

INTERPERSONAL VIOLENCE AND RURAL ADOLESCENTS' BODY IMAGE
PERCEPTIONS, EATING DISORDERED BEHAVIORS, AND BODY MASS INDICES

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by
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Abstract

INTERPERSONAL VIOLENCE AND RURAL ADOLESCENTS' BODY IMAGE PERCEPTIONS, EATING DISORDERED BEHAVIORS, AND BODY MASS INDICES

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This epidemiological study examined how interpersonal violence (IPV) relates to poor body image, eating disorder behavior, and body weight in adolescents from rural Appalachia in Western North Carolina using the Youth Risk Behavior Surveillance Survey in 2011-2012. Multinomial logistic regression found rural female adolescents with both physical and sexual IPV histories were at higher risk for poor body image (Odds Ratio [*OR*] = 6.00), restricting food (*OR* = 3.47), purging (*OR* = 14.70), and diet pills (*OR* = 7.44) relative to those without a history of these two types of IPV. Male adolescents with a history of physical IPV, versus those without, were at higher risk for diet pill use (*OR* = 4.23). As such, longitudinal research is needed to identify the longitudinal ramifications of victimization in rural adolescents. Additionally, intervention programs would benefit from identifying the temporal relationship between a combined history of physical and sexual IPV so as to inform programs of intervention that may be able to destigmatize discussion of healthy dating and unhealthy IPV.

Keywords: Interpersonal violence, rural adolescents, YRBS, body image, eating disorders, BMI

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Table of Contents

Abstract	iv
Acknowledgments.....	v
List of Tables	vii
Introduction.....	1
Methods.....	9
Results.....	13
Discussion.....	19
References.....	32
Appendix A.....	39
Appendix B.....	42
Vita.....	48

List of Tables

Table 1. Prevalence of females and males by demographic variables.....	44
Table 2. Base rates of females and males on predictor and outcome variable.....	45
Table 3. Male model of IPV experiences predicting body image, eating disorder behavior, & BMI with each level of IPV contrasted with students reporting no history of physical or sexual IPV.....	46
Table 4. Female model of IPV experiences predicting body image, eating disorder behavior, & BMI with each level of IPV contrasted with students reporting no history of physical or sexual IPV.....	47

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Interpersonal Violence and Rural Adolescents' Body Image Perceptions, Eating Disordered Behaviors, and Body Mass Indices

In recent years, research documenting the detrimental effects of interpersonal violence (IPV) has increased dramatically and has been associated with self-induced bodily harm, development of various health conditions and psychopathology, substance abuse, risky sexual behavior, and other maladaptive behavior (Centers for Disease Control and Prevention [CDC], 2015b). Additionally, IPV has been found to relate to poor body image, increased body mass index (BMI), and to specific eating disorder behaviors (EDB) such as purging, diet pill/laxative use, restricting, and binge eating (Ackard, Eisenberg, & Neumark-Sztainer, 2007; Chronister, Marsiglio, Linville, & Lantrip, 2014; Conley & Garza, 2011; Huang, Yang, & Omaye, 2011; Perkins & Luster, 1999; Silverman, Raj, Mucci, & Hathaway, 2001; Thompson, Wonderlich, Crosby, & Mitchel, 2001). Yet, even within this foundational support for the associative negative outcomes of IPV in relation to body image, eating disorder behavior, and BMI, there is a dearth of research investigating rural adolescent populations. Thus, the following epidemiological study explores associative risks between reports of IPV and negative body image (BI), EDB, and BMI in a sample of adolescents from rural Appalachian of North Carolina.

Interpersonal Violence

The World Health Organization (WHO) defines IPV as an "...intentional use of physical force or power, threatened or actual, against another person or against a group or community that results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment, or deprivation" (Dahlberg & Krug, 2002, p. 5). In the IPV literature, similar terms have been used to describe the same type of harm caused by a partner. Some of

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

the more prominent terms used are “intimate partner violence,” “dating violence,” and “adolescent dating violence” (Ackard et al., 2007; CDC, 2014 a; CDC, 2014b). These terms may change in their specificity, such as intimate partner violence referring to “physical, sexual, or psychological harm by a current or former partner or spouse...” (CDC, 2014a), or be more broad in their definition, such as dating violence and adolescent dating violence referring to any violence within a “dating” relationship (Ackard et al., 2007), or within adolescent dating relationships (CDC, 2014b). As such, the core facet of all these terms is in reference to any sort of violence perpetrated by a known and trusted individual of the victim.

IPV in Rural Communities

Perpetration of IPV within rural communities is pervasive and likely due a combination of geographic, social, socioeconomic, and cultural influences, including limited health care access, financial insecurity, social isolation, and a culture of honor. In a pilot study on outcome differences between female IPV victims in rural and urban communities, Logan, Walker, Cole, Ratliff, and Leukefeld (2003) found that rural female IPV victims tended to report more compromised mental and physical health compared to urban female victims. Additionally, in a meta-analysis concerning the similarities and differences of IPV in rural, urban, and suburban communities, rural women were found to actually have the same risk as their urban and suburban counterparts, but tended to have more detrimental health outcomes due to limited access and availability to quality health services (Edwards, 2015).

IPV frequency in rural communities also appears to be influenced by poor financial stability. Lanier and Maume (2009) found that economic distress within rural communities tended to increase the risk for IPV perpetration in men. Additionally, further inspection suggests that young adults living in impoverished rural environments reported more instances

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

of IPV than those living in more financially stable ones (Edwards, Mattingly, Dixon, & Banyard, 2014), thus leading authors to conclude that the inflated IPV risk is due to increased financial stress.

Social isolation has also been shown to be noticeably present within rural communities, and detrimental to rural victims and IPV perpetration. Logan et al. (2003) found that the rural women in the study tended to report significantly less social support and significantly more feelings of loneliness compared to their urban counterparts. Further, the authors found that rural women who felt socially isolated reported coping strategies that tended to be solitary or maladaptive in nature, versus urban women who reported social coping strategies that involved talking to others. This is problematic as social connectedness is associated with decreased IPV experiences. For example, Edwards et al. (2014) found that young men living in impoverished rural communities tended to report fewer experiences of IPV perpetration and victimization when they had a sense of collective efficacy within their community. Further, Lanier and Maume (2009) found that the frequency of IPV decreased as social support, via helping behaviors for daily life activities (e.g., child care), increased in rural communities. However, this evidence insinuates that, as social support increases, the risks of IPV decreases. It also suggests that individuals in rural populations may tend to have less social support in general, and in turn, and may utilize poorer coping strategies.

Finally, another factor that may relate to perpetration and acceptability of violence in rural communities is the *culture of honor*. This is a culturally constructed belief that conceptually tolerates forms of violence as a reasonable reaction to emotional or moral damage against an individual's or family's reputation (Cohen & Nisbett, 1994). In two separate studies, Cohen (1998) and Cohen and Nisbett (1994) found that southern U.S.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

citizens tended to internalize the culture of honor and tolerate violence when it was used as a means for self-protection, socializing children, or protecting a sense of dignity and respect within the individual or family. Further, Marquart, Nannini, Edwards, Stanley, & Wayman, (2007) found that adolescents in southern US regions had an overall higher likelihood of being a victim of dating violence compared to adolescents from other US regions. Also, Edwards et al. (2014) suggested that the cultural norms of a socially cohesive community could impact bystander assistance for instances of IPV and thus, may decrease support for IPV victims when a culture of violence acceptance is present. Thus, when a community accepts a culture of honor, individuals may be more likely to tolerate the presence of IPV within relationships as a means to maintain a sense of honor, and may be less likely to seek out help if victimized.

IPV, Body Image, and EDB

BI and IPV. The body image literature has found connections between experiencing IPV and BI. However, when considering a rural adolescent population, the association between IPV experiences and BI has not been thoroughly examined. Research has shown that BI is not isolated to one particular gender, but seems to be present in both women and men (Furnham, Badmin, & Sneade, 2002). In a meta-analytic review, Feingold and Mazzella (1998) concluded both sexes have some documented BI dissatisfaction, yet women tend to be more dissatisfied with their bodies than men. Additionally, women's dissatisfaction has been found to generally revolve around a desire to be thinner than their current body size (Cohn & Adler, 1992; Feingold & Mazzella, 1998). In a study of English adolescents, Furnham, Badmin, and Sneade (2002) found 81.7% of female teens illustrated body dissatisfaction via a desire to change their current body size, with an overwhelming 74.6% wishing to be thinner

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

than their current perceived size. However, in recent years more research attention has been given to the nature of young men's inner body dissatisfaction when it exists (Furnham, Badmin, & Sneade, 2002; Olivardia, Pope, Borowiecki, & Cohane, 2004). Specifically, young men who were dissatisfied generally wished to have increased muscle mass (Olivardia et al., 2004). Similarly, while Furnham, Badmin, and Sneade (2002) found that 29.4% of men wished to gain weight and be more muscular, 35% wished to lose weight.

While there is a plethora of literature documenting various constructs impacting youth body image, there is only limited extant research examining adolescents' body image in association with a history of IPV. Rural teens have been found to experience body image disturbances similar to their urban peers, with adolescent Caucasian girls tending to be the most dissatisfied (Jones, Fries, & Danish, 2007). Additionally, in a review of suburban and rural female adolescents, IPV was found to associate with female body dissatisfaction, as illustrated by increase feelings of being "damaged" and having low self-worth after a reported history of IPV (Chronister et al., 2014). Further, in a similar study of in Minnesotan adolescents, Ackard and Neumark-Sztainer (2002) concluded, after finding extensive connections between IPV and maladaptive weight control methods, that a history of IPV was associated with poor body image. Finally, rural young women who experienced unwanted sex after violent coercion (physical IPV leading to sexual IPV) or unwanted sex after external non-violent threats (sexual IPV) during adolescence, tended to have lower mean self-esteem and BI scores as adults (Zweig, Crockett, Sayer, & Vicary, 1999). Thus overall, both young women and men are represented in the literature as being victims of both IPV and body image dissatisfaction. However, young women appear to be represented more in the literature as being victims of IPV, BI dissatisfaction, or both.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

EDB and IPV. The literature shows an established link between the increased risks of IPV and EDB for both young women and men. Ackard and Neumark-Sztainer (2002) found an association between an overall history of IPV and laxative/diet pill use, purging, fasting, and binge eating in Minnesotan adolescents. Others have found connections between individual forms of IPV. A history of physical IPV was found to be associated specifically with diet pill use only (Silverman et al., 2001), while a history of sexual IPV was associated with diet pill and laxative use (Gidycz, Orchowski, King, & Rich, 2008; Silverman et al., 2001), binge eating in young adulthood (Conley & Garza, 2011), vomiting in rural college-aged women (Gidycz et al., 2008), and increased risk for maladaptive eating patterns in women, many patterns which could eventually result in eating disorder pathology (Fuemmeler, Dedert, McClernon, & Beckham, 2009). Finally, a combined history of both physical and sexual IPV has been connected with several EBD's including purging, diet pill use, laxative use, and vomiting (Silverman et al., 2001; Thompson et al., 2001).

Research, however, suggests some unexpected findings in how young women and men report EDB after experiences of IPV. Chronister et al. (2014) found that suburban and rural girls who experienced IPV reported more restrictive eating compared to their non-IPV counterparts. Ackard, Neumark-Sztainer, Hannan, French, and Story (2001), interestingly found that urban/suburban adolescent boys were actually more likely to binge and purge than girls. Further, Ackard et al. (2007) found dating violence was associated with binge-purge behavior eating in male, but not female adolescents from urban and suburban areas.

Yet, when considering the studies described above, many are national studies are without clear descriptions of how many participants were from rural areas, or used a mixed population between urban, suburban, or rural youth without clear definitions what proportion

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

each group of adolescents made up the overall sample size. Therefore, it is unknown if the relationship between IPV and BI dissatisfaction or EDB is similar for rural adolescents compared to those from urban or suburban areas of the U.S. As rural adolescents may experience different cultural and environmental factors that may make it more likely they would experience IPV, this topic deserves additional study to further explore the possible associative risks between a history of IPV in rural adolescents, and BI dissatisfaction or EDB.

IPV and Body Mass Index

Limited research has been conducted that explores associations between IPV and body mass index (BMI). Childhood sexual abuse has been linked to higher BMI later in adolescence or adulthood in both men women, and a more recent meta-analysis connected both childhood physical and sexual IPV with higher prevalence of obesity in adolescence (Conley & Garza, 2011; Mamun et al., 2007; Midei & Matthews, 2011). Furthermore, in a national longitudinal study, BMI was found to steadily increase from childhood through adolescence for children who had been sexually abused (Shin & Miller, 2012). Hence, sexual abuse as a child may increase risk for adolescent weight gain, thus creating a risk for adulthood obesity (Fuemmeler et al., 2009). Finally, in a study done with Norwegian youth (ages 12-20), overweightness and obesity was significantly correlated with exposure to IPV (Stensland, Thoresen, Wentzel-Larsen, & Dyb, 2015). Yet, as with other constructs discussed above, research specifically studying body image, BMI, and eating disordered risk factors in rural adolescents, in relation to a history of IPV, is quite limited.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Present Study

Extant research studying rural male and female Appalachian adolescents has shown that experiences of IPV is related to increased risk for depression, suicide, risky sexual behavior, substance abuse, and lower high school academic grades (Martz, Jameson, & Page, 2016). However, research documenting risks for BI dissatisfaction, EDB, and body weight as measured by BMI in rural adolescents is limited. Additionally, much of the research concerning IPV, eating disorder pathology, body image, and BMI in adolescent populations has been done primarily with youth in either urban or suburban settings, or in national studies that do not classify participants based on population density (Ackard & Neumark-Sztainer, 2002; Silverman et al., 2001; Thompson et al., 2001). Although previous research has established a relationship between IPV and eating disorder pathology for adolescents living in urban and suburban environments, there is still a paucity of research within rural adolescent populations. Additionally, rural communities that tend to be isolated, interconnected, and potentially adherent to a culture of honor, may lead to more acceptance of violence by its victims. This may lead to a desire for personal secrecy, and/or less openness to seek help or report abuse to the legal system. Moreover, IPV victims experience pervasive detrimental health consequences from IPV, like cardiovascular disease, anxiety, suicidality, PTSD, and substance abuse (Campbell et al., 2002; Coker et al., 2002; CDC, 2015a).

The present epidemiological study examined these constructs together by comparing potential risks for poor BI, EDB, and body size as captured by BMI in rural adolescents when they report a previous history of physical, sexual, or both form of IPV as compared to those who reported no history of these types of IPV. Because of previous literature showing that

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

IPV is associated with poor body image eating disorder behavior, and unhealthy body shapes (as related to BMI), several key hypotheses were predicted. For body image, participants who reported either a history of physical IPV alone, sexual IPV alone, or a combination of both physical and sexual IPV, were expected to have higher risks of weight dissatisfaction, as operationalized and described in Appendix A, compared to rural adolescents who did not report either physical or sexual IPV. Thus, a rural adolescent who reported any history of physical or sexual IPV would be more likely to report body image dissatisfaction. Further, for the "efforts taken regarding their weight" item, young women with a history of physical IPV, sexual IPV, or both physical and sexual IPV, were expected to be more likely to express wishing to be thinner or lose weight, while young men with a history of physical IPV, sexual IPV, or both physical and sexual IPV, would wish to be more muscular or gain weight.

For eating disorder behavior, participants who reported a history of physical IPV alone, sexual IPV alone, or a combination of both would result in more risk for experiencing eating disorder behavior (including restrictive eating, diet pill use, and purging) compared to participants who did not report either physical or sexual IPV. Finally, participants reporting a history of either physical IPV alone, sexual IPV alone, and specifically when reporting a history of both forms of IPV, would have larger body sizes, as determined by higher BMIs indicating more overweight/obesity, as compared to participants without a history of victimization.

Methods

Participants

Participants were recruited from two high schools in two different rural counties in Western North Carolina. Each county only had one high school. School 1 has a rural urban

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

continuum code of 7, which indicates that it has a non-metro urban population of 2,500 to 19,999, not adjacent to a metro area, with a population (2013) of approximately 27,000, including 21.1% of citizens below the poverty level (United States Census Bureau, 2015). School 2 has a rural urban continuum code of 9, which indicates that it has a non-metro completely rural or less than 2,500 urban population, not adjacent to a metro area with a population (2013) of approximately 11,000, including 19.8% of its citizens below the poverty level (United States Census Bureau, 2015). Additionally, between 2011 and 2012, 57.1% of students in these schools received free or reduced lunches (NC Department of Public Instruction, 2015). Due to incomplete and/or missing data on YRBS variables relevant to this study, 75 individuals (females: $n = 41$, males: $n = 34$) were deleted from the original data set ($n = 1,003$) to create the present studies data set ($n = 928$). The present demographic data ($n = 928$) included 52.6% females ($n = 488$) and 47.4% males ($n = 440$). The majority of the sample was primarily Caucasian for both females and males. The ages of the participants ranged from 14 years old to 18 years old or older, with the majority of ages range from 15-17 years old. By grade, the majority was in 9th-11th grades. For complete prevalence and demographic information, refer to Table 1.

Measures

The 2011 Youth Risk Behavior Surveillance Survey (YRBS) is an anonymous 86 item self-report paper and pencil survey established by the CDC that assesses for various behaviors and cognitions such as suicidal ideation, substance abuse, sexual risk behaviors, violent interaction, body image perceptions, and EDB. It also collects basic demographic data on age, gender, race, and self-reported height and weight (CDC, 2012). The YRBS has a two-week test-retest reliability with three-fourths of YRBS items having a substantially high

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

kappa rating between 61-100% (CDC, 2013). Additionally, Brenner et al. (2002) found that the 47.2% of YRBS items had substantial reliability (greater than 61%) and 93.1% had moderate reliability of YRBS items (greater than 41%) in a test-retest design ranging from 10-22 days. The IPV items had moderate to substantial reliability with sexual IPV having slightly stronger reliability (65.8%) than physical IPV (53.6%). The dietary and disordered eating behavior items had a kappa range of 40.1-58.6% reliability, with a mean kappa of 50.0%.

The present study will utilize similar methodology to Martz et al. (2016) with this same YRBS sample of rural adolescents to explore outcomes of eating disorder pathology, body image perceptions, and overweight/obesity in among a sample of rural adolescents. Eleven items were utilized including body image perceptions, reported EDB, and self-reported height and weight (i.e., to calculate BMI). The specific items used in this research study can be found in Appendix A. Any psychometric information that is known will be indicated below each item's verbatim description.

Procedure

YRBS data was collected in two high schools in adjacent rural school districts ($n = 1003$) in western North Carolina in 2011-2012. The YRBS is collected during the spring semester by the local health department. As is typical with YRBS administration, a passive consent process was used whereby parents were given the choice of opting their child out of participation after having two weeks to review the survey and consent form. Approval was received from the university's Institutional Review Board to analyze the data after it was collected by health department officials (Exemption 16-0016; see Appendix B). Across the two schools, 78.2% of enrolled students completed the YRBS, meaning 22% of them did not

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

complete the study because their parents opted out or they were not in school on the survey day.

For the present study, IPV was separated into two categories: “physical dating violence” as the physical IPV predictor and “rape” as the sexual IPV predictor, per the confines of the CDC’s Youth Risk Behavior Surveillance Survey (YRBS; 2011 YRBS data). Physical IPV was defined as any type of violence, including hitting, slapping, or physically hurting, as taken from a single item from the 2011 YRBS concerning physical IPV. Sexual IPV was defined as having been forced to have sexual intercourse against one’s will as taken from a single item on the 2011 YRBS concerning sexual IPV. Finally, reporting a history of both IPVs included reporting both physical IPV and sexual IPV. Reporting no to both a history of physical IPV and to a history of sexual IPV YRBS items was used as the reference variable in the multinomial logistic regression contrasts to compare those students to those who had reported 1) physical IPV, 2) sexual IPV, and 3) both physical and sexual IPV to 4) those students who reported no history of these types of IPV. See Appendix A for the precise wording of these variables.

The outcome variables taken from YRBS questionnaire items are broken into three categories: body image perceptions, eating disorder behavior, and body mass index (see Appendix A). Items that we have deemed to be proxy measures for what has been historically called “body image” included participants’ perception of their body weight and efforts to change or not change their body weight. Perception of body weight was categorized as very underweight, slightly underweight, about the right weight, slightly overweight, and very overweight. Efforts regarding weight included trying to gain weight, lose weight, stay the same weight, or not doing anything about their weight. Due to the similarity between two of

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

the choices “stay the same weight” and “not doing anything about their weight,” it was concluded that these choices might best represent individuals who are maintaining weight by combining the two into one answer choice. All of the eating disorder behavior items are naturally dichotomous and could only be responded to with a “yes” or “no.” There are three EDB items: restrictive eating, purging, and diet pill use. Self-reported height was assessed via asking participants to report how tall they were in inches without their shoes on. Self-reported weight was assessed via asking participants to report how much they weighed in pounds without their shoes on. BMI was computed from self-reported height and self-reported weight.

Analyses were conducted separately for adolescent females and males in accordance with common practice in the IPV literature. First, base rates for adolescent females and males were calculated and compared for each predictor and outcome variable utilizing chi-square analyses. This was done to establish a baseline understanding of prevalence for each of these variables and if these base rates varied by gender in this rural adolescent population. Then, multinomial logistic regression was conducted to assess the power between interpersonal violence and the outcome variables, so as to examine statistical significance. Odds ratios and their confidence intervals were used to report effect sizes for each of the three contrasts of the IPV predictor variable and the following outcomes: perceived body weight, efforts regarding weight, restrictive eating, diet pill use, purging, and BMI (see Appendix A).

Results

All analyses were conducted separately for the female and male statistical models. Due to low *n* sizes of reporting certain responses for certain outcome variables (i.e., low base rates that sabotage statistical power) and because exploratory analyses verified problems of

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

multicollinearity among these outcome variables, multinomial logistic regressions were conducted separately for each YRBS outcome variable. Additionally chi-square analyses were run to examine the likelihood of either gender being more likely to endorse the predictor or outcome variables. For the BMI continuous outcome variable, a one-way ANOVA was used to examine whether there were significant difference between a history of IPV and BMI separately for both females and males.

Base Rates of Predictor and Outcome Variables

IPV variable. For physical IPV, there was no statistically significant relationship between gender and physical IPV, $\chi^2(1, N = 928) = 0.01, p < 0.91$. However, there was a statistically significant relationship between gender and sexual IPV, $\chi^2(1, N = 928) = 15.73, p < .001$, with girls being more likely than boys to report a history of sexual IPV. There was no statistically significant relationship between gender and both forms of IPV, $\chi^2(1, N = 928) = 2.01, p < 0.16$. Overall, the base rates of physical IPV alone, or a history of both forms of IPV was not significantly different between males and females; however, females in this sample were much more likely to report a history of sexual IPV (see Table 2).

BI perception variables. There was a statistically significant relationship between gender and the five categories of perceived body weight, $\chi^2(14, N = 928) = 26.52, p < .001$. Adolescent boys were more likely than adolescent girls to report describing their weight as "very underweight," "slightly underweight," and "about the right weight." However, adolescent girls were more likely than boys to describe their weight as "slightly overweight," or "very overweight" (see Table 2).

The efforts regarding weight variable had three categories: lose weight, gain weight, and stay the same weight. There was also a statistically significant difference between gender

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

and efforts taken regarding weight, $\chi^2 (2, N = 928) = 97.4, p < .001$. Girls were more likely than boys to endorse "wanting to lose weight;" however, boys were more likely than girls to endorse wanting to "stay the same weight," and much more likely to endorse "wanting to gain weight" (see Table 2). This indicates that rural young men are more likely than young women to describe their weight in terms of being underweight or at an adequate weight, whereas young women were more likely to describe their weight in terms of overweightness.

Eating disorder variables. There was a statistically significant difference between girls and boys for two of three eating disorder variables. For restrictive eating, adolescent girls were more likely than adolescent boys to endorse restrictive eating to control weight, $\chi^2 (1, N = 928) = 52.81, p < .001$. Additionally, for purging, adolescent girls were more likely than boys to report purging behavior, $\chi^2 (1, N = 928) = 10.41, p < .001$. However, there was no gender difference for diet pill use to lose weight, $\chi^2 (1, N = 928) = 0.671, p = 0.41$. These results suggested that rural young women, compared to their male counterparts had a higher likelihood of reporting use of restrictive eating and purging, but not diet pills, as means of losing or controlling weight.

BMI variable. The BMI variable was a calculated variable from self-reported height and weight. A one-way ANOVA was conducted to identify differences for BMI between rural girls and boys. Results indicate that BMI did not significantly differ between genders [$F(1,926) = 0.028, p = 0.87$].

Results for Male BI Perceptions

In regards to the perceived body weight variable and supporting the hypothesis, results indicated that adolescent boys who reported a history of sexual IPV were 6.14 times more likely to describe their weight as "very underweight," compared to describing their

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

weight as “about the right weight.” Additionally, results found that adolescent males who reported a history of both forms of IPV were 6.70 times more likely to describe their weight as “slightly overweight,” compared to describing their weight as “about the right weight” (see Table 3). In contrast to the hypothesis, a history of physical IPV was not related to rural adolescent boys describing their weight in a particular manner. Further, there were no effects for efforts regarding weight for adolescent males, because a low base rate made this analysis uninterpretable, $\chi^2 (6) = 10.42, p = 0.12$.

Results for Male EDB

Contrary to the hypotheses, null results were found for the outcome variables Restrictive Eating, $\chi^2 (3) = 0.19, p = 0.98$ and Purging, $\chi^2 (3) = 4.14, p = 0.25$. Only the Diet Pill Use model was found to be significant and indicated that adolescent males who reported a history of physical IPV were 4.23 times more likely to have reported using diet pills as a means to lose or control weight (see Table 3). Also in contrast to the hypotheses, a history of sexual IPV or both forms of IPV did not significantly affect the likelihood of adolescent boys who reported the use of diet pills.

Results for Male BMI

The average BMI among males in the present sample was 23.9, which falls within the 83.9 percentile for adolescent males of similar age. Per CDC (2015b) guidelines, healthy weight percentiles ranged from the 5th percentile to less than the 85th percentile. Thus, our sample of rural adolescent males, on average, was within a healthy weight range. A one way ANOVA was conducted to compare the self-reported body sizes as measured by BMI between male victims of sexual IPV alone, physical IPV alone, a combination of both physical and sexual IV, and between rural males who reported no history of physical or

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

sexual IPV. Contrary to the hypothesis, there was no statistically significant difference between body sizes as measured by BMI [$F(3,436) = 0.626, p = 0.60$].

Results for Females and BI Outcomes

Supporting the hypothesis, results indicated that female adolescents with a reported history of physical IPV were 17.57 times more likely to describe their weight as “very underweight,” and 2.93 times more likely to describe their weight as “very overweight,” compared to describing their weight as “about the right weight.” Female adolescents who reported a history of both forms of IPV were 5.60 times more likely to describe their weight as “slightly overweight” compared to describing it as “about the right weight.” In contrast to the hypothesis, a reported history of sexual IPV was not related to how participants described their weight (see Table 4).

As for efforts regarding weight, results supported the hypothesis and indicated that rural female adolescents who reported a history of both forms of IPV were 5.35 times more likely to report wanting to lose weight, compared to wanting to stay the same weight. Due to the above finding, post hoc analyses were conducted and found a statistically significant difference between weight description and efforts made regarding this description in adolescent girls $\chi^2(8, N = 488) = 159.35, p < .001$. As expected, girls who described themselves as “slightly overweight” were more likely to report wanting to lose weight ($n = 131, 87.9\%$), compared to staying the same weight ($n = 17, 11.4\%$), or gaining weight ($n = 1, 0.7\%$) and similarly, adolescent girls who described themselves as “very overweight” were more likely to report wanting to lose weight ($n = 34, 97.1\%$), compared to staying the same weight ($n = 1, 2.9\%$), or gaining weight ($n = 0, 0.0\%$). Somewhat unexpected was the finding for girls who described their weight as “very underweight.” Post hoc analyses revealed that

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

those who described their weight as “very underweight” were actually more likely to report wanting to lose weight ($n = 6, 85.7\%$), compared to staying the same ($n = 0, 0.0\%$), or gaining weight ($n = 1, 14.3\%$). Further, females who described themselves as “slightly underweight” were more likely to make an effort to stay the same ($n = 20, 60.6\%$), than to try to lose ($n = 4, 12.1\%$) or gain weight ($n = 9, 27.3\%$). These particular results intuit possible eating disorders for these young women. Finally, although over half of adolescent girls described themselves as “about the right weight” ($n = 264, 54.1\%$), almost half of this portion of girls (46.2%; $n = 122$) still reported making efforts to lose weight.

Finally and in contrast to the hypothesis, it was found that experiencing physical or sexual IPV alone did not affect the likelihood of female adolescents reporting any particular effort taken regarding their described weight status.

Results for Females and Eating Disordered Outcomes

In regards to the restrictive eating, diet pill use, and purging outcome variables, results indicated that adolescent girls who reported a history of both forms of IPV were 3.47 times more likely to use restrictive eating, 7.44 times more likely to use diet pills, and 14.70 times more likely to use purging behavior as means to lose or control their weight. Further, rural adolescent girls who reported a history of physical IPV alone were 4.32 times more likely to report using purging as a means to lose or control weight, compared to not reporting use of these methods (see Table 4). All of these results are consistent with hypothesized predictions.

Results for Female BMI

The average BMI among rural females in the present sample was 24.0, which falls within the 82.0 percentile for adolescent females of similar age. Per CDC (2015b) guidelines,

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

healthy weight percentiles ranged from the 5th percentile to less than the 85th percentile. Thus, our sample of rural adolescent females, on average, was within a healthy weight range. A one way ANOVA was conducted to compare the self-reported body sizes as measured by BMI between female victims of sexual IPV alone, physical IPV alone, a combination of both physical and sexual IV, and between rural females who reported no history of physical or sexual IPV. There was no statistically significant difference between body sizes as measured by BMI for participants with a history of each form of IPV versus those who did not have one of these IPV histories [$F(3,484) = 1.057, p = 0.37$].

Discussion

Interpersonal violence (IPV) affects a variety of people, of all sexes, races, and geographic locations, producing numerous detrimental mental and physical health concerns in individual's lives (CDC, 2015a). Specifically, the present study illustrated the influential nature of IPV within adolescents in rural Appalachia. However, in IPV scientific literature, rural adolescents have typically been understudied, especially when pertaining to potential sequelae or associations with poor body image and unhealthy weight control practices. As such, it was valuable to study the risks from sexual and physical violence experienced during adolescent development to further inform how interpersonal violence experienced in adolescence influences the overall risks to experience detrimental emotional and physical health consequences (i.e., poor body image, eating disorder behavior, and unhealthy body size as measured by BMI).

Base Rates

As only a limited amount of literature details the rates of interpersonal violence in rural adolescents (Martz et al., 2016), base rates were established to understand the general

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

presence of IPV, BI dissatisfaction, EDBs, and BMI in the study's sample of rural adolescents. These base rates confirm that a history of sexual and/or physical violence is present in rural Appalachian adolescent girls and boys. Rural girls and boys reported similar rates of victimization from physical violence, with 8.4% of girls and 9.8% of boys reporting a history of physical IPV (see Table 2). Further, rural girls and boy were similar in how often they reported a combined history of victimization from both physical and sexual violence, with 3.9% of girls and 2.3% of boys reporting both. The sample of boys and girls significantly differed when reporting only a history of sexual IPV (see Table 2). Results indicated that rural adolescent girls were much more likely (7.2% vs. 1.8%) to report a history of rape compared to adolescent boys. Although this percentage is lower than 2003 national average of female rape (13.0%), it still provides a disheartening picture of the risk that rural young women face in regard to experiencing sexual violence (Kilpatrick, Saunders, & Smith, 2003). Moreover, in the current study's sample, 1.8% of rural boys also experience sexual violence, and may similarly face severe mental and physical health consequences because of it (see Table 2).

Patterns of Risk

Overall, the current study hypothesized that a history of interpersonal violence, whether that be physical IPV alone, sexual IPV alone, or both physical and sexual IPV, would increase the likelihood that young rural men and women would report BI dissatisfaction, EDBs, and larger body sizes (i.e., BMIs) trending towards unhealthy ranges. Odds ratios indicated that while several hypothesized predictions in the relationships between IPV and these outcomes were supported in both young women and men, null results were found for other hypotheses.

Patterns for BI Dissatisfaction

The present study hypothesized that a history of either physical or sexual IPV alone, or a combination of both, would result in more robust risk for weight dissatisfaction compared to those without a history of physical or sexual IPV. Additionally, it was hypothesized that young men and women would report differential desires in how to change their weight status as a function of their history of victimization in that, young men with either physical or sexual IPV alone, or a combination of both, would wish to be larger or gain weight, whereas young women with similar history would wish to be thinner or lose weight. Overall, both of these hypotheses were partially supported.

Patterns of risk for adolescent boys. Rural adolescent boys who reported a rape history were significantly more likely to describe their weight as “very underweight” although they were within healthy weight percentile ranges by CDC (2015a) guidelines. Similarly, rural young men who reported a history of both physical and sexual IPV victimization were more likely to describe their weight as “very overweight” compared to non-victimized males although they too were within healthy weight percentiles. However, young men who reported a history of only physical IPV were not significantly different in regards to their weight description compared to their non-victimized counterparts. As such, a history of physical IPV does not appear to influence the likelihood of young men describing their weight in a particular manner.

Another pattern that emerged was related to what efforts adolescent boys made in regards to their weight description. The present study hypothesized that rural boys would be more likely to report wishing to gain weight compared to non-victimized male peers, when reporting a history of either physical IPV alone, sexual IPV alone, or a combination of both

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

physical and sexual IPV. However, rural young men with a history of physical, sexual, or a combination were at no more risk for gaining, losing, or staying the same weight compared to non-victimized male counterparts, and the overall model supported the null hypothesis. As such, this suggests that while young male victims of IPV, specifically sexual IPV, may experience some dissatisfaction about their weight, they are not currently making a reported effort to change their prescribed weight in comparison to non-victimized rural young men.

Patterns of risk within rural adolescent girls. Adolescent girls who reported a history of either physical IPV alone, sexual IPV alone, or a combination of both physical and sexual IPV were expected to report higher risk of body image dissatisfaction in regards to weight perception. This hypothesis was partially supported in that young women with a reported history of physical dating violence had a higher likelihood of describing their weight as very underweight or very overweight. Similarly, when reporting both physical and sexual IPV, rural young women were at increased risk for describing themselves as slightly overweight. As these young women were on average within health weight percentiles, these reported weight perceptions seem discrepant based on their self-reported height and weight. However, as the BI literature has found that rural adolescent females tend to experience BI dissatisfaction more often than rural adolescent males (Jones, Fries, & Danish, 2007), these results are not surprising and expected based on the current study's hypotheses. Curiously, a history of sexual violence was not associated with increased risk for body image dissatisfaction in regards to weight description in rural young women, although a history of both physical and sexual IPV was. As such, it is unclear whether physical IPV is the triggering factor for body image dissatisfaction in rural young women, although it does appear to be influential in how a rural young woman evaluates her body. Regardless, it

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

appears that rural young women may have some internalized dissatisfaction with their bodies when experiencing a history of physical IPV alone or when experiencing a combination of physical and sexual violence.

The present study also hypothesized that adolescent girls would be more likely to report wishing to lose weight compared to non-victimized female peers when reporting a history of either physical IPV alone, sexual IPV alone, or a combination of both physical and sexual IPV. This hypothesis was partially supported in that young women with a history of both physical and sexual IPV had a higher likelihood of reporting wanting to lose weight, even though, as a group they fell within healthy weight percentiles. A history of physical IPV alone or sexual IPV alone did not significantly influence self-reported weight change behaviors for these rural young women. As such, it coincides with Furnham, Badmin, and Sneade (2002) who noted that, while young men may equally wished to lose weight or gain, young women more often than not wished to lose weight compared to their current weight.

Patterns for EDB

The present study hypothesized that a history of physical or sexual IPV alone, or a combination of both, would result in more robust risk for restrictive eating, diet pill use (not prescribed by a doctor), and purging. These hypotheses were partially supported in young men and young women.

Patterns of risk for adolescent boys. It was predicted that young men would be at increased risk for the above EDBs when reported a history of physical IPV alone, sexual IPV alone, or a combination of both physical and sexual IPV. This hypothesis was partially supported in that adolescent boys who reported only a history of physical IPV were over four times more likely to use diet pills as means to control their weight, compared to those

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

without a history of IPV. A history of sexual IPV had no impact on the risk for these EDBs and any history of IPV had no influence on rural young men's reported restrictive eating or purging. Although IPV and eating disorder literature does not explicitly explore associations between adolescent boys, physical violence victimization, and inappropriate diet pill usage, adolescent boys have been shown to express EBD when reporting victimization of violence (Ackard et al., 2001; Ackard et al., 2007). These patterns suggest that rural boys may be at risk for developing poor BI, and specifically, diet pill usage, when reporting a history of violence.

Patterns of risk within rural adolescent girls. Adolescent girls with a history of both physical and sexual IPV were at the highest risk for disordered eating. Their risks included over three times the risk of restrictive eating, over seven times the risk for diet pill use, and 15 times the risk of purging behavior. Further, girls who reported only a history of physical IPV were over four times the risk for purging behavior. A history of sexual IPV was not associated with increased likelihood of EDBs, including restriction, diet pills, and purging. This finding is curious in that, although the current sample of girls had twice the reported prevalence of rape as compared to the sample of boys, this history did not dramatically alter their risk for poor BI, EDB, or unhealthy body size. Ultimately, these young women were no more likely to report any risk areas assessed for in this study. This result is noteworthy given previous research has illustrated that experiences of rape or sexual violence are associated with maladaptive eating and weight control practices, such as diet pill/ laxative use, binge eating, and vomiting in female adolescents and college-aged women (Conley & Garza 2011; Fuemmeler et al., 2009; Gidycz et al., 2008; Silverman et al., 2001).

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Further, a history of IPV was associated with increased risk for depression, suicide, and substance abuse for rural girls from this same study sample (Martz et al., 2016).

Patterns for Body Weight at Measured by BMI

The present study hypothesized that a history of either physical or sexual IPV alone, or a combination of both, would result in a larger body sizes indicative of overweight or obesity for rural adolescents; yet this hypothesis was not supported for either rural young men or rural young women. Although the literature discusses how a history of childhood violence is associated with obesity in adolescence and into adulthood, the current study differs from this in that it appears rural adolescents' risk for unhealthy BMI was not a function of their history of IPV.

Conclusion

This study is one of the first to explore connections between a history of IPV victimization, BI, EBD, and body size in rural adolescents and has implications for future research to identify long-term consequences of IPV in a rural adolescents, as well as bolstering the evidence for further prevention and treatment interventions in this rural region of Appalachia. From the results, rural adolescents were identified to be at risk for BI dissatisfaction and disordered eating behaviors when they had a history of IPV. Further, the current study's sample of rural young women appeared to be at particular increased risk for several BI items and EDBs when reporting a history of both physical and sexual IPV. However, several of the current study's hypotheses were not supported or only partially supported. This was particularly evident amongst the sample of rural young men.

Men typically have less risk for sexual or physical IPV victimization compared to women (Coker et al., 2002; Marquart et al., 2007). The present study's results coincide with

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

this partially in that rural young men have less risk for rape history compared to rural young women. However, when assessing for physical IPV or a combined history, the two sexes report similar rates of victimization. Although young men had risk for BI dissatisfaction and diet pill use, the results of the present study indicate that the sample of rural young men with a history of IPV, whether physical, sexual, or a combination of both, were at no more risk for other indicators of BI dissatisfaction, other EDBs, or unhealthy body weight as measured by BMI compared to those without a history of physical or sexual IPV.

As such, it appears that rural young men may not similarly experience the consequences of IPV as their female counterparts, and thus, may experience differential risk for other maladaptive coping strategies, or none at all, when faced with a history of sexual or physical violation. However, as some risk for BI dissatisfaction and specifically diet pill use were present, it points out that young men are still at risk for some maladaptive BI beliefs or weight control efforts. Thus, further research should identify the function of the reported diet pill use and BI/BMI discrepancies, identify longitudinal ramifications of victimization in rural young men, and also, whether a history of BI discrepancy and diet pill use remains present over time in this sample. Further, as only rural boys from the male sample with a rape history were significantly at risk for disordered eating or poor BI, clinicians might wish to further query for potential BI or eating concerns when working with rural adolescent boys who may have been sexually victimized.

For rural young women, there was noticeably robust risk for BI and EDBs, especially when reporting a combined history of physical and sexual IPV. However, when reporting only a history of sexual IPV, rural young women were not at risk for any outcome variables assessed for in the current study. This is curiously different than the literature, which detailed

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

increased risk, especially for eating disorder behavior, when experiencing a history of rape (Conley & Garza, 2011; Fuemmeler et al., 2009; Gidycz et al., 2008; Silverman et al., 2001). However, as extensive risk for EBDs and BI dissatisfaction was present in the sample of rural females when a history of rape coincided with a history of physical IPV, it appears that the combined experience of victimization increased young women's risk for EBDs and BI dissatisfaction overall, more so than either form of IPV alone. This is also consistent with the literature that details how a combined history of physical and sexual IPV is associated with eating disorder behavior (Silverman et al., 2001; Thompson et al., 2001). As such, further research should investigate how this combination of physical and sexual violence is associated with other risk factors across multiple domains, while experience of only physical or sexual IPV has only moderate risk or no risk at all. This could include identifying temporally which experience of victimization occurred first or if they occurred at the same time, the number of instances each form occurred, the longitudinal ramifications of victimization from adolescence into adulthood, and subsequent maladaptive behavior or thinking and their sequelae. In doing so, potential prevention and intervention programs could be further modified to target specific risks for not only IPV victimization but also for BI dissatisfaction and EBDs.

Hence, since the current study suggested IPV is clearly associated with BI and EBDs in rural females, along with some associated risks for rural males, not only is further research necessitated, but also further prevention and intervention activities that are easily accessible to rural adolescents, and could be practically implemented within a school or local community setting. Results suggest that these programs would target both the prevention and treatment for individuals who have experienced violence in their lives and students who are

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

exhibiting signs or symptoms of poor body image or eating disorders. Additionally, as the literature supports the impact that a "culture of honor" has upon a rural setting, the treatment should be sensitive to overall cultural beliefs of rural Appalachia in regards to treatment and psychoeducation, and including how to disseminate this information.

Some means of targeting prevention and treatment for adolescents who have experienced IPV would be using evidence-based therapeutic and educational IPV interventions that emphasize group support (Ball et al., 2012), include a skills-building component (Rosen & Bezold, 1996), and target both primary (i.e., students without a history of IPV) and secondary forms of prevention (i.e., for students who have experienced mild forms of IPV or are in relationships with this risk; Foshee et al., 1998; Foshee, Bauman, & Greene, 2000; Foshee et al., 2004). All have found to be successful in decreasing victimization and promoting healthy change in regards to attitudes and beliefs surrounding IPV and dating violence in adolescence.

Limitations

There are multiple notable limitations to this study. The actual sample size of adolescents who self-reported instances of IPV might have been too limited to accurately detect statistical significance in some of the relationships of interest. As an example, some of the Odds Ratios for men seemed to indicate some association between IPV and body image risk (e.g., 3.65 *OR* for desire to "gain weight" if also reporting a sexual IPV history), yet the low base rates compromised the power to achieve statistical significance for this particular association. Further, several items included wide ranges within confidence intervals and small sample sizes (i.e., some consisting of only $n = 2$) that could have also compromised the power to achieve statistical significance among these relationships.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Further, the self-report nature of our questionnaire allows for a certain amount of biases and inaccuracy to occur. As noted previously, several participants had to be eliminated due to invalid answers. Thus, as can be seen, self-report can lead to inattentive answering and increase the risk for improbable answers.

Another limitation included the dearth of validity information or psychometric proprieties for YRBS on BID or EDB variables. The current study was unable to determine whether the individual questions used to create the BID and EDB variables were accurately assessing for BID or EDB behaviors. Further, as earlier editions of the YRBS were utilized, there was limited clarity of the severity or prevalence of self-reported violence experienced, which could noticeably impact results or risk for using maladaptive weight control methods.

Additionally, there was poor discrimination on YRBS sexual IPV questions regarding who perpetrated the forced sexual intercourse. Although the physical IPV questions identified the violence as being specific within a dating relationship, the sexual IPV item did not. This difference in granularity between YRBS IPV questions could impact reporting of IPV experiences. For example, an individual with a history of self-reported rape could have been victimized by a family member or stranger, instead of a romantic partner. Further the YRBS IPV items did not assess if these episodes occurred just once or repeatedly so we did not have data on who were perpetrators, severity of victimization, or when it occurred.

As a cross-sectional research design, this epidemiological study was able to explore associations, but was not able to ascertain causality between IPV and impact on body image and eating disordered behaviors and/or vice versa. It is likely that victimization results in maladaptive coping such as eating disordered behaviors in an attempt to regain some sense of control over one's body and one's life, versus the opposite that poor body image and use of

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

eating disordered behavior causes susceptibility to victimization or from a third variable; however future research will need to examine this longitudinally in adolescents.

Finally, as the study only included two forms of interpersonal violence, it failed to effectively capture the many variant ways in which violence can be perpetrated. As such, individuals who had histories of other forms of interpersonal violence such as cyber bullying, verbal abuse, or sexual assault not involving forced intercourse may have been missed. These individuals may also have an increased risk for eating disorder behavior and poor body image as those suffering from physical or sexual violence.

Future Directions

The results of this study illustrate that when rural adolescents have a history of physical dating violence and a history of forced sexual intercourse, they tend to have substantial risk for unhealthy body image and disordered eating behavior. Although the rates at which rural adolescents experience IPV is similar to urban and suburban adolescents, rural adolescents tend to lack access to community resources such as appropriate mental or medical health care or domestic violence shelters due to geographic limitations or problems with transportation (Edwards, 2015). Further, it may be taboo to even discuss experience of violence with an outsider, particularly a stranger, as these may be viewed as “abnormal or inappropriate” within the lens of a “culture of honor.” Yet, respect must be paid to the fact that not *all* rural settings and *all* individuals who live in rural setting follow or believe in a culture of honor and that it is not equivalent to endorsing IPV. Additionally, it is not always the case that rural adolescents have no access to health services that involve educating and treating victims of violence. In turn, as the results of the current study indicate that rural adolescents are at risk for IPV, poor BI development, and eating disorder pathology, an

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

emphasis on further prevention violence and incorporation of further screening and treatment is necessary.

Future researchers may also wish to design longitudinal studies to understand the impact that interpersonal violence has on rural adolescents on BI, EBD, and body weight outcomes. Further, intervention and prevention programs would benefit from identifying the temporal relationship between a combined history of physical and sexual IPV, so as to inform specific, yet brief, programs of intervention that may be able to destigmatize discussion of healthy dating and unhealthy IPV.

Interpersonal violence is present and painful, often being associated with intense and long-lasting emotional, physical, and mental damage (World Health Organization, 2002). Often, this violence is impacted by several sociopolitical/environmental factors existing within community backgrounds, which may in turn affect how violence is viewed and reported. The present study illustrates that rural adolescents with a history of rape and physical dating violence are robustly at risk for eating disorder behavior and poor body image compared to those who have not experienced these two forms of violence. However, through careful prevention planning that includes screening for unhealthy body image and disordered eating, the risk for these behaviors and for IPV may be lessened and eventually, cease to exist amongst rural adolescents.

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INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

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INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Appendix A
Predictor & Outcome Variables

Predictor or Outcome Variables	Variable Name	YRBS Item	Scoring Options	Reliability
^a Interpersonal Violence				
Predictor	^b Physical IPV	During the past 12 months, did your boyfriend or girlfriend ever hit, slap, or physically hurt you on purpose?	Yes or No	The results of test-retest reliability was Kappa = 0.536, $p < .005$ (Brenner et al., 2002).
Predictor	^c Sexual IPV	Have you ever been forced to have sexual intercourse when you did not want to?	Yes or No	The results of test-retest reliability was Kappa = 0.658, $p < .005$ (Brenner et al., 2002).
Predictor	^d Both IPV	Student answered “yes” to both physical IPV and sexual IPV.	Yes or No	
Predictor	No IPV	Student answered “no” to both physical IPV and sexual IPV.	Yes or No	
Body Image Perceptions				
Outcome	Perceived body weight	How do you describe your weight?	A= very underweight B = slightly underweight C = about the right weight	The results of test-retest reliability was Kappa = 0.586, $p < .005$ (Brenner et

^a IPV will be described as violence perpetuated by another person, and not specifically by a romantic partner, because of differences in IPV item description within the 2011 YRBS. Additionally, the YRBS did not assess if these IPV incidents occurred once or repeatedly.

^b Physical IPV was specifically defined by the 2011 YRBS as perpetuated via a romantic partner

^c The 2011 YRBS did not specify whether sexual IPV was perpetrated by a romantic partner, thus it will be operationalized as “forced sexual intercourse by another person.”

^d Both IPV includes reporting both physical and sexual IPV, but not exclusively at the same time, or by the same person.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

			D = slightly overweight E = very overweight	al., 2002).
Outcome	Efforts regarding weight	Which of the following are you trying to do about your weight?	°A = lose weight B = gain weight C = stay the same weight D = not trying to do anything about my weight.	The results of test-retest reliability was Kappa = 0.582, $p < .005$ (Brenner et al., 2002).
Eating Disordered Behavior				
Outcome	Restrictive Eating	Have you ever eaten less food, fewer calories, or foods low in fat to lose weight or to keep from gaining weight?	Yes or No	The results of test-retest reliability was Kappa = 0.532, $p < .005$ (Brenner et al., 2002).
Outcome	Diet Pill Use	Have you ever taken any diet pills, powders, or liquids without a doctor's advice to lose weight or keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)	Yes or No	The results of test-retest reliability was Kappa = 0.421, $p < .005$ (Brenner et al., 2002).
Outcome	Purging	Have you ever vomited or used laxatives to lose weight or keep from gaining weight?	Yes or No	The results of test-retest reliability was Kappa = 0.403, $p < .005$ (Brenner et al., 2002).
Body Mass Index				

° The "efforts regarding weight" variables was recoded so that answer choices C "stay the same weight" and D "not trying to do anything about my weight" were collapsed into one answer choice as they were determined to be assessing for the same answer of no weight change. This collapsed variable will be named "stay the same weight" in results.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Outcome	Self-reported Height	How tall are you without your shoes on?	Assessed via self-reported height in feet and inches.	^f Results of Pearsons correlation between self-reported height and measured height was ($r = .94$) for males and ($r = .84$) for females (Bowring et al., 2012).
Outcome	Self-reported Weight	How much do you weigh without your shoes on?	Assessed via self-reported weight in pounds.	^g Results of Pearsons correlation between self-reported weight and measured weight was ($r = .92$) for males and ($r = .93$) for females.

^f The CDC (2013) found that, on average, students over reported height by 2.7 inches. However, CDC (2013) still concluded that the self reported height, weight, and BMI were reliable for use.

^g The CDC (2013) found that, on average, students over reported weight by 3.5 pounds. However, CDC (2013) still concluded that the self reported height, weight, and BMI were reliable for use.

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Appendix B Exemption 16-0016



INSTITUTIONAL REVIEW BOARD

Office of Research Protections
ASU Box 32068
Boone, NC 28608
828.262.2692
Web site: <http://researchprotections.appstate.edu/>
Email: irb@appstate.edu

To: Heather Batchelder
Human Development and Psychological Counseling
CAMPUS MAIL

From: Dr. Lisa Curtin, Institutional Review Board Chairperson

Date: 7/31/2015

RE: Notice of IRB Exemption

Study #: 16-0016

Study Title: Interpersonal Violence and Rural Adolescents Body Image Perceptions, Eating Disorder Behaviors, and Body Mass Indices

Exemption Category: 4

Research involving the collection or analysis of existing data, documents, records, pathological specimens, or diagnostic specimens, if such sources are a matter of public record or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

Study Change: Proposed changes to the study require further IRB review when the change involves:

- an external funding source,
- the potential for a conflict of interest,
- a change in location of the research (i.e., country, school system, off site location),
- the contact information for the Principal Investigator,
- the addition of non-Appalachian State University faculty, staff, or students to the research team, or
- the basis for the determination of exemption. Standard Operating Procedure #9 cites examples of changes which affect the basis of the determination of exemption on page 3.

Investigator Responsibilities: All individuals engaged in research with human participants are responsible for compliance with University policies and procedures, and IRB determinations. The Principal Investigator (PI), or Faculty Advisor if the PI is a student, is ultimately responsible for ensuring the protection of research participants; conducting sound ethical research that complies with federal regulations, University policy and procedures; and maintaining study records. The PI should review the IRB's list of PI responsibilities.

To Close the Study: When research procedures with human participants are completed, please send the Request for Closure of IRB Review form to irb@appstate.edu.

If you have any questions, please contact the Research Protections Office at (828) 262-2692 (Robin).

Best wishes with your research.

Websites for Information Cited Above

Note: If the link does not work, please copy and paste into your browser, or visit <https://researchprotections.appstate.edu/human-subjects>.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS



INSTITUTIONAL REVIEW BOARD

Office of Research Protections
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1. Standard Operating Procedure

#9: <http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/IRB20SOP920Exempt%20Review%20Determination.pdf>

2. PI

responsibilities: <http://researchprotections.appstate.edu/sites/researchprotections.appstate.edu/files/PI20Responsibilities.pdf>

3. IRB forms: <http://researchprotections.appstate.edu/human-subjects/irb-forms>

[CC]

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Table 1

Prevalence of Females and Males by Demographic Variables

Demographic Variables	Female		Male	
	n	%	n	%
Age				
14 years	59	12.1	39	8.9
15 years	136	27.9	134	30.5
16 years	135	27.7	122	27.7
17 years	110	22.5	98	22.3
18 years or older	48	9.8	47	10.7
Grade⁸				
9 th grade	130	26.7	131	30.0
10 th grade	149	30.6	118	27.1
11 th grade	123	25.3	109	25.0
12 th grade	84	17.2	78	17.9
Ungraded or other grade	1	0.2	0	0.0
Race⁹				
American Indian/Alaska Native	11	2.4	8	2.0
Asian	4	0.9	2	0.5
Black/African American	4	0.9	9	2.2
Native Hawaiian/Other Pacific	8	1.8	5	1.2
Islander				
White	428	93.7	383	93.4
Hispanic or Latino/a¹⁰				
Yes	43	8.8	48	11.0
No	443	91.0	388	88.6

⁸ Five participants chose not to answer this question on the YRBS.

⁹ Sixty-one participants chose not to answer this question on the YRBS.

¹⁰ Three participants chose not to answer this question on the YRBS.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Table 2

Base Rates of Females and Males on Predictor and Outcome Variables

Predictor & Outcome Variables	Female		Males	
	n	%	n	%
IPV Experiences				
Physical IPV	41	8.4	43	9.8
Sexual IPV**	35	7.2	8	1.8
Both forms of IPV	19	3.9	10	2.3
Perceived Body Weight**				
Very Underweight	7	1.4	17	3.9
Slightly Underweight	33	6.8	57	13.0
About the Right Weight	264	54.1	252	57.3
Slightly Overweight	149	30.5	99	22.5
Very Overweight	35	7.2	15	3.4
Efforts Regarding Weight**				
Lose weight	297	60.9	146	33.2
Stay the same weight	171	35.0	203	46.1
Gain weight	20	4.1	91	20.7
Restrictive Eating**				
Yes	264	54.1	134	30.5
No	224	45.9	306	69.5
Diet Pill Use				
Yes	28	5.7	20	4.5
No	460	94.3	440	95.5
Purging**				
Yes	31	6.4	9	2.0
No	457	93.6	431	98.0

Note. **Indicates that there is a statistically significant difference, $p < .001$, between gender and the predictor or outcome variable.

NTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Table 3

Male Model of IPV Experiences Predicting Body Image, Eating Disorder Behavior, & BMI with Each Level of IPV Contrasted with Students Reporting No History of Physical or Sexual IPV

Outcome Variable Compared to No Physical & No Sexual IPV	Physical IPV OR (CI) [n size]	Sexual IPV OR (CI) [n size]	Both IPV's OR (CI) [n size]
Perceived Body Weight***			
Very Underweight	2.91 (0.75-11.21) [3]	6.14 (1.12-33.69)* [2]	- [0]^
Slightly Underweight	2.23 (0.95-5.23) [9]	- [0]^	0.78 (0.09-6.66) [1]
Slightly Overweight	1.32 (0.59-2.96) [10]	- [0]^	0.41 (0.05-3.53) [1]
Very Overweight	2.12 (0.44-10.25) [2]	- [0]^	6.70 (1.21-37.07)* [2]
Efforts Regarding Weight			
Lose weight	1.37 (0.65-2.87) [15]	0.29 (0.03-2.53) [1]	8.76 (1.04-73.65) [6]
Gain	1.83 (0.83-4.07) [12]	0.98 (0.19-5.16) [2]	7.34 (0.75-71.69) [3]
Restrictive Eating	1.00 (0.50-1.98) [13]	1.38 (0.32-5.86) [3]	0.98 (0.25-3.87) [3]
Diet Pill Use***	4.23 (1.53-11.66)* [6]	- [0]^	- [0]^
Purging	1.48 (0.17-12.59) [1]	8.88 (0.94-83.85) [1]	6.91 (0.75-63.46) [1]

Notes. Significant effects have been bolded; OR = odds ratios; CI = 95% confidence intervals, * $p \leq .05$; **; $p \leq .001$; ***model fit is $p \leq .05$; ^ = too few data to calculate odds ratio or confidence interval; all significant effects have been highlighted in bold.

INTERPERSONAL VIOLENCE ON RURAL ADOLESCENTS

Table 4

Female Model of IPV experiences Predicting Body Image, Eating Disorder Behavior, & BMI with Each Level of IPV Contrasted with Students Reporting No History of Physical or Sexual IPV

Outcome Variable Compared to No Physical & No Sexual IPV	Physical IPV OR (CI) [n size]	Sexual IPV OR (CI) [n size]	Both IPV's OR (CI) [n size]
Perceived Body Weight***			
Very Underweight	17.57 (3.63-84.96)* [4]	- [0]^	- [0]^
Slightly Underweight	0.98 (0.21-4.46) [2]	1.84 (0.58-5.85) [4]	- [0]^
Slightly Overweight	1.41 (0.65-3.06) [12]	1.22 (0.56-2.68) [11]	5.60 (1.97-15.94)** [14]
Very Overweight	2.93 (1.06-8.06)* [6]	0.92 (0.20-4.19) [2]	- [0]^
Efforts Regarding Weight***			
Lose weight	1.01 (0.51-1.98) [24]	1.89 (0.83-4.315) [24]	5.35 (1.22-23.49) * [17]
Gain weight	1.30 (0.27-6.23) [2]	3.65 (0.87-15.24) [3]	- [0]^
Restrictive Eating ***	1.07 (0.56-2.05) [22]	1.78 (0.86-3.67) [23]	3.47 (1.13-10.65)* [15]
Diet Pill Use***	1.65 (0.46-5.84) [3]	1.26 (0.28-5.68) [2]	7.44 (2.42-22.93)** [5]
Purging***	4.32 (1.58-11.84)* [6]	2.36 (0.65-8.60) [3]	14.70 (5.07-42.66)** [7]

Notes. Significant effects have been bolded; OR = odds ratios; CI = 95% confidence intervals, * $p \leq .05$; **; $p \leq .001$; ***model fit is $p \leq .05$; ^ = too few data to calculate odds ratio or confidence interval; all significant effects have been highlighted in bold.

Vita

Heather Ruth Angela Batchelder was born in Wilmington, Delaware, to Phyllis and David Batchelder. She graduated from Roanoke Rapids High School in June 2010 with honors. In fall 2010, she entered East Carolina University (ECU) to double major in Psychology and Anthropology, where she pursued an honors thesis examining how subjective well-being can be influenced by thin ideal internalization. In May 2014, she graduated *summa cum laude* from ECU and was awarded the Bachelor of Arts degree for Psychology and Anthropology. In autumn of 2014, she entered Appalachian State University (ASU) to pursue a Master of Arts degree in Clinical Psychology. During her time at ASU, she completed three practica including: the ASU Psychology Clinic, the ASU Counseling Center, and the Community Care Clinic. She also pursued a six-month psychology internship at Central Regional Hospital in Butner, NC, while also completing research regarding insulin omission and disordered eating in type 1 diabetics. In autumn 2016, she completed her master's thesis regarding how interpersonal violence influences risk for poor body image, disordered eating, and unhealthy BMI in rural adolescents; and in December 2016, she was awarded her Masters of Arts degree.

Ms. Batchelder is a member of the Association for Behavioral and Cognitive Therapies, the Association for Contextual Behavioral Science, and Lambda Alpha National Honor Society. She currently resides in Raleigh, NC, pursuing her license as a licensed psychological associate in the state of North Carolina.