THE ASSOCIATION AMONG SOCIAL SUPPORT, BINGE EATING, AND BINGE DRINKING IN NDSU COLLEGE STUDENTS

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

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ABSTRACT

Zaruba, Julie Irene, M.S., Department of Health, Nutrition, and Exercise Science, College of Human Development and Education, North Dakota State University, November 2009. The Association Among Social Support, Binge Eating, and Binge Drinking in NDSU College Students. Major Professor: Dr. Gary Liguori.

The purpose of this thesis was to determine the association between bingeing behaviors and social support in college students. Participants were 216 male (57%) and female students, between 18-25 years, who were enrolled in a university required Wellness course. Participants volunteered to complete an online survey. The survey contained questions related to binge eating (BE), binge drinking (BD), social support, and basic demographic data. Groups were constructed based on the participants' gender or age and reported bingeing behaviors (binge eating (BE), binge drinking (BD), binge eating and binge drinking (BE/BD), and no bingeing behavior (NB)). Further, the social support data were broken down into low, moderate, and high categories for S- and N- Scores. S-scores represent the level of perceived social support an individual reports and an N-Score represents the number of individuals in a social network. Paper 1 (Social Support and Bingeing Behaviors in College Students) examined descriptive data on bingeing behaviors and social support to assess if any associations occur between these variables. Paper 1 also assessed the prevalence of bingeing behaviors among college students and identified gender/age differences among individuals who reported bingeing behaviors. Findings from the study indicate no significant associations between bingeing behaviors and social support (S-Score: p=.778 (BE); .362 (BD); .748 (BE/BD); .144 (NB)) (N-Score: p=.853 (BE); .362 (BD); .602 (BE/BD). Findings from the study also indicate no significant correlation between bingeing behaviors and social support (S-Score: r =.006, p=.573 (BE); r =.047, p=.502 (BD); r =.080, p=.246 (BE/BD)) (N- Score: r =.074, p=.284 (BE); r =.006,

p=.936 (BD); r =.036, p=.601 (BE/BD)). The prevalence of bingeing behaviors was similar to the rest of the nation as 40.3% report BE, and 49.5% report BD. Related to age/gender differences males reported higher levels of bingeing behaviors and males reported significantly higher binge drinking severity level 1(males = 64.04% vs. females = 35.96 %, p= .008). Reported binge drinking behaviors were divided into three levels. The three severity levels are; level 0= individuals who drink alcohol, yet have not binged in the past 30 days; level 1=individuals who binge drank only once in the past 30 days; and level 2= individuals who frequently binge drink (2 or more binge drinking episodes in the past 30 days). Differences in binge drinking severity level 0, 1, and 2 also occurred between age category 18-20 and 21-25 (p=.007, .000, .000, respectively). Implications of this dissertation suggest that, within a collegiate population, social support may not have as much of a positive influence as previously thought. Another implication is the significant differences that exist between age, gender, and bingeing behaviors suggest any attempt to modify binge behaviors within a collegiate population should be gender and age specific.

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CHAPTER 1

INTRODUCTION

College can be a stressful time for students (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2003). Some students are able to adapt to their new environment and develop effective ways to cope with the stressors associated with college; other students struggle to develop effective coping strategies. Some of these stressors include changes in environment, financial strain, roommate conflicts, and pressure to succeed academically. These stressors impact the individual, and the individual must appraise the stressor and decide how to cope (Cohen & Wills, 1987). Binge eating and binge drinking are potential examples of coping strategies for certain individuals, even when healthier coping strategies might be available. University students seem especially susceptible to these bingeing behaviors, given the multitude of stressors faced in college (Von Ah et al., 2003).

An additional factor related to stress and coping is social support (Cohen & Wills, 1987; Von Ah et al., 2003; Bosari & Carey, 2006). Previous literature indicates that social support is beneficial to maintaining positive health behaviors. For example, researchers found a link between positive health behaviors, and social support in a survey of 97 retired adults (Hubbard, Muhlenkamp, & Brown, 1984). Researchers found those individuals who reported having a confidant also scored higher in a survey of positive health behaviors and level of social support emerged as the most significant indicator of positive health practices (Hubbard et al., 1984). Another study of coping, drinking motives, goal attainment expectancies and family models was reviewed. Researchers found among 218 college students' positive social drinking motives and coping by seeking social support were possible protective factors to risky health behaviors (Karwacki & Bradley, 1996).

Students cannot only be influenced by their level of social support but possibly by their social networks as well. Social networks and social support are similar; however, there are differences between these two concepts. A social network is made of individuals who interact with each other whereas social support is the result of this process of interactions (Langford et al., 1997). The structure of the social network is made up of providers of support for an individual. Social networks vary from person to person and each network has its own characteristics. Characteristics, and the extent in which they are successful in helping an individual, vary depending on the environment and on the people who make up the social network (Cohen & Wills, 1987; Hays & Oxley, 1986). For instance, social support can be either positive, negative, or a combination of the two (Groh et al., 2007). Positive social support for an individual who binge drinks would be encouraging abstinence, negative social support would be encouragement of the undesirable behavior, and a combination would be not encouraging them to drink but drinking around the individual. An individual's social network is related to their level of social support and this can affect how the individual interacts with his or her environment (Cohen & Wills, 1987; Hays & Oxley, 1986).

When social support is absent, negative health behaviors may be more likely. Alcohol use, as stated earlier, may be one common coping strategy, and is frequently noted on college campuses. Typically, about half of all students report binge drinking (Vicary & Karshin, 2002). The highest rates of alcohol consumption can be found in adults ages 18-24, and consumption is more prevalent among college students compared to non-students (Vicary & Karshin, 2002). Wechsler, Dowdal, Davenport, & Castillo (1995) claim binge drinking to be the number one public health hazard in college students and the primary source of preventable morbidity and mortality for the more than six million full-time

college students in the United States. Wechsler et al. (1995) support this claim with data from studies indicating an association between binge drinking and substantially higher risks of acute health problems such as serious injury, auto crashes, unplanned and unsafe sex, assault, and aggressive behavior, and a spectrum of drinking related social and psychological problems.

Binge drinking is not the only bingeing behavior present on college campuses; binge eating is present as well. Non-clinical binge eating can be described as consuming an unusually large amount of food (Mayo Foundation for Medical Education and Research, 2008). Those who binge eat at least two times a week on average over the course of six months while lacking control over their eating behavior can be classified as having binge eating disorder (BED) (Diagnostic and Statistical Manual of Mental Disorders-IV [*DSM-IV-TR*], American Psychiatric Association [APA], 2000). According to the U.S. Department of Health and Human Services (HHS) BED is the most common eating disorder among adults of all ages, and affects about 3% of all U.S. adults. There is no known cause for BED but it has been found that as many as half of all people with BED have depression, or have been depressed in the past (HSS, 2009). Depression can result in binge eating due to the belief that bingeing regulates mood, these behaviors reduce stress due to their comforting affect (Hawkins & Clement, 1984). The HHS (2009) also states BED can cause weight gain which can lead to high blood pressure and dyslipidemia, along with fatigue, joint pain, type II diabetes, gallbladder disease, and heart disease. Non-clinical binge eating also may lead to weight gain, and obesity (HSS, 2009).

The study involves the topics of social support, binge eating, and binge drinking. Therefore, the purpose of this study is threefold. The first objective, is to determine the prevalence of binge eating and binge drinking within a Midwestern collegiate population.

The second objective is to determine what association exists between perceived social support and number of individuals in one's social network and binge eating/binge drinking. The third objective is to identify gender and age differences among individuals who report binge eating and drinking behaviors.

Rationale, Significance, or Need for the Study

As previously stated bingeing behaviors can potentially have negative health outcomes. Learning more about these behaviors may help in the development of interventions on college campuses. As Hendricks, Herbold, and Fung (2004), p. 982, state, "college represents an important transition period in the lives of most young people, and should be an important point for interventions." The prevalence of binge drinking at least once in a two-week period on college campuses is about 40% (Wechsler et al., 1995). The prevalence of binge eating is about 16-19% in college females and 6-7% in college males (Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007). Binge eating may also occur at sub threshold levels meaning, bingeing once per week instead of twice per week. The prevalence of sub threshold level bingeing in college females, is between 23% and 30% (Mintz & O'Halloran, 2000).

There is a need for this study for various reasons. This investigation will include both genders, which is uncommon in many studies, especially studies involving binge eating behaviors. Social support related to binge eating is also a relatively new research topic. This study will provide information regarding social support and bingeing. The potential sample size for this study is also larger than some of the previous research. This investigation will provide information regarding university students' perceived level of social support, a potentially critical risk factor in the development of binge behaviors.

Research Questions

1) What is the prevalence of binge eating and drinking among North Dakota State University college students?
2) What association exists between perceived social support and/or number of individuals in one's social network and binge eating/binge drinking?
3) Are there gender/age differences between binge eating and binge drinking behaviors?
4) What are the general characteristics of NDSU students who binge eat and binge drink?

Limitations and Delimitations

1) The data collected will be self reported, therefore, there is a chance that binge behaviors may be misreported, as tends to be the trend in self-report (Pritchard & Yalch, 2008).

2) This survey will be completed by college students at a Midwestern university so the results may not apply to non-college populations.

3) A delimitation of the study is the social support questionnaire measures a general level of support and is not broken down into specific constructs such as family and friends.

Definition of Terms

Binge drinking: A pattern of drinking that brings a person's blood alcohol concentration (BAC) to .08 grams percent or above. This typically will occur when a man consumes five or more drinks and a woman consumes four or more. (National Institute of Alcohol Abuse and Alcoholism [NIAAA], 2009).

Binge eating: consuming an unusually large amount of food (Mayo Foundation for Medical Education and Research, 2008).

Binge Eating Disorder (BED): Occurrence of at least two binge eating episodes a week on average for 6 months, and meets three of the five following symptoms; eating more rapidly than usual, until uncomfortably full, when not physically hungry, alone or feeling upset, and over eating. In addition, individuals must not engage in compensatory behaviors (purging, excessive exercise) and binges may be followed by feelings of guilt, disgust, and self-loathing (*DSM-IV-TR*, 2000).

Social Support: a multidimensional construct consisting of people as interpersonal resources who provide gratification of basic human needs in relationships (Hubbard et al., 1984).

CHAPTER 2

LITERATURE REVIEW

The two main purposes of this review of literature are to identify associations between binge eating and binge drinking behaviors. The second is to assess the role perceived social support has on the presence of these bingeing behaviors.

The review will begin with a discussion of behavioral theory. The determination of how an individual develops his or her ability to cope (their behaviors) and why they may turn to negative health behaviors, such as binge eating and drinking is complex. Individuals that are unable to cope and the differing responses are studied through behavioral theories. There are many theories related to coping strategies and health behaviors; specific to binge eating and drinking the Affect Model is one such theory. The Affect Model was selected to be reviewed because it is often referred to in the literature (Whiteside, 2007).

The following three sections will be a review of studies related to social support, binge eating, and binge drinking. The last three sections will review assessment methods, beginning with the assessment of social support using the Social Support Questionnaire: 6 (SSQ: 6) (APPENDIX A). Next the assessment of binge eating utilizing the Questionnaire on Eating, and Weight Patterns-Revised (APPENDIX B) will be reviewed, and lastly the assessment of binge drinking will be discussed.

Social Support Theory

Since the 1970's researchers have taken an interest in social support and health behaviors. A link between social support, psychological, and physical well being has been noted in many studies (Cohen & Wills, 1987; Langford, Bowsher, Maloney, & Lillis, 1997;

Osteberg & Lennartsson, 2007; Semmer, Elfering, Jacobshagen, Perrot, Bechr & Boos, 2008). However, defining social support is complicated because of the multi-faceted nature of social support (Hupcey, 1998). Most researchers agree on a broad definition of social support as a "multidimensional construct consisting of people as interpersonal resources who provide gratification of basic human needs in relationships" (Hubbard et al., 1984, p. 267).

Defining the Attributes of Social Support

Although the definition of social support may be very broad there are four defining attributes of support most researchers have agreed upon. These four attributes are emotional, instrumental, informational, and appraisal support (Cohen & Wills, 1985; Langford et al., 1997; Osteberg & Lennartsson, 2007; Semmer et al., 2008). These attributes refer to 1) the functional aspect of social support and 2) how interactions translate between supportive people and supported people (Cohen & Wills, 1985; Semmer et al., 2008).

Emotional support includes support related to caring, empathy, and esteem (Semmer et al., 2008). This type of support is related more to intangible acts such as listening and providing a sense of concern (Osteberg & Lennartsson, 2007). Instrumental support is tangible support and can be defined as the use of tangible help or information in problem solving (Langford et al., 1997; Semmer et al., 2008). Instrumental support includes more concrete forms of support, for example, in the form of money and labor (Osteberg & Lennartsson, 2007). Informational support is based on support in the form of advice or information (Osteberg & Lennartsson, 2007). Lastly, appraisal support is similar to informational support in that it deals with advice and information. It differs from

informational support, however, because it is based on information relevant to self-evaluation instead of problem solving (Langford et al., 1997).

The four types of social support are usually highly correlated and all attributes are important to providing an individual with support (Semmer et al., 2008). The occurrence of this high correlation is especially true if the types of social support are all provided by the same individual (Semmer et al., 2008). When measuring social support a global measure, which encapsulates all types of support, such as the Social Support Questionnaire (Sarason, Shearin, Pierce, & Sarason, 1987) is most often utilized.

Social Networks

As previously stated, social support is a multidimensional concept with many different interacting aspects (Langford et al., 1997). One interaction that occurs is the individual receiving support with the providers of support, i.e. the recipient's social network. A social network is the structure of an interactive process, where as social support is developed out of this process (Langford et al., 1997). The structure of the social network is made up of providers of support for an individual. Social networks vary from person to person and each network has its own characteristics. Social network characteristics and the extent in which they succeed in helping an individual vary depending on the environment and on the people that comprise the social network. For instance, social support can be either positive, negative, or a combination of the two. An individual's social network is related to their level of social support and this can affect how the individual interacts with their environment (Cohen & Wills, 1987; Hays & Oxley, 1986).

Social networks help determine the affect peer relationships have on health behaviors (Hubbard et al., 1984). If an individual can rely on their social support network

to help them cope, they will have a better chance of transitioning into college, and possibly avoid risky health behaviors (Bosari & Carey, 2006; Cohen & Willis, 1987; Hays & Oxley, 1986). Researchers state if an individual's quality of peer relationships (social network) starts to disappear it can result in the individual feeling alone or conflicted (Bosari & Carey, 2006; Lepore, 1992). This situation of loneliness then presents a challenge for the individual that they must then attempt to handle. For example, researchers found a breakdown in quality of peer relationships (social networks) can in turn increase alcohol intake among adult females (Bosari & Carey, 2006).

Specific to college students, a study completed on college freshman that followed the development and functioning of social networks found social networks do affect adaptation to college life (Hays & Oxley, 1986). Specifically, a significant amount of variance in the college adaptation of first year students was due to differences in social network characteristics (Hays & Oxley, 1986). Hays and Oxley (1986) studied the social support networks of an individual, finding social support is influenced by personal, environmental, and temporal factors. Depending on the type of stressor that a person is experiencing, the adaptiveness of a particular characteristic of a network will vary (Hays and Oxley, 1986, p.306). Hays and Oxley (1986) found that social support networks were significantly associated with the successful adaptation of freshman into college life.

Received versus Perceived Social Support

Another interaction of social support is received social support and perceived social support. Received social support refers to specific supportive behaviors that are provided to individuals by their support networks (Sarason et al., 1990). An individual that is receiving social support may receive support through various avenues. Examples of how individuals may give social support are listening to a friend, helping a sibling move into a

new house, and lending money to someone in need. Whether or not these actions of social support, listening to a friend etc., are helpful is determined by the perception of the individual receiving the support, also known as, perceived social support. Perceived social support is support that may be influenced by values and judgments regarding the relationship with the individual that is providing the support. In other words, the relationship with the individual that is providing the support may affect the level of satisfaction with the perceived level of social support. In the same manner the level of satisfaction with the received social support may be influenced by various factors such as self- esteem and locus of control. Also, the current events of an individuals' life can influence level of perceived social support (Sarason et al., 1995).

In a study of 46 post surgery low back pain patients, researchers found the majority of supportive behaviors were important because of the emotional meaning the individual attached to them (Semmer et al., 2008). In other words, how the acts were perceived made the supported individual feel supported. Specifically, more than 70% of the situations that were described as instrumental carried an emotional meaning, at least in part (Semmer et al., 2008).

Behavioral Theory

When an individual is experiencing negative emotions a decision of how to cope with these negative emotions must be made (Cohen & Willis, 1987). The Affect model states that bingeing behaviors are brought on by negative affect (NA) (Whiteside et al., 2007). Negative affect is used to refer to the full spectrum of negative emotions including depression, anxiety, etc. (Whiteside et al., 2007). The model hypothesizes that stress is reduced by a negative reinforcer, such as bingeing (Cooper, 1994; Whiteside et al., 2007). Bingeing is a form of coping that may provide brief relief from painful emotions (Cooper,

1994; Stewart, Brown, Devoulyte, Theakston, & Larsen, 2006; Whiteside et al., 2007). Some studies report that in individuals who binge eat, more than 50% of their binges are not due to hunger but to NA instead (Whiteside et al., 2007.) This causal model not only hypothesizes NA plays a role in determining factors for binge eating disorder (BED), such as coping, but also plays a role in maintaining bingeing behaviors (Engelberg, Steiger, Gauvin, & Wonderlic, 2007).

Co-Morbidity of Binge Eating and Binge Drinking

Binge eating and drinking are often considered addictive behaviors that have a high rate of co-occurrence (Benjamin & Wufert, 2005; Luce, Engler, &, Crowthner, 2006). Studying these behaviors together may provide insight into the mechanisms behind these negative health behaviors. Various traits are associated with individuals who binge eat and/or drink. For example, low self-esteem, and depression are linked to both binge eating and binge drinking (Benjamin & Wufert, 2003; Bosari & Carey, 2006).

Although research reports a high co-occurrence of alcohol use and eating disorders it is still unknown what the direct link between alcohol use and eating disorders could be (Krahn, Kurth, Gomberg & Drewnowski, 2005; Luce et al., 2007; Piran & Robinson, 2006; Stewart et al., 2000). Research has determined alcohol use may alter eating patterns among college students (Krahn et al., 2005; Lloyd-Richardson, Lucero, DiBello, Jacobson, & Wing, 2008; Luce et al., 2007; & Stewart, Angelopoulos, Baker, & Boland, 2007). More specifically, in a study of 1384 first year college women investigators found the prevalence and intensity of binge eating was more closely associated with the intensity of alcohol use than other measures such as depression, parents' drinking level, and early age of first drink (Krahn et al., 2005). Although most of the published research involves only college women one of the reviewed studies included men and women (Lloyd-Richardson et al.,

2008). Investigators studied 282 college men and women. Utilizing the Eating and Alcohol Use Questionnaire and the Alcohol Use Disorders Test researchers sought to understand how alcohol consumption in college freshmen affects eating patterns before, during, and after drinking (Lloyd-Richardson, 2008). They found alcohol intake did have an impact on eating behaviors, which was an increase in appetite in 32.5% of students. The impact of alcohol on eating behaviors occurred especially in those that were drinking at moderate or high levels. Moderate and high drinkers, or those who drank an average of four to five drinks per episode on one to three days per week, were more likely to over eat than low or non-drinkers (Lloyd-Richardson, 2008).

The reviewed studies have found an association between binge eating and problematic alcohol use. However, some of the investigators found the correlations to be weak (Xinaris & Boland, 1990; Piran & Robinson, 2006). The researchers completed a study on 167 randomly selected undergraduate women. Researchers of the study did suggest that in different population correlations between alcohol use and binge eating could be stronger (Xinaris & Boland, 1990). The trend in the literature shows an association between these bingeing behaviors. The studies reported a correlation between alcohol use and binge eating. However, researchers cannot prove a causal relationship, meaning alcohol use does not necessarily cause an individual to binge eat and vice versa.

Social Support, Coping, and Bingeing

As a reaction to stress an individual may go to extreme eating and drinking behavior in order to cope with stress (Cooper, 1994; Agras & Telch, 1998). Researchers found in a study of 2,052 young adult males and females coping motives were the strongest predictor of heavy alcohol use (Cooper, 1994). Coping motives can be affected by stress and emotions. Stress and emotions are factors that can affect food and drink intake (Agras

& Telch, 1998; Cooper, 1994; Lepore, 1992; Luce et al., 2001; Whiteside et al., 2007). When stress levels are increased, perceived social support can provide a level of emotional comfort which may in turn decrease the need for coping activities such as binge eating and drinking. Stress levels alone do not directly cause harmful behaviors in individuals but the choice of negative coping strategies in reaction to stress could be the cause (Agras & Telch, 1998; Cooper, 1994; Lepore, 1992; Luce et al., 2001; Whiteside et al., 2007). Eating and drinking related to stress may occur when individuals try to cope with stressful situations. These behaviors are referred to as emotion focused coping, or "trying to avoid the problem causing stress, and/or the emotions connected to it" (Laitinen, Ek, & Sovio, 2001, p. 29). Other researchers completed a study of over 5,000 men and women. Researchers reported the best predictor of stress related eating and drinking among women was a lack of emotional support, which is an aspect of social support (Lepore, 1992). Others have found similar results in that perceived social support affects the ability to cope with stress (Hays & Oxley, 1986).

Researchers also investigated the alcohol use patterns, and motives for drinking among women with the diagnosis of bulimia nervosa (BN), binge eating disorder (BED), eating disorder not otherwise specified (EDNOS), as well as those with out eating disorders (Luce et al., 2001). The results of the investigation were also similar to previous studies in that they found women with "probable BED" reported consuming more alcohol over the weekend and binge drank more than women who were not diagnosed with BED (Luce et al., 2001). The pattern that emerged in motives for drinking was women with eating disorders might use alcohol to cope with NA. The question 'does the perception of a high level of social support reduce the psychological distress?' was raised by researchers (Lepore, 1992). After a study of 228 college students took place researchers found that

individuals that faced social conflicts needed an increased level social support, much like the findings of other researchers (Hays & Oxley, 1986; Lepore, 1992). The extra social support aided individuals in coping with difficult situations where they may have turned to other coping mechanisms.

Overall, the studies support the tendency for binge eating and drinking to occur together (Krahn et al., 2005; Lloyd-Richardson, Lucero, DiBello, Jacobson, & Wing, 2008; Luce et al., 2007; & Stewart, Angelopoulos, Baker, & Boland, 2007). The studies also support similar motives for binge eating and drinking such as to cope with stress and depression (Benjamin & Wufert 2005; Krahn et al., 2005; Stewart et al., 2000). The above studies also show the importance social support may have on managing individual stress. If stress is managed properly, the need to rely on negative compensatory coping mechanisms may be diminished.

Bingeing, Negative Affect (NA) and Mood

As previously stated research exists to support the hypothesis that there is a high co-morbidity of alcohol use and eating disorders (Benjamin & Wufert 2005; Krahn et al., 2005; Stewart et al., 2000). While this is an important finding it is also helpful to understand why these behaviors are likely to occur together. A cited explanation is that these disorders occur as a coping mechanism for lack of social support (Laitinen et al., 2001).

All researchers found binge eating and/or drinking may occur as a coping mechanism to deal with NA in women (Birch, Stewart, & Brown, 2007; Luce et al., 2007; & Stewart et al., 2006). More specifically Birch et al. (2007) p. 441 states, "binge eating and drinking are equally likely to occur in relief situations involving unpleasant emotions, and physical discomfort". Researchers reported NA can trigger binge eating. Investigators

also found the presence of NA may not only trigger binge eating but a potential reason for binge eating may be to avoid or reduce negative affect (Luce et al., 2007). Stewart et al. (2006) found similar results in women with alcohol problems stating, "women who frequently binge eat for emotional relief also tend to engage in frequent heavy drinking for similar reasons of emotional relief" (Stewart et al., 2006, p.420). These findings suggest that the more a woman drinks heavily in order to cope with negative emotions, the more binge eating will occur for the same reason.

All three of these studies tested suggest that alcohol intake/food consumption will be more likely to occur if the individual expects that NA will be reduced or if positive affect will be increased (Birch et al., 2007, Luce et al., 2007, & Stewart et al., 2006). All three studies came to support binge drinking may be more likely than binge eating to be perceived as increasing positive affect (Birch et al., 2007).

Researchers took a slightly different approach when they investigated negative mood and its relationship to binge eating (Agras & Telch, 1998; Whiteside et al., 2007). Both studies found that a negative mood could have an affect on bingeing behaviors. Agras and Telch (1998) found in a study of obese women negative mood and caloric deprivation can be linked to loss of control over eating. Researchers reported binge eaters most often lack the skills necessary to cope with negative moods effectively (Whiteside et al., 2007).

Lastly, a study was reviewed which investigated loneliness and disordered eating. Those who suffer from eating disorders often feel alone (Pritchard & Yalch, 2008). They tend to emotionally separate themselves from family and friends; therefore, they lose their social network and social support (Pritchard & Yalch, 2008). Researchers found loneliness might in fact be related to disordered eating in men and women (Pritchard & Yalch, 2008).

All of the studies reviewed found binge eating and drinking to be a response to certain negative aspects or stressors of an individual's life (Agras & Telch, 1998; Birch et al., 2007; Luce et al., 2007; Prichard & Yalch, 2008; Whiteside et al., 2007). College students are especially at risk for experiencing overwhelming stress as they struggle to adjust to new surroundings and changes in their social support (Pritchard & Yalch, 2008). As students internalize these experiences, they may rely on their social support networks for coping or seek out some other less healthy coping mechanism, such as binge eating or drinking.

Contribution to the Literature

This study helps fill in a gap in the research on social support. There have been studies completed on alcohol use or binge eating alone and social support but there are not many studies completed on the specific behaviors of binge drinking, binge eating, and social support. Another strength of this study is the relatively large sample size; small sample size was a limitation of many of the reviewed studies. This study also included males and females, which was strength of the study because most bingeing behaviors studies do not include males, especially binge eating behaviors studies. This investigation also aids in the design of interventions and awareness campaigns on college campuses. If a trend in the data between bingeing and lack of social support is found interventions can be tailored to include strategies for increasing the social support networks in college students.

Assessment Methods

Based on the review of literature, a variety of assessment methods regarding social support, binge eating, and binge drinking may be utilized by researchers. There appears to be no gold standard in the assessment of these behaviors. Through personal communication with a researcher in the field (B. Lewis, personal communication,

November 12, 2008) it was determined the most appropriate assessment methods for this population are the Social Support Questionnaire (SSQ) and the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R). This review of literature will focus on the use of the SSQ, the QEWP-R, and the general binge drinking questions used in the research questionnaire.

Assessment of Social Support

Social support may be assessed through questionnaires and interviews. For the purposes of this review of literature the focus will be on social support questionnaires. Social support research suggests individuals have certain general expectations about their social relationships (Pierce, Sarason, & Sarason, 1991). Therefore, in order to assess social support a researcher must first determine the number of supporting individuals in a participant's life and the level of satisfaction with the support (Sarason et al., 1987). The Social Support Questionnaire (SSQ) assesses both of these measures. The SSQ is available in three forms; which are the long form, the SSQ-6 form, and the SSQ-3 form. The long form is a 27-item questionnaire, the SSQ-6 is a six-item questionnaire, and the SSQ-3 is a three-item questionnaire. All of the questionnaires are accompanied by a Likert scale to rate the level of satisfaction of support with each specific question. The SSQ-6 was chosen for this current study because of the validity and reliability of the instrument is comparable to the long form (Sarason et al., 1987). Pierce et al., (1991) compared the SSQ to many other general perceived social support measures. It was found the SSQ was consistently correlated to the other measures (Pierce et al., 1991). For example, in a study of 136 female and 81 male undergraduate students it was found the SSQ was highly correlated with other general perceived social support measures including; the Inventory of Socially Supportive Behaviors, Social Network List, and the Family Environment Scale (Sarason et

al., 1987). This correlation is most likely due to the broad nature of the SSQ, which has the ability to assess the main concepts of social support (Sarason et al., 1987).

Assessment of Binge Eating

Binge eating disorder can be defined as; two binge-eating episodes a week, on average for six months, with lack of control over eating behavior. The behavior of binge eating is also often associated shame and/or embarrassment and most often binges occur when the individual is alone (*DSM-IV-TR*, 2000). In order to clinically assess binge eating disorder all of these behaviors must be evaluated. Binge eating may be evaluated through a personal interview or a survey. The QEWP-R is an example of a survey commonly utilized in the field (B. Lewis, personal communication, November 12, 2008).

The QEWP-R is a self-report measure that assesses these bingeing behaviors meaning the questions are based on the *DSM-IV* definition of binge eating, a strength of this measure. Binge eating includes many behaviors. The internal consistency of the QEWP-R has been tested in a study of 44 obese participants. The QEWP-R and a clinical evaluation, through an interview, were utilized to evaluate binge eating. The study reported similar findings for binge eating levels between the QEWP-R and the interview (Allison, 1995, p. 314-315).

Assessment of Binge Drinking

Binge drinking was be defined as drinking five or more alcoholic drinks in one setting for males, and four or more alcoholic drinks for females. A standard drink consisted of 12 oz of beer, 1.5 oz of liquor, or 5 oz. of wine (U.S. Department of Health and Human Services, [HHS] 2009). The National College Health Assessment (NCHA, 2008) survey is nationally recognized, and provides simple, and easy to complete questions. The NCHA was created by the American College Health Association (ACHA).

Data from NCHA has been cited in several academic journals, including, Journal of American College Health, American Journal of Health Education, and Journal of Studies on Alcohol.

Summary

Although the use of bingeing behaviors as a coping mechanism in the absence of social support has yet to be definitively established there are a few statements related to bingeing and social support that are generally accepted. One is some college students will choose to participate in risky behaviors at some point (Mintz & O'Halloran, 2000; Wechsler et al., 1995; Whiteside et al., 2007). Some of those risky behaviors could include binge drinking and binge eating. What is unknown is why these behaviors occur in some college students but not all. All students eat and many drink alcohol, yet not all go to the extreme of bingeing. An objective of this study is to determine if there is an association between bingeing behaviors and social support in college students. Secondly, it is known that binge eating and drinking behaviors can occur together. What was found in the literature was a possible explanation for the motives behind these behaviors, including NA and the use of bingeing as a coping mechanism (Fisher et al., 2004; Fisher & Smith, 2008; Whiteside & Lynam, 2001; Xinaris & Boland, 1990). Related to coping are certain aspects of social support. Social support is related to emotional functioning and a person's ability to cope, which may lead to bingeing (Hays and Oxley, 1986; Lepore 1992). Even with a large body of research on social support and on bingeing behaviors there are still unanswered questions. A current research question is, what level of social support is associated with bingeing behaviors and if bingeing behaviors are co-morbid specific to this population. The goals of this study are to answer what level of social support is found in

college students who binge eat and/or drink, what is the prevalence of binge eating and binge drinking, and if there are gender or age differences in those individual who binge.

CHAPTER 3

METHODS

Participants

The sample consisted of consenting students enrolled in HNES 100 and 111 Wellness courses. Approximately 300 students were eligible to complete the survey (Appendix C).

Instrumentation

The survey included questions related to binge eating behaviors, binge drinking behaviors, and social support. Participants were also asked to provide their student ID number and general demographic data. General demographic questions included age, gender, ethnicity, height, weight, and class standing. The student ID number was needed to provide the students with five extra credits points for completion of the survey. The ID number was removed from the survey once credit was given; therefore, no identifiers were present in the final data set.

The survey contained nine questions related to binge eating, taken from the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R). The QEWP-R is a reliable and valid measure for predicting disordered eating (Benjamin & Wulfert, 2005). Binge eating was classified as eating a large amount of food in the past six months without participating in compensatory behavior such as purging after the binge eating behavior (Hays and Oxley, 1986; Mayo Foundation for Medical Education and Research [MFMER], 2008). An example questions from the survey is, "*During the past six months, did you ever eat within any two-hour period what most people would regard as an unusually large amount of food?*".

The survey also included two binge drinking questions based on previous health surveys conducted by the American College Health Association, National College Health Assessment survey (NCHA, 2008). The two binge drinking questions were 1) *"During the past 30 days, on how many days did you have at least one alcoholic drink? (One drink defined as 1.5 oz. cocktail, 5 oz. wine, 12 oz. beer.)* 2) *"For Males: During the past 30 days on how many days did you have five or more drinks of alcohol within a few hours?"* and *"For Females: During the past 30 days on how many days did you have four or more drinks of alcohol within a few hours?"*. The participants were allowed to select from seven responses, " *0-zero, 1-one, 2-two, 3-three to five, 4-six to nine, 5-ten to nineteen, 6-twenty to twenty-eight, 7-all days"*, when answering the binge drinking questions. Participants were classified as binge drinkers if they had five or more alcoholic drinks (men) and four or more alcoholic drinks (women) in one setting. A standard alcoholic drink was defined as 12 oz of beer, 1.5 oz. of liquor or 5 oz. of wine (U.S. Department of Health and Human Services, [HHS] 2009). Severity of binge drinking was measured by the frequency of binge drinking episodes during the past 30 days from zero (*days of bingeing*) to seven (*bingeing on all days*).

Questions related to social support were included in the last section of the survey. There were six questions taken from the Social Support Questionnaire (SSQ; Sarason, Levine, Basham, & Sarason, 1983). Each question described a situation and the participant selected the person/people that supported them in that type of situation. The question also asked participants to rate their level of satisfaction with the available support for each of the situations on a six point Likert Scale. For example one of the questions was, "*Whom can you really count on to distract you from your worries when you feel under stress?*". Social support was determined by the frequency of satisfaction with the level of support

they receive (S-score) and the number of individuals the participant has supporting them (N-score).

Procedures

An electronic survey was distributed to consenting students. Recruitment consisted of a brief in-class announcement by the principle investigator (APPENDIX D). Only students who were at least 18 years of age were included and consent was implied by completion of the survey. Any students who responded to the survey and were not yet 18 years old were removed from the database. The survey was available on Blackboard, an online portal for students of the university, for one week, and took approximately five minutes to complete. Students that completed the survey received five extra credit points towards their overall course grade. Those who choose not to participate in the survey were still eligible for extra credit points by writing a short essay on the consequences of binge eating or drinking for college students.

Data Analysis

Once all data was collected results were downloaded from the survey on Blackboard and transferred to an Excel spreadsheet. The Statistical Package for the Social Sciences (SPSS) for Windows, version 15.0, was used for all statistical analysis. Levels of significance were set at $p \leq .05$ for all tests.

Descriptive statistics were used to gain more knowledge about the population being tested. To answer research question one, related to the prevalence of binge eating and drinking among college students, an unpaired independent t-test was used on the data. Research questions two and three are, "is a low level of perceived social support associated with binge drinking, and/or eating", and "are there a gender/age differences between binge eating and drinking behaviors". To answer questions two and three unpaired independent

t-tests and a Spearman's rank correlation were used for comparisons between the level of participation in bingeing behaviors and level of perceived social support. In order to answer question four descriptive statistics were calculated.

CHAPTER 4

PAPER 1: SOCIAL SUPPORT AND BINGEING BEHAVIORS IN COLLEGE STUDENTS

Every year millions of young adults enter college (U.S. Department of Education, 2008); with most facing a diverse array of financial, academic, and social challenges and changes. While each change is unique, social changes, particularly in individual social networks, can have a direct impact on health and health behaviors (Bosari & Carey, 2006; Hubbard, Muhlenkamp, & Brown, 1984; Von Ah, Ebert, Ngamvitroj, Park, & Kang (2004). Two health behaviors that are especially relevant to college students and changing social networks are binge eating (BE) and binge drinking (BD) (Agras & Telch, 1998; Cooper, 1994; Hays and Oxley, 1986; Lepore 1992).

Both binge drinking and binge eating are magnified during college. The highest rates of alcohol consumption are found in adults ages 18-24, with consumption more prevalent among college students compared to non-students. Typically, about half of all students report binge drinking (Vicary & Karshin, 2002). Another bingeing behavior is binge eating. Within the scope of eating disorders binge eating is a relatively new classification, not arriving into the *DSM* manual until 1994 (Diagnostic and Statistical Manual of Mental Disorders; *DSM-IV*; American Psychiatric Association, 1994). For the purpose of this study binge eating is characterized as eating a large amount of food, without participating in compensatory behavior such as purging after the binge eating behavior (Hays and Oxley, 1986; Mayo Foundation for Medical Education and Research [MFMER], 2008). This definition of binge eating differs from other eating disorders such as anorexia nervosa and bulimia nervosa, which include dietary restraint. Anorexia nervosa and bulimia nervosa are less prevalent than binge eating, with anorexia nervosa affecting about 0.3% of U.S. adults

and no consistent data on the prevalence of bulimia nervosa. The prevalence of binge eating, however, is near 20% in college females and 6-7% in college males (Whiteside, Chen, Neighbors, Hunter, Lo, & Larimer, 2007). Binge eating may also occur at sub threshold levels, thereby increasing the true prevalence closer to 20% or even 30% in college females (Mintz & O'Halloran, 2000).

Bingeing behaviors, drinking or eating, are thought to be more prevalent in college students faced with difficult social challenges, real or perceived. As a student begins college, and with each new school year, there can be both subtle and dramatic changes in social support and social networks, creating new social challenges. New social challenges can affect a student's health and life (Agras & Telch, 1998; Cooper, 1994; Hays and Oxley, 1986; Lepore 1992; Pritchard & Yalch, 2008; Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2003). For example, a student may choose to include individuals in their social network who partake in risky behaviors. A few risky behaviors include; binge eating, binge drinking, tobacco use, and unsafe sexual activity (Von Ah et al., 2003) If a student's social network includes individuals who partake in these risky behaviors they themselves are more likely to participate in risky health behaviors (Groh, Jason, Davis, Olson & Farrari, 2007). These risky behaviors can sometimes have long term effects on the student's health and life.

Studying associations of risky behaviors allows practitioners to further develop and refine specific interventions. The value of this study is enhanced by the sample size and the inclusion of binge eating behaviors. Many of the previous studies were limited by the sample size and have not included binge eating when evaluating bingeing behaviors. Additionally, including male and female participants in the study enhances its value, as men are traditionally underrepresented in disordered eating studies.

The primary objectives of this study are to determine if there is an association between bingeing behaviors and social support in college students and to determine differences within bingeing behaviors. Utilizing a sample of college students provides a different estimate of the nature of these associations from the general U.S. population samples, and has been advocated for by other researchers (Piran & Robinson, 2006).

Methods

Participants were 216 college students (57% male), between 18- 25 years, who were enrolled in a university required general education Wellness course at a Midwestern University. Participants volunteered to complete an online survey, and were awarded a small amount of course extra credit for doing so. The survey was administered electronically through the course management system outside of class time, and participants were given one full week to complete the survey. Not all of the questions were answered by every participant; therefore, the results/percentage for each of the questions was based on the specific response to that question and not the total number of responses.

Measures

The survey included a variety of questions related to; basic demographics, eating and drinking behaviors, and social support. Participants' age, class standing, ethnicity, gender, height, and weight were collected by the survey.

Questionnaire on Eating and Weight Patterns-Revised (QEWP-R)

Binge eating behaviors were assessed with nine questions taken from the Questionnaire on Eating and Weight Patterns-Revised (QEWP-R). For example one of the questions on the survey was, "*During the past six months, did you ever eat within any two-hour period what most people would regard as an unusually large amount of food?*".

The QEWP-R is a self-report measure designed to assess the presence of binge eating, the frequency of these episodes, and other diagnostic criteria as defined in the Diagnostic and Statistical Manual of Mental Disorders-IV-Text Revision (*DSM-IV-TR*). The QEWP-R is a reliable and valid measure for predicting disordered eating (Benjamin & Wufert, 2005). Participants were classified as having binge ate if at some point in the past six months, they ate what most people would regard as an unusually large amount of food within any two hour period with out participating in compensatory behavior such as purging after the binge eating behavior (Hays and Oxley, 1986; Mayo Foundation for Medical Education and Research [MFMER], 2008)

Binge Drinking

Binge drinking behaviors were assessed by two questions on the survey. The questions on the survey were, 1) "During *the past 30 days, on how many days did you have at least one alcoholic drink? (One drink defined as 1.5 oz. cocktail, 5 oz. wine, 12 oz. beer),* 2) *"For Males: During the past 30 days on how many days did you have five or more drinks of alcohol within a few hours?"*, and *"For Females: During the past 30 days on how many days did you have four or more drinks of alcohol within a few hours?"*. The participants were allowed to select from seven responses, " *0-zero, 1-one, 2-two, 3-three to five, 4-six to nine, 5-ten to nineteen, 6-twenty to twenty-eight, 7-all days"*, when answering the binge drinking questions. The two survey questions were based on previous health surveys conducted by the American College Health Association, National College Health Assessment survey (NCHA, 2008).

Social Support Questionnaire-6 (SSQ-6)

Level of perceived social support was assessed with the Social Support Questionnaire-6 (SSQ-6). The SSQ-6 is a self-report measure that measures the number of perceived available support (N) and the level of satisfaction with the participants' perceived available support (S). The SSQ-6 lists six different circumstances such as, *"Whom can you really count on to distract you from your worries when you feel under stress?"*. Participants were then asked to select up to twelve different sources of support and rate their satisfaction with their support on a six-point Likert scale (Sarason, Shearin, Pierce, & Sarason, 1987).

Statistical Analysis

Data were analyzed via Statistical Package for the Social Science (SPSS) for Windows, version 15.0. Descriptive statistics were used to compute various demographic variables. To achieve the objectives of the study, groups were constructed based on the participants' gender or age and reported bingeing behaviors (binge eating (BE), binge drinking (BD), binge eating and binge drinking (BE/BD), and no bingeing behavior (NB)). Further, the social support data were broken-down into low, moderate, and high categories for S- and N- Scores. Dividing the scores in this manner is typical of social support research (Pierce et al., 1991; Sarason et al., 1987). The categories were determined by frequency distribution of S- and N-Scores. Those with the lowest S-scores fall into category 1, their scores ranged from 6 to 36. Individuals with S-Scores ranging from 28-32 were in the moderate category. Individuals with S-scores ranging from 33-36 were placed in the highest category. The low category for N-Scores included scores ranging from 0-15. The N-scores in the moderate category were scores ranging from 16-22. Lastly, N-scores

ranging from 23-50 were in the high category. Data were then analyzed by bingeing behavior, age, and gender.

Independent sample *t* tests were used to examine difference in means between genders. Chi-square tests for independence were used to examine differences in proportion between genders. Lastly, Spearman's rank correlations were used to determine correlations between bingeing behaviors and social support. Levels of significance for all tests were set at $p \leq .05$

Results

A total of 216 out of 314 enrolled students completed the online survey (68.8%). Basic demographic data and social support scores (mean perceived level of Social Support (S Score) and mean number in Social Network (N Score)) were calculated and are described in Table 1. The majority of participants were Caucasian (91.5%), which is representative of the University as a whole.

Table 1 also contains information regarding the proportion of males and females who report each bingeing behavior. No significant differences between genders existed for binge eating (males = 46.0% vs. females = 32.6%, p=.056, $\chi 2$ =3.656,) or binge drinking (males = 54.0% vs. females = 43.5%, p=.095, $\chi 2$ =2.789). However, male students reported significantly higher rates of the two behaviors combined compared to the female students (binge eating/drinking 28.2% vs. 15.2%, respectively, p=.027, $\chi 2$ =4.875). Gender and severity level of binge drinking behavior were also a part of the study and are detailed in Table 1. The three severity levels are; level 0= individuals who drink alcohol, yet have not binged in the past 30 days; level 1=individuals who binge drank only once in the past 30 days; and level 2= individuals who frequently binge drink (2 or more binge drinking episodes in the past 30 days). Between genders there was a significant difference in Level

1 severity (males = 64.04% vs. females = 35.96%, p=.008, $\chi 2$ =7.022). Lastly, no significant differences were found between males and females and; mean age, mean perceived level of social support, and mean number in social network.

Table 1. Descriptive Statistics for College Students by Gender

Variable	Male n=124	Female n= 92	Total n=216	*P*
Mean Age in Years[a]	19.90 ± 2.23	20.24 ± 5.91	20.05 ± 4.210	.548
Mean S Score[a]	29.72 ± 5.53	28.56 ± 6.44	29.21 ± 5.96	.155
Mean N Score[a]	19.71±8.76	20.26±9.01	19.95 ± 9.12	.657
Binge Eating[b,c]	57(46.0%)	30(32.6%)	87(40.28%)	.056
Binge Drinking[b,c]	67 (54.0%)	40 (43.5%)	107(49.54%)	.095
Binge Eating/Drinking[b,c,d]	35 (28.2%)	14(15.22%)	49 (22.69%)	.027
Severity Level 0[a]	55 (50.92%)	53 (49.07%)	108 (48.87%)	.414
Severity Level 1[a,d]	57 (64.04%)	32 (35.96%)	89 (40.27%)	.008
Severity Level 2[a]	14 (58.33%)	10 (41.66%)	24 (10.86%)	.847

Note. The *p* values represent differences between genders; a: tested with *t* test; b: tested with Chi Square Test for Independence c: the total refers to the number of individuals who report bingeing behaviors; d: significant at $p \leq .05$.

Means and standard deviations of bingeing behavior data, binge drinking severity level, and social support scores were also divided by age and are detailed in Table 2. A Chi square test was used to test for differences in the proportion of reported bingeing behaviors between those ages 18-20 and ages 21-25 (n= 29) the *p* values were found and are listed in (Table 2). When considering age, there were significantly greater proportion of younger students reporting binge drinking compared to the older students (level 0, 89.42% vs. 10.58%, respectively, *p*= .007; level 1, 84.52% vs. respectively, 15.48% , *p*=.000;level 2, 78.26% vs. respectively, 21.74%, *p*=.000) The chi square values for testing differences in proportion in age category with in binge eating, drinking, and eating/drinking were also calculated and there was no significant difference in any of the bingeing behaviors ($\chi 2$=.083, 1.883, and .029) respectively.

Table 2. Descriptive Statistics for College Students by Age

Variable	Age 18-20 n=182	Age 21-25 n= 29	Total n=211	*P*
Mean Age in Years[a]	18.93 ± .608	22.24 ± .828	19.38 ± 1.35	-
Mean S Score[a]	29.16 ± 6.00	29.47 ± 5.81	29.21 ± 5.96	.155
Mean N Score[a]	19.64 ± 9.07	21.42 ± 9.34	19.95 ± 9.12	.675
Binge Eating[b,c]	75 (41.21 %)	11 (37.93 %)	86 (40.76%)	.773
Binge Drinking[b,c]	88 (48.35%)	18 (62.07%)	106(50.24%)	.170
Binge Eating/Drinking[b,c]	42 (23.08%)	7 (24.14%)	49 (23.22%)	.864
Severity Level 0 [a,d]	93 (89.42%)	11 (10.58%)	104(49.29%)	.007
Severity Level 1 [a,d]	71 (84.52%)	13 (15.48%)	84 (39.81%)	.000
Severity Level 2 [a,d]	18 (78.26%)	5 (21.74%)	23 (10.90%)	.000

Note. The *p* values represent differences between age categories; a: test with t-test; b: tested with Chi-square; c: the total refer to the individuals who report bingeing behaviors; d: significant at $p \leq .05$.

Table 3 includes data on number of individuals related to their bingeing and/or non bingeing behaviors and their perceived level of social support (S-Score). The social support data were broken-down into three levels of social support. Regardless of reported bingeing behaviors, including non-bingeing, there was no significant difference found between level of S-score within a specific behavior (p= .778, .277, .748, .144, respectively).

Table 3. Differences within Bingeing Behaviors and Perceived Level of Social Support (S-Score)

Variable	Low	Moderate	High	$\chi 2$	*P*
Binge Eating (n=89)	27	33	29	.503	.778
Binge Drinking (n= 112)	30	41	41	2.569	.277
Binge Eating/Drinking (n=51)	13	20	18	.580	.748
Non-Bingeing (n=78)	19	38	21	3.882	.144

Note. Tested with Chi Square Test for independence, *p* values represent differences within bingeing behaviors.

Table 4 reports data on number of individuals related to their bingeing and/or non bingeing behaviors and number of individuals in their social network. The social support data were broken-down into three levels. No significant differences were found in N-scores in those who binge eat, binge drink, binge eat and binge drink, and those who do not binge (p= .853, .362, .602, .334, respectively).

Table 4. Differences within Bingeing Behaviors and Number of Individuals in Social Network (N-Score)

Variable	Low	Moderate	High	$\chi 2$	*P*
Binge Eating (n=89)	27	31	31	.318	.853
Binge Drinking (n= 112)	38	34	40	2.035	.362
Binge Eating/Drinking (n=51)	18	15	18	1.014	.602
Non-Bingeing (n=78)	24	32	22	2.194	.334

Note. Tested with Chi Square Test for independence, *p* values represent differences within social support scores and bingeing behaviors.

Table 5 describes the correlation between bingeing behaviors and N-score. There was no significant correlation between any of the bingeing behaviors and N-score (N-Score: r =.074, p=.284 (BE); r =.006, p=.936 (BD); r =.036, p=.601 (BE/BD). The bingeing behaviors were categorical either a 0 for no bingeing behavior reported or a 1 for bingeing behavior reported. The N-scores were also categorical, 1 for low scores, 2 for moderate, and 3 for high.

Table 5. Correlation between Bingeing Behaviors and N- Score

Variable	R	*P*
Binge Eating (n=89)	.074	.284
Binge Drinking (n= 112)	.006	.936
Binge Eating/Drinking (n=51)	.036	.601

Note. Tested with Spearman's rank correlation coefficient.

Table 6 describes the correlation between bingeing behaviors and S-score. There was no significant correlation between any of the bingeing behaviors and S-score (S-Score: r =.006, p=.573 (BE); r =.047, p=.502 (BD); r =.080, p=.246 (BE/BD)). The bingeing behaviors were categorical either a 0 for no bingeing behavior reported or a 1 for bingeing behavior reported. The S-scores were also categorical, 1 for low, 2 for moderate, and 3 for high scores.

Table 6. Correlation between Bingeing Behaviors and S-Score

Variable	R	*P*
Binge Eating (n=89)	.039	.573
Binge Drinking (n= 112)	.047	.502
Binge Eating/Drinking (n=51)	.080	.246

Note. Tested with Spearman's rank correlation coefficient.

Discussion

The main objectives of this study were 1) to determine association between perceived social support and number of individuals in one's social network and binge eating and binge drinking, 2) to determine the prevalence of binge eating and drinking behaviors in college students, and 3) to identify gender/age differences among individuals who report binge eating and drinking behaviors. Related to the first objective, the findings of the study found no statistically significant difference or correlation between levels of S- or N- scores within any of the bingeing behaviors. In some of the previous studies, social support has been associated with binge eating and drinking behaviors in adults, indicating that health behaviors may be influenced by the level of social support an individual receives (Bosari & Carey, 2006; Cohen & Willis, 1987; Hays & Oxley, 1986). This study and another study by Von Ah et al., (2003), did not yield similar results. The researchers in the Von Ah et al., (2003) study utilized the SSQ-6 as well. Researchers also separated participants into low and high threat groups. The students in the low perceived threat group reported social support had no effect on alcohol use and those in the high threat group only had a moderate effect (Von Ah et al., 2003) In the present study we found social support scores have no significant effect on bingeing behaviors. A possible explanation for the difference in results is the size of social network in the study. The students in this sample all reported large social networks, (~20), whereas, in previous studies on college students and adults the range was typically from 4 to 12 (Hays and Oxley,1986; Sarason et al., 1983 & Sarason et al., 1987). The large difference in N-scores may be affected by the percentage of students living on campus versus off campus. The current study reported 61.9% of students reside on campus. Researchers reported students living on campus had a much higher percentage of new acquaintances than did networks of

commuters (Hays and Oxley, 1986). The large social networks of the students may provide more support. The large network may provide more support by offering greater probability of resources being available when they are needed. Another possible explanation is this study asked participants to choose from a list of potential social support sources, whereas other studies had participants list their sources of social support. Choosing from a list of possible sources of support may have influenced the students to select individuals they normally would not have thought of had they been asked to list their sources on their own.

The study also investigated the prevalence of bingeing behaviors. Related to this second objective, findings from the study indicate that bingeing behaviors are quite prevalent as 40.3% of students reported binge eating behaviors and 49.5% reported binge drinking behaviors. Other studies have reported the number of students who binge drink to be around 30-50% of the total population and the number of students who binge eat on a sub threshold level to be around 30%-40% (Benjamin & Wulfert, 2005; Mintz & O'Halloran, 2000; Wechseler et al., 1995). The study reports the co-occurrence of bingeing behaviors as well; the percentage who reported both binge eating and drinking was 22.70%, and given that binge eating and drinking are often co-occur, this is not unusual to see in our results (Benjamin & Wufert, 2005; Luce, Engler, &,Crowthner, 2006). Bingeing behaviors may occur as a reaction to stress (Cooper, 1994; Agras & Telch, 1998). Researchers found in a study of 2,052 young adult males and females coping motives were the strongest predictor of heavy alcohol use (Cooper, 1994). Stress and emotions are factors that can affect food and drink intake (Agras & Telch, 1998; Cooper, 1994; Lepore, 1992; Luce et al., 2001; Whiteside et al., 2007). If an individual copes with stress by increasing their alcohol consumption they may also increase their food consumption.

Reports of bingeing behaviors were also divided by gender. Gender differences were noted for binge eating and binge drinking together, with males reporting a significantly higher prevalence of this behavior than females. These results follow the trend of other studies involving binge drinking. According to the Centers for Disease Control and Prevention (CDC), the prevalence of binge drinking among men is three times the prevalence among women (CDC, 2009). The ACHA-NCHA Fall 2008 has similar findings. The fall 2008 data reported 42.9% of males binge drank in the past two weeks where as 28.5% of females binge drank. The results of this study showed a higher prevalence of about 12% in males who reported binge drinking than females. Other studies on average similarly found the percentage of males reporting binge drinking behaviors to be about 15-20% higher than in females (Wechsler et al., 1995; Wilsnack, Vogeltanz, Wilsnack & Harris, 2000). The prevalence of binge eating in males was about 12 percent higher than in females and in binge drinking and eating, men were about 15 percent higher prevalence than women.

Lastly, bingeing behaviors were divided by age. Participants were grouped by age to identify possible differences in binge drinking for students above and below the legal drinking age. The only significant difference between age categories and bingeing behaviors was in regards to the binge drinking severity level. Individuals age 18-20 reported a significantly higher prevalence in severity level 0 and 1, whereas, individuals age 21-25 reported a significantly higher prevalence in severity level 2. Wechsler et al., 1995 reported age played only a slight role in predicting binge drinking behaviors of college students, with legal age having close to no predictive value, however, this study did not include binge drinking severity levels.

As with any study, this study has its limitations. The use of self report data on bingeing behaviors could be considered a limitation of this study. Although several other studies have utilized this methodology (Birch et al., 2007; Laitinen et al., 2001; Luce et al., 2007; Pritchard & Yalch 2008; Stewart et al., 2006 & Whiteside et al., 2007), it may not be as reliable as using clinical interviews for classification. When self-report measures are used in assessing binge eating, there is a tendency to over identify binge eaters (Pritchard & Yalch 2008). Even though self-report may not be as reliable as the use of clinical interviews it is an important aspect of the study because provides a non-clinical and possibly broader view of the associations between bingeing behaviors and alcohol use.

Another limitation was the cross sectional design of the survey. Drinking habits and eating habits may change over time, and these changes may not be represented with a cross sectional study design. However, the nature of this study is consistent with most others on this topic (Allison, 1995, p. 314-315; Birch et al., 2007; Laitinen et al., 2001; Luce et al., 2007; Pritchard & Yalch 2008; Stewart et al., 2006 & Whiteside et al., 2007). Lack of diversity among the sample is another possible limitation, as the vast majority of the sample was Caucasian, thereby limiting the generalization of the results. However, the sample demographics are consistent with those of the university as a whole.

A strength of this study was the large sample size which was a limitation of other studies related to this topic. Examining multiple bingeing behaviors together was strength of this study. Including binge eating and binge drinking in the study gives researchers a chance to examine the behaviors together and separately. A noteworthy feature of this examination of bingeing behaviors was the inclusion of men in the sample. Most of the previous research on bingeing behaviors has dealt only with women (Krahn et al., 2005; Luce et al., 2007; Piran, 2006; Stewart et al., 2000; & Wiedman & Pryor, 1996). Including

men in this study allowed us to reveal potential differences between genders, such as the increased prevalence of bingeing behaviors in males and differences in severity level.

In summary, this study described the prevalence of binge eating and drinking to be similar to those of previous published research. The results also indicated very little, if any, difference in levels of S- and N- scores with a specific bingeing behavior, indicating for this sample social support may have little influence on these two bingeing behaviors. There was, however, a difference found in binge drinking severity levels in males and females and in age categories. These differences being a higher prevalence of bingeing behaviors in males, for males who binge eat and binge drink. As for the severity levels those in age category 18-20 they had a higher prevalence in severity level 0 and 1, whereas those in age 21-25 had a higher prevalence in severity level 2. Additionally, this study found a higher percentage of males binge ate and drank than females. The findings from the study also support the previous research in the areas of prevalence of bingeing behaviors and gender differences. On the hand the results of the study did not support the previous research which presented associations between social support and bingeing behaviors.

After reviewing the results this investigation revealed: the need for more comprehensive research in regards to social support, supported previous research related to gender differences between bingeing behaviors, and provided helpful information related to bingeing behaviors in a Midwestern university. Future studies should include larger samples and more heterogeneous populations. In addition, longitudinal studies that evaluate how levels of social support and bingeing behaviors change over time may be of considerable value.

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APPENDIX A

SOCIAL SUPPORT QUESTIONNAIRE: 6 (SSQ: 6)

1) Whom can you really count on to distract you from your worries when you feel under stress?

Please rate your satisfaction (1=not satisfied, 3= moderately satisfied 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

2) Whom can you really count on to help you feel more relaxed when you are under pressure or tense? (Select all that apply.)

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

3) Who accepts you totally including both your worst and best points? (Select all that apply.)

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

4) Whom can you really count on to care about you, regardless of what is happening to you?

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

5) Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps?

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

6) Whom can you count on to console you when you are very upset?

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

APPENDIX B

SELECTED QUESTIONS FROM QUESTIONNAIRE ON EATING AND WEIGHT PATTERNS-REVISED (QEWP-R)

1) During the past six months, did you ever eat within any two-hour period what most people would regard as an unusually large amount of food?
1-yes 2-no

2) During the time(s) when you ate this way, did you feel that you could not stop eating or control what/how much you were eating?
1-yes 2-no 3-have not eaten this way

3) During the past six months, how often, on average, did you have times when you ate this way-that is, large amounts of food plus feeling that your eating was out of control? (There may have been some weeks when it was not present-just average those in.)

1- Have not eaten this way
2- One day a week
3- Two or three days a week
4- Four or five days a week
5- Nearly every day

4) During these occasions, did you usually have any of the following experiences? (Mark all that apply.)
1- Eating much more rapidly than usual
2- Eating until you felt uncomfortably full
3- Eating large amounts of food when you didn't feel physically hungry
4- Eating alone because you were embarrassed by how much you were eating
5- Feeling disgusted with yourself, depressed or feeling very guilty after overeating
6- Have not had any of the above feelings after eating

5) Think about a typical time when you ate large amounts of food, plus feeling that your eating was out of control. How long did the episode last?
1-less than a ½ hour
2-1/2 hour to an hour
3-one hour to one ½ hours
4-one ½ hours to two hours
5-greater than two hours
6-have not eaten this way

6) List everything you ate or drank, including the amount, the last time you ate and felt out of control. Leave blank and skip to question 13 if you have never felt out of control while eating.

7) From the time you ate out of control, how long had it been since you had last eaten?
1-0 to1 hour 2-2 to 3 hours 3-3 to 5 hours 4-5 to 8 hours 5-8 to 12 hours 6-greater than 12 hours

8) In general, during the past six months, how upset were you by overeating (eating more than you think is best for you)?
1-not at all 2-slightly 3-moderately 4-greatly 5-extremely 6-have not eaten more than what is best for me

9) Did you participate in any compensatory activity after overeating? (i.e. excessive exercise, laxative/diuretic use, vomiting etc.)
1-yes every time 2-yes occasionally 3-no

APPENDIX C

COLLEGE HEALTH SURVEY

1) What is your current age in years?
2) What is your gender: 1) Male 2) Female
3) Indicate your current class status: 1) Freshman 2) Sophomore 3) Junior 4) Senior
4) What is your current height in inches?
5) What is your current weight in pounds?
6) Do you smoke cigarettes? (y/n)
7) Whom did you mostly live with while growing up?
    a. Biological mom and dad
    b. Biological mom
    c. Biological dad
    d. other

8) During the past six months, did you ever eat within any two-hour period what most people would regard as an unusually large amount of food?
1-yes 2-no

9) During the time(s) when you ate this way, did you feel that you could not stop eating or control what/how much you were eating?
1-yes 2-no 3-have not eaten this way

10) During the past six months, how often, on average, did you have times when you ate this way-that is, large amounts of food plus feeling that your eating was out of control? (There may have been some weeks when it was not present-just average those in.)

1- Have not eaten this way
2- one day a week
3- Two or three days a week
4- Four or five days a week
5- Nearly every day

11) During these occasions, did you usually have any of the following experiences? (Mark all that apply.)
1- Eating much more rapidly than usual
2- Eating until you felt uncomfortably full
3- Eating large amounts of food when you didn't feel physically hungry
4- Eating alone because you were embarrassed by how much you were eating
5- Feeling disgusted with yourself, depressed or feeling very guilty after overeating
6- Have not had any of the above feelings after eating

12) Think about a typical time when you ate large amounts of food, plus feeling that your eating was out of control. How long did the episode last?
1-less than a ½ hour
2-1/2 hour to an hour
3-one hour to one ½ hours
4-one ½ hours to two hours
5-greater than two hours
6-have not eaten this way

13) List everything you ate or drank, including the amount, the last time you ate and felt out of control. Leave blank and skip to question 13 if you have never felt out of control while eating.

14) From the time you ate out of control, how long had it been since you had last eaten?
1-0 tol hour 2-2 to 3 hours 3-3 to 5 hours 4-5 to 8 hours 5-8 to 12 hours 6-greater than 12 hours

15) In general, during the past six months, how upset were you by overeating (eating more than you think is best for you)?
1-not at all 2-slightly 3-moderately 4-greatly 5-extremely 6-have not eaten more than what is best for me

16) Did you participate in any compensatory activity after overeating? (i.e. excessive exercise, laxative/diuretic use, vomiting etc.)
1-yes every time 2-yes occasionally 3-no

17) During the past 30 days, on how many days did you have at least one alcoholic drink? (One drink defined as 1.5 oz. cocktail, 5 oz. wine, 12 oz. beer.)
0-zero, 1-one, 2-two, 3-three to five, 4-six to nine, 5-ten to nineteen, 6-twenty to twenty-eight, 7- all days

18) For Males: During the past 30 days on how many days did you have five or more drinks of alcohol within a few hours? 0-zero, 1-one, 2-two, 3-three to five, 4-six to nine, 5-ten to nineteen, 6-twenty to twenty-eight, 7-all days

For Females: During the past 30 days on how many days did you have four or more drinks of alcohol within a few hours? 0-zero, 1-one, 2-two, 3-three to five, 4-six to nine, 5-ten to nineteen, 6-twenty to twenty-eight, 7-all days

19) Whom can you really count on to distract you from your worries when you feel under stress? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor 8) counselor
9) teammate/coach 10) family relative 11) other 12) spouse/significant other

Please rate your satisfaction (1=not satisfied, 3= moderately satisfied 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

20) Whom can you really count on to help you feel more relaxed when you are under pressure or tense? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor 8) counselor 9) teammate/coach
10) family relative 11) other 12) Spouse/significant other

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

21) Who accepts you totally including both your worst and best points? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor
8) counselor 9) teammate/coach 10) family relative 11) other
12) Spouse/significant other

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

22) Whom can you really count on to care about you, regardless of what is happening to you? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor
8) counselor 9) teammate/coach 10) family relative 11) other
12) Spouse/significant other

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

23) Whom can you really count on to help you feel better when you are feeling generally down-in-the-dumps? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor
8) counselor 9) teammate/coach 10) family relative 11) other
12) spouse/significant other

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

24) Whom can you count on to console you when you are very upset? (Select all that apply.)
1) parent/guardian 2) current roommate 3) college friend 4) friend from hometown
5) co-worker/supervisor 6) sibling 7) spiritual advisor 8) counselor
9) teammate/coach 10) family relative 11) other 12) spouse/significant other

Please rate your satisfaction (1=not satisfied, 3=moderately satisfied, 6=very satisfied) with your level of available support in the situation described above.
1 2 3 4 5 6

Thank-you for your time and participation!

APPENDIX D

RECRUITMENT ANNOUNCEMENT

Hello HNES Wellness Students,

You are invited to participate in a research study conducted by Gary Liguori, Assistant Professor in Health, Nutrition, and Exercise Sciences at NDSU. The focus of this research study is the health behaviors of college students. Please take the time to complete a short survey on health behaviors. For your time you will receive five extra credit points. The survey will take about five minutes to complete.

Thank-you for your time!

APPENDIX E

CONSENT TO PARTICIPATE IN RESEARCH:

Eating and Drinking Behavior Study

You are invited to participate in a research study conducted by Gary Liguori, Assistant Professor in Health, Nutrition, and Exercise Sciences at NDSU. You have been selected for this research because you are enrolled in an HNES wellness course. The main objective of this study is to examine health behaviors among college students. Any student that is 18 or older can participate in this study. By participating in the survey, you will receive five extra credit points. Agreeing to this consent form simply allows the researchers to use your data for research purposes. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time. Choosing to participate or not in this study will have no bearing on your course grade or on your ability to successfully complete the survey. If you chose not to participate in the study, you can still receive five extra credit points by writing a paper on the consequences of binge drinking in college students. There are no risks to your participation, as all information will be held confidential, and results will be reported as group means. Although your ID is requested, it is only to make sure you receive your extra credit points. Once the survey is collected, ID numbers will be removed and there will be no way to identify any participants. Data and records created by this project are owned by the University and the investigator. You may view information collected from you by making a written request to the Dr. Liguori anytime during the Spring 2009 semester. You may view only information collected from you, and not information collected about others participating in the project. You should feel free to ask questions now or at any time during the study.

If you have any questions about this study, you can contact Gary Liguori 231-8682, gary.liguori@ndsu.edu. If you have questions about the rights of Human research participants, or wish to report a research-related problem or injury, contact the NDSU IRB Office at (701) 231-8908 or ndsu.irb@ndsu.edu.

By completing this survey, you are stating that you have read and understand this form and the research project, and are freely agreeing to be a part of this study. If there are things, you do not understand about the study, please email the researchers before you complete the survey.