

PROBLEMATIC EATING AND WEIGHT CONTROL BEHAVIORS AMONG  
NATIVE AMERICANS: A META-ANALYTIC REVIEW

by

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## ABSTRACT

A ubiquitous clinical stereotype has conventionally associated eating pathology with White, upper-class girls and women. However, recent studies suggest that problem eating behavior and use of unhealthy weight control techniques span many ethnic and socioeconomic groups. High rates of obesity and non-insulin-dependent diabetes suggest that unhealthy eating behaviors may be a particularly serious problem among Native American youth and adults. This meta-analytic review of studies reporting the prevalence of specific eating practices among Native American participants reveals that on average, 18% of Native Americans report engaging in pathologic eating and weight control behaviors. Additionally, nearly half of Native Americans report body dissatisfaction, while 10% report chronic dieting, despite normal body mass index. Finally, compared to their White counterparts, Native Americans are significantly more likely to report body dissatisfaction, pathologic weight control methods, as well as binge eating. Study limitations and future considerations are discussed.

## CHAPTER 1

## INTRODUCTION

Eating behaviors are influenced by many factors, which may include family, peer, and cultural practices as well as attempts at voluntary control. Problematic eating and weight control pathology typically involves one or more the following behaviors: (a) restricting, which entails an extreme and unhealthy reduction of food intake; (b) binge eating, characterized by severe overeating during a short period of time (less than 2 hours), accompanied by feelings of being out of control; and (c) purging, which includes the use of laxatives, diuretics, vomiting, or excessive exercise after eating. Such behaviors may stem from feelings of distress or extreme concern about body shape or weight. Females are much more likely than males to develop eating problems; only an estimated 5-15% of people who report eating disturbances are male, and an estimated 0.5-4.2 % of females show symptoms of eating pathology during their lifetimes [National Institute of Mental Health (NIMH), 2001]. Chronic eating pathology has been shown to be a risk factor for depression, social impairment, and increased substance use (Stice & Fairburn, 2003; Stice et al., 2000). Long-term eating problems also account for a variety of negative health outcomes, including reproductive health complications in women, immune system impairment, and the future onset of obesity (Brewer, Kolotkin, & Baird, 2003; Marcos, Nova, & Monero, 2003; McCrone et al., 2000; Stice et al., 1999; Stice et al., 2005; Wolfe, 2005).

A ubiquitous clinical stereotype has conventionally associated pathologic eating and weight control with White, upper-class girls and women. A number of reviews have suggested that eating problems are statistically less frequent not only among Eastern cultures, but also among ethnic minorities in North America (King, 1993; Mumford, 1993; Wildes, Emery, & Simmons, 2001). However, the authors admit that variation across sample type, as well as the content of questionnaires and diagnostic criteria leave commonly accepted ideology regarding culture and eating disturbances lacking in empirical support. Indeed, the view of eating pathology as limited to upper-class White girls and women seems to be changing with more recent investigations, which expose problem eating behaviors among both lower class women and ethnically diverse populations. For instance, an overview of existing research that specifically assessed socioeconomic status failed to find a predominance of eating problems in high socioeconomic groups (Gard & Freeman, 1996). The authors suggested that external factors have heretofore influenced the ideological link between affluence and eating pathology, such as the impact of clinical impression, bias in referral procedures, and the failure to examine specific symptoms in relation to common predisposing factors. Moreover, additional studies indicate that problem eating behavior and weight management techniques span many ethnic groups (for reviews, see Crago & Shisslak, 2003; Dounchis, Hayden, & Wilfley, 2001; see also Shaw et al., 2004). These studies suggest that some ethnic minorities may actually be at an elevated risk, particularly for binge eating and purging behaviors. An assessment of data from a school-based survey completed by more than 80,000 9<sup>th</sup>-12<sup>th</sup> graders indicated that American Indian youth

reported among the highest prevalence of unhealthy weight control techniques such as fasting, smoking cigarettes, taking diet pills, and vomiting (Croll et al., 2002). Similarly, Lynch, Eppers, and Sherrodd (2004) explored differences in eating attitudes between groups of Native American and White female adolescents and found that Native American girls scored significantly higher on both dieting and restricting and purging items on an eating attitudes test. Lynch et al., (2006) more recently examined ethnic differences in the relationship between body image and weight control behaviors, and found that both male and female Native American adolescents scored higher than all other groups on a composite measure of dieting behaviors.

Native American populations (which include American Indians, Alaska Natives and Native Hawaiians) are also susceptible to other eating and weight-related hazards. For instance, some of the highest rates of obesity - defined as having a body mass index (BMI) above 30 - are found among American Indian youth (for a review, see Story et al., 2003). A study that included American Indians residing on reservations across Montana reported overweight and obesity rates of approximately 75% (Macvicar, 2002), and a more recent survey conducted in 14 states revealed the median prevalence of obesity among American Indian men and women to be near 40% (Liao et al., 2004). Furthermore, the literature suggests that a high incidence of non-insulin-dependent diabetes in Native Americans may be attributed to increasing rates of obesity (Callahan & Mansfield, 2000; Eisler & Hersen, 2000; Jovanovic & Harrison, 2004; Lee et al., 2004).

The preceding findings suggest that pathologic eating behavior and weight control methods may be a serious problem among Native American youth and adults. Although a

variety of studies have examined factors that may play a part in the development of such problems, this literature has not yet been quantitatively synthesized. A synthesis of this nature will be beneficial in order to establish an overall estimate of problem eating and weight-control practices among Native Americans. Such knowledge may be used to identify what kinds of intervention or prevention efforts will be most appropriate for this population. As such, the first goal of this study is to establish the proportion of Native Americans who have reported utilizing chronic, pathologic eating practices to control weight. The second goal is to compare reported weight-control behaviors of Native Americans to those of White participants. The third goal is to discuss some methodological limitations of the existing literature and make suggestions for the improvement of future research design.

## CHAPTER 2

## METHOD

Study Inclusion

Articles that, by their title or abstract, appeared to consider the relationship between Native American ethnicity and eating problems, weight control problems, or both were considered. The selection of articles involved several steps. First, a computer search was performed on PsycInfo, MEDLINE, and *Dissertation Abstracts International* using the key terms *Native American(s) or American Indian(s), combined with eating, eating disorder(s), BMI, weight, health, and obesity*. Second, the reference sections of all identified articles, review chapters, and books in this area were examined. Finally, an effort was made to obtain additional data or unpublished articles related to eating problems among Native Americans by (a) contacting researchers who have published work in this area to request unpublished studies, and (b) posting a request for information on listserves for both the *International Association for Cross-Cultural Psychology* (<http://www.iaccp.org>) and the *Academy for Eating Disorders* (<http://www.aedweb.org>).

Table 1 provides a summary of the included studies, all of which (a) reported the prevalence of specific eating and weight control behaviors or attitudes among Native American participants, or among Native Americans compared with other ethnicities, and (b) contained data derived from structured questionnaires or interviews. A total of 21 published papers, one Master's thesis, and three Doctoral dissertations were considered for inclusion in the meta-analysis. Of the published papers, five utilized data from the

same survey and could only be included as two separate studies. All three of the dissertations reported composite measures of eating behaviors or attitudes in the form of scores, rather than prevalences, and could not be included for comparison. Two more studies were excluded due to inadequate statistical information. As such, 17 total studies, or 68% of the initially considered articles, were included in the analysis.

Table 1. Demographic Information and Findings from Studies Examining Weight Control Behavior and Attitudes Among Native Americans.

Study	Sample	Geographic Area/Tribe Reported	Socioeconomic Status Measure	Measurement Tool	Findings
Auker (1993)	109 Native American adolescents	Montana/ Crow	Not reported	Eating Behaviors and Weight Control Survey, Binge Scale	About half of Native American girls and boys perceived themselves to be overweight. More than 30% reported using pathogenic methods to control weight.
Croll et al. (2002)	81,247 9 <sup>th</sup> and 12 <sup>th</sup> graders 641 Native Americans	Minnesota/ Not reported	Number of parents in household	Minnesota Adolescent Health Survey, National Institute on Drug Abuse Monitoring the Future Survey, National Youth Risk Behavior Survey.	Native American youth reported among the highest prevalence of any problematic eating behavior; 63% of females and 46% of males.
Davis & Lambert (2000)	1,996 Native American fifth graders	New Mexico/ Not reported	Not reported	“Feelings About Weight” Survey, Body Shape Pictorial Scale.	About 30% of females and 20% of males who were an appropriate weight indicated body dissatisfaction. Dieting behavior was equally prevalent across weight category and gender.
Lynch et al. (2004)	77 5 <sup>th</sup> - 12 <sup>th</sup> graders from Montana schools 25 Native Americans	Montana/ Not reported	Not reported	EAT-26, ChEAT	Both Native ethnicity and low BMI scores contributed to higher restricting/purging and social pressure scores.

Table 1. Demographic Information and Findings from Studies Examining Weight Control Behavior and Attitudes Among Native Americans (continued).

Study	Sample	Geographic Area/Tribe Reported	Socioeconomic Status Measure	Measurement Tool	Findings
Lynch et al. (2006)	2009 5 <sup>th</sup> – 10 <sup>th</sup> graders from Montana schools 489 Native Americans	South central Montana/ Crow and Northern Cheyenne	Number of parents in household, parental marital status, family income	McKight Risk Factor Survey-IV	In comparison to Whites, Native American boys and girls reported more weight control behaviors, and also had higher BMIs and reported wanting to be smaller.
Neumark-Sztainer et al. (1997)	11,868 Native American 7 <sup>th</sup> – 12 <sup>th</sup> graders	Alaska, South Dakota, New Mexico, Utah, Minnesota, Montana, Tennessee, Arizona/ Not reported	Parental education and employment, eligibility for assistance	Minnesota Adolescent Health Survey	Thirty percent or more of non-overweight youth reported weight-related concerns and behaviors. Prevalence rates for the same were significantly higher for overweight youth.
Neumark-Sztainer et al. (2002)	4,746 7 <sup>th</sup> -12 <sup>th</sup> graders 165 Native Americans	Minnesota/ Not reported	Not reported	Project EAT Survey	In comparison to Whites, Native Americans tended to report similar weight-related concerns and behaviors. ∞
Rosen et al. (1988)	85 Native American girls and women Mean age = 21.81	Michigan/ Chippewa	Regional employment rates, parental education, food stamp use	Michigan State University Weight Control Survey	Seventy-four percent of participants were trying to lose weight, and 75% of those were employing pathogenic methods. Such methods were more likely used by those with higher BMIs.
Sherwood, et al. (2000)	203 Native American adult women	Minnesota/ Sioux, Ojibwa	Education, marital status, employment status, number in household	Weight Locus of Control Scale	Non-overweight women reported substantial weight-related concerns and behaviors, but overweight women were more likely to be dissatisfied with weight, and to be trying to lose weight.

Table 1. Demographic Information and Findings from Studies Examining Weight Control Behavior and Attitudes Among Native Americans (continued).

Study	Sample	Geographic Area/Tribe Reported	Socioeconomic Status Measure	Measurement Tool	Findings
Smith & Krejci (1991)	545 Southwestern high school students 129 Native Americans	New Mexico/ Not reported	Not reported	Bulimia Test (BULIT), Eating Disorders Inventory (EDI)	Native Americans scored consistently highest on each of seven items representing disturbed eating behaviors and attitudes.
Snow & Harris (1989)	95 Rural public high school students 58 Native Americans	Not reported/ Pueblo	Number of people in household, number of bedrooms per household	DSM-III for bulimic behavior, other individual questions dealing with weight concern and behavior	No ethnic differences in eating behavior were found. The majority of girls, but few boys, reported both weight concerns and behaviors
Stevens et al. (1999)	304 4 <sup>th</sup> grade Native American children	Arizona, New Mexico, South Dakota/ Navajo, Tohono O'odham, Pima, Apache, Lakota	Not reported	"Knowledge, Attitudes, & Behaviors Instrument" (Pathways Survey)	Over a third of the children reported that they had tried to lose weight. Girls were more likely than boys to be dissatisfied with their body size.
Story et al. (1995)	36,320 7 <sup>th</sup> - 12 <sup>th</sup> graders 560 Native Americans	Minnesota/ Not reported	Parental educational attainment and employment status	Series of individually developed questions	Native American females reported among the highest prevalence of extreme weight control behaviors, while males reported the highest prevalence of binge eating. Both genders reported the lowest satisfaction with weight.

Table 1. Demographic Information and Findings from Studies Examining Weight Control Behavior and Attitudes Among Native Americans (continued).

Study	Sample	Geographic Area/Tribe Reported	Socioeconomic Status Measure	Measurement Tool	Findings
Story et al. (2001)	1441 2 <sup>nd</sup> - 3 <sup>rd</sup> grade Native American children	Arizona, New Mexico, South Dakota/ Apache, Lakota, Navajo, Gila River, Tohono O’odham	Not reported	“Knowledge, Attitudes, & Behaviors Instrument” (Pathways Survey)	Forty-two percent of the children were overweight or obese. Heavier children were more likely to have tried to lose weight or were currently trying to lose weight. No gender differences were found.
White et al. (1997)	788 Native American adults	Arizona, New Mexico, Utah/ Navajo	Not reported	Navajo Health and Nutrition Survey	About 20% of participants perceived themselves to be overweight. Nearly half were currently trying to lose weight, and 20% of those reported using pathogenic methods.
Wilson (1992)	60 adult women undergoing drug treatment 21 Native Americans	North Dakota/ Not reported	Not reported	Bulit-R, SCIT (Structured Clinical Interview for DSM-III-R)	Seventeen percent (5% of Native Americans) of participants were diagnosed with either bulimia or anorexia.
Yates et al. (2004)	821 community college students 70 Native Hawaiians	Hawaii, Missouri/ Not reported	Not reported	Self-Loathing Subscale (from the Exercise Orientation Questionnaire)	BMI was highly correlated with body and self-dissatisfaction for males and females. Native Hawaiians had a normal mean BMI, but about 64% reported body dissatisfaction.

### Coding Scheme

The following information was coded for each study: (a) publication year, (b) year of data collection, (c) publication type (i.e., journal, dissertation, or thesis), (d) research design (i.e., survey or interview), (e) height and weight status (i.e., measured or self-report), (f) number of total participants, (g) number of males, (h) number of females, (i) mean age, (j) mean grade, (k) geographic area of study, (l) tribe reported (i.e., yes or no), (m) participants dwelling on a reservation (i.e., yes, no, or not reported), and (n) average body mass index. Additionally, prevalence was recorded for the following variables: (a) body dissatisfaction (defined as wanting to be smaller), (b) perceived overweight, (c) currently dieting, (d) chronic dieting (i.e., more than 5 times per year), (e) unhealthy weight control behaviors (i.e., fasting, use of diet pills, vomiting, use of laxatives, use of diuretics), and (f) binge eating.

### Coding Reliability

Accurate coding can be crucial to the results of a meta-analysis. Accordingly, two independent raters coded each study. Any disagreements in coding decisions were resolved by discussion.

### Calculation of Effect Sizes

Most of the included studies reported findings from a single Native American population. According to Lipsey and Wilson (2001), “research findings in the form of the proportion of a sample with a particular characteristic can be represented with the

*proportion* as the effect size statistic” (p. 39). Computer simulations using this method have shown that it provides appropriate estimates of the mean proportion across studies. Correspondingly, pooled proportions were calculated through the weighted mean proportion of each variable of interest, taking into account the sample size of each study.

A subset of the included literature reported data gathered from both Native Americans and White participants. In an effort to compare the eating and weight control behaviors of these groups, pooled odds ratios were calculated by taking the inverse of the natural log of each effect size. Overall proportions and frequencies were weighted for each study using SPSS, while heterogeneity tests, mathematical pooling, and 95% CIs were performed through the use of StatsDirect meta-analytic software (StatsDirect, 2005).

#### Random Versus Fixed Effects Models

The theory behind mixed and random effects models (Hedges & Vevea, 1998; Hunter & Schmidt, 2000) relates to the assumptions made about each study population within a meta-analysis. When the effect size in the population is assumed to be the same for all studies (i.e., the studies are homogenous), a fixed-effects model is more powerful. However, if effect sizes are assumed to vary randomly from study to study (i.e., studies are significantly heterogeneous), then a fixed-effects model will inflate the Type I error rate, thus underestimating confidence intervals, as well as underestimating standard errors of parameter estimates. For example, Monte Carlo simulations suggest that the Type I

error rate in heterogeneous fixed-effects models range between .43 and .80, dramatically higher than the .05 level (Field, 2003).

The classical measure of heterogeneity is Cochran's  $Q$ , which is calculated as the weighted sum of squared differences between individual study effects and the pooled effect across studies. Because this measure indicated significant heterogeneity among all but a few effect sizes, a random-effects model was employed for this analysis. Specifically, the DerSimonian and Laird (1986) method was used. This method utilizes the  $Q$  statistic to estimate heterogeneity, and assigns variability to each study's effect size based on its deviation from the population mean.

## CHAPTER 3

## RESULTS

The prevalence of specific weight control behaviors and attitudes among Native Americans, reported as pooled proportions, is summarized in Table 2.

Table 2. Prevalence of Weight Control Behaviors and Attitudes Reported by Native Americans.

Variable	Number of studies	Pooled proportion	95%CI	Cochran's $Q^a$
Body dissatisfaction	9	.49	.42/.57	327.04**
Currently dieting	7	.47	.37/.56	223.69**
Chronic dieting	4	.10	.08/.13	10.58*
Weight control				
Fasting	11	.21	.12/.33	872.22**
Diet pills	6	.06	.03/.10	126.26**
Vomiting	11	.08	.06/.11	116.43**
Laxatives	8	.05	.01/.12	273.00**
Diuretics	4	.02	.01/.03	0.58
Binge eating	9	.32	.25/.38	146.63**
All weight control	14	.15	.09/.24	1294.76**
All eating behaviors	14	.18	.13/.24	582.00**

<sup>a</sup>Cochran's  $Q$  describes the degree of between-study variability in a group of studies, with df equal to one less than the number of studies.

\* $p < .05$ ; \*\* $p < .01$ .

### Body Dissatisfaction

Dissatisfaction with one's body shape or weight increases according to the discrepancy between ideal and actual body image. Within the context of Western culture, body dissatisfaction is theorized to arise from persistent sociocultural messages that one is not thin enough, and the resulting pursuit of the "thin-ideal" (Stice & Shaw, 2002).

There is consistent robust support for the assertion that body dissatisfaction is related to,

and often predicts, the development and maintenance of eating pathology. This particularly applies to excessive dieting and binge-purge patterns (Stice, 2002; Stice, Presnell, & Spangler, 2002). Given these risks, it was important to determine the prevalence of body dissatisfaction among Native Americans. The pooled proportion of body dissatisfaction was calculated using effect sizes derived from nine studies, and nearly half of all participants reported wanting to be a smaller size.

### Chronic Dieting

Discontent with one's weight or shape may lead to dieting due to the belief that it is an effective method of weight control. Theoretically, frequent or prolonged dieting may result in bingeing by "promoting the adoption of a cognitively regulated eating style" (Polivy & Herman, 1985, pp. 193). In other words, individuals who routinely restrict their calorie intake may rely on cognitive controls, such as strict dietary rules, to override physiological signals to eat. However, anything that disrupts this control may result in disinhibition and consequent overeating. Consistent with the model, self-reported dieting appears to predict increases in both bulimic symptoms and other eating pathology (for a review, see Jacobi et al., 2004; see also Stice, 2002). Since chronic dieting appears to influence unhealthy eating practices, the prevalence for this sample was evaluated. Based on four studies that assessed this variable, 10% of Native Americans reported chronic dieting as a weight control technique.

Weight Control Behaviors

The included studies consistently measured specific weight control behaviors used to lose or maintain weight, including fasting, taking diet pills, vomiting after eating, or using laxatives or diuretics. The proportion of Native Americans who reported using these individual methods is shown in Table 2. Proportions of total weight control behaviors by study are depicted in Figure 1.

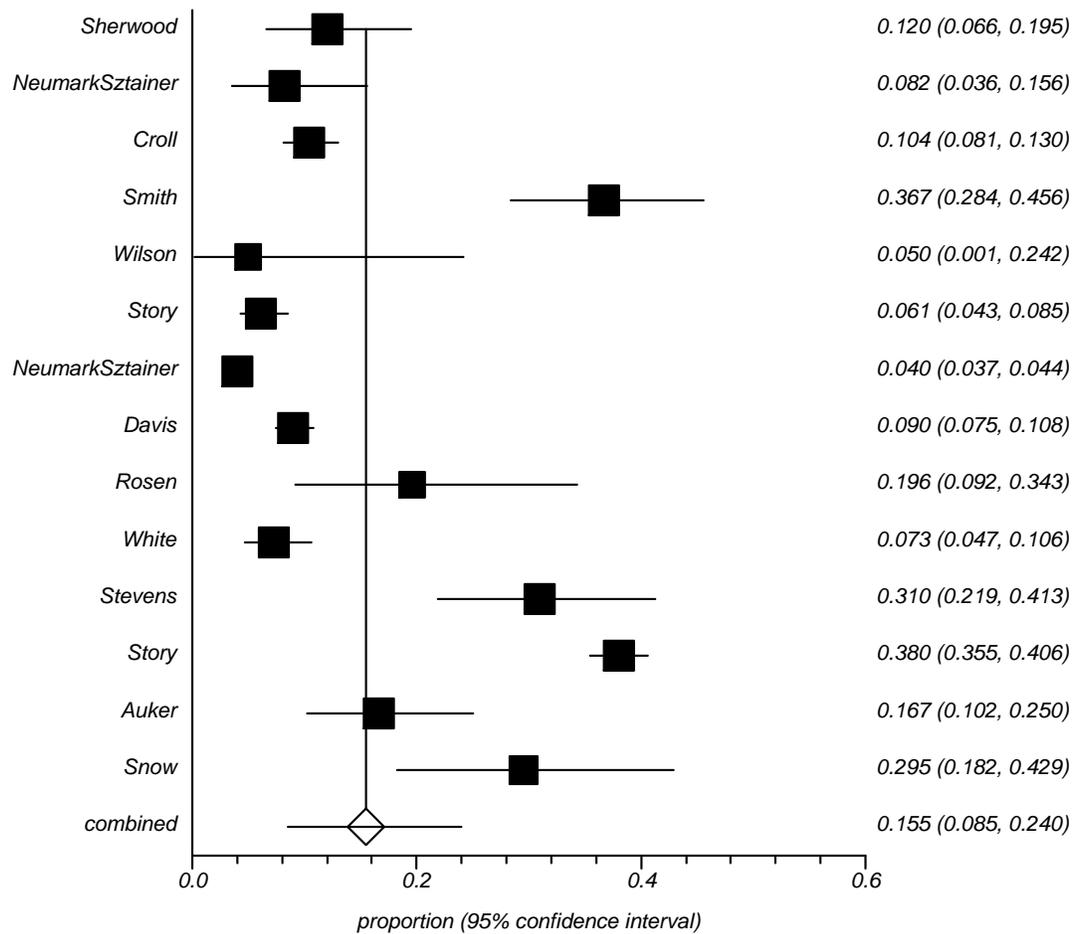


Figure 1. Total weight control behavior reported by Native Americans in each study.

### Binge Eating

Binge eating was typically assessed with the question, “Have there been occasions when you ate, within a 2-hour period, what most people would regard as an unusually large amount of food (not counting social events when most people typically eat more than usual)?” Within this context, over one-third of Native Americans reported instances of binge eating.

### Group Differences

#### Males Compared to Females

Perhaps the most robust findings in the eating disorder literature is the greater prevalence of eating problems among women than among men; the female-to-male ratio is approximated at 10:1 for both anorexia and bulimia and 2.5:1 for binge-eating disorder (for a review, see Jacobi et al., 2004). Though this effect appears generally consistent, cross-cultural research has indicated that Native American males report higher body mass indexes (BMIs), along with significantly more body dissatisfaction and weight control behaviors than males of other ethnic groups (Lynch et al., 2006). Interestingly, the current synthesis indicated that Native American females were more likely to report employing unhealthy weight control behaviors than Native American males, but not significantly so. However, Native American males had significantly higher odds than White males of reporting engaging in both weight control behaviors and binge eating.

### Native Americans Compared to White Participants

Ethnic differences in specific weight control behaviors and attitudes among Native Americans and White participants were calculated as odds ratios for each variable of interest. Odds ratios were employed in this study as a way to compare whether certain weight control behaviors or attitudes were the same for both Native Americans and Whites. As such, a value of 1.0 indicates that a behavior or attitude was equally likely for both groups, whereas a value greater than 1.0 indicates that a behavior or attitude was more likely among Native Americans. The pooled odds ratios are summarized in Table 3.

Table 3. Ethnic Differences in Reported Weight Control Behaviors and Attitudes.

<b>Variable</b>	<b>Number of studies</b>	<b>Pooled OR (Overall) 95% CI<sup>a</sup></b>	<b>Pooled OR (Females) 95% CI<sup>a</sup></b>	<b>Pooled OR (Males) 95% CI<sup>a</sup></b>
Body dissatisfaction	5	<b>1.25</b> 1.11/1.40	<b>1.09</b> .092/1.28	<b>1.38</b> 1.16/1.64
Chronic dieting	2	-		
Weight control				
Fasting	4	<b>1.22</b> 1.04/1.44	<b>1.20</b> .097/1.48	<b>1.52</b> 1.07/2.17
Diet pills	2	-		
Vomiting	5	<b>1.71</b> 1.44/2.04	<b>1.69</b> 1.37/2.08	<b>2.18</b> 1.48/3.20
Laxatives	4	<b>1.57</b> 1.08/2.28	<b>1.38</b> 0.83/2.29	<b>2.27</b> 1.30/3.97
Diuretics	2	-		
Binge eating	5	<b>1.32</b> 1.17/1.50	<b>1.03</b> .086/1.23	<b>1.99</b> 1.65/2.41

<sup>a</sup>Odds ratios are considered statistically significant ( $p < .05$ ) if 1.0 is *not* included within the confidence interval.

Note: Results for variables assessed by  $\leq 2$  studies were not reported due to insufficient data.

Due to the small number of studies available for this portion of the analysis, some variables were not included. However, some interesting findings emerged. For instance,

Native Americans were significantly more likely than Whites to report being dissatisfied with their shape ( $\chi^2(1)=14.17, p<.001$ ) In terms of specific weight control behaviors, significant differences existed in food intake restriction, or fasting ( $\chi^2(1)=5.8, p<.05$ ), vomiting after eating ( $\chi^2(1)=36.55, p<.001$ ), and use of laxatives to lose weight ( $\chi^2(1)=5.53, p<.05$ ). On average, Native Americans were 1.5 times as likely to report using these methods of weight control than White participants. Additionally, Native Americans were significantly more likely to engage in binge eating than Whites ( $\chi^2(1)=19.36, p<.001$ ).

### Body Mass Index

BMI is routinely considered the preferred index of relative body weight as a reflection of adiposity (Kraemer, Berkowitz, & Hammer, 1990), and is calculated by dividing weight in kilograms by height in meters squared ( $\text{kg}/\text{M}^2$ ). There has been speculation that ethnic differences in eating behavior may be significantly associated with BMI differences (Neumark-Sztainer et al., 2002; Stice, 2003), which may be partly attributable to the finding that minority females tend to have higher BMIs than White females (Crago & Shisslak, 2003; Striegel-Moore & Smolak, 2000). In general, findings support the notion that as BMI increases, so do levels of pathologic eating behavior and attitudes about weight. Lynch et al. (2006) found that in Native American and Hispanic adolescents, higher BMI correlated with increased levels of behavior aimed at weight control. In the current study, Native Americans had an average BMI of 24.5 (BMI between 18.5 and 24.9 is categorized as “normal”). This is noteworthy, considering that

despite normal weight, Native Americans were significantly more likely than White participants (with an average BMI of 22.7) to report body dissatisfaction and use of pathologic methods of weight control.

## CHAPTER 4

## DISCUSSION

A qualitative review (Shaw et al., 2004) found no ethnic differences in eating disorder risk factors, including body dissatisfaction, among Asian, Black, Hispanic, and White adolescents. Similarly, a meta-analytic review of eating disturbance and body dissatisfaction (Wildes et al., 2001) found that more White than non-White women experience these difficulties. However, when compared with White girls Native American girls have been shown to be generally more (Bronner, 1996), less (Story et al., 1995; Lynch et al., 2006), and equally dissatisfied with their weight (Snow & Harris, 1995). The current synthesis indicates that nearly half of Native Americans are dissatisfied with their weight or shape, and they are significantly more likely to be dissatisfied than Whites, despite having relatively small differences in BMI. Body dissatisfaction in the included studies was most commonly measured on a continuum, wherein participants could pick both their perceived and desired weight on a pictorial scale. Therefore, there are likely degrees of dissatisfaction that could not be identified in this study. Determining the degree of unhappiness with one's size or shape, by using multiple, reliable measures of satisfaction with both weight and appearance, may well yield more consistent comparisons among samples (Thompson, 2004).

Smith and Krejci (1991) reported that Native Americans scored higher on eating disorder screening tests than White participants. However, according to Crago and Shisslak's (2003) review of ethnic differences in eating pathology among American

females, pathologic weight control such as vomiting or laxative use was equal to or more common among White women than any other ethnic group. This same study indicated that dieting was also more prevalent among White women than other groups.

Alternatively, few of the reviewed studies demonstrated that Native Americans were more likely than other groups to report the same behaviors. In the current synthesis, nearly half of all Native Americans reported dieting on a chronic basis, while about 15% indicated engaging in pathologic weight control methods. Furthermore, Native Americans were significantly more likely to use each of these methods than Whites in comparison studies. One reason for such diverse results may relate to the suggestion by Wildes et al. (2001) that there are differences between clinical and subclinical eating pathology. Specifically, although certain behaviors may be present, they may not meet all the criteria of a clinical eating problem (i.e. severity or frequency of behavior). Some articles included in the current study measured clinical eating disturbances, while others measured subclinical behaviors; such nuances were lost in this synthesis.

It has been suggested that minority females tend to have higher BMIs than White females (Crago & Shisslak, 2003; Striegel-Moore & Smolak, 2000), which may lead to ethnic differences in the development of eating problems and weight concerns. Additionally, heavier Native Americans have reported more overall eating pathology (for a review, see Crago, Shisslak, & Estes, 1996; see also Lynch et al., 2006). The current analysis indicates, however, that both Native American and White participants tended to be in the same BMI category (18.5-24.9), and that Native Americans reported more eating pathology despite these similarities. This is likely due to the fact that (a) few

studies that included direct comparisons between Native Americans and Whites, and (b) of those that did, even fewer reported the exact BMIs of participants. A larger sample of comparative data that reports actual BMI measurements is essential for making further assumptions in this area.

### Limitations and Future Considerations

The primary limitations of this study are inherent to the general use of meta-analysis as a synthesis technique. First, the potential threat of publication bias is a concern that was addressed throughout the review process. The initial search for studies was not limited to research published in prominent journals. Though the effort was made to contact researchers and to search a variety of sources to locate relevant unpublished studies, only one unpublished Master's thesis contained data that could be included. Second, the small number of studies that were included in this review, as well as possible heterogeneity within the Native American sample, potentially limits the generalization of its results to larger populations. This analysis summarizes data from 17 studies, which is a relatively small number. The analysis also utilizes samples that vary from study to study, insomuch as participants reside in both rural and urban areas in many different regions of the United States. As pointed out by Crago and Shisslak (2003), the meta-analytic procedure has no method to account for the possible effects of these within-group differences. Larger samples that could be divided into more homogeneous subgroups may allow for more meaningful predictions of eating and weight-control behavior among Native American peoples as a whole. Third, as can be seen in the

summary of included articles in Table 1, studies sampled a wide range of ages. As the emergence of specific eating behaviors and weight concerns can vary by age of onset (Stice et al., 1998), more age-matched samples should be examined in the future. Finally, a limited number of cells contributed to each effect size. In addition to the drawbacks of the current study, several weaknesses of the available literature should be addressed in future research.

Perhaps the most important methodological limitation of the body of literature investigating eating and weight control pathology among Native Americans is the omission of consistent measure of cultural identification and acculturation. As reviewed by Stice and Shaw (2002), women in Western cultures experience pressure to be thin, emanating from sources such as the media, parents, peers, and dating partners. Osbold and Sadowsky (1993) pointed out that such pressures may have an increasingly negative impact on ethnic minorities as they acculturate to American society. However, Wildes et al. (2001) noted that very little research exists that includes measures of either cultural identity or acculturation. Level of acculturation should be consistently assessed in studies of ethnic minorities, as it likely exists on a continuum and may elucidate differences in eating behavior and attitudes. Cultural identity is “the degree to which an individual identifies with his or her own ethnic group, as well as the type and extent of involvement that he or she has” (Dounchis et al., 2001, p. 68). Sound cultural identification may benefit mental health, as well as encourage positive, and protect against negative health behaviors (Abeita, 2004; Mossakowski, 2003). Only one study included in this analysis provided measures that allowed the participant to indicate high or low identification with

any culture. In order to relate ethnicity to any type of behavior, it is essential not only to assess cultural identification and acculturation to the majority culture, but also to examine specific subgroups and take local cultural content and other environmental situations into account (Oetting & Beauvais, 1991).

The second major limitation of the group of studies included in this synthesis is related to questionnaire structure and diagnostic criteria. Specifically, the measurements of eating behavior ranged from one survey question, to standardized measures such as the EAT-26 (Eating Attitudes Test) or the EDI (Eating Disorder Inventory). Such variability indicates a need for consistent use of psychometrically valid measures. Furthermore, as pointed out by Smolak and Striegel-Moore (2001), the use of measures that were developed for a primarily White population “leaves the question of whether they actually address the entire range of eating problems and attitudes faced by various ethnic groups” (pp. 116). In other words, many behavior-related questions on the included questionnaires may not be culturally appropriate or meaningful. More detailed methods of inquiry have been urged by Miller (1999), and may include focus groups, semi-structured interviews, and response content analysis (Becker, 2002). Such techniques will help incorporate the understanding of Native American culture into the current constructs used to identify eating and weight control behaviors.

Another future endeavor should involve the evaluation of participant socioeconomic status. As previously mentioned, early research provided the basis for one of the prevailing stereotypes concerning eating pathology and social class by demonstrating an increased prevalence of eating disorders among high socioeconomic

groups. Since that time, a number of investigations that assessed eating behavior made a point of reporting the socioeconomic level of the participants as a demographic variable (Pate et al., 1992). However, relatively few studies have specifically addressed the relationship between socioeconomic status and pathologic eating, and those that have impart mixed findings. Many earlier studies tend to support a preponderance of eating problems in high socioeconomic groups, whereas somewhat later research indicates either the opposite relationship, or no relationship at all (for a review, see Gard & Freeman, 1996). Seven studies in the current analysis reported socioeconomic status of the participants, but via diverse measures such as educational level, employment status, household size, and marital status. Consistent assessment of socioeconomic status in future research will provide additional insight into the relationship between Native American ethnicity and eating management.

A fourth future consideration is the examination of certain cognitive factors. Psychosocial concerns such as overall emotional well-being and self-esteem, as well as family and peer support, may moderate the relationship between ethnicity and eating problems. Specifically, among diverse ethnic groups high self-esteem has been shown to be a protective factor for body dissatisfaction, while lower general self-esteem has predicted increased eating disturbance as well as higher disordered eating scores (Beato-Fernández et al., 2004; Cervera et al., 2003; Finstad, 2003). Support from and connectedness to one's family, other adults, and friends can serve as protective against extreme weight control behaviors (Croll et al., 2002; Fonseca, Ireland, & Resnick, 2002). Although such protective factors have been shown to be similar across gender, they may

differ across ethnicity. Only one study in the current analysis (Croll et al., 2002) investigated psychosocial variables. Consistent measurement of such variables is important for future examination of eating pathology among various ethnic groups.

Finally, many of the studies rely on self-report methods to assess height and weight, which often yield inaccurate results and may impact effect sizes associated with BMI. For instance, an early meta-analysis (Bowman & Delucia, 1992) investigating the accuracy of self-reported weight among diverse samples found discrepancies between self-report and true weight for all groups, including estimations in pounds. Similarly, Himes and Story (1992) showed that among Native American youth, there was no systematic bias in self-reported stature, but self-reported weight was significantly less than measured weight by over 2 kg for both boys and girls. More recently, a study obtained stature, weight, and BMI from self-reports among Minnesota adolescents (Himes et al., 2005). Here, both genders systematically overestimated their statures and underestimated their weights. Interestingly, these errors were significantly associated with age, ethnicity, and socioeconomic status, suggesting that differences in self-assessed body size vary according to these characteristics. It appears likely that the measurement of height and weight is more accurate than self-report, and should be employed in future studies that seek to analyze eating and weight issues among Native Americans.

Aside from studies that examine differences between African American and White populations, research that examines ethnic differences in eating-related behaviors is relatively preliminary. Based on the composite limitations of the group of studies included in this analysis, future investigation in this area could be strengthened in the

following ways: (a) assess cultural identification and acculturation using psychometrically validated methods; (b) account for heterogeneity within Native American groups by inquiring about tribe membership and place of residence; (c) develop more valid, reliable, and culturally sensitive measures by providing adequate operational definitions of the behaviors of interest; (d) assess additional potential moderators of the relationship between ethnicity and eating pathology, such as socioeconomic status and psychosocial factors; and (e) measure height, weight, and other anthropometric variables individually in order to accurately represent BMI and other measures of fat distribution.

## CHAPTER 5

## CONCLUSION

This study is the first quantitative synthesis of available empirical studies of pathological eating and weight management among Native Americans. Although some past studies have provided results suggesting that eating pathology is more prevalent among White than minority populations, research that is more recent has yielded mixed results or even suggested that Native Americans are at particularly high risk for such problems. The current meta-analysis has elucidated the magnitude of specific eating behaviors among Native Americans, and it indicates that this population may be even more likely than Whites to be dissatisfied with their weight and to engage in pathologic eating. Given the inherent weaknesses of meta-analysis for the reported data, as well as many methodological limitations of the available research, the above results cannot be considered conclusive. However, this effort has provided a quantitative starting point for future research in this area.

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