Mean Scores and Standard Deviations for EDI - 3- RF subscales as a Function of PFH compared to No LD (N = 64)

	BD	DT	BN	BMI
PFH vs. No LD	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
PFH (<i>n</i> = 24)	21.64 (10.91)	9.33 (7.07)	4.53 (6.02)	36.11 (14.24)
No LD (<i>n</i> = 40)	11.73 (9.45)	4.78 (5.10)	1.65 (3.47)	28.95 (5.92)

Table 8

MANCOVA Comparing PFH and No LD on the EDI-3-RF Subscales

Source Variance	<i>df</i>	SS	MS	<i>F</i>	<i>p</i>	Partial Eta Squared
Multivariate group effects						
Covariate (BMI status)	3, 59			5.50	0.002	0.22
Group (PFH vs. No LD)	3, 59			3.21	0.029	0.14
Univariate group effects						
Body Dissatisfaction	2, 61	2593.54	1296.77	15.49	< 0.001	0.34
Drive for Thinness	2, 61	498.35	249.18	7.69	0.001	0.20
Bulimia	2, 61	215.70	107.85	5.43	0.007	0.15
Error	61	8295.42	135.99			
Total	63	11603.01	1789.79			

Table 9
Body Monitoring Behaviors

		Total Sample		HIV Positive		HIV Negative		LD		No LD	
How often do you measure various parts of your body (e.g., waist size, hips, neck size, etc.)?		<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Very Regular Body Monitoring	More than once per day	3	1.9	3	2.6	0	0	2	5	1	2.4
	Daily	3	1.9	2	1.7	1	2.4	0	0	1	2.4
	Twice per week	5	3.2	5	4.3	0	0	3	7.5	2	4.9
	Every week	0	0	0	0	0	0	0	0	0	0
	Twice per Month	3	1.9	5	2.6	0	0	2	5	0	0
	Monthly	2	1.3	3	0.9	1	2.4	0	0	1	2.4
	Total	16	10.3	14	12.2	2	4.9	7	17.5	5	12.2
Some Body Monitoring	A few times per year	38	24.4	28	24.3	10	24.4	10	25	8	19.5
	Total	38	24.4	28	24.3	10	24.4	10	25	8	19.5
Infrequent Body Monitoring	About once per year	8	5.1	3	2.6	5	12.2	1	2.5	1	2.4
	Less than once per year	94	60.3	70	60.9	24	58.8	22	55	27	65.9
	Total	102	65.4	73	63.5	29	70.7	23	57.5	28	68.3
χ^2				.404				.596			

Table 10
Weight Management Behaviors

	Total Sample		HIV-Positive		HIV-Negative		LD		No LD	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
What is the most important physical goal for your work out?										
Stay fit	25	43.9	18	41.9	7	50	8	38.1	4	40
Lose weight	8	14	6	14	2	14.3	5	23.8	0	0
Lose fat	9	15.8	6	14	3	21.4	4	19	1	10
Gain muscle	1	1.8	1	0.9	0	0	1	4.8	0	0
Improve fitness/ability	11	19.3	9	7.8	2	14.3	2	9.5	4	40
Other	2	3.5	2	1.7	0	0	1	4.8	1	10

Table 11
EDI-3-RF-DT Scores

	Drive for Thinness (0 - 28)				Clinical Cutoff
	<i>n</i>	<i>M</i>	<i>SD</i>	Range	
HIV-Positive	114	6.18	6	0 - 28	≥ 21
HIV-Negative	41	8.2	6.84	0 - 25	
Lipodystrophy	40	8.55	7	0 - 28	

Table 12

EDI-3-RF-BN and EDI-3-RF-DT Scores for CFA and PFA

	Bulimia Nervosa (0 - 32)					Drive for Thinness (0 - 28)			
	<i>n</i>	<i>M</i>	<i>SD</i>	Range	Clinical Cutoff	<i>M</i>	<i>SD</i>	Range	Clinical Cutoff
Central Fat Atrophy	8	4.01	6.51	0 - 19.0	≥ 4	9.25	10.89	0 - 28.00	≥ 16
Peripheral Fat Atrophy	12	3.26	5.43	0 - 19.0		8.75	9.42	0 - 28.00	

Table 13

Types of LD and BIQLI Scores

	<i>n</i>	<i>M</i>	BIQLI (Range of Scores: -3.00 - +3.00)	
			<i>SD</i>	Range
Central Fat Hypertrophy	29	1.37	.97	-.79 – 2.84
Peripheral Fat Hypertrophy	24	1.37	1.12	-.79 – 2.84
Central Fat Atrophy	8	1.38	.97	-.42 – 2.58
Peripheral Fat Atrophy	12	1.59	.93	-.42 – 2.74

**Note:* These are not mutually exclusive groups; thus, only descriptive statistics are provided.

Table 14

Level of "Bothersomeness" by Type of LD

Area of Body	Body Part A change in the...		<i>n</i>	% of total with LD	Bothersome (Not Really to Extremely: 1-4)		
					<i>M</i>	<i>SD</i>	Range
Central	size of one or both of your breasts (unrelated to pregnancy)	Atrophy	2	5.00%	2	1.41	1-3
		Hypertrophy	10	25.00%	2.1	1.29	1-4
	size of your belly or abdominal	Atrophy	5	12.50%	1.2	0.45	1-2
		Hypertrophy	25	63.00%	2.76*	1.01	1-4
	size of your waist	Atrophy	6	15.00%	1.33	0.52	1-2
		Hypertrophy	24	60.00%	2.42	1.06	1-4
	amount of fat in your upper back	Atrophy	4	10.00%	1	0	1
		Hypertrophy	7	17.50%	2.43	1.13	1-4
Peripheral	shape of your face	Atrophy	3	7.50%	2.33	1.53	1-4
		Hypertrophy	10	25.00%	1.90	1.1	1-4
	amount of fat in your cheeks, just next to your nose and mouth	Atrophy	3	7.50%	2.67*	1.53	1-4
		Hypertrophy	10	25.00%	1.8	0.92	1-3
	size of your neck	Atrophy	3	7.50%	1.67	1.16	1-3
		Hypertrophy	9	22.50%	2.22	1.09	1-4
	amount of fat in your arms	Atrophy	7	17.50%	1.71	1.11	1-4
		Hypertrophy	11	27.50%	2.36	1.03	1-4
	amount of fat in your legs	Atrophy	8	20.00%	2.13	1.36	1-4
		Hypertrophy	14	35.00%	2.43	1.22	1-4
amount of fat in your buttocks	Atrophy	7	17.50%	2.57*	1.27	1-4	
	Hypertrophy	11	27.50%	2.00	1.27	1-4	

Note: * These types of LD scored more than a 2.50, the midpoint, on a scale of 1 to 4 for how "bothersome" each LD change was to them.

** These are not mutually exclusive groups; thus, only descriptive statistics are provided.

Table 15

The Negative Life Impact of LD (N = 40)

Negative Life Impact	Yes		Severity (Mild to Severe: 1-3)		
	<i>n</i>	%	<i>M</i>	<i>SD</i>	Range
More concern and worry about physical appearance	16	40.00%	2	0.66	1-3
More concern and worry about my health and mortality	13	32.50%	2.08	0.67	1-3
Lowered self-esteem or confidence	12	30.00%	2.17	0.84	1-3
Decreased sexual activity or quality	8	17.50%	2.25	0.71	1-3
Less time spent meeting new people	7	13.00%	1.71	0.74	1-3
Less time spent around friends	6	15.00%	2.17	0.75	1-3
Less time spent around family	5	12.50%	1.4	0.55	1-2
Less following of "doctors orders" (e.g., not always taking HIV medications when I'm supposed to"	4	10.00%	2	0.82	1-3
Experienced prejudice or discrimination because changes make my HIV status "visible" to others	3	7.50%	2.33	1.16	1-3
Increased financial expenses for cosmetic treatments or procedures	0*	0%	-	-	-
If gay or bisexual, return of or increase in negative feelings about being gay or bisexual	0*	0%	-	-	-

Note: **n* = 39

** Participants could check as many as applied.

Table 16

Rates of Objective LD from Bodily Measurements from the Past 6 Months

Type of LD	<i>n</i>	%
Atrophy	14	9.50%
Hypertrophy	2	1.40%
Mixed	3	2.0%
No LD	129	87.2%

Table 17

Clinical Level by HIV and LD Status

EDI-3-RF Subscale	Clinical Range	HIV+		HIV-		LD		No LD	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Body Dissatisfaction	Low	84	73.7	26	63.4	23	57.5	35	85.4
	Typical	26	22.8	15	36.6	14	35	4	9.8
	Elevated	4	3.5	0	0	3	7.5	1	2.4
Bulimia	Low	93	81.6	31	75.6	28	70	36	90
	Typical	20	17.5	9	22	11	27.5	4	10
	Elevated	1	0.9	1	2.4	1	2.5	0	0
Drive for Thinness	Low	104	91.2	35	85.4	33	82.5	38	95
	Typical	9	7.9	5	12.2	6	15	2	5
	Elevated	1	0.9	1	2.4	1	2.5	0	0

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