

NATIONAL STUDY OF THE ASSOCIATION BETWEEN INTERPERSONAL  
VIOLENCE IN DATING RELATIONSHIPS AND UNHEALTHY WEIGHT CONTROL  
BEHAVIORS IN MALE AND FEMALE ADOLESCENTS

A Thesis  
by  
JENNIFER KATHERINE FUNARO

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## **Abstract**

### **NATIONAL STUDY OF THE ASSOCIATION BETWEEN INTERPERSONAL VIOLENCE IN DATING RELATIONSHIPS AND UNHEALTHY WEIGHT CONTROL BEHAVIORS IN MALE AND FEMALE ADOLESCENTS**

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In the United States, 25% of adolescents report physical or sexual abuse from an intimate partner (i.e., interpersonal violence [IPV]), placing them at increased risk for developing Unhealthy Weight Control Behaviors (UWCBs). Currently, 2.7% of adolescents have been diagnosed with an eating disorder; however, as much as 35-50% of female adolescents and 30% of male adolescents endorse subclinical behaviors such as crash dieting, skipping meals, fasting, or taking laxatives or diet pills. Three percent of adolescents engage in anabolic steroid use. The primary aim of this study was to examine possible associations between IPV and UWCBs in adolescents on a national level. Secondary aims include informing and potentially influencing the way mental and health professionals interact with and treat adolescents who report IPV. Using the Center for Disease Control and Prevention's (CDC) Youth Risk Behavioral Surveillance System (YRBS), this study examined 13,583 adolescents by gender to determine the odds ratios of individuals who reported IPV as compared to female and male adolescents who did not report IPV, for UWCBs such as

perceived under/overweight, disordered eating behaviors, and steroid use. Additionally, this study examined the association between IPV and self-reported body mass indices (BMI). An association was found in both male and female adolescents such that those who reported IPV also reported higher UWCBs. Generally, adolescents in the United States who report IPV in dating relationships are at higher risk for UWCBs. Knowledge of this should inform therapy and general practitioners when interacting with adolescents.

*Keywords:* Interpersonal violence, adolescents, unhealthy weight control behaviors, disordered eating behaviors, steroid use, body mass index, YRBS

## **Acknowledgments**

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## **Dedication**

I dedicate this thesis to my family. To my parents, Dr. Kip and Brigitt Berry, thank you for being my tireless cheerleaders as I made my way through the writing process and graduate school. You both have made so many things possible for me, and I would not be the person I am today without your love and encouragement.

I also dedicate this thesis to my amazing husband, Kyle Funaro. Words cannot describe how grateful I am to have the privilege of doing life by your side. You have been my rock through graduate school and a safe haven in times of need. Thank you, Kyle, for your steadfast kindness and love.

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National Study of the Association Between Interpersonal Violence in Dating Relationships  
and Unhealthy-Weight Control Behaviors in Male and Female Adolescents

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December 2017

### Abstract

In the United States, 25% of adolescents report physical or sexual abuse from an intimate partner (i.e., interpersonal violence [IPV]), placing them at increased risk for developing Unhealthy Weight Control Behaviors (UWCBs). Currently, 2.7% of adolescents have been diagnosed with an eating disorder; however, as much as 35-50% of female adolescents and 30% of male adolescents endorse subclinical behaviors such as crash dieting, skipping meals, fasting, or taking laxatives or diet pills. Three percent of adolescents engage in anabolic steroid use. The primary aim of this study was to examine possible associations between IPV and UWCBs in adolescents on a national level. Secondary aims include informing and potentially influencing the way mental and health professionals interact with and treat adolescents who report IPV. Using the Center for Disease Control and Prevention's (CDC) Youth Risk Behavioral Surveillance System (YRBS), this study examined 13,583 adolescents by gender to determine the odds ratios of individuals who reported IPV as compared to female and male adolescents who did not report IPV, for UWCBs such as perceived under/overweight, disordered eating behaviors, and steroid use. Additionally, this study examined the association between IPV and self-reported body mass indices (BMI). An association was found in both male and female adolescents such that those who reported IPV also reported higher UWCBs. Generally, adolescents in the United States who report IPV in dating relationships are at higher risk for UWCBs. Knowledge of this should inform therapy and general practitioners when interacting with adolescents.

*Keywords:* Interpersonal violence, adolescents, unhealthy weight control behaviors, disordered eating behaviors, steroid use, body mass index, YRBS

National Study of the Association Between Interpersonal Violence in Dating Relationships  
and Unhealthy-Weight Control Behaviors in Male and Female Adolescents

Interpersonal Violence (IPV), defined as violence between individuals, is a universal public health concern that has detrimental effects on individuals' physical and psychological health (World Health Organization [WHO], 2017). Approximately 25% of adolescents in the United States have reported physical or sexual violence within a dating relationship (Silverman, Raj, Mucci, & Hathaway, 2001). Many adolescents report unhealthy weight control behaviors (UWCBs) in relation to IPV, yet limited research documenting this association is currently available (Black, Noonan, Legg, Eaton, & Breiding, 2006; Silverman et al., 2001). UWCBs often begin during adolescence and can be a precursor to clinical mental illnesses such as eating disorders or substance use disorders (Gonsalves, Hawk, & Goodenow, 2014). Further, most adolescents begin romantic dating relationships in their teens, thus exposing adolescents to potential physical and sexual assaults within these relationships. The present study examined the association between IPV within dating relationships and the following UWCBs: perceived over/under weight, disordered eating behaviors (fasting, diet pill use, and purging), steroid use, and body mass indices (BMI). This study improved on and expanded current literature by examining associations between IPV in a dating relationship and UWCBs in a large, representative sample of male and female adolescents in the United States.

**Interpersonal Violence in Dating Relationships**

IPV within adolescent dating relationships in the United States is ubiquitous (Conley & Garza, 2011; WHO, 2002). Nationwide, 8.9% of high school students report physical violence and 9% report sexual assault within a dating relationship; depending on the

demographic year, approximately 2-9% of male and 4-20% of female adolescents report physical or sexual abuse within a dating relationship (Ackard, Eisenberg & Neumark-Sztainer, 2007; Grunbaum et al., 2004; & Neumark-Sztainer, 2007). The CDC (2015) specifies that IPV within a dating relationship can affect both heterosexual or homosexual couples.

The severity of consequences of IPV is often greater in cases where the pattern of abuse was established in adolescence (Conley & Garza, 2011). Adolescents in grades 7 through 12 who were victims of violence in a dating relationship are at risk for unhealthy dieting behaviors and substance use (Black et al., 2006). Women with a history of sexual IPV (e.g., rape) are between 1.5 to 2.7 times more likely to engage in some kind of risky behavior that is of greater physical, emotional, and psychological risk as compared to those who do not have a history of sexual IPV (Gidycz, Orchowski, King, & Rich, 2008). The severity of victimization and the process of recurrent victimization places adolescents at risk for physical and psychological maladaptive behaviors, especially when these adolescents observe very maladaptive coping strategies at home (Champion et al., 2004; Gidycz et al., 2008). IPV can result in both internalizing and externalizing consequences, such as UWCBs, major depressive disorder, post-traumatic stress disorder, anxiety, suicidal ideation, substance abuse, low self-esteem, emotional detachment, lack of self-care, or poorer health outcomes (Ackard & Neuman-Sztainer, 2002; Black et al., 2006; Caldwell, Swan & Woodbrown, 2011; Fuemmeler, Dedert, McClernon & Beckham, 2009; Gidycz et al., 2008; Huang, Yang, & Omaye, 2011; Iverson et al., 2013; WHO, 2002).

Existing research indicates that male and female adolescents differ in the way they report IPV and the resulting consequences. Male adolescents are more likely than female

adolescents to report physical IPV (e.g., assault), while female adolescents are more likely than male adolescents to report sexual IPV (Iverson et al., 2013). A meta-analysis examined gender differences in IPV found that 21% of adult males and 39% of adult females were injured during the latest IPV incident and adult females were more likely to die from IPV than males (Caldwell et al., 2011). Furthermore, adult females were more likely to be diagnosed with additional psychological disorders after experiencing IPV as compared to their male counterparts, which could be a direct consequence of victimization. The associations between IPV and psychiatric comorbidities have been studied more thoroughly in adult females, with very few studies addressing this association in males (Iverson et al., 2013). The strength of the associations between different forms of IPV and mental disorders were similar for both men and women; yet, the nature of the mental disorders differed between male and females. For example, adult women and men who have reported sexual IPV are more likely to display risky behaviors that are socially endorsed based on gender, such as disordered eating behaviors in adult women and risky sexual behaviors in adult men (Conley & Garza, 2011).

### **Interpersonal Violence and Unhealthy Weight Control Behaviors**

There is a deficit in epidemiological research examining a possible link between reported IPV from an intimate partner and the risk of developing UWCBs. Numerous studies have examined IPV; however, there is little research available that assesses IPV within a dating relationship in the national adolescent population, especially male adolescents (Swanson, Crow, LeGrange, Swendsen, & Merikangas, 2011). Previous researchers who examined IPV in male adolescents encountered low base rates of IPV and UWCBs thereby rendering poor statistical power to detect effects (Swanson et al., 2011). Given the prevalence

of IPV in dating relationships, as well as the development of UWCBs in adolescence, the association between IPV and UWCBs should be given attention.

Several studies have shown that adolescents who reported IPV are at risk for developing the UWCBs of body image dissatisfaction and disordered eating behaviors (Gonsalves et al., 2014; Herrman, 2013; Swanson et al., 2011). Adolescents who reported IPV in a dating relationship stated that they grew accustomed to the abuse and disrespect and began to feel as though the abuse was inevitable as long as they were in a relationship (Herrman, 2013). Davidson and Gervais (2015) suggest there is a link between sexual and dating violence against women and self-objectification, specifically body shame. Self-objectification theory states that when people are treated as an object rather than a person, they start to view themselves as an object (Fredrickson & Roberts; 1997). The physical and psychological disrespect these individuals report from intimate partner violence often influences the way they will later treat themselves, making them more likely to engage in unhealthy behaviors such as disordered eating behaviors, purging, laxative use, fasting, and/or steroid use (Gonsalves et al., 2014; Herrman, 2013; Noll & Frederickson, 1998). Women who experience this often objectify their physical appearance by placing more importance on their appearance than on self-concept or internal factors (Noll & Fredrickson; 1998). After experiencing the trauma of IPV, some adolescents are vulnerable to poor self-care and/or attempt to re-establish control over their bodies by exhibiting UWCBs.

Additional research provides support for the current study to examine these associations further in the context of IPV within a dating relationship. Fuemmeler, Dedert, McClernon and Beckham (2009) found that adolescent females who reported a history of physical IPV were more likely to skip meals and report they were afraid to eat because they



may lose control. They also found that adolescent males who reported a history of sexual IPV were at increased risk of being overweight, while adolescent females with a history of sexual IPV were more at risk for problematic eating (i.e., skipping meals and using laxatives).

UWCBs are subclinical by definition; however, they should be examined more closely as they can be a precursor to psychological disorders such as Feeding or Eating Disorders or Substance-Related and Addictive Disorders as defined by the *DSM-5* (American Psychiatric Association, 2013; Gonsalves et al., 2014).

**Body image dissatisfaction.** Body image dissatisfaction is one of the strongest predictors for a range of disordered eating and weight related outcomes such as frequent dieting, bulimic symptoms, fasting, and the abuse of steroids (Bjork, Skarberg, & Engstrom, 2013; Bucchianeri, Arikian, Hannan, Eisenberg, & Neumark-Sztainer, 2013). Body image dissatisfaction is the negative evaluation of specific parts or all of one's body and is pervasive in adolescents (Bucchianeri et al., 2016). One component of body image dissatisfaction is body perception, which was examined in the current study. The way in which an adolescent handles these transitions is predictive of the potential for positive resilience or maladaptive inflexibility later in life (Bucchianeri et al., 2016). Given the developmental transitions that occur during adolescence, body image dissatisfaction increases during this time period, especially in those who are overweight as compared to those who are underweight or within a healthy weight (Calzo et al., 2012; Murray, Reiger, & Byrne, 2013).

Few studies have examined the association between IPV in dating relationships and body image perception. In females who have reported IPV from an intimate partner, there was a significant association between the aggressor dominating them, and then an increase in

the victims feeling isolated and experiencing body image dissatisfaction (Weaver, Resnick, Kokoska, & Etzel, 2007). IPV in a dating relationship may be associated with body image dissatisfaction, as the occurrence of IPV has been shown to shape negative appearance perceptions (Weaver et al., 2007). Additionally, research conducted on college females indicated that intimate partner violence and sexual violence are positively correlated with body shame, body surveillance, and physical self-objectification (Davidson & Gervais, 2015).

Existing literature on body image dissatisfaction has found significant differences between women and men in how they perceive body image. In general, females idealize a thin body, wanting to lose weight primarily in their lower body, while males idealize a muscular body, wanting to increase weight primarily in their upper body (Ata, Ludden & Lally, 2007; Bjork et al., 2013). This results in male and female adolescents engaging in different behaviors in order to exert control over their weight based on the idealized body (Furnham, Badmin, & Sneade, 2002). Female adolescents, in general, place emphasis on weight, describe themselves as “fat,” weigh themselves often, and diet frequently, especially those who idealize a thin body shape (Calzo et al., 2012; Furnham et al., 2002). Additionally, females endorsed greater body image dissatisfaction and higher rates of UWCBs, such as excessive exercise to lose weight and abnormal eating behaviors, as compared to males (Ata et al., 2007; Furnham et al., 2002). For male adolescents, a lack of muscularity is more important in predicting body image dissatisfaction than obesity (Olivardia, Pope, Borowiecki, & Cohane, 2004). Male adolescents do not tend to strive for a lean ideal, rather, they strive for muscularity (Ata et al., 2007; Calzo et al., 2012), which could explain why appraisals of male body image or eating disorders are likely underestimated (Furnham et al.,

2002). Male adolescents may engage in steroid use as well as fasting, purging, or laxative use as a form of weight control, as evidenced by recent literature (Calzo et al., 2012).

**Disordered eating behaviors.** Disordered eating behaviors consist of activities such as fasting, restrictive eating, purging, and/or taking pills in order to control weight (Gonsalves et al., 2014). These behaviors may not by themselves be indicative of a clinical eating disorder, but they are indicative of distress, and individuals engaging in these behaviors are at greater risk for developing an eating disorder in the future (Haley, Hedberg, & Leman, 2010; Stice, Marti, Shaw & Jaconis, 2009). Prevalence of diagnosable eating disorders is 2.7% for adolescents, with even higher rates of subclinical disordered eating behaviors such as crash dieting, skipping meals, fasting, or taking laxatives/diet pills (Merikangas et al., 2010). Swanson et al. (2011) used the National Comorbidity Survey to determine that the median age of onset for all eating disorders defined as by the DSM-IV was between the ages of 12.3-12.6 years old. Eating disorders rank as one of the top ten leading causes of mortality in women, with anorexia nervosa having the highest mortality rate of all mental disorders (Streigel-Moore & Bulik, 2007). According to the National Death Index, the mortality rates were found to be 4.0% for anorexia nervosa, 3.9% for bulimia nervosa, and 5.2% for not otherwise specified, where most of subclinical disordered eating behaviors fall (Crow et al., 2009; Stice et al., 2009). Given these numbers, it is important to note that the subclinical cases are at a higher risk for mortality than those actually diagnosed with anorexia nervosa or bulimia nervosa (Stice et al., 2009).

Much of the previous literature on eating disorders indicates that a traumatic event, such as IPV, is a common risk factor in addition to body image dissatisfaction for the onset of eating disorders in adolescents (Bulik, Trace, Kleimen, & Mazzeo, 2014; Dworkin,

Javdani, Verona, & Campbell, 2014; Lejonclou, Nisson, & Holmqvist, 2013). Individuals who reported physical IPV in a dating relationship were at a higher risk for the use of diet pills and laxatives, while those who reported sexual IPV in a dating relationship were at a higher risk for using diet pills, laxatives, and/or purging as compared to adolescents who did not report IPV in a dating relationship (Silverman et al., 2001). Individuals who reported both physical and sexual IPV in a dating relationship reported using a combination of disordered eating behaviors such as using diet pills, laxative, and/or purging (Silverman et al., 2001). Sexual IPV is strongly connected with eating disorders, specifically bulimia (Thompson, Wonderlich, Crosby & Mitchell, 2001). Adolescents in grades 9-12 who reported sexual IPV in a dating relationship were 1.5 - 3.5 times more likely to report disordered eating behaviors as compared to women who had not reported IPV (Thompson et al., 2001). Individuals with eating disorders also reported a higher frequency of trauma with IPV and different types of traumas as compared to those who did not report having an eating disorder (Lejonclou et al., 2013). After experiencing trauma such as IPV, some adolescents are likely to create behavioral control strategies in hopes of regaining control over their lives (Dworkin et al., 2014). These compensatory behaviors of purging and/or restricting can be meant to undo or gain control in their lives after having that control or power taken away. Thus, traumatic sexual IPV reports in youth can have long-lasting behavioral effects, including the development of disordered eating behaviors (Thompson et al., 2001).

Existing research documents higher prevalence and vulnerability for anorexia nervosa and bulimia nervosa in women compared to men (Feingold & Mazzella, 1998; Streigel-Moore & Bulik, 2007). One meta-analysis found that gender differences in disordered eating behaviors were more pronounced in adulthood as compared to adolescence (Feingold &

Mazzella, 1998). The increased prevalence of eating disorders in women as compared to their male counterparts may be due to the fact men use excessive exercise more frequently as compensatory control over their weight instead of disordered eating behaviors (Bjork et al., 2013; Crow et al., 2009). In spite of the clear gender discrepancies, there are still gaps in the literature regarding associations between these gender differences for the association between IPV in a dating relationship and eating disorders.

**Steroid abuse.** Steroid abuse, despite its prevalence and potentially serious morbidity, is an often unrecognized UWCB. Most anabolic steroid abuse is used to enhance secondary male sex characteristics such as strength, muscularity, and/or performance (Blashill, 2014). In a 2014 study that used the national Youth Risk Behavioral Surveillance System (YRBS) dataset for the year 2009, 4.3% of the adolescent population reported using non-prescribed steroids and 2.8% of those who described themselves as “very underweight” engaged in non-prescribed steroid use (Blashill, 2014). Usually there is a higher rate of incidence during adolescence (Miller et al., 2005). As previously discussed, one of the strongest risk factors of steroid use is a negative body image, or body image dissatisfaction (Bjork et al., 2013; Blashill, 2014).

Unlike gender differences in other UWCBs with greater prevalence in female than male adolescents, steroid abuse appears to be more prevalent in young men. Male adolescents are more likely to engage in steroid use as compared to female adolescents given that most adolescent males strive for a lean and muscular body (Bjork et al., 2013; Blashill, 2014). Abusers of steroids are not just athletes or those focused on strength conditioning (Miller et al., 2005). Steroid use is more normative and a traditionally accepted gendered behavior for boys to engage in as compared to female adolescents (Miller et al., 2005). The

majority of the existing literature on steroid abuse has focused on men and did not include women in the studies. Although an association between male adolescents who reported IPV and the abuse for anabolic steroids has been suggested, there is no published research to support this hypothesis.

**Body mass indices (BMI).** The previously discussed UWCBs are consistent with the research on food restriction, a key behavior of anorexia, and purging, a key behavior of bulimia; however, individuals with UWCBs can also fall into the category of overeating and weight gain. Therefore, BMI will be used as an anthropometric indicator of health as calculated by dividing an individual's weight in kilograms by the individual's height as measured in meters squared (Mamun et al., 2007). One of the marked changes that occurs to male and female bodies during adolescence is an increase in height and weight (Mamun et al., 2007). BMI will reflect developmentally appropriate growth that occurs during adolescence and will also capture the teenagers who reported a body size that is outside the normal range. Given that body image dissatisfaction has been shown to be a mediator between BMI and negative psychological health outcomes such as decreased self-esteem and depression, it is appropriate to use BMI as an indicator of healthy or unhealthy weight (Bucchianeri et al., 2013).

Literature examining the relationship between BMI and IPV in dating relationships is very limited, as many studies have only examined this relationship in adult females. Mamun et al. (2007) found that women who reported childhood sexual assault had larger bodies as captured by BMI when compared to those who did not report childhood sexual assault. Victims of IPV are also at risk for behavior changes such as overeating that can lead to obesity (Huang et al., 2011). Studies have shown that obesity can be an outcome of IPV,

especially when the individual additionally endorsed depression as an outcome of IPV (Huang et al., 2011). The existing literature examining the association between IPV and BMI has not specifically studied this association in adolescent females or males, nor has it examined the association in the context of intimate partner violence.

Adolescent men and women's body image dissatisfaction, as a function of their body size or BMI, tends to follow somewhat different patterns (Bucchianeri et al., 2013). Girls are more likely to exhibit dissatisfaction with normal to higher BMIs, while boys exhibit dissatisfaction with low and high BMIs. A 10-year longitudinal study showed that both female and male adolescents had a natural rise in BMI and reported higher levels of dissatisfaction during high school as compared to middle school (Bucchianeri et al., 2013). Body sizes grow when male and female adolescents transition into adulthood and generally leads to an increase in body image dissatisfaction (Bucchianeri et al., 2013). Calzo et al. (2012) conducted a longitudinal study looking at children ages 9-10 and followed them until they were 17-18 years old. They found that higher BMI predicted higher body dissatisfaction across both genders. Further, male adolescents who were fixated with having a lean, muscular body indicated higher body dissatisfaction when their BMI was too high or too low. However, in another study, female adolescents who reported higher body image dissatisfaction tended to be at a normal to overweight BMI. To review, research states that adolescents are highly susceptible to UWCBs when female adolescents report normal to high BMI and when male adolescents report low or high BMI (Calzo et al., 2012).

### **Present Study**

Overall, previous literature was limited by small sample sizes, eating disorder literature that excluded male adolescents in their samples, and steroid abuse literature that

overlooked the female adolescent samples (Bjork et al., 2013; Gonsalves et al., 2014). Additionally, the base rates for male adolescents who report disordered eating behaviors is typically small and lower than female adolescents. Previous studies such as Olivardia et al. (2004) and Dworkin et al. (2014) may have struggled with low statistical power (i.e., Type II error) potentially leading to the inability to detect the presence of a relationship between IPV and UWCBs. This study evaluated adolescents, a developmentally appropriate population for the onset of dating violence and maladaptive UWCBs. To my knowledge, there has not been a study that has specifically looked at adolescents who reported IPV within the context of dating relationships and its association with UWCBs, specifically, perceived under/overweight, disordered eating behaviors, steroid use, and BMI in a nationally representative sample. Hence, this study examined possible associations between physical and/or sexual IPV occurring in the context of teen dating and unhealthy weight control behaviors in both male and female adolescents.

The Center for Disease Control and Prevention created the YRBS to analyze U.S. adolescents attending high school grades 9 through 12 biennially from 1991 until 2013 (CDC, 2014). The YRBS was created to monitor health risk behaviors in adolescents that contribute to the leading causes of mortality and morbidity in adolescents in the United States. The data collected in 2013 was weighted by the CDC to represent the national populations of 9<sup>th</sup>-12<sup>th</sup> grade students enrolled in public and private schools to account for oversampling and nonresponse (CDC, 2014). This large nationally represented dataset afforded us with statistical power to detect even small effect sizes. Additionally, these variables are important public health concerns that have the potential to influence the way health care and mental health professionals interact with and treat adolescents. This



epidemiological study examined associations between male and female adolescents who reported IPV and the following unhealthy weight control behaviors: perceived weight, disordered eating behaviors, steroid use, and BMI as defined by the CDC's 2013 YRBS dataset and modified for this study as described in Appendix A.

### **Hypotheses**

1) Female adolescents will report a significantly higher base rate of physical IPV, sexual IPV, both physical and sexual IPV, perceived under/overweight, disordered eating behaviors (fasting, diet pill use, and purging) than male adolescents. Male adolescents will report a higher base rate of steroid use than female adolescents.

2) It was hypothesized there will be a significant statistical relationship in female adolescents who reported IPV (physical, sexual, or both) are more likely to report perceived under/overweight, disordered eating behaviors, and higher BMIs as compared to female adolescents who did not report IPV in a dating relationship.

3) Finally, it was hypothesized there will be a significant statistical relationship in male adolescents who reported IPV (physical, sexual, or both) are more likely to report perceived under/overweight and steroid use as compared to male adolescents who did not report IPV in a dating relationship.

## **Method**

### **Participants and Data Collection**

Data for the current analysis was obtained using the Center for Disease Control's 2013 Youth Risk Behavioral Surveillance System (YRBS) designed for adolescents. This survey was designed to evaluate risky behaviors that contribute to the leading mortality and morbidity rates of male and female adolescents in the United States (CDC, 2013b). The CDC

required a response rate of 88% or higher, thus 148 out of 193 schools sampled were included in this study which resulted in 13,583 adolescent participants. The responses from participants were weighted to represent the national adolescent population based on gender, race, and grade for the 2013 school year in the United States. The age of the sample ranged from 12 to 18 years old ( $M = 16$ ,  $SD = 1.26$ ). Participants were equally divided by gender (50.03% males, 49.96% females). The race and ethnic composition of this sample was 55.6% White, 14.3% Black/African American, 10.7% Multiple Races where one race is Hispanic, 10.4% Hispanic/Latino, 4.39% multiple races where one race is not Hispanic, 3.0% Asian, .8% Native Hawaiian/Other Pacific Islander, and .7% American Indian/Alaska Native. Finally, the sample was consistent in the representation of individuals enrolled in each high school grade in the year 2013 (27.28% 9<sup>th</sup> grade, 25.67% 10<sup>th</sup> grade, 23.84% 11<sup>th</sup> grade, and 23.06% 12<sup>th</sup> grade).

The target population for the 2013 national dataset collected by the CDC was students attending grades 9 through 12 in both public and private schools across the 50 states and the District of Columbia, not including any U. S. territories (CDC, 2013b). Adolescents voluntarily and anonymously participated in the YRBS biennially since in 1991 (CDC, 2013a). The local health or education department administered the 2013 survey during the spring semester to participants during one class period. The participants were allowed to take as long as they would like during the class period and recorded their responses on either a computer-scannable booklet or a hand written scantron sheet (CDC, 2013b).

Parental permission was obtained before the administration of the YRBS; however, obtaining permission differed based on the location of the school audited (CDC, 2013b). The two forms of obtaining permission were active permission, where the parents were required

to indicate their approval, or passive permission, where the parents were required to indicate when they do not approve of their child participating in the survey. If a student was absent on the day the YRBS was conducted, then the data collectors from the local health or education department provided additional dates for the administration of the YRBS as long as privacy could be maintained at these additional times (CDC, 2013b).

### **Measures**

The YRBS was developed in 1989 by the CDC to monitor health risk behaviors in adolescents covering the six most common categories of behavior contributing to the leading causes of mortality and morbidity in adolescents (Brener et al., 2002). Each national dataset was an independent study conducted biennially and does not contain data from every state. The CDC has weighted the 2013 national dataset to match the population projections for public and private high school students enrolled in the 50 states and the District of Columbia. Schools were selected by probability proportional to the size of the students currently enroll in grades 9-12 throughout the United States (CDC, 2013b). See Appendix B for the administration process and more details about the school selection process.

According to the Morbidity and Mortality Weekly Report published by the CDC (2013b) the 2013 national dataset is able to produce estimates which are “accurate within  $\pm 5\%$  at a 95% confidence level” of the adolescent population in the United States by weighting the responses (p.11). The weighting standard corrected for nonresponse, oversampling, as well as adjusting each student’s answers to equal the national population projections for 2013. Table 1 contains further demographic information pertinent to this study.

**Data management.** The YRBS, provided by the CDC, created a multi-stage cluster design sample that required specific statistical software to analyze the weighted data (CDC, 2013a). The ASCII zip file and the SPSS syntax were obtained and downloaded from “<https://www.cdc.gov/healthyyouth/data/yrbs/data.htm>” (CDC, 2013a). Analyses were conducted in STATA, a statistical software program that allows for survey data analysis. After declaring the Primary Sampling Unit (PSU), Stratum, and Weight, the dataset was examined based on the proposed data analysis. The PSU accounted for the counties surrounding the school that was sampled. The Stratum indicated which section the school fell into based on racial and ethnic concentrations. The Weight applied a weighted value to each of the participant’s responses based on the participant’s gender, race/ethnicity, and grade, making this dataset and the results generalizable to all adolescents in grades 9-12 who were enrolled in high school during the 2013-2014 school year.

This study defined the construct variables of physical IPV, sexual IPV, perceived over/underweight, perceived underweight, perceived normal weight, perceived overweight, disordered eating behaviors, fasting, diet pill use, purging, steroid use, and BMI within the context of the specific questions asked on the YRBS. The data was re-coded to dichotomous responses for the purpose of this study. See Appendix A for a description for how the predictor variables (i.e. physical IPV, sexual IPV, both forms of IPV and no IPV) were re-constructed so that a participant would only exist in one category and would not be present in more than one category. For example, if a participant reported physical IPV and sexual IPV, the participant would only be present in the both forms of IPV variable and would no longer be counted in the physical IPV or sexual IPV variables. The two outcome variables (i.e.

perceived weight, disordered eating behaviors) used for omnibus analyses as well as steroid use were recoded as dichotomous responses as outlined in Appendix A.

If the outcome variables perceived weight and any eating disordered behaviors were statistically significant in their omnibus relationship with IPV, then they were expanded to examine three categories in post-hoc analyses. Thus, the perceived weight variable was separated into three outcomes: perceived underweight, perceived normal weight, and perceived overweight. The disordered eating behaviors variable was a combination of three questions concerning fasting, diet pill use, and purging. If this variable was significantly related to our IPV predictor variable, then post-hoc analysis examined each of these three constructs separately in their individual relationships to IPV.

**YRBS psychometrics.** The psychometric properties of the 2013 dataset have not been studied; however, the CDC conducted research that examines the psychometric properties of previous versions of the YRBS. The CDC conducted a test-retest reliability study in 1992 and in 2000 (Brener et al., 2002). The reliability study conducted in 1992 examined the 1991 version of the YRBS. The first test-retest reliability study ( $n = 1,679$ ) was administered 14 days apart and had 75% of the questions rated as substantial or higher reliability with mean kappa values from 61% - 100% consistently with students in grades 9-12. The CDC reported no significant differences between the prevalence estimates between the first and second time that the questionnaire was given. Brener et al. (2002) conducted a test-retest reliability study on the 1991 YRBS and found that females had a mean kappa of 64.3% (95% CI [58.1, 70.6]) and males had a mean kappa value of 57.1% (95% CI [51.3, 63.0]). They also found that the mean kappa value for the dietary behaviors (50.0%) was lower as compared to the other categories. They attributed this decrease in kappa to

unreliability of an individual's recall on eating behaviors (Brener et al., 2002). The second test-retest study (n = 4,619) was conducted on the YRBS given in 1999 and administered approximately 14 days apart. In this reliability study, the CDC found that 22% of the questions (5 questions) had different prevalence estimates between the two times the test was administered, so they revised or deleted these specific questions (CDC, 2013b). These psychometric properties informed some changes to the 2001 YRBS by adding 16 questions, deleting 11 questions, and changing the wording to 14 questions. Each year that the YRBS is not given, the CDC collects input from leading experts regarding questions that should be changed, deleted, or added. This input is presented to the CDC board and is then voted on to determine if a question should be changed, deleted, or added. The 2013 YRBS questionnaire is a product of the prior YRBS versions and has undergone minor changes by the CDC since the 1999 study (CDC, 2013b).

The CDC examined the extant literature to evaluate factors that could affect the validity of adolescent's self-reporting on the behaviors measured by the YRBS (CDC, 2013b). The CDC assessed the validity of adolescents reporting height and weight in 2000. This validity study (n = 2,965) allowed the students to complete the survey, and then the researchers directly measured the adolescents weight and height. Overall, the self-reported height, weight and BMI were shown to be reliable; however, there was a tendency for the adolescents to over report their height by 2.7 inches, and under report their weight by 3.5 pounds. The CDC concluded that the YRBS data underestimates the prevalence of adolescents who are overweight or obese. Therefore, the results should be interpreted cautiously with this knowledge in mind (CDC, 2013b). Social desirability can bias adolescents' responses on self-report measures, especially given the nature of the questions

asked as many inquire about illegal behaviors (e.g., drug use or driving) given the participant's age. Additional limitations to self-reported data are cognitive and situational biases; however, the CDC reported that these factors do not threaten the validity of the data collected (CDC, 2013b).

### **Statistical Analyses**

Using the YRBS 2013 national dataset, analyses were conducted to determine the prevalence of adolescents who reported IPV in dating relationships and UWCBs. All analyses were conducted separately for adolescent females and males as is customary in IPV literature, and because of the gender differences in prevalence of the predictor and outcome variables as determined in the Stage 1 analysis.

**Stage 1: Analyses on variable base rates.** First, we determined national base rate percentages of female and male adolescents for the predictor variables (physical IPV, sexual IPV, both forms of IPV, and no IPV) and outcome variables (perceived under/overweight, perceived underweight, perceived normal weight, perceived overweight, disordered eating behaviors, fasting, diet pill use, purging, and steroid use) as calculated by the statistical software. Chi-square analyses of independence were completed for each variable to examine the potential association between gender for each predictor and outcome variable with a dichotomous response. Given the complexity of the sampling required for chi-squared analysis of weighted data, STATA, the software program used to analyze the weighted data, converted the chi-squared analysis to an F statistic. The design-based F statistic corrects for the distribution of the uncorrected Pearson chi-square statistic based on the weighted data. A *p*-value less than or equal to .05 was considered significant.

**Stage 2: Analyses examining relationships between interpersonal violence and unhealthy weight control behaviors.** The second stage of analyses was designed as an omnibus analysis whereby we used a binomial logistic regression to determine the odds ratios for each category of the predictor variable and the resulting association with UWCBs. This allowed us to examine the associations between the different categories of IPV (physical IPV, sexual IPV, both forms of IPV) and the dichotomous UWCBs outcome variables. A *p*-value less than or equal to .05 was considered significant.

Additionally, a one-way ANOVA was used to examine the relationship between the four categories of IPV and the participant's reported BMI separately for male and female adolescents. Due to limitations of the STATA statistical program, this analysis was conducted on the non-weighted dataset. The results from the ANOVA analysis are specific to the 13,583 adolescent individuals who participated in the 2013 YRBS. A *p*-value less than or equal to .05 was considered significant.

**Post-hoc analyses.** If a relationship was present in the omnibus analyses between IPV and perceived weight and the disordered eating behaviors post-hoc analyses would be conducted to further examine the specific relationship between IPV and specific perceived weight and disordered eating behaviors. A *p*-value less than or equal to .05 was considered significant.

## Results

### Stage 1: Analysis on Variable Base Rates

Demographic information was obtained for the participants based on the three weighted variables. See Table 1 for the distribution of gender, race/ethnicity, and grades.



Weighting the dataset for these variables allowed the results to be representative of the adolescent population attending school in 2013.

In order to examine the first hypothesis, the base rate values for each variable were assessed. The results supported what was anticipated (See Table 2). Female adolescents reported more occurrences of all the predictor and outcome variables as compared to male adolescents except for the steroid use variable, in which case male adolescents reported more occurrences than female adolescents. The clear gender differences for each predictor and outcome variable were evidenced by the design-based F statistic between male and female adolescents and each dichotomous variable. Each analysis was significant at  $p < .001$  level, indicating well-defined gender differences in every predictor and outcome variable examined in this study. Female adolescents are more likely to report physical IPV within a dating relationship than male adolescents,  $F(1,41) = 27.23, p < .001$ . Because of the gender differences on this study's key variables, the remainder of the analyses between IPV and UWCBs were separated by gender to improve the investigation of the hypotheses.

## **Stage 2: Analyses Examining Relationships between Interpersonal Violence and Unhealthy Weight Control Behaviors**

Given the significant results found in the stage 1 analysis, the following two analyses were conducted separately for female and male adolescents. Logistic regressions examined the predictor variable's (the four categories of IPV) association with each UWCB. These analyses produced odds ratios where a value over 1.0 indicated the population who reported IPV was at increased risk for the UWCB and a value under 1.0 indicated the population was less at risk for the UWCB as compared to those who did not report IPV. The results from the logistic regressions are reported in Table 3 for the females and Table 4 for the males.

**Female adolescents.** When considering the female adolescent population, the odds ratios generally indicated that those who reported IPV within dating relationships were at increased risk for UWCBs as compared to females who did not report IPV, supporting the hypotheses. Female adolescents who reported physical IPV in a dating relationship were 1.15 times more likely to report perceived under/overweight as compared to the females who reported no IPV. Results indicated an association between physical, sexual, and both forms of IPV and disordered eating behaviors, again supporting the hypothesis. Female adolescents who reported physical IPV were 1.57 times more likely, those who reported sexual IPV were 1.43 times more likely, and those who reported both forms of IPV were 2.09 times more likely to report disordered eating behaviors as compared to female adolescents who reported no IPV. Additionally, the results suggest a relationship between IPV in a dating relationship and steroid use for female adolescents. Females who reported sexual IPV were 1.94 times more likely and female adolescents who reported both forms of IPV were 2.35 times more likely to report steroid use as compared to those who reported no IPV (see Table 3).

Numerous significant effects were found when examining the two composite variables for female adolescents, indicating the need to run post-hoc analyses. Significant results were seen in the association between physical IPV and perceived weight. Females who reported physical IPV were 1.90 times more likely to report they perceived themselves as underweight. Females who reported physical IPV were 0.87 times, or less likely, to report they perceived themselves as normal weight. There were significant results in the examination of the associations between IPV and disordered eating behaviors. Females who reported physical IPV were 1.65 times more likely to report fasting and 2.05 times more likely to report purging. Females who reported sexual IPV were 1.43 times more likely to

report fasting, 1.76 times more likely to report diet pill use, and 1.66 times more likely to report purging. Finally, female adolescents who reported both forms of IPV were 2.23 times more likely to report fasting, 1.45 times more likely to report diet pill use, and 3.26 times more likely to report purging.

Results from the one-way between subjects ANOVA indicated that different categories of IPV were significantly associated with BMI in female adolescents,  $F(3,6161) = 2.94, p = 0.03, \omega^2 = 0.001$ . The Kolmogorov-Smirnov (KS) test of normality for participants significantly deviated from the normal distribution,  $D(6165) = 0.12, p < .001$ . Levene's test indicated that equal variances cannot be assumed,  $F(3,6161) = 5.48, p = .001$ . The Welch F is reported to account for the significantly different variances. The Welch F allows us to conclude that there was a significant effect when examining the different categories of IPV and its association with BMI,  $F(3,600.46) = 3.74, p = .011$ . Post-hoc comparisons using the Games-Howell test indicated that the mean BMI for female adolescents who reported sexual IPV ( $M = 22.78, SD = 4.39$ ) was significantly lower ( $p = .025$ ) than the mean BMI of females who reported no IPV ( $M = 23.53, SD = 5.12$ ). The normal weight range for adolescent BMI is between the 5 to 95 percentiles on the growth chart (CDC, 2015). Thus, it is challenging to determine an exact BMI range for normal weight; however, based on the average height and weight of adolescents, these BMIs are on the high end of normal ranges (CDC, 2015). Post-hoc comparisons using the Games-Howell test also indicated that the mean BMI of females who reported physical IPV ( $M = 23.55, SD = 4.85, p = 1.00$ ) and both forms of IPV ( $M = 23.76, SD = 5.10, p = .894$ ) were not significantly different from the mean BMI of females who reported no IPV ( $M = 23.53, SD = 5.12$ ).

**Male adolescents.** In the male adolescent population, the odds ratios generally indicated that those who reported IPV within dating relationships were significantly more at risk for UWCBs as compared to males who did not report IPV. Male adolescents who reported both forms of IPV in a dating relationship were 1.14 times more likely to report perceived under/overweight than males who reported no IPV thereby supporting the hypothesis. Male adolescents who reported physical IPV were 2.82 times more likely, those who reported sexual IPV were 2.63 times more likely, and those who reported both forms of IPV were 6.64 times more likely to report steroid use as compared to male adolescents who reported no IPV. These results supported the hypothesis that males are statistically more at risk for steroid use when they report IPV in a dating relationship. The analyses of disordered eating behaviors and BMI were novel associations examined in this research. Robust associations were found between IPV and disordered eating behaviors in male adolescents. Male adolescents who reported physical IPV were 2.22 times more likely, those who reported sexual IPV were 2.14 times more likely, and those who reported both forms of IPV were 4.00 times more likely to report disordered eating behaviors as compared to males who reported no IPV.

Significant effects were found when examining the two composite variables for male adolescents. A significant result was seen in the association between both forms of IPV and perceived under/overweight. Males who reported both forms of IPV were 0.89 times likely to report they perceived themselves as normal weight. There were significant results in the examination of the associations between IPV and disordered eating behaviors. Males who reported physical IPV were 2.20 times more likely to report fasting, 2.86 times more likely to report diet pill use, and 3.30 times more likely to report purging. Males who reported sexual

IPV were 2.37 times more likely to report fasting and 3.21 times more likely to report purging. Finally, male adolescents who reported both forms of IPV were 4.64 times more likely to report fasting, 4.47 times more likely to report diet pill use, and 9.61 times more likely to report purging.

The next association examined was between IPV and BMI in male adolescents. Results from the one-way between subjects ANOVA indicated that there was not a significant difference between categories of IPV and BMI in male adolescents,  $F(3,6410) = 2.44, p = 0.063, \omega^2 = 0.001$ .

### **Discussion**

The purpose of the current study was to explore the relationship between different types of interpersonal violence within a dating relationship and unhealthy attempts at weight control. This study examined this relationship in the adolescent population in the United States during the 2013 school year using the CDC's YRBS. The present study added to the current literature in the areas of physical and sexual violence in a dating relationship and weight control behaviors in number of ways. First, the results are representative of the national population of adolescents who were enrolled in the 2013-2014 school year. The CDC collected a large sample that was weighted to represent the adolescent population, thereby enabling us to have enough power to examine constructs with relatively low base rates. Second, previous literature examined constructs such as disordered eating behaviors and steroid use in a gender stereotyped fashion. This study was distinctive in that it conducted analyses of the measurement of the same constructs in both male and female adolescents. Third, the adolescent population proved to be an appropriate age to examine given that adolescence is the developmental period where generally dating has commenced.

Finally, current literature has not examined physical or sexual violence specifically within an adolescent dating relationship with great depth. The results from this study suggest that there is an association between physical, sexual, or both forms of interpersonal violence in a dating relationship and detrimental behaviors aimed at controlling weight in both female and male adolescents. Overall, components of the three hypotheses postulated were supported, but the component surrounding body sizes was not.

This study examined different constructs such as dating violence and unhealthy attempts at weight control. Per the YRBS questionnaire, physical dating violence was defined as those who reported being physically hurt on purpose in a dating relationship (being hit, slammed into something, or injured with a weapon), sexual dating violence as those who reported they were forced by a partner to engage in a sexual action they did not want to do (kissing, touching, or rape), and the final category of dating violence was when an adolescent reported both physical and sexual violence. The unhealthy attempts at weight control were defined as how participants perceived their current weight (perceived underweight, perceived normal weight, or perceived overweight), three specific types of unhealthy eating behaviors (fasting or restricting diet, using diet pills that were not prescribed by a doctor, and vomiting) in order to lose or control weight, the use of steroids, and the participant's weight as an indicator of health.

### **Base Rates**

We first examined the rate at which male and female adolescents reported the presence of dating violence and unhealthy attempts at weight control. Distinct gender differences were revealed in the percentages of reported physical and sexual violence in dating relationships, as well as in the varied forms of unhealthy weight control behaviors as

indicated in previous literature. Females reported a higher rate of physical and sexual violence, fasting, diet pill use, and purging as compared to males. Females perceived themselves as under/overweight at a higher rate as compared to male adolescents. Male adolescents reported steroid use at a higher rate than female adolescents. Further analyses revealed that male and female adolescents report these behaviors at different rates, thereby supporting the first set of hypotheses. This provided empirical support for separating males and females as we examined the relationships between reported physical and sexual violence and the different forms of unhealthy weight control behaviors.

### **Dating Violence Associated with Unhealthy Weight Control Behaviors**

The results indicated an association exists between interpersonal violence in dating relationships and weight control behaviors, of particular note was disordered eating behaviors and steroid use, thereby supporting the hypotheses. The odds of an adolescent reporting disordered eating behaviors or steroid use increased depending on the category of dating violence they reported. This study went beyond the previous research to examine a nationally representative sample of adolescents regarding physical and sexual violence within the context of a dating relationship. Previous research on the associations specifically examined in this study did not use nationally representative samples, nor include analyses on both female and male adolescents. The results of this study reflect prior research documenting similar associations in smaller, more specific, regional populations.

Findings indicated strong connections between dating violence and unhealthy attempts at weight control for female adolescents. Generally, females who reported interpersonal violence in a dating relationship were two times more likely to report abnormal eating behaviors and steroid use. This revealed a trend toward increased risk in adolescents

who reported both physical and sexual violence as compared to those who reported only physical or only sexual violence in a dating relationship. This suggests that the combination of physical and sexual violence could increase female adolescents' risk for unhealthy attempts at weight control. For example, the odds of an adolescent who reported physical dating violence engaging in fasting behaviors to lose weight were not meaningfully different from the odds of an adolescent who experienced both physical and sexual dating violence engaging in fasting behaviors to lose weight.

These results were mirrored in the male adolescent population. Male adolescents who reported dating violence were 2 to 9.6 times more likely to exhibit disordered eating behaviors and steroid use as compared to males who did not report such violence in a dating relationship. Again, there was an upward trend in risk of exhibiting unhealthy attempts at weight control when examining the combination of physical and sexual dating violence as compared to physical dating violence or sexual dating violence; yet, we know these values are not significantly different from one another as evidenced by the confidence intervals.

Even though the majority of the associations between adolescent dating violence and unhealthy attempts at weight control were documented, there were some expected associations that were not found. In female adolescents, there was not a noteworthy relationship between physical dating violence and the use of diet pills to lose weight or the use of steroids. These associations should not be considered in support of the hypotheses. In male adolescents, there was not a significant relationship between sexual dating violence and the use of diet pills to lose weight, even though a statistical trend was present. Thus, future research will wish to continue to explore this as a possibility.



Previous research examining the relationship between dating violence and body sizes using body mass indices has mostly examined samples of adult female populations and has not examined adolescents or male populations (Huang et al., 2011; Mamun et al., 2007). Female adolescents who reported sexual dating violence had smaller body sizes compared to females who did not report dating violence; thus, the hypothesis was not supported. In hindsight, adolescence may not be the most appropriate time to examine body mass indices as an anthropometric body size indicator of health as many are still growing and developing. Additionally, the CDC cautions users interpreting adolescents' self-report of body size given previous studies cited which indicate adolescents are inclined to underreport weight on self-report measures (CDC, 2013b). Based on the results, we would suggest that a relationship does not exist between physical dating violence or a combination of physical and sexual dating violence and body size during adolescence, but the relationship could be burgeoning and perhaps reveal itself later in adulthood. Future research could examine this longitudinally to see what is unfolding for individuals over different life stages.

Given previous research suggesting the association of body image dissatisfaction and disordered eating behaviors (Ata, Ludden & Lally, 2007; Bucchianeri et al., 2013; Cash & Deagle, 1997), the minimal amount of meaningful relationships between dating violence and perceived weight was unexpected. Taking into consideration there were few associations found in the perceived weight variable, perhaps this question did not successfully capture body image dissatisfaction. Body image dissatisfaction would have been better studied with an assessment that measures the participants outlook or attitude about personal body image, a perception of weight, and the difference between actual versus perceived body size. Interestingly enough, the meaningful relationships revealed that females and males who

reported dating violence were less likely to consider themselves to be within a “normal weight” range as compared to those who did not report dating violence. Given that “normal weight” was not considered an unhealthy attempt to control weight, this is consistent with the intention of what I proposed. Female and male adolescents who reported dating violence were less likely to perceive their weight as “normal.” These results indicated that reporting dating violence is associated with the following features of body image dissatisfaction: idea of an unattainable normal weight, inability to perceive themselves as “normal,” or dissatisfaction with current weight even if others have indicated they are a “normal weight.”

The current study examined associations that have not previously been studied. There was a significant relationship between dating violence and steroid use in female adolescents. Female adolescents who reported sexual dating violence and a combination of both sexual and physical violence were twice as likely to report abusing anabolic steroids compared to females who had been victimized in dating relationships. Male adolescents who reported physical, sexual, and the both of these forms of dating violence were at higher risk for fasting or restricting foods in their diet, using diet pills that were not prescribed by a doctor, and vomiting in order to lose weight or keep from gaining weight. In fact, male adolescents who reported dating violence had higher risks, 2 to 9.5 times more likely to have abnormal eating behaviors as compared to female adolescents with risks ranging from 1.6 to 3.2 times more likely to have abnormal eating behaviors. Previous research on anabolic steroid abuse and disrupted eating behaviors are stereotypically gendered in that studies included males but not females. Females who reported sexual dating violence or both physical and sexual dating violence were 1.9 or 2.3 times more likely to engage in steroid use respectively. Given these results, further research concerning steroid use and abnormal eating behaviors should include

both genders. These topics warrant further investigation into the mechanisms surrounding this association.

### **Application of Current Study**

Understanding the association between teen dating violence and unhealthy attempts at weight control is intricate. In attempts to reduce the harm created by interpersonal violence for adolescents, mental and medical health professionals should routinely screen for dating violence when treating adolescents given that they are ethically bound to inquire, intervene, and legally bound to report the violence to the Department of Child Protective Services in the county where the child lives. Teen dating violence is compounded by the fact that many victims do not disclose when they experience dating violence nor do they seek professional services immediately following the traumatic events. In the year 2014, only 33% of adolescents who were victims of IPV told anyone about the abuse, leaving 67% of adolescents to carry these traumatic events by themselves (CDC, 2014). Without relying on the adolescent to disclose these traumatic events, it falls to the responsibility of mental health and medical professionals to assess for IPV experiences and the potentially associated behaviors discussed in this study. The following provides specific, evidence-based interventions and screenings for schools, families, communities, and medical facilities.

**School intervention.** The majority of teen dating abuse preventions are aimed for use in schools as school-based interventions are the most promising for the reduction of teen dating violence (Cutter-Wilson & Richmond, 2012). Safe Dates is one example of an evidence-based intervention that can be applied in school settings (Foshee et al., 2004). This program contains 10 sessions on teen dating violence, a play about teen dating violence, a poster contest, and parent materials. This is to be implemented into a health or life-skills

class and is appropriate for both males and females in high school. The 10 sessions cover information such as: defining caring relationships and dating abuse, how to help friends, coping strategies for feelings, and general communication in relationships. The play about teen dating violence was written by high school drama students and can be easily implemented into a class or an assembly. The poster contest is incorporated specifically for the benefit of the students writing the posters to better know the facts about teen dating violence and to spread some awareness through the school. Finally, Safe Dates has designed material for parents of the students in the class. The authors of Safe Dates found that the parent portion of the curriculum was vital, so they created another program specifically for families called Families for Safe Dates (Foshee et al., 2004).

**Family intervention.** Families for Safe Dates is a prevention program focused on teen dating abuse administered in a family setting (Foshee et al., 2012). This program uniquely strives to motivate and facilitate the caregiver's engagement in the prevention intervention by engaging the parents in different activities and equipping them to provide education to their children. A randomized control trial found that Families for Safe Dates was effective at motivating and engaging the caregivers as well as less physical dating abuse victimization of adolescents (Foshee et al., 2012). Foshee and colleagues (2015) went on to adapt Families for Safe Dates to a program specifically designed for mothers who had been victims of domestic violence but no longer living with the abuser to implement with their teenagers given that these adolescents had witnessed parental dating violence in their homes. These researchers found success in adapting Families for Safe Dates to their desired population. They went on to propose a randomized control trial using "Moms and Teens for

Safe Dates,” the adaption of Families for Safe Dates, to prevent and reduce dating violence victimization and perpetration (Foshee et al., 2015).

**Community intervention.** Given the multitude of associations found in this study, it is suggested to provide community interventions targeting prevention of dating violence and unhealthy weight control behaviors, dating violence education, breaking the cycle of violence in relationships, and coping strategies for stress. Interventions can be located at the individual, group, and community level across the United States. The first line of interventions should be aimed at preventing and decreasing interpersonal violence within dating relationships (Foshee et al., 2012). At the bare minimum, prevention interventions should include psychoeducation and skills acquisition (Antle, Sullivan, Dryden, Karam, & Barbee, 2011; Foshee et al., 2012). Providing brief education can produce significant gains in adolescents by covering topics such as defining a healthy relationship, developing relationship skills, and identifying attitudes towards dating violence (Antle et al., 2011). Decreasing adolescent’s acceptance of dating abuse has been shown to be a key indicator of decrease in victimization (Antle et al., 2011; Foshee et al., 2012). Additional intervention points can include skill building in the following domains: communication, conflict resolution, emotional distress tolerance, and stable self-concept (Ackard & Neumark-Sztainer, 2002; Antle et al., 2011; Foshee et al., 2012).

The Center for Disease Control and Prevention (CDC) is actively creating and studying preventative interventions that target violence from a public health approach (CDC, 2016). One example of violence prevention is Striving to Reduce Youth Violence Everywhere (STRYVE). STRYVE is a compilation of evidence-based approaches for preventing youth violence and it is a resource to support those who are planning,

implementing, or evaluating youth violence prevention. STRYVE has a list of evidence-based prevention interventions for Teen Dating Violence that are organized based on different demographic information (e.g. ethnicity, race, community setting; CDC, 2016).

**Screening and assessment.** Current literature revealed a lack of brief screening or assessment for teen dating violence that has been both validated and normed for adolescents in the United States. Rabin, Jennings, Campbell, and Bair-Merritt (2009) investigated all available intimate partner violence screening tools for adult and adolescent populations, examining each screening's psychometric properties, appropriateness for setting, and they had been peer-reviewed. After an extensive review of 33 screening tools, they were not able to find one that was brief, comprehensive in that it included different aspects of dating violence, and appropriate for diverse clientele (Rabin, Jennings, Campbell, & Bair-Merritt, 2009). Cutter-Wilson and Richmond (2012) conducted a similar review of current screening and interventions for adolescent dating violence. They concluded that a more effective and reliable screening method would be the Audio Computer Assisted Survey Instruments (ACASI) followed by an interview from a healthcare professional. Unfortunately, the ACASI is not assessable or convenient for primary care or school settings due to expense and the need for access to technology (Cutter-Wilson & Richmond, 2012). Therefore, advocating for this to be the universal standard of care may never be realized. This leaves the burden of creating a brief, accurate, and culturally diverse assessment on future researchers. Future work in creating screenings should assess elements such as current safety of adolescent, current experiences in relationship, and past experiences in relationship (Cutter-Wilson & Richmond, 2012). Additionally, there needs to be screenings that are conducive to not only

the location (e.g. school counselor, school psychologist, primary care, hospital emergency rooms) but also for diverse populations (i.e., race, gender, ethnicity, etc.).

**Training.** Individuals who work in the medical profession need to be uniquely equipped to assess for dating violence in the adolescent population. Herrman (2009) suggested that pediatric nurses hold an important role in counseling, ensuring safety, and preventing dating violence in adolescents. Herrman (2009) proposed that these pediatric nurses need to know “the definitions of dating violence and rape, data about the incidence and prevalence of this issue, risk factors for violence in intimate relationships, dating violence myths, and the potential impact of youth dating violence” (p. 164). Additionally, pediatric nurses need training in how to inquire about dating violence, how to create a welcoming environment (e.g. in a private room, without parent involvement), and appropriate resources for youth. Erickson, Gittelman, and Dowd (2010) approached females ages 15-21 in a pediatric emergency department of which 36.6% reported teen dating violence. In the emergency department, nurses needed to inquire about teen dating violence if female patients endorsed having tried alcohol, having ridden in a car with a partner who was doing drugs or alcohol, fighting with peers, and history of sexually transmitted diseases (Erickson, Gittelman, & Dowd, 2010). These examples point to the need for educating all health care professionals who interact with and facilitate assessments. This will not only aid the adolescent, it will also equip the medical professionals with confidence and skills in assessing and providing interventions for the difficult topic of dating violence.

Despite the different presentations of dating violence and the differing needs of professionals, training should include the following common elements. Adolescents are more likely to report dating violence if the provider exhibits comfort in talking about the nature of

dating violence, comfort in talking about confidentiality to provide a safe space for the adolescents, and presents the patient with information on intervention and prevention regardless of the adolescent's reporting or not reporting of dating violence (Cutter-Wilson & Richmond, 2012). For example, a medical provider could say: 'Many adolescents are starting intimate dating relationships at your age. Some do not know if their relationship is healthy or unhealthy. Let's take the next few minutes to talk about what an unhealthy relationship would look like and then talk about what a healthy relationship would look like, so you will know how to identify this when you are ready to be in an intimate relationship.' Ideally, a mental health professional could be available at the site of the medical facility to connect the adolescent with support. The environment should illicit safety by providing brochures and signs concerning topics such as risks, prevention and intervention for teen dating violence. Professionals should be equipped with resources such as websites, community interventions, or a list of local mental health professionals. (Cutter-Wilson & Richmond, 2012). Finally, mental health and health care professionals should also be knowledgeable about the proper steps to take when a minor discloses dating violence, as there may be legal actions for the health care provider to pursue or legal options for the patients to consider.

**Additional prevention interventions.** Given the higher prevalence rates of teen dating violence, interventions should begin by focusing on violence; however, this study also examined the disordered eating behaviors and steroid use, of which there have been effective prevention interventions. Russell-Mayhew and Grace (2016) examined the eating disorder literature to find the best practice prevention interventions currently available for treating eating disorders and obesity in males and females living in westernized society. School based interventions that included calculating body size were harmful given that it could lead to



unhealthy social comparisons and the use of weight as the standard for a healthy lifestyle. Instead, interventions should focus on training teachers and parents, developing a healthy body image, increasing tolerance of differences in appearances, reducing bullying about weight or appearance, and decreasing stigma around obesity (Russell-Mayhew & Grace, 2016). Goldberg and Elliot (2007) created two effective prevention intervention programs that target steroid use in the adolescent populations called Athletes Training and Learning to Avoid Steroids (ATLAS) and Athletes Targeting Healthy Exercise and Nutrition Alternatives (ATHENA). Researchers cite psychoeducation as the primary prevention intervention during early adolescents as the most effective building block for prevention of steroid use. The primary target for these interventions focus on athletes; however, I would suggest incorporating these interventions into middle school health classes or assemblies to reach a wider population (Goldberg & Elliot, 2007).

### **Limitations**

The current study offers many important research contributions to the understanding of the relationship between dating violence and unhealthy attempts at weight control; however, there are several limitations that should be considered. Previous literature does not shed light on the causality of this association, nor does this study allow us to conclude causality. The temporal relationship between dating violence and unhealthy attempts to control weight may provide insight on how consumers of this study integrate this knowledge into the workplace. It is possible that the trauma experienced from dating violence could spark adolescents longing to regain a sense of control over their lives in the form of unhealthy weight control behaviors. Equally, there could be an additional variable that has

not been considered that accounts for the link in these associations or potential possibility for bi-directionality.

The YRBS data is a self-reported measure which relies on accuracy and reliability of the participant's responses. As previously stated, the CDC has conducted and reliability tests on the YRBS with great success. Additionally, the CDC did not include data when they encountered conflicting answers within in a single questionnaire in order to limit inaccurate or unreliable responses (MMWR, 2013). Even with these precautions, I cannot rule out the possibility that the participants reported in a biased manner leading to over reporting or underreporting of certain behaviors. Second, using an archival dataset placed us at a disadvantage in the lack of control over the type and wording of the questionnaire. For example, the question concerning how the adolescent perceived their current body weight (i.e., their perception of if their weight met the description of under, at, or above normal weight) did not fully capture the classic aspects of how people feel about their weight or body image dissatisfaction. Third, the YRBS may not capture students who are at increased risk of the behaviors examined in this study due to the administration process (i.e., the students did not attend school the day the test was administered or did not receive parental consent; MMWR, 2013). Finally, the YRBS only captured adolescents who are enrolled in school during the year 2013; according to the National Center for Education Statistics (NCES), 96.1% of adolescents ages 14-18 were enrolled in secondary education (NCES, 2015). This would mean that 3.9% of the adolescent population was not accounted for in this sample. Additionally, participation from each of the 50 states was not required for this dataset, even though the weighted values are made to represent the general population in

each state based on race, gender, and grade (MMWR, 2013). The method by which the CDC weights these variables statistically helps to address some of the population sampling issues.

### **Future Directions**

It would be beneficial for research to expand upon the present study in future research, given the many significant findings. One area of future research would be longitudinal studies to better conceptualize the interworking of the associations between dating violence and unhealthy attempts to control weight. Longitudinal studies would also provide the opportunity to examine a myriad of variables such as the frequency, duration, and intensity of dating violence, precipitating factors such as trauma history, and other psychosocial factors that could contribute to the significant associations found in this study. Understanding differential relationships between each variable could have significant treatment implications and is, therefore, considered valuable. Historically, research has studied one gender when examining disordered eating behaviors and steroid use. Future research should be dedicated to departing from this perspective, not only exploring both female and male adolescents, but also adopting a gender fluid stance, allowing the participants to write in self-identified gender descriptions. Finally, research should pay attention to steroid use in female adolescents, the association between dating violence and disordered eating behaviors in male adolescents, and the association between dating violence and steroid use.

### **Conclusion**

This study provided evidence of the strong associations between different categories of dating violence and unhealthy attempts to control weight in female and male adolescents at a national level. Both males and females who reported different categories of dating

violence were at higher odds for the risky behaviors that control, by suppressing or enhancing, weight as compared to adolescents who did not report dating violence.

Additionally, this study provided new findings regarding steroid use in female adolescents and disordered eating behaviors in male adolescents. The clinical significance of these findings encourage mental health and medical professionals to use evidenced- based intervention programs to decrease the base rates and know how to better respond to teen dating violence, and how to better prevent and treat disordered eating behaviors and steroid use.

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Table 1  
*Demographic Information on the Weighted Variables in the 2013 YRBS Dataset*

<b>Demographics</b>	<b>Percent Reported</b>	<b>SE</b>	<b>95% CI</b>
<b>Gender</b>			
Females	49.96	.63	48.69 – 51.23
Males	50.03	.63	48.77 – 51.31
<b>Race</b>			
American Indian/Alaska Native	.68	.07	.53 - .83
Asian	3.01	.65	1.71 – 4.32
Black or African American	14.35	2.05	10.21 – 18.48
Native Hawaiian/Other PI	.83	.24	.35 – 1.30
White	55.62	3.56	48.42 – 62.82
Hispanic/Latino	10.40	1.55	7.26 – 13.54
Multiple Races, Hispanic	10.73	.89	8.92 – 12.53
Multiple Races, Non-Hispanic	4.39	.39	3.59 – 5.18
<b>Grade</b>			
9th	27.28	.60	26.08 – 28.49
10th	25.67	.53	24.61 – 26.73
11th	23.84	.48	22.87 – 24.81
12th	23.06	.62	21.82 – 24.30

*Note:* \*SE = Linearized Standard Error

Table 2  
*Percentage of Female and Male Adolescents Who Reported Predictor and Outcome Variables and Design-Based F Statistics Between the Genders*

	<b>Percent Reported</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>	<b>Design-Based F Statistic</b>
<b>Physical IPV</b>				
Females	4.83	.37	4.08 – 5.57	27.23*
Males	2.90	.24	2.42 – 3.39	
<b>Sexual IPV</b>				
Females	5.82	.34	5.13 – 6.51	93.55 *
Males	2.05	.21	1.63 – 2.47	
<b>Both forms of IPV</b>				
Females	4.63	.40	3.85 – 5.40	37.22*
Males	2.32	.21	1.89 – 2.75	
<b>No IPV</b>				
Females	84.72	.66	83.39 – 86.06	140.92*
Males	92.73	.46	91.81 – 93.65	
<b>Perceived Under/Overweight</b>				
Females	47.15	.88	45.38 – 48.92	13.53*
Males	42.73	.99	40.74 – 44.72	
<b>Fasting</b>				
Females	18.72	.81	17.10 – 20.35	190.05*
Males	7.38	.49	6.40 – 8.37	
<b>Diet Pill Use</b>				
Females	6.64	.56	5.51 – 7.79	45.22*
Males	3.41	.32	2.77 – 4.05	
<b>Purging</b>				
Females	6.60	.49	5.61 – 7.59	87.23*
Males	2.18	.23	1.72 – 2.63	



	<b>Percent Reported</b>	<b>Standard Error</b>	<b>95% Confidence Interval</b>	<b>Design-Based F Statistic</b>
<b>Steroid Use</b>				
Females	2.25	.24	1.76 – 2.73	24.76*
Males	4.03	.34	3.34 – 4.72	

*Note.* The degrees of freedom was calculated by subtracting the number of primary sampling units from the number of strata. The degrees of freedom for all of the above analyses was 41.

\* $p < .001$

Table 3

*Odds Ratios of the National Female Adolescent Population Examining the Association Between Reported IPV and Reported Unhealthy Weight Control Behaviors*

<b>Outcome Variables</b>	<b>Physical IPV [95% CI]</b>	<b>Sexual IPV [95% CI]</b>	<b>Both forms of IPV [95% CI]</b>
<b>Perceived Under/Overweight</b>	1.15* [1.01-1.28]	0.96 [0.80-1.12]	1.11 [0.81-1.39]
<b>Perceived Underweight</b>	1.90*** [1.50-2.35]	1.24 [0.90-1.68]	2.31 [1.35-3.53]
<b>Perceived Normal Weight</b>	0.87* [0.74-1.00]	1.03 [0.88-1.16]	0.90 [0.63-1.16]
<b>Perceived Overweight</b>	0.94 [0.75-1.13]	0.89 [0.70-1.09]	0.83 [0.51-1.22]
<b>Disordered Eating Behaviors</b>	1.57*** [1.28-1.85]	1.43*** [1.19-1.67]	2.09*** [1.50-2.58]
<b>Fasting</b>	1.65*** [1.33-1.97]	1.43** [1.14-1.74]	2.23*** [1.50-2.93]
<b>Diet Pill Use</b>	.81 [0.52-1.25]	1.76*** [1.29-2.35]	1.45*** [0.67-2.86]
<b>Purging</b>	2.05** [1.31-3.07]	1.66* [1.03-2.56]	3.26*** [1.35-6.30]
<b>Steroid Use</b>	1.22 [0.60-2.43]	1.94* [1.04-3.50]	2.35*** [0.62-7.75]

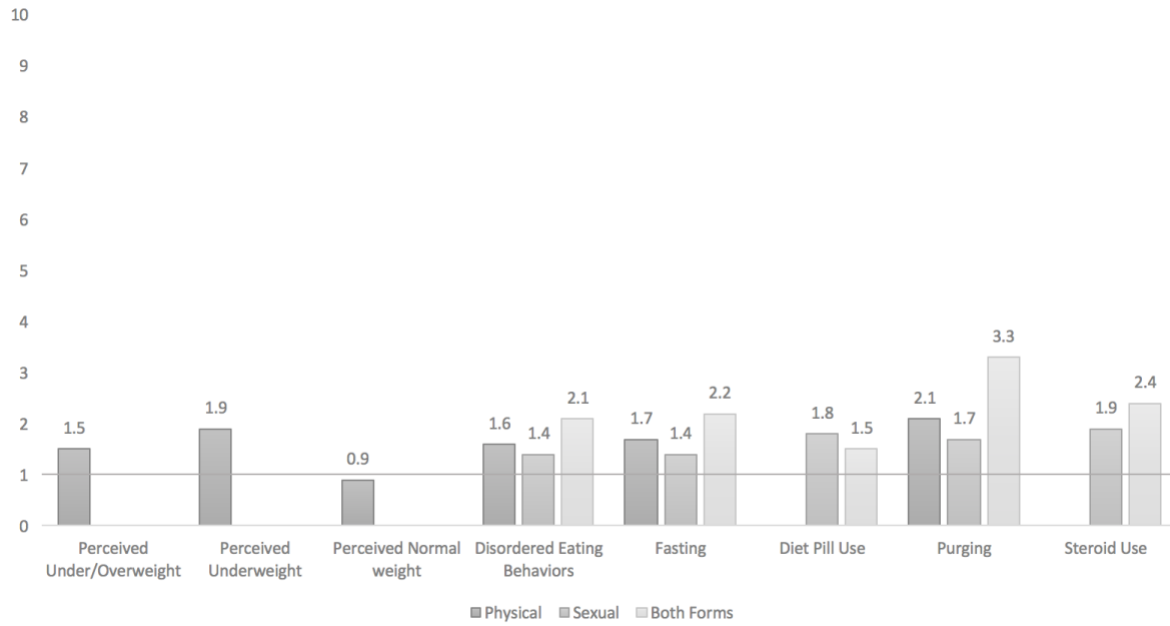
*Note:* \* indicates the value is significant at  $p < .05$  level. \*\* indicates the value is significant at  $p < .01$ . \*\*\* indicates the value is significant at  $p < .001$ .

Table 4

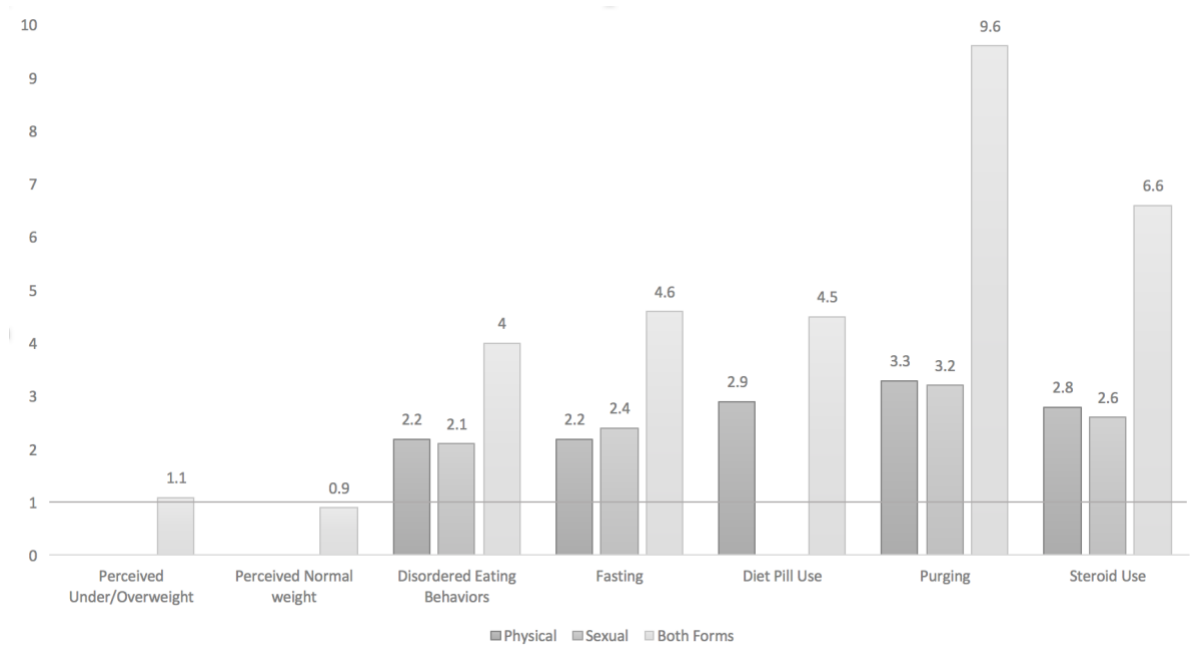
*Odds Ratios of the National Male Adolescent Population Examining the Association Between Reported IPV and Reported Unhealthy Weight Control Behaviors*

<b>Outcome Variables</b>	<b>Physical IPV [95% CI]</b>	<b>Sexual IPV [95% CI]</b>	<b>Both forms of IPV [95% CI]</b>
<b>Perceived Under/Overweight</b>	1.16 [0.97-1.33]	0.98 [0.79-1.18]	1.14* [0.76-1.50]
<b>Perceived Underweight</b>	1.42 [0.95-1.99]	0.80 [0.52-1.19]	1.15 [0.49-2.27]
<b>Perceived Normal Weight</b>	0.88 [0.73-1.02]	1.01 [0.86-1.14]	0.89* [0.60-1.16]
<b>Perceived Overweight</b>	.99 [0.72-1.32]	1.10* [0.80-1.45]	1.10 [0.56-1.80]
<b>Disordered Eating Behaviors</b>	2.22*** [1.55-2.94]	2.14*** [1.48-2.84]	4.00*** [2.23-5.29]
<b>Fasting</b>	2.20*** [1.43-3.20]	2.37** [1.41-3.68]	4.64*** [2.00-7.76]
<b>Diet Pill Use</b>	2.86** [1.50-5.09]	1.62 [0.79-3.18]	4.47*** [1.19-11.85]
<b>Purging</b>	3.30** [1.48-6.83]	3.21** [1.54-6.24]	9.61*** [2.27-23.69]
<b>Steroid Use</b>	2.82** [1.41-5.19]	2.63*** [1.54-4.26]	6.64*** [2.16-13.59]

*Note:* \* indicates that the value is significant at  $p < .05$  level. \*\* indicates that the value is significant at  $p < .01$ . \*\*\* indicates that the value is significant at  $p < .001$ .



*Figure 1.* Odds Ratios in Female Adolescents. This figure illustrates the odds of female adolescents reporting unhealthy weight control behaviors given the different types of interpersonal violence. Of note, only significant figures are illustrated and the line is drawn at 1, where values over 1 indicate an increased risk and values under 1 mean a decreased risk as compared to those who reported no interpersonal violence.



*Figure 2.* Odds Ratios in Male Adolescents. This figure illustrates the odds of male adolescents reporting unhealthy weight control behaviors given the different types of interpersonal violence. Of note, only significant figures are illustrated and the line is drawn at 1, where values over 1 indicate an increased risk and values under 1 mean a decreased risk as compared to those who reported no interpersonal violence.

Appendix A

Operationalized Variables

Variable Name	YRBS Item	Verbatim Scoring Options from YRBS	Operationalized Scoring	Defined Operationalized Scoring
<b>Demographic Information</b>				
Sex	What is your sex?	1. Female 2. Male	1. Female 2. Male	
Raceeth	Raceeth is coded by the CDC based on 2 questions: “Are you Hispanic or Latino?” “What is your Race? (Select one or more responses)”	1. American Indian/Alaska Native 2. Asian 3. Black or African American 4. Hispanic/Latino 5. Native Hawaiian/Other Pacific Islander 6. White 7. Multiple Races (Non-Hispanic)	1. American Indian/Alaska Native 2. Asian 3. Black or African American 4. Hispanic/Latino 5. Native Hawaiian/Other Pacific Islander 6. White 7. Multiple Races (Non-Hispanic)	
Grade	In what grade are you?	1. 9th grade 2. 10th grade 3. 11th grade 4. 12th grade	1. 9th grade 2. 10th grade 3. 11th grade 4. 12th grade	
<b>Interpersonal Violence</b>				
Physical IPV	During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being	1. I did not date or go out with anyone during the past 12 months 2. 0 times 3. 1 time 4. 2 or 3 times 5. 4 or 5 times	0. No 1. Yes	Physical IPV variable was recoded to a dichotomous variable, where responses 1 and 2 were coded as “No” and all remaining responses of 3, 4,

	hit, slammed into something, or injured with an object or weapon.)	6. 6 or more times		5, or 6 were coded as “Yes.” For participants to be represented in this category of IPV, they have reported only physical IPV.
Sexual IPV	During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)	1. I did not date or go out with anyone during the past 12 months 2. 0 times 3. 1 times 4. 2 or 3 times 5. 4 or 5 times 6. 6 or more times	0. No 1. Yes	Sexual IPV variable was recoded to a dichotomous variable, where responses 1 and 2 were coded as “No” and all remaining responses were coded as “Yes.” For the participant to be represented in this category of IPV, they have reported only sexual IPV.
Both forms of IPV	Endorsed “Yes” to the two previous questions.		1. Yes	For the participant to be represented in this category of IPV, they must report IPV in both of the previous questions.
No IPV	Reported “I did not date or go out with anyone during the past 12 months” or “0 times” on the questions examining physical and sexual IPV.		0. No	For the participant to be represented in this category of IPV, they must report no IPV in both of the previous questions.
<b>Perceived Weight (Dichotomous)</b>				

Perceived Weight	How do <b>you</b> describe your weight?	1. Very underweight 2. Slightly underweight 3. About the right weight 4. Slightly overweight 5. Very overweight	0. Perceived Normal Weight 1. Perceived Under/ Overweight	The Perceived Weight variables were recoded so that if an individual reported 1, 2, 4 or 5, they were coded as “Perceived Under/Overweight” and individuals who reported 3 were coded as “Perceived Normal Weight.”
<b>Perceived Weight (Categorical)</b>				
Perceived weight	How do <b>you</b> describe your weight?	1. Very underweight 2. Slightly underweight 3. About the right weight 4. Slightly overweight 5. Very overweight	1. Perceived Underweight 2. Perceived Normal Weight 3. Perceived Overweight	The perceived weight variables were recoded so that if an individual reported 1 or 2 they were coded “perceived underweight”, and those who reported 4 or 5 were coded as “perceived overweight.” The “perceived normal weight” category did not change from the previous variable.
<b>Disordered Eating Behaviors (Any)</b>				
Fasting, Diet Pill Use, and Purging	During the past 30 days, did you <b>go without eating for 24 hours or more</b> (also called fasting) to lose weight or to keep from gaining weight?	1. Yes 2. No	0. No 1. Yes	The Disordered Eating Behavior variable was recoded so that if an individual reported “yes” to any of the three questions, they were coded as “yes” and all other



	<p>During the past 30 days, did you <b>take any diet pills, powders, or liquids</b> without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal replacement products such as Slim Fast.)</p> <p>During the past 30 days, did you <b>vomit or take laxatives</b> to lose weight or to keep from gaining weight?</p>			<p>individuals were coded as "no"</p>
<b>Disordered Eating Behaviors (Specific)</b>				
Fasting	<p>During the past 30 days, did you <b>go without eating for 24 hours or more</b> (also called fasting) to lose weight or to keep from gaining weight?"</p>	<p>1. Yes 2. No</p>	<p>0. No 1. Yes</p>	
Diet Pill Use	<p>During the past 30 days, did you <b>take any diet pills, powders, or liquids</b> without a doctor's advice to lose weight or to keep from gaining weight? (Do not include meal</p>	<p>1. Yes 2. No</p>	<p>0. No 1. Yes</p>	

	replacement products such as Slim Fast.)			
Purging	During the past 30 days, did you <b>vomit or take laxatives</b> to lose weight or to keep from gaining weight?	1. Yes 2. No	0. No 1. Yes	
<b>Steroid Use</b>				
Steroid Use	During your life, how many times have you taken <b>steroid pills or shots</b> without a doctor's prescription?	1. 0 times 2. 1 or 2 times 3. 3 to 9 times 4. 10 to 19 times 5. 20 to 39 times 6. 40 or more times	0. No 1. Yes	The Steroid Use variable was recoded to a dichotomous outcome, where individuals who reported 1 were coded as "No" and all other responses were coded as "Yes."
<b>Body Mass Index</b>				
BMI	This variable was calculated based on the participant's response to the following questions: "How tall are you without your shoes on?" and "How much do you weigh without your shoes on?"			BMI was calculated by dividing the weight in kilograms by the height in meters squared.

Note: All bolded words in the "YRBS Item" category are bolded on the YRBS

## Appendix B

## Collection of Data

The follow is a description of how the CDC determined the data that was incorporated into the 2013 national dataset that was weighted to be representative of U.S. adolescents. The CDC oversaw specific contractors who were responsible for getting the proper permission from states, districts, or schools, for the survey conducted (CDC, 2013b). The contractors worked with each school to determine appropriate times to contact parents for consent and convenient times for data collection. The contractor also was responsible for hiring and training individuals to go into the schools to collect the data. The standardized protocol included reading a script to the students, coordinating the data collection, weighing the data, and preparing the data for analysis. The CDC received feedback every year after collecting the data, and compiled it into a *Handbook for Conducting Youth Risk Behavior Surveillance System* that endeavors to answer questions or address issues that may arise that contracted workers could reference at any time (CDC 2013b).

The CDC conducted three stages of sampling before selecting which states, districts, or schools were incorporated in the 2013 national dataset (CDC, 2013b). The first stage was to find primary sampling units that were made up of 16 strata and organized based on metropolitan status and percentages of racial distribution in the given sampling units. The metropolitan status was either urban, one of the 54 largest cities in the United States, or rural, all the other cities in the United States. The primary sampling units were selected based on the probability that the sample was proportional to current school enrollment in the United States in the year it was collected. The second stage of sampling was to select a specific school from a database that contained all the public and private schools in the primary

sampling unit. A “whole school” contained all four grades (9-12) and a “fragment school” contained less than four grades, and would be combined with another “fragment school” to become a “cluster school” that was chosen with other “whole school” in the primary sampling unit. The “cluster schools” and “whole schools” were then split based on size. Schools that had greater than or equal to 25 students in each grade were considered larger and three schools were then selected from this group. Schools with less than 25 students in each grade were considered small and one school was selected from this group. The third and final stage of sampling for the national dataset was to select one or two classes from each grade in the chosen school (CDC, 2013b).

### **Vita**

Jennifer Katherine Funaro was born in Woodland, California, to Kip and Brigitt Berry. She graduated from Lake Highland Preparatory School in May 2007. The following fall, she entered Wheaton College and then transferred to Illinois Wesleyan University in fall 2010. She studied Biology and was awarded a Bachelor of Science degree in May 2012. In fall 2015, she began study towards a Master of Arts degree in clinical psychology. The M.A. is expected to be awarded in December 2017.

Mrs. Funaro is completing her internship to apply for licensure when M.A. is awarded in December 2017. She currently resides in Cary, North Carolina with her husband.