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PREVALENCE OF EATING DISTURBANCE AND BODY IMAGE DISSATISFACTION IN YOUNG GIRLS: AN EXAMINATION OF THE VARIANCE ACROSS RACIAL AND SOCIOECONOMIC GROUPS

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Eating disorder research has predominantly focused on White adolescent females. More recent research suggests that eating disorders occur in various racial and age groups. The current study examines prevalence and stability of body image dissatisfaction and eating disturbance in 9- and 10-year-old girls and whether there is variability by racial group or socioeconomic status (SES). Five hundred eighty-one girls completed the Children's Eating Attitude Test (ChEAT) and the Body Image Measure (BIM). Results showed that 11% of the sample scored in the Anorexic range at age 9 and about 7% at age 10. When examining body image, 35% of the sample at age 9 and 38% at age 10 selected Ideal Figures that were smaller than their Real Figures on the BIM. There was a significant difference between the racial groups in their reports of eating disturbance, but not body image dissatisfaction. Specifically, the Minority group had higher eating disturbance scores on average at ages 9 and 10 when compared to the White group. SES did not account for eating disturbance or body image dissatisfaction. These results challenge the maxim that eating disturbance and body image dissatisfaction occur primarily in White females from middle and upper SES populations. © 2009 Wiley Periodicals, Inc.

Historically, eating disorders were believed to occur predominantly in White adolescent and adult females from middle to upper socioeconomic status (SES). Adolescents from upper-middle socioeconomic backgrounds dominated research agendas, whereas youth from diverse backgrounds went unexamined. Similarly, the SES of younger children has not been examined in depth. However, the importance of understanding concerns around dieting, body image, and weight is essential because difficulties that emerge prior to adolescence may persist into adulthood (Johnson, Cohen, Kasen, & Brook, 2002; Knez, Munjas, Petrovečki, Paučić-Kirinčić, & Peršić, 2006; Maloney, McGuire, Daniels, & Specker, 1989; Rolland, Farnill, & Griffiths, 1997).

Eating Disturbance and Age

Maloney et al. (1989) found that approximately 7% of boys and girls ages 7–13 scored in the anorexic range on the Children's Eating Attitude Test (ChEAT). Specifically, 10.6% of fourth grade and 7.3% of fifth grade girls fell into the anorexic range (Maloney et al., 1989). Furthermore, serious eating disturbances have been found in young girls at ages 5, 7, and 9 years who reported body image dissatisfaction and weight concerns that increased and persisted as they aged (Davison, Markey, & Birch, 2003).

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Eating Disturbance, Race, and SES

Researchers are now finding that eating disorders, maladaptive eating behaviors, and body image dissatisfaction occur in various racial groups, yet it is not well understood whether or how difficulties vary across racial groups (Arriaza & Mann, 2001). Some studies have shown that African American females are less concerned about their body size and shape, less likely to view themselves as overweight and diet, and less likely to be diagnosed with an eating disorder when compared to other racial groups (Arriaza & Mann, 2001; Crago, Shisslak, & Estes, 1996; Story, French, Resnick, & Blum, 1995). Greater weight tolerance, lower body dissatisfaction, less reliance on dieting and vomiting, higher self-esteem, and a culture more accepting of larger body types are some factors that have been hypothesized to account for the low prevalence of maladaptive eating behaviors in African Americans (Crago et al., 1996; Gordon, Perez, & Joiner, 2002). However, the findings from prevalence studies on eating disorders, maladaptive eating behaviors, and body image dissatisfaction are inconsistent across racial groups. For example, other studies examining eating disturbance and body image dissatisfaction in adolescents and young adults have found that there are fewer differences between ethnic groups than previously reported (Gentile, Raghavan, Rajah, & Gates, 2007; Shaw, Ramirez, Trost, Randall, & Stice, 2004). There are few data regarding ethnic differences and eating disturbances in young girls.

In terms of SES and eating disorders, some researchers have concluded that the existing research fails to support the conclusion that eating disorders occur primarily in upper-middle SES individuals (Striegel-Moore & Bulik, 2007; Walcott, Pratt, & Patel, 2003). For example, researchers highlight that previous literature has frequently failed to include individuals from lower SES groups in their subject pools. Also, researchers have found that, when examining the prevalence of eating disorders, SES influences are not meaningful in countries with better health care quality, improved eating disorder detection, and more available services (Doyle & Bryant-Waugh, 2000; Hoek, 1995), suggesting that eating difficulties may be more common in individuals from various racial groups and levels of SES than traditionally thought. Unfortunately, issues related to eating behaviors and body image in minorities and diverse racial groups may not be considered by clinicians due to longstanding stereotypes (Walcott et al., 2003). Currently, anorexia nervosa is predominantly diagnosed in White females; however, this may change as minority participants are included in new research samples and increasingly adopt and internalize Western ideals (Walcott et al., 2003). Moreover, it is important to establish whether this relationship is found in younger female samples.

Considering Puberty

Although the milestone of puberty is not a necessary precondition for the development of an eating disorder, the onset of a majority of cases of eating disorders (especially anorexia nervosa) occur around the time of puberty (Walsh & Cameron, 2005). There are several theories surrounding why puberty is a risk factor for the development of an eating disorder. For example, some hypothesize that there may be an increased vulnerability to the cultural ideals of thinness and social pressure to be thin during puberty. Others suggest that the bodily changes (e.g., increases in fat stores) contribute to body image dissatisfaction and eating disorders (Walsh & Cameron, 2005). Based on this information and the age of the youth to be examined, the role of puberty should also be considered.

Current Study

As more recent research begins to include more diversified samples, the presence of maladaptive eating behaviors and body image dissatisfaction is beginning to be discovered in adolescents and adults from various racial groups and SES. However, few studies have longitudinally examined maladaptive eating symptomology and body image dissatisfaction in young children. The current

study will contribute to the extant literature by examining a younger and more racially and economically diverse sample than typically assessed. Additionally, this study will attempt to reduce recall bias as a potential source of error by obtaining prospective reports for all measures. Specifically, we examine whether there are differences in the prevalence of eating disturbances and body image dissatisfaction between White and minority samples of young children and if SES contributes to our understanding of any potential differences.

METHOD

Participants

Participants ($n = 581$) included 9- and 10-year-old females participating in the Pittsburgh Girls Study (PGS; Loeber et al., 2002). The PGS is a community-wide prospective longitudinal study focusing on the development of a variety of problem behaviors in girls (see Hipwell et al., 2002, for a detailed description of the sample). Based on primary caregiver report, 51.9% of the sample was African American, 42.1% were White, 5.1% described the child as being of mixed or other race, .8% were Asian, and .2% were Hispanic/Latina. Because of the small number of participants in the mixed or other race, Asian, and Hispanic/Latina categories, these three groups were combined with the African American reporters into a single Minority ($n = 337$, 58%) group for statistical comparisons with the White ($n = 244$, 42%) group.

SES was determined based on participation in public assistance programs (e.g., Women, Infants, and Children [WIC], food stamps, and welfare). Participants were classified into one of two groups: no public assistance received or received public assistance. In this sample, 28.6% received public assistance.

MEASURES

Eating Disturbance

ChEAT (Maloney, McGuire, & Daniels, 1988), developed for use with children between the ages of 8 and 13, was used to determine the prevalence of eating disturbance in children and make comparisons to adolescent and adult populations. ChEAT items are measured on a Likert scale ranging from 1 (always) to 6 (never). A total ChEAT score ranges from 0 to 78; scores greater than or equal to 20 are associated with anorexia nervosa (Maloney et al., 1989; Smolak & Levine, 1994). Researchers have used 23-, 25-, and 26-item versions of ChEAT reporting adequate reliabilities (Maloney et al., 1989; Smolak & Levine, 1994); however, the 23-item version was selected as it is the most parsimonious with a high reliability (.84).

Body Image Dissatisfaction

The Body Image Measure (BIM; Collins, 1991) was used to measure the degree of body dissatisfaction of the participants. The BIM consists of seven pictures of a female child; the first figure is the thinnest and each subsequent figure increases in body size. There are White, African American, and Asian versions of the BIM selected to match the child's reported identity. First, the child is asked to "Point to the picture that looks most like you." Next, the child is asked to "Point to the picture that you think looks the best." This is described as a measure of the child's perception of her real and ideal body sizes. The discrepancy between the ideal and real size is an index of body image dissatisfaction (Ideal Self – Real Self). Collins (1991) reports test-retest reliability values of .71 for the Real Self and .59 for the Ideal Self in a sample of 1st through 3rd grade children with an intervening period of 3 days.

Pubertal Status

Pubertal status was assessed with the Pubertal Development Scale (PDS; Peterson, Crockett, Richards, & Boxer, 1988). This self-report measure asks both the child and parent (e.g., Yes or No) whether the youth has started menstruating. The PDS is reported to be a reliable and valid noninvasive assessment of pubertal status (Peterson et al., 1988; Peterson, Tobin-Richards, & Boxer, 1983; Robertson et al., 1992). When examining the reliability of the PDS, higher Cronbach's alpha values were obtained for the parent version compared to the child version. As such, the parent version of the PDS was used in the current study's analyses.

Body Mass Index

Body Mass Index (BMI) is a tool used to determine one's weight status. The Centers for Disease Control and Prevention (CDC; 2003) has found that the Body Mass Index for Children and Teens (BMI-for-age) compares well with measures of body fat taken in laboratory settings. In the current study, participant's height and weight were used to calculate each participant's BMI using charts issued by the CDC.

Data Analysis

For the current study, participants were excluded from the analyses if fewer than 75% of the items were completed on any measure in the study. This resulted in a 5% reduction of the original sample from $N = 611$ to $N = 581$. Participants who had minimal missing data were included in the analyses, and the data set was managed by using maximum likelihood estimation (MLE) imputation using an expectation-maximization (EM) algorithm. The percentages of missing data that were imputed for each measure are as follows: pubertal status parent age 9 (0.3%) and age 10 (3.1%), ChEAT age 9 (11%) and age 10 (4.3%), and BIM age 9 (0.9%) and age 10 (2.6%).

Normality was assessed statistically by examining values of skewness and kurtosis for each of the study's measures. ChEAT age 9 and ChEAT age 10 were positively skewed requiring a square root transformation for ChEAT age 9 and a log transformation for ChEAT age 10.

RESULTS

At age 9, 35% of the girls desired to be thinner as compared to 38% at age 10, and 1.4% of 9-year-olds as compared to 9.3% of 10-year-olds began menstruation. There was no significant difference between groups. However, due to the small number of girls who started menstruation at age 9, this variable may not be a useful indication of eating disturbance at this young age. Similarly, there was no significant difference in body image dissatisfaction (BIM) of the two racial groups at age 9 or 10.

There were significantly different results for Minority and White groups on BMI. The Minority reported a mean of 19.26 (standard deviation [SD] = 4.84) as compared to the White group mean of 18.27 ($SD = 3.88$) with a difference of $t(555) = -2.702$, $p < .05$. Cohen's D for this difference was .21 suggesting a small, but meaningful effect size (Cohen, 1988).

Prevalence of Eating Disturbance

To determine the prevalence of eating disturbance at ages 9 and 10, a cut score greater than or equal to 20 on ChEAT was used to classify children into an "Anorexic" group. Based on a total sample ($N = 581$) 11% of 9-year-olds and approximately 7% of 10-year-olds scored in the anorexic range. Table 1 summarizes the percentage of girls reporting selected maladaptive eating behaviors. Importantly, these results can be directly compared to those of Maloney et al. (1989) and provide support for the hypothesis that eating disturbance occurs in girls as young as age 9.

Table 1
Percentage of Children Endorsing Specific Maladaptive Thoughts and Behaviors

ChEAT Items	Age Group	
	9 years	10 years
Thinks a lot about wanting to be thinner	22.5	18.2
Has gone on eating binges	9.5	5.2
Is aware of energy (calorie) content in foods she eats	21.2	17.4
Has vomited after eating	1.9	1.4
Reported the urge to vomit after eating	3.1	2.9
Thinks about burning up energy (calories) when she exercises	16.9	19.1

Body Image and Eating Disturbance in Racial and Socioeconomic Groups

Results of the repeated-measures multivariate analysis of variance (MANOVA) revealed significant differences among the Race categories (Pillai's Trace = .050, $F(2,575) = 15.080$, $p < .001$, multivariate $\eta^2 = .050$) and Age categories (Pillai's Trace = .359, $F(2,575) = 160.828$, $p < .001$, multivariate $\eta^2 = .359$) on the dependent variables. There were no significant differences among the SES categories on the dependent variables (Pillai's Trace = .003, $F(2,575) = .955$, $p = .385$, multivariate $\eta^2 = .003$). The only significant interaction discovered was between Age and Race (Pillai's Trace = .028, $F(2,575) = 8.431$, $p < .001$, multivariate $\eta^2 = .028$). Despite having statistically significant differences, the Race categories and the interaction between Age and Race had small effect sizes ($\eta^2 = .050$ and $\eta^2 = .028$, respectively).

Univariate ANOVA results reveal that the age category significantly differs for eating disturbance ($F(1,576) = 321.134$, $p < .001$, partial $\eta^2 = .358$), but not for body image dissatisfaction ($F(1,576) = 1.720$, $p = .190$, partial $\eta^2 = .003$). Furthermore, the children had higher mean eating disturbance scores at age 9 than at age 10. With regard to the race category, the groups differ significantly on eating disturbance ($F(1,576) = 25.286$, $p < .001$, partial $\eta^2 = .042$), but not on body image dissatisfaction ($F(1,576) = 1.455$, $p = .228$, partial $\eta^2 = .003$). Lastly, there were no significant differences between the SES groups on either eating disturbance ($F(1,576) = 1.873$, $p = .172$, partial $\eta^2 = .003$) or body image dissatisfaction ($F(1,576) = .214$, $p = .644$, partial $\eta^2 = .000$).

When examining the interaction between age and race, there is a significant interaction with eating disturbance ($F(1,576) = 16.833$, $p < .001$, partial $\eta^2 = .028$), but not with body image dissatisfaction ($F(1,576) = .091$, $p = .763$, partial $\eta^2 = .000$). Figure 1 represents the significant interaction between age and race on eating disturbance; there is a greater difference between the eating disturbance of the racial groups at age 9 compared to age 10.

Next, the interaction between age and SES was examined. No significant interaction was found between age and SES on either eating disturbance ($F(1,576) = .349$, $p = .555$, partial $\eta^2 = .001$) or body image dissatisfaction ($F(1,576) = .078$, $p = .779$, partial $\eta^2 = .000$). Likewise, no significant interactions were discovered between race and SES on eating disturbance ($F(1,576) = .377$, $p = .540$, partial $\eta^2 = .001$) or body image dissatisfaction ($F(1,576) = 1.579$, $p = .209$, partial $\eta^2 = .003$). Finally, the interaction between age, race, and SES was examined. Results reveal no significant interactions on either eating disturbance ($F(1,576) = .717$, $p = .397$, partial $\eta^2 = .001$) or body image dissatisfaction ($F(1,576) = .318$, $p = .573$, partial $\eta^2 = .001$).

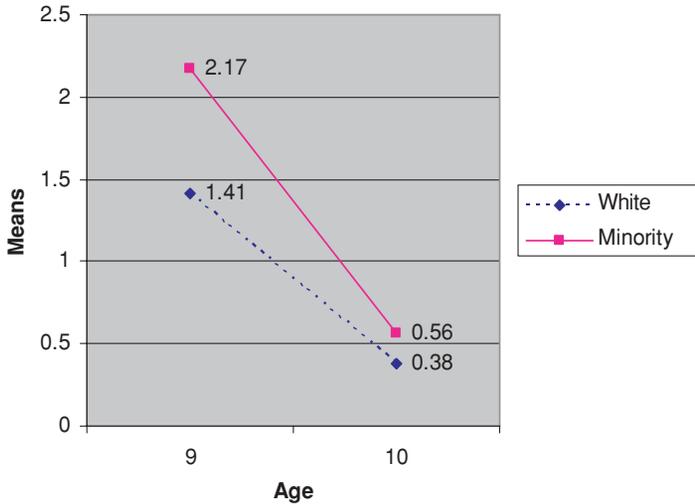


FIGURE 1. Significant interaction between age and race on eating disturbance.

DISCUSSION

Collectively, this research suggests that disturbed eating attitudes and behaviors begin earlier than adolescence. Approximately 11% of the sample scored in the anorexic range on ChEAT at age 9, and approximately 7% of the sample scored in the anorexic range at age 10. These findings compare closely with those obtained by Maloney et al. (1989), who reported 10.6% of fourth grade girls and 7.3% of fifth grade girls scored in the anorexic range. These results differ from the Davison et al. (2003) findings where disruptive eating behaviors were reported to increase with age. In fact, the current study found a reduction of eating disturbance over the course of 1 year. There are several hypothesized reasons for this finding. For example, some researchers have questioned the validity of ChEAT by suggesting that younger children may have had difficulty comprehending its simplified questions (Maloney et al., 1989; Rolland et al., 1997). Additionally, Rolland et al. (1997) stated that, although many items show face validity, some items may provoke socially desirable responses (i.e., “I cut my food into small pieces”) or confuse children by reminding them of occasions when they were ill (i.e., “I vomit after I have eaten”). Despite these questions, ChEAT has demonstrated good test-retest and internal reliability. Thus, young children are responding consistently on ChEAT. Another hypothesis offered by Maloney et al. (1989) states that younger children may have more maladaptive eating behaviors than older children have. As such, these authors emphasize the importance of additional longitudinal studies that investigate this possibility. A third explanation for these findings is that older children with disruptive eating behaviors indicative of an eating disorder may be more likely than younger children to try to conceal their symptoms (Knez et al., 2006).

The importance of examining maladaptive eating attitudes and behaviors in young children is evident when examining the frequency of symptoms that were reported in the current study. These findings are similar to other research that supports the presence of disordered eating attitudes and behaviors in young children. For example, Shisslak et al. (1998) found that 50% of elementary school girls and 66% of middle school girls reportedly attempted to lose weight in the past year. Additionally, Maloney et al. (1989) found that 45% of the children (55% of girls) reported a desire to be thinner and that 37% have tried to lose weight. Although these findings are higher than those

obtained in the current study, they may be due to the inclusion of older children from grades 3 to 6; approximately 79% of sixth grade girls reported a desire to be thinner, and 60% reported that they have tried to lose weight. When considering results from ChEAT, Maloney et al. (1989) found that 40% of the children indicated using exercise as a means of controlling their weight, 13% of children restricted their caloric intake, 10% binged, and 1% reported vomiting to control weight.

In examining body image dissatisfaction, approximately 35% of children at age 9 and 38% age 10 selected Ideal Figures that were smaller than their Real Figures on the BIM, suggesting a desire to be thinner. This increase may be due to an increased awareness of society's "thin ideal." Furthermore, this finding supports previous research, which has demonstrated that children show greater body image dissatisfaction with age (Davison et al., 2003; Gardner, Sorter, & Friedman, 1997).

Racial differences were found in reported eating disturbance, but not with body image dissatisfaction. More specifically, the Minority group had higher eating disturbance scores on average at both 9 and 10 years of age than did the White group. This finding is in direct contrast to those of earlier reports (Arriaza & Mann, 2001; Crago et al., 1996; Edwards-Hewitt & Gray, 1993; Story et al., 1995), but is supported by more recent work indicating that eating disturbance is not restricted to White females (Gentile et al., 2007; Shaw et al., 2004). The finding that the Minority group had a significantly higher BMI may be one factor contributing to the greater eating disturbance observed in this group. Interestingly, when examining eating disturbance, the disparity between the scores of the Minority and White groups lessened with age. This interaction was significant and suggests the need to continue to examine these groups across development.

There were no significant differences between the SES groups on either eating disturbance or body image dissatisfaction. This study fails to support the assumption that eating disorders occur primarily in upper-middle SES individuals. As stated, previous literature frequently has not included individuals from lower SES groups in their subject pools.

Puberty does not need to be a precursor to eating disturbances. In the present study, only 1.4% of 9-year-old girls and 9.3% of 10-year-old girls had begun menstruating, yet eating disturbances were detected. This finding is consistent with reports of eating disorder symptoms present in young prepubertal girls (Bryant-Waugh & Lask, 1995). However, these results should be interpreted with caution as there were few girls in the 9-year-old age range and there was no difference between puberty at ages 9 and 10. As such, there is a need for further longitudinal research, which follows females over the course of their development.

Limitations

The current study had several limitations. First, according to census data, the lower SES group is oversampled. As such, this sample may be considered "at-risk" and this should be taken into consideration when generalizing results. Second, although the sample was racially diverse, each racial group could not be examined separately. Third, it is important to note that BMI does not take into account one's muscle mass (CDC; 2003). Consequently, it is possible to have a high BMI without actually being overweight or obese. Fourth, it is possible that girls of different weights may report eating disturbance differently. More specifically, girls who are underweight may try to hide restrictive eating thoughts/behaviors, and girls who are overweight may feel that it is socially desirable for them to report more restrictive eating thoughts/behaviors (e.g., "I think a lot about wanting to be thinner," "I stay away from eating when I am hungry," "I eat diet foods"). Finally, the current study was able to examine the girls over a period of only 1 year rather than follow the girls over the course of their development.

Contributions

There are several clinical implications from the findings of the current research study. The presence of maladaptive eating disturbance in girls as young as age 9 suggests that clinicians must be careful not to overlook these symptoms in young girls. Also, it is important to recognize that the onset of puberty is not a necessary precondition for the development of eating disturbance. Additionally, high SES and White girls are not the only groups at risk for eating problems. Clinicians need to be aware of their own biases as researchers have found that racial stereotypes may interfere with the detection of eating disorders in minority groups (Gordon et al., 2002). Finally, the study used a large-scale community sample of girls assessed longitudinally (from age 9 to age 10) who were younger and more racially and economically diverse than were previous samples in the literature.

Future Research

Based on these results, there are several areas for future study. First, the inclusion of a more diverse (e.g., age, race, and SES) sample is critical. Second, body image dissatisfaction and eating disturbance in males should be examined. If clinicians are able to recognize maladaptive eating behaviors early, there is a potential to prevent and better treat eating disturbances. If future studies validate the finding that eating disturbance occurs in young girls, policy makers may wish to reexamine the current diagnostic criteria for its appropriateness for young children.

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