THE IMPLEMENTATION OF EATING DISORDER EDUCATION AND PREVENTION PROGRAMS IN HIGH SCHOOLS

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A Thesis

Presented to

The Faculty of the Department of Psychology and Philosophy

Sam Houston State University

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In Partial Fulfillment

of the Requirements for the Degree of

Master of Arts

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by

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May, 2017

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ABSTRACT

Green, Emalee T., *The implementation of eating disorder education and prevention program in high schools*. Master of Arts (Clinical Psychology), May, 2017, Sam Houston State University, Huntsville, Texas.

The purpose of this study was to examine the retrospectively-reported implementation of eating disorder education and prevention programs in high schools among college freshmen, exploring whether characteristics of the schools' influence rates of implementation. The sample consisted of 169 first-year students from an East Texas university. The sample was 19.5% male, 78.7% female, and 1.8% other, with ages ranging from 18-19. Students participated in an online survey consisting of questions regarding demographics, exposure to education and prevention programs, and high school characteristics (i.e., size of graduating class, public or private, and location of school). Results demonstrated that few students were exposed to any eating disorder programming in high school (29.0%), with no students reporting that they were exposed to prevention programming. Furthermore, there were no significant differences in the implementation of eating disorder education programs based on the size of the participant's graduating class, whether the school was public or private, or where the school was located (public, rural, or urban areas). These results suggest that, universally, there is a lack of prevention programs being implemented in high school—a significant public health problem given existing evidence that prevention programs successfully prevent eating disorders in college and high school students.

KEY WORDS: Eating Disorder, Prevention, Implementation of Prevention, High school.

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CHAPTER I

Introduction

Eating disorders are a serious public health problem among college students (Eisenberg, Nicklett, Roeder, & Kirz, 2011). Specifically, there has been an increase of college-aged females and males diagnosed with anorexia nervosa, bulimia nervosa, and binge eating disorders in the past years (National Eating Disorders Association, 2013). This rise in eating disorder rates has called to attention the need for prevention and education programs in high schools. Indeed, research conducted on middle and high school students (fifth, seventh, ninth, and eleventh grade) has shown that this age group is at high risk of developing an eating disorder (Zeiler et al., 2016). Specifically, 30.9% of females and 14.6% of males were at risk, as evidenced by high scores on body dissatisfaction, food thoughts, and loss of control over food (Zeiler et al., 2016). These results were consistent with results found by Herpertz-Dahlmann, Wille, Hölling, Vloet, and Ravens-Sieberer (2008), which showed that, in a sample of children and adolescents, 29.4% of females and 14.4% of males were at risk for developing an eating disorder. Critically, 4.4%-5.9% of students start college with an active, untreated eating disorder (National Eating Disorders Association, 2013). Regarding eating disorder diagnoses, the prevalence rates in college have been recorded as 1.5% of females and 0.6% of males for anorexia and 1.3% of females and 0.6% of males for bulimia (American College Health Association, 2015). This is notably higher than the DSM-5 twelve-month prevalence rates for anorexia, which are 0.4% for females, and somewhat comparable to the DSM-5 prevalence rates for bulimia, which are 1%-1.5% for females, and 1.6% for females with binge eating disorder (American Psychiatric Association, 2013).

In light of the high prevalence of eating disorders in college students, and the documented vulnerability for developing an eating disorder while in high school, there has been a call to implement high school programs to prevent and educate students on the risk factors of, medical and social correlates of, and available treatments for eating disorders during this critical period. However, there has been a serious lack of programs in many high schools across the United States and, to date, it is unknown what proportion of students are receiving this type of education in high school. Against this background, the aim of the current study was to examine a sample of incoming freshman at a large public university in the Southwestern United States with the goals of: (1) examining exposure to high school prevention and educational programs, (2) determining the association between high school characteristics and exposure to prevention and educational programs; and (3) exploring whether exposure to prevention and education programs related to college eating disordered behavior. To this end, the present paper will review relevant empirical literature regarding, first, the public health impact of eating disorders in college students; second, existing prevention and education programs implemented in high schools; and third, high school characteristics relevant to eating disorder symptoms and prevention/education programs.

Correlates of Eating Disorders in College Students

Overall, there are deleterious consequences of eating disorders on college students (Yager & O'Dea 2008). Some of these consequences are medical, including physical damage, severe medical issues, and possible death. Furthermore, there are social consequences including motivational and memory problems that can affect a university student's grades and goals (Wolz, 2016; Ridout, Matharu, Sanders, & Wallis, 2015;

Green et al., 2003). Finally, it has been shown that individuals with eating disorders have an increased prevalence of other psychological disorders (Hudson, Hiripi, Pope, & Kessler, 2007). These medical, social, and psychological impacts have motivated public health efforts aimed at high schools' prevention and education programs to assist students in recognizing the signs and symptoms of eating disorders.

Medical correlates of eating disorders. Eating disorders are harmful at any age, however, developing an eating disorder while attending college may be especially debilitating. There are many medical issues arising from anorexia and the malnutrition that can affect a college student in a variety of ways. First, weight loss or failure to gain weight in an adolescent who is still growing can cause a number of medical complications while the body is adapting to the starvational state it is forced into (Westmoreland, Krantz, & Mehler, 2016; Fairburn & Harrison, 2003). The body will try to conserve its energy by providing energy only to the most vital functions, which can cause the extremities to become intolerant of cold as a result of decreased blood circulation in the limbs (Craighead et al., 2013). There can also be episodes of lethargy, fatigue, or dizziness due to the lack of nourishment (Fairburn & Harrison, 2003).

Additionally, in individuals with eating disorders, the cardiac muscles can weaken, which causes low heart rate (bradycardia) or low blood pressure (hypotension) (Yahalom et al., 2013; Westmoreland et al., 2016). Some purging methods, like vomiting, can result in an imbalance of electrolytes and fluids, which can lead to arrhythmias (Craighead et al., 2013). These symptoms may eventually lead to death due to the circulatory system slowing down to conserve energy (Craighead et al., 2013). Sudden cardiac death and other complications result in anorexia having the highest

mortality rate out of psychiatric illnesses (Harris & Barraclough, 1998). Individuals with anorexia are also found to have hemotology problems, including anemia, leukopenia and thrombocytopenia (Hütter, Ganepola, & Hofmann, 2009).

Gastrointestinal problems can arise from purging including gastroesophageal reflux disease, irritable bowels, constipation, or dysphagia (Boyd, Abraham, & Kellow, 2010). The endocrine system is also affected in individuals with eating disorders, potentially causing amenorrhea and reduced fertility in females (Katz & Vollenhoven, 2000). Furthermore, the musculoskeletal system is affected drastically in individuals with eating disorders. Calcium is lost due to the lack of nutrients and lower levels of estrogen, which can lead to osteopenia or osteoporosis (Katz & Vollenhoven, 2000; Craighead et al., 2013). Finally, there are many dental and dermatological problems that arise from eating disorders including tooth erosion from purging, hair loss, callouses on the hands from sticking their fingers down the throat (Russell's sign), and lanugo hair (Westmoreland et al., 2016; Uhlen, Tveit, Stenhagen, & Mulie, 2014).

Social and behavioral correlates of eating disorders. A range of social and behavioral problems have also been linked to eating disorders, which can negatively affect college students. Specifically, eating disorders are associated with atypical eating patterns, for example nibbling or picking at their food, eating meals twice, or night eating (Masheb, Grilo, & White, 2011). Individuals with bulimia eat fewer meals, particularly lunches, compared to others; and individuals with binge eating disorders eat more snacks (Masheb, Grilo, & White, 2011). Additionally, individuals with eating disorders who display addictive eating, a correlate of binging, have reduced self-directedness, goal orientation, and accountability (Wolz et al., 2016; Alvarez-Moya et al., 2007; Fassino et al.,

2002). Pathological eating patterns are also linked to sleep disturbances (Chardon, Janicke, Carmody, & Dumont-Driscoll, 2016; Kim et al., 2010). Indeed, college students with bulimia symptoms were found to have more disturbed sleep compared to students with anorexia symptoms (Soares et al., 2011). In sum, atypical behavior related to meal-time behavior and sleeping have been linked to eating disorder symptoms and would be expected to have consequences for college students' social relationships and academic performance.

Lower amounts of social contact and higher amounts of social-emotional isolation have been found in individuals with eating disorders. In a study by Zaitsoff, Fehon, and Grilo (2009), the amount of body image disturbance directly correlated with the amount of social-emotional isolation. It was also found that individuals with higher body image disturbances had more interpersonal difficulties (Zaitsoff et al., 2009). These results are similar to what other studies have found regarding interpersonal relationships and individuals with dietary restriction or bulimic symptoms (Jones, Lindekilde, Lübeck, & Clausen, 2015; Mcevoy, Burgess, Page, Nathan, & Fursland, 2013; Fairburn, Cooper, & Shafran, 2003). Specifically, a study on interpersonal relationship and university students found that disordered eating was associated with low interpersonal functioning (Ambwani, Slane, Thomas, Hopwood, & Grilo, 2014). Furthermore, individuals with eating disorders demonstrate large impairments in maintaining their friendships, expressing interpersonal warmth, and partaking in social groups (Arkell & Robinson, 2008).

Psychological correlates of eating disorders. Comorbidity with other psychological disorders can also be associated with eating disorders. For individuals who

develop anorexia or bulimia, the most commonly co-occurring disorders are depressive, anxiety, and bipolar disorders, with substance use disorders occurring to a lesser extent (American Psychiatric Association, 2013; Hudson et al., 2007; Godart, Flament, Lecrubier, & Jeammet, 2000). Regarding anxiety, there is a high prevalence of social phobia and social anxiety in individuals with anorexia or bulimia (Mattar, Thiébaud, Huas, Cebula,& Godart, 2012; Swinbourne et al., 2012; Grabhorn et al., 2006; Godart et al., 2000). One study conducted on undergraduates additionally found links between social anxiety and bulimic symptoms (Menatti, Weeks, Levinson, & McGowan, 2013). Moreover, among public university students, higher amounts of eating disorder symptoms are correlated with depression, anxiety, and substance use (Eisenberg et al., 2011). This study also found that individuals who have a high amount of disordered eating symptoms have an increased rate of suicidal ideation and non-suicidal self-injury (Eisenberg et al., 2011). Regarding depression specifically, female college students with any degree of maladaptive eating patterns or attitudes reported higher amounts of depressive symptoms (Graziano & Sikorski, 2014).

Individuals with eating disorders have also been found to have deficits regarding memory retrieval (Ridout et al., 2015; Green et al., 2003). In memory retrieval, autobiographical memory deficits have specifically been found, with eating disorder patients recalling fewer specific memories compared to the control groups (Ridout et al., 2015; Bomba et al., 2014; Ková, Szabó, & Pászthy, 2011; Nandrino, Doba, Lesne, Christophe, & Pezard, 2006; Laberg & Andersson, 2004; Dalgleish et al., 2003). Executive functioning is also impaired in individuals with eating disorders (Billingsley-Marshall et al., 2013; Gillberg et al., 2010; Green et al., 2003), with likely consequences

for the quality of the students' work in college, since executive functioning deals with planning and working memory (Baddeley, 1996).

Unsurprisingly, body dissatisfaction is found at a higher level in individuals with eating disorders and eating pathology compared to those who do not display eating disorder behaviors (Munkholm et al., 2016; Góngora, 2014; Graziano & Sikorski, 2014). There have also been findings that individuals who develop eating disorders have lower self-esteem (Günes & Çalik, 2015; Noordenbos, Aliakbari, & Campbell, 2014; Obeid, Buchholz, Boerner, Henderson, & Norris, 2013). High levels of shame have also been linked with eating disordered behavior, particularly bulimia (Obeid et al., 2013; Grabhorn, Stenner, Stangier, & Kaufhold, 2006).

Existing High School Programs

Several programs have been implemented to attempt the prevention of eating disorders or education of students about healthy eating in an effort to reduce eating disorder rates (Yager & O'Dea, 2008). Given the deleterious consequences of eating disorders among college students, high school prevention and education programs may be a promising area of public health intervention. However, few implemented programs have been found to produce significant reductions in risk for future eating disorder symptoms. High school programs generally target body image, dieting, thin idealization, and eating disorder symptoms and fall into two categories: educational or prevention programs.

Educational programs. Most programs that have been implemented in the past are psychoeducational and informational programs aimed at preventing eating disorders. These programs involve educating the targeted group about the general facts of what

dieting/eating disorders do to the body and the harm of eating disorders (Yager & O'Dea, 2008). However, this approach has not been successful in reducing disordered eating behavior, with some speculating that these programs actually introduce disordered eating behavior to youth, rather than preventing it (Mann et al., 1997). Killen and colleagues (1993) designed a program for sixth and seventh-grade females to provide information on the negative effects of unhealthy weight regulation, promote the idea of a healthy weight with nutrition and exercise, and develop coping skills to help resist the influences that contribute to the model idea of thinness. This program did not yield a significant difference between the control and treatment group on eating attitudes or weight regulation practices (Killen et al., 1993), mirroring numerous studies that have found that programs focusing on information about eating disorders, the consequences of eating disorders, and how to control the weight in a healthy way have shown minimal or no significant effects (Stice, Trost, & Chase, 2003; Mutterperl & Sanderson, 2002; Martz & Bazzini, 1999; Franko, 1998; Rabak-Wagener, Eickhoff-Shemek, & Kelly-Vance, 1998). Further, Mann et al. (1997) reported that freshman college students who attended an educational program actually reported more eating disorder symptoms, compared to the students who did not attend. These findings suggest that individuals who have a larger amount of knowledge about eating disorders are actually at a higher risk of having a strong fear of gaining weight, compared with those who do not have a thorough understanding of eating disorders (Faccio, Fusa, & Iudici, 2013). This possibility led to the de-emphasis of educational programs, based on a concern that information on eating disorders may be utilized by students to regulate weight gain and may actually exacerbate pathological eating patterns.

Prevention programs. Prevention programs for eating disorders are largely dissonance-based interventions, which focus on verbally or behaviorally challenging body image beliefs and attitudes in students, rather than focusing on specific eating disorder symptoms or behaviors (Stice, Shaw, Burton, & Wade, 2006; Stice, Marti, Spoor, Presnell, & Shaw, 2008). The dissonance-inducing exercises can include writing statements against the thin-ideal, role-playing where the participant tries to convince the group leader not to pursue the thin-ideal, at-home body acceptance activities (for example standing in front of a mirror and listing their positive aspects), discussing problems that the participants might encounter by defying the thin-ideal, and finally, learning to challenge the thin-ideal thinking that occurs (Stice, Rohde, Shaw, & Gau, 2011; Stice, Chase, Stormer, & Appel, 2001). Theoretically, these exercises create internal disagreement (dissonance) for the individual, which then influences them to reduce the idealization of thinness and decrease eating disorder symptoms (Stice et al., 2001).

Many studies have found that dissonance-based programs successfully reduce eating disorder risk factors, like perceived pressure to be thin, dieting, and overall eating disorder symptoms (Linville et al., 2015; Stice et al., 2008; Stice et al., 2006; Green, Scott, Diyankova, Gasser, & Pederson, 2005; Matusek, Wendt, & Wiseman, 2004). An important study by Stice et al. (2011), found that a dissonance-based intervention significantly lowered a high school group of participants' risks for clinically significant disordered eating, with lowered body dissatisfaction found at a two-year follow-up and lower eating disorder symptoms at a three-year follow-up. A specific dissonance-based intervention program that has been widely supported is the Body Project (Stice, Rohde, Butryn, Shaw, & Marti, 2015). This program mainly focuses on body dissatisfaction and

challenging the rigid thin-ideal cognitions by performing exercises that involve verbal, behavioral, or written arguments against the ideal thinness. These efforts to challenge harmful body image beliefs in students and prevent eating disorders in the specified age range have been implemented in numerous universities and high schools across the United States.

Relevant High School Characteristics

The aforementioned research and prevention/educational programs have largely been implemented with high schools and undergraduates, an effort that stands to reduce the high prevalence and public health costs of eating disorders in college students. To date, little research has examined the extent to which exposure to eating disorder prevention and education programs relates to high school characteristics and, thus, it is currently unknown to what extent these programs reach students from varied educational backgrounds. The latter is an important consideration given documented relations between high-school characteristics and eating disordered behavior.

Several high school characteristics may relate to whether students have access to eating disorder prevention or education programs: private versus public, rural versus urban versus suburban, and size. Moreover, several of these characteristics have been linked to eating disorder prevalence among students. Specifically, in private schools, females have a higher prevalence of disordered eating behavior, compared to their public-school counterparts (Lesar, Arnow, Stice, & Agras, 2001; Huon, 1994; Råstam, Gillberg, & Garton, 1989). This is possibly due to increased pressure or expectations from parents or peer pressure found in private school settings (Lesar et al., 2001). Regarding rural/urban/suburban schools, results are mixed. A study by Hoek and Bartelds (1995)

found that bulimic patterns were higher in urban areas, compared to rural. These results are similar to other studies that found higher rates of eating disorders in urban settings (Preti et al., 2007; Senekal, Steyn, Mashego, & Nel, 2001). However, Fisher et al., (1994) assessed the eating attitudes of students in urban and suburban areas and found that abnormal eating attitudes were more prevalent in females in a suburban high school, compared to the females in an urban high school. Finally, the study by Santos et al., (2013) found little difference between rural and urban schools in eating disorder symptoms. Regarding size of the school, O'Malley, Johnston, Delva, Bachman, and Schulenberg (2007) found that the size of the students' grade was moderately significant in influencing their body mass index (BMI), indicating that mid-sized schools had a higher influence on BMI, compared to smaller and larger schools.

Though these studies show a link between high school characteristics and disordered eating, no study to date has examined whether high school characteristics relate to the actual implementation of educational or prevention programs. Thus, the current study assessed a number of high school characteristics in order to explore whether private v. public, urban v. suburban v. rural, and school size relate to students' exposure to eating disorder prevention/education programs.

The Current Study

The current study did not focus on whether educational/prevention programs are effective, rather it focused on the implementation of these educational/prevention programs in high schools and whether the characteristics of the school influence if the programs are implemented. Specifically, the aims of this study were to examine a sample of incoming freshman at a public university in the Southwestern area of the United States

with the goals of: first, examining exposure to high school eating disorder prevention and educational programs; second, determining the association between high school characteristics and exposure to prevention and educational programs; and third, exploring whether exposure to prevention and educational programs relate to college eating disordered behavior.

The hypotheses were as follows: first, minimal exposure to high school eating disorder prevention and educational programs throughout the Southwestern United States was expected; second, there as no hypothesis made regarding the rate of education/prevention programs at public schools versus private, urban, suburban, or rural, and school size, this aim was exploratory in nature; and finally, it was expected that individuals who received prevention programs would report reduced college eating disordered behavior compared to individuals who received education programs or no eating disorder programing.

CHAPTER II

Methods

Participants

The sample utilized in this study included incoming freshman at a large public university in the Southwestern United States during the Fall 2016 semester. The study obtained 169 participants, which was 19.5% male, 78.7% female, and 1.8% other, with an age range from 18 to 19 years of age. An online survey was created and advertised in First Year Experience courses to the incoming freshman. Students who participated in this study had the opportunity to win one of three $100 Target gift cards.

Measures

Demographics and high school characteristics. A demographic questionnaire asked the participants their age, gender, ethnicity, major, educational history including year they graduated high school, and if they did athletics during their high school career. Participants were also asked to provide the name, state, city, and zip code (if known) of the high school they attended, an estimated number of people in their senior graduating class, and indicate whether it was private, public, and/or religious. Additionally, they were asked to describe their school district as rural, suburban, or urban. For accuracy, a short definition of each word was included on the question: rural was described as sparsely populated areas away from towns or cities, suburban was described as a residential area on the outskirts of a city, and urban was described as a metropolitan area or a city.

Eating disordered behavior questionnaire. Two measures of disordered eating behavior were utilized in this study. First, the SCOFF questionnaire, which is an

acronym for the key words in each of the five questions, was used. This measure, developed by Morgan, Reid, and Lacey (1999), includes five questions designed to screen individuals for disordered eating which are:

Do you make yourself **S**ick because you feel uncomfortably full?

Do you worry you have lost **C**ontrol over how much you eat?

Have you recently lost more than **O**ne stone in a 3 month period? (14 pounds)

Do you believe yourself to be **F**at when others say you are too thin?

Would you say that **F**ood dominates your life?

A score of two or above is indicative of disordered eating pathology (Morgan et al., 1999). The psychometrics properties of the SCOFF questionnaire have been examined in university students by Rueda et al. (2005), where the Cronbach's alpha was 0.48 and test-retest concordance was 91.6%. When compared to eating disorder classifications, Rueda et al. (2005) reported that the SCOFF's sensitivity was 78.4%, specificity was 75.8%, and diagnostic accuracy was 0.823. In a different study conducted with university students, the SCOFF's sensitivity was 53.3%, specificity was 93.2%, positive predictive value was 67%, and negative predictive value was 89% in relation to eating disorder classifications (Parker, Lyons, & Bonner, 2005). Overall, there is strong psychometric support for the SCOFF as a screening measure for eating disorders, and it is free, short, simple to do, and easy to score (Parker et al., 2005; Rueda et al., 2005; Morgan et al., 1999). In this study, Cronbach's alpha was comparable to previous research (alpha = 0.53).

Second, the Eating Attitudes Test (EAT-26), which is based on the original EAT-40 but reduced to 26 items, was utilized for a more in-depth assessment of eating disorder

symptoms (Garner, Olmsted, Bohr, & Garfinkel, 1982; Garner & Garfinkel, 1979). The EAT-26 uses a cut-off score of 20 to classify participants as having significant eating disorder symptoms and assesses three factors: dieting, bulimia and food preoccupation, and oral control (Garner et al., 1982). Among university students, researchers reported the sensitivity of the EAT-26 at .77, specificity at .94, positive predictive power at .79, and negative predictive power at .94 in comparison to eating disorder classifications (Mintz & O'Halloran, 2000). The Cronbach's alpha has been estimated at 0.85 (Siervo, Boschi, Papa, Bellini, & Falconi, 2005). Overall, the EAT-26 is a psychometrically sound measure for screening abnormal eating among college students (Mintz & O'Halloran, 2000; Garner et al., 1982; Garner & Garfinkel, 1979). In this study, Cronbach's alpha was comparable to previous research (alpha = 0.90).

Depression, Anxiety, and Stress Scale. The Depression, Anxiety, and Stress Scale (DASS) is a 21-item instrument that measures the severity of current depression, anxiety, and stress symptoms (Lovibond & Lovibond, 1995). The scoring for the DASS-21 for each item ranges from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). This questionnaire has been found to be psychometrically sound in non-clinical samples with alpha of .88 for the Depression Scale, .90 for the Stress Scale, .82 for the Anxiety Scale, and .93 for the total scale (Henry & Crawford, 2005). In the current study, the Cronbach's alpha for the Depression scale was 0.92, Anxiety scale was 0.85, and Stress Scale was 0.87.

Exposure to education and prevention programs. Students completing the online survey were asked to describe the experiences they had in high school regarding eating disorder educational or prevention programs. First, participants answered if any

classes in their high school contained eating disorder topics (yes or no). If they received any information, they were asked to write a brief statement about the discussion's intended purpose, duration, topics discussed, activities conducted, and which class(es) discussed eating disorders. Participants were then asked if they know someone close to them that developed an eating disorder (yes or no) and if they have personally talked to a mental health professional about an eating disorder (yes or no). Based on the obtained information, researchers coded the following variables (1) participants did or did not receive information on eating disorders in school, and if they did (2) assessed if it was an educational or prevention program.

Procedure

IRB approval from Sam Houston State University was sought for the proposed study. Once attained, participants were contacted through the First Year Experience courses. Researchers visited the classes to advertise the study and remind them that the study will be received over their school email. They were then sent an email regarding a statement of informed consent including the IRB approval, procedures involved, and goals of this study. After indicating their consent to participate in the study, participants were able to anonymously fill out the online measures that are described above.

CHAPTER III

Results

Preliminary Analyses

Several potential confounds (i.e., age, sex) were assessed and relations with main study variables were examined in order to identify whether these variables should be included as covariates in subsequent analyses. Bivariate correlations are reported in Table 1 (below) and showed no significant relation between age and any other variable. SCOFF total score was significantly correlated with EAT 26 and all DASS subscales. Likewise, EAT-26 was significantly correlated with all DASS subscales. No evidence of a relation between age and exposure to education/prevention programs was noted (t = .53, p = .598).

Table 1: Correlations Between Total Scores of Questionnaires and Age

	1	2	3	4	5	6	7
1. Age	---						
2. SCOFF	-0.03	---					
3. EAT	-0.00	.65**	---				
4. DASS	-0.00	.60**	.71**	---			
5. DASS-Depression	-0.02	.56**	.69**	.93**	---		
6. DASS-Anxiety	-0.05	.53**	.65**	.95**	.82**	---	
7. DASS-Stress	0.03	.52**	.66**	.93**	.78**	.84**	---

Note. **Correlation is significant at 0.01 level (2-tailed)

Researchers also analyzed the prevalence rates of eating disorders in the sample based on the participants' SCOFF and EAT-26 cut-off scores. Based on the SCOFF, 24.9% of the participants had a score that indicated a likely diagnosis of anorexia or bulimia nervosa. Regarding the EAT-26, 13.6% of participants were over the cut-off score, which indicates a need to talk to a health care professional about eating concerns. The DASS subscale scores were also examined, however, the cut-off scores indicated the level of severity the individuals experience depression, anxiety, or stress, instead of a likely diagnosis. The Depression Subscale scores indicated 12.4% of participants, the Anxiety Subscale scores indicated 19.5% of participants, and the Stress Subscale scores indicated 10.1% of participants reported a high level of severity that causes a significant amount of distress in the participant.

Independent samples t-tests were conducted to compare men and women on the SCOFF, EAT 26, and DASS subscales. Women reported significantly higher eating disorder symptoms than men on the SCOFF (M_{male} = .39, SD_{male} = .70, M_{female}=1.02, SD_{female}=1.12; t = -3.98, p < .001) and the EAT 26 (M_{male} = 5.47, SD_{male} = 5.06, M_{female}=11.00, SD_{female}=11.59; t = -4.02, p < .001). No significant differences were found with regard to the DASS depression, stress, or total scores; however, women reported significantly higher anxiety than men (M_{male} = 3.30, SD_{male} = 2.97, M_{female} = 4.79, SD_{female} = 4.74; t = -2.09, p = .041). There was no evidence of a significant relation between gender and exposure to education/prevention programs (*Chi-square* = 3.11, p = .211). Please note that the 1.8% of participants who answered "Other" on the gender question were excluded from this preliminary analysis. However, these individuals were included in the main study hypothesis.

Main Study Hypotheses

First, the proposed study examined exposure to high school eating disorder prevention and educational programs. Based upon participant responses, the researchers assigned a dichotomous rating to whether (1) participants did or did not receive information on eating disorders in school, and if they did (2) assessed if it was an educational or prevention program. Regarding variable (1), an overall percent endorsement was computed. 29.0% (n = 49) of respondents stated that their high school classes contained eating disorder topics. 7.1% (n = 12) of respondents stated that their high school sports teams discussed eating disorder topics; due to the small number of participants endorsing this variable, it was not included in subsequent analyses. Regarding variable (2), percent endorsement of each program was computed. Of the 49 individuals who reported having exposure to eating disorder topics in high school: 47 described educational programming, two described hybrid programming that was focused on education but included at least some prevention effort (discussion of body image concerns), and none reported exposure to a full prevention program.

Second, we determined the association between high school characteristics and exposure to prevention and educational programs. A three-category variable was created: exposed to prevention/education program, exposed to education program, or no high school programs. Overall, 27.8% were categorized as having received education, 1.2% were categorized as receiving education/prevention, and 71.0% were categorized as having received no programming. Due to the low percentage of education/prevention programming, this variable was dichotomized into those that received any type of programming and those that did not for subsequent analyses. Participants self-rated their

high school as: private (*n* = 12) versus public (*n* = 157); rural (*n* = 36, 21.3%), urban (*n* = 39, 23.1%) or suburban (*n* = 94, 55.6%); and rated the number of students in their graduating class (*M* = 425.76, *SD* = 291.27, Range = 4-1441). Relations between the two-way programming v. no-programming variable and whether the school was private v. public, were examined via Chi-square analyses. Findings provided no evidence of a significant relation between private v. public and eating disorder programming (*Chi-Square* = 1.01, *p* = .315). Relations between the two-way variable and whether the school was urban, suburban, or rural were examined via Chi-square analyses. Findings provided no evidence of a significant relation between the location of the school and eating disorder programming (*Chi-Square* = .45, *p* = .80). Relations between the two-way variable and the size of the school were examined via an independent samples t-test. Results did not indicate a significant difference in the size of the respondent's graduating class based on whether they received eating disorder programming or not (*t* = -1.77, *df* = 165, *p* = .078).

Third, this study explored whether exposure to prevention and educational programs related to college eating disordered behavior. Relations between the two-way variable (i.e., education/prevention or no program) and the SCOFF classification (likely diagnosis of eating disorder v. no likelihood) were examined via Chi-square analyses. Findings provided no evidence of a significant relation between eating disorder programming and likelihood of eating disorder (*Chi-Square* = .21, *p* = .644). When SCOFF responses were treated continuously, individuals who had received education/prevention reported fewer symptoms (*M* = .80, *SD* = .98) than those without programming (*M* = .99, *SD* = 1.16), though the groups were not statistically significantly

different (t = 1.04, df = 167, p = .301). Regarding the EAT-26 total score, no significant difference (t = -.69, df = 160, p = .491) was noted between education/programming (M = 11.71, SD = 12.43) and no programming (M = 10.26, SD = 12.07). The EAT-26 was also used to categorize respondents as having significant symptoms of an eating disorder v. no significant symptoms, Chi-square analyses were used to examine relations between this variable and the programming variable. Findings provided no evidence of a significant relation between eating disorder programming and likelihood of eating disorder on the EAT-26 (*Chi-Square* = 1.16, p = .281). In order to examine relations between high school programs and eating disordered behavior in greater detail, the EAT-26's three subscales were examined. Regarding the subscale scores, independent samples t-tests showed no relation between eating disorder programming and any EAT-26 subscale: Diet (t = -.580, df = 152, p = .563); Bulimia (t = -.594, df = 153, p = .554); or Oral Control (t = .688, df = 158, p = .492).

Follow-Up Analyses

All aforementioned analyses were also conducted in a sample of 129 women given significant difference between men and women with regard to eating disorder behavior. All study findings mirrored analyses conducted in the whole sample.

CHAPTER IV

Discussion

The proposed study focused on the implementation of educational/prevention programs in high schools, and if the characteristics of the school influence whether programs are implemented. Specifically, this study examined a sample of incoming freshman in a Southwestern public university with the goals of: first, examining exposure to eating disorder prevention and educational programs in high school; second, determining the association between high school characteristics and exposure to prevention and educational programs; and third, exploring whether exposure to the programs related to college eating disorder behavior.

The first aim analyzed the amount of exposure to eating disorder programs incoming freshman reported experiencing while in high school. We expected to find minimal exposure to eating disorder prevention and educational programs in high schools throughout the Southwestern United States. Results of this study supported this hypothesis; the majority of participants in this study had never received an education or prevention program related to eating disorders. Indeed, 71% of respondents said that they had never received eating disorder programming. Based on the present study, eating disorder prevention and educational programs—even those that have effectiveness data (Linville et al., 2015; Stice et al., 2011, Stice et al., 2008; Stice et al., 2006; Green, Scott, Diyankova, Gasser, & Pederson, 2005; Matusek, Wendt, & Wiseman, 2004)—are not being implemented in the overwhelming majority of high schools represented in this study, despite the very high risk of eating disorders in this age group.

The second aim sought to determine how exposure to an education or prevention program related to high school characteristics, specifically: public schools versus private, urban, suburban, or rural area, and school size. Since there is little research that has examined this relation, this aim was exploratory. Researchers found that exposure to programming was not related to any of the high school characteristics examined. However, it should be noted that the proportion of respondents who endorsed receiving any type of eating disorder programming was very small. The overall low rate of endorsement precluded meaningful analyses regarding the role of high school characteristics; indeed, it was found that there is a lack of implementation generally, regardless of the school's characteristics. Future research should endeavor to assess a larger number of respondents in order to have larger subsamples who have received education and/and prevention programming. Findings from the current study indicated a near-significant (p = .078) relation between school size and programming, which should be evaluated in future research with more respondents.

The final aim of this study explored college eating disorder behavior and how it relates to exposure to programming. Researchers hypothesized that the students exposed to a prevention program would have less disordered eating behaviors compared to the students who received educational programs or no programs at all. This study found no evidence of a significant relation between eating disorder behavior and exposure to an educational or prevention program. These findings stand in contrast to previous research that found fewer eating disorder behaviors in individuals who were exposed to prevention programs (Linville et al., 2015; Stice et al., 2011, Stice et al., 2008; Stice et al., 2006; Green, Scott, Diyankova, Gasser, & Pederson, 2005; Matusek, Wendt, & Wiseman,

2004). It should be noted that, in the current study, only one participant indicated that they had received a hybrid educational and prevention program and, due to under-representation of this sub-sample, analyses compared respondents with educational *or* prevention programming to those without any programming. Prior research on educational programming suggest that it is either ineffective (Killen et al., 1993; Franko, 1998; Rabak-Wagener, Eickhoff-Shemek, & Kelly-Vance, 1998; Martz & Bazzini, 1999; Mutterperl & Sanderson, 2002; Stice, Trost, & Chase, 2003) or iatrogenic (Mann et al., 1997). Thus, the current study's findings likely reflect prior research suggesting that educational programs have limited public health utility.

There were several limitations of this study to consider. First, few people endorsed any kind of programming, which prevented researchers from fully examining the effect of programming and relations between programming and high school characteristics. There could have been several factors contributing to the low amount of reporting other than a lack of implementation. For instance, it is possible that students who denied receiving educational/prevention programming simply did not recall programming that did indeed occur in their high school. While this is a limitation of the current study's retrospective design, it also calls into question how variables related to student attention, engagement, and recall might relate to programming effectiveness. This is a critical area of future research aimed at enhancing the utility of prevention programs. Several other limitations should be noted. First, this sample was recruited from a single Southwestern public university, suggesting that caution should be exercised when generalizing the results to other populations. Indeed, most students in this study were from Texas—a state that is well-documented as having poor mental healthcare

services in the public-school sector (Cook, Ruggiero, Shore, Daggett, & Butler, 2007). Future research should replicate this study with a broader geographic sample. Regarding high school characteristics, there was little variation regarding public versus private school, since many the students in the current study attended public schools. Additional research is needed based on private school samples. Also, this study relied on online self-report which can lead to random or careless responding; however, internal consistency analyses in the current study did not suggest reliability issues. Finally, researchers inquired about high school eating disorder interventions only. Future research should endeavor to ask what grade participants received the eating disorder topics.

Still, this study provides important information regarding education and prevention programs. Specifically, researchers found that few students reported exposure to any kind of eating disorder programming and that what little exposure was endorsed was almost uniformly of educational programming. Given that prevention has more empirical support than education (Linville et al., 2015; Stice et al., 2011, Stice et al., 2008; Stice et al., 2006; Green, Scott, Diyankova, Gasser, & Pederson, 2005; Matusek, Wendt, & Wiseman, 2004), this study identifies a current lack of implementation of evidence-based prevention programs. Other strengths of the study include the utilization of two psychometrically strong eating disorder questionnaires and a large sample size that contained a variety of ethnicities and undergraduate majors. Researchers also examined age, gender, and the participants' results on the DASS as potential confounding variables. Finally, the study design, while retrospective, was novel in that data was collected from undergraduates within the first month of their undergraduate career.

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VITA

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Department of Psychology & Philosophy
Sam Houston State University

EDUCATION

Sam Houston State University, Huntsville, TX (2015 – May 2017)
M.A., Clinical Psychology (APA-Accredited)
Overall GPA 4.00

Texas A&M University-Kingsville, Kingsville, TX (2011 – 2014)
B.A., Psychology, *Summa Cum Laude*

CLINICAL ACTIVITIES

Role: Practicum Student
Received opportunities through the practicum class to conduct individual therapy sessions and group therapy at the Counseling Center. Responsibilities included case conceptualization, formulation of treatment plans, and acquisition of techniques. Also attended outreach programs in the community on a variety of topics.
Institution: Sam Houston State University
Supervisor: Dr. Annie Mathew, Psy.D.
Dates: January 2017 – Present

Role: Practicum Student
Received opportunities through my practicum and group practicum to co-lead adult and adolescent group therapy with Dr. Michel and the ERC's primary therapist. Responsibilities also included helping the milieu coordinator prepare materials for group therapy and assisting with meal support during the Intensive Outpatient Program and Partial Hospitalization Program.
Institution: Eating Recovery Center- The Woodlands
Supervisor: Dr. Deborah Michel, Ph.D., CEDS
Dates: August 2016 – December 2016

Role: Mock Counselor
Conducted mock individual therapy sessions with classmates and undergraduates through the Psychology Research Participation System.
Institution: Sam Houston State University

Supervisors: Dr. Marsha Harman
Dates: August 2016 – December 2016
Role: Mock Group Counselor
Facilitated group during in-class sessions. I also researched and developed a body-image technique to use in an in-class group session. The technique used flowers and a worksheet regarding body image.
Institution: Sam Houston State University
Dates: August 2016 – December 2016

Role: Volunteer
Worked as a volunteer with responsibilities including assessing the clients' vitals (heart rate, blood pressure, and temperature), assisting in food preparation for Meal Support, and administrative duties. Also received the opportunity to stay for the patients' nightly group therapy sessions, where I was able to observe their primary therapist and licensed psychologist and receive guidance on appropriate group counseling behavior.
Institution: Eating Recovery Center- The Woodlands
Dates: January 2016 – August 2016

EMPLOYMENT

Nov 2016-Present *Milieu Coordinator*
Eating Recovery Center, The Woodlands, TX

Spring 2015 *Graduate Assistant*
Department of Psychology & Sociology
Texas A&M University-Kingsville, Kingsville, TX

May-Aug 2013 *Camp Counselor / Waterfront*
Texas Lions Camp for Disabled Children, Kerrville, TX

RESEARCH

2016 *Project Leader*
"The Implementation of Eating Disorder Education and Prevention Programs in High Schools"
Youth & Family Studies Lab of Amanda Venta
Department of Psychology and Philosophy
Sam Houston State University, Huntsville, TX

2016 *Graduate Research Assistant*
Youth & Family Studies Lab

Department of Psychology and Philosophy
Sam Houston State University, Huntsville, TX

2013 – 2015 *Research Assistant*
Cognitive Psychophysiological Lab of Dr. Dana Byrd
Department of Psychology and Sociology
Texas A&M University- Kingsville, Kingsville, TX

PROFESSIONAL MEMBERSHIPS

Academy for Eating Disorders, Fall 2016 - Present
National Eating Disorder Association, Spring 2016 - Present
American Psychological Association, Spring 2016 - Present
Psi Chi (International Honor Society), 2013 - Present
Society for Advancement of Hispanics/Chicanos and Native Americans in Science, 2014 - 2015
Southwest Psychology Association, 2014-Present

SCHOLARLY PUBLICATIONS

Manuscripts in Progress

1. Green, E., & Venta, A., (In Progress). The Implementation of Eating Disorder Education and Prevention Programs in High Schools.

PRESENTATIONS AND POSTERS

Poster Presentations

1. Green, E., & Venta, A., (2017) *The Implementation of Eating Disorder Education and Prevention Programs in High School*. Poster accepted for presentation at the 2017 American Psychological Association Annual Conference, Washington, D.C.
2. Green, E., under supervision of Dr. Dana Byrd (2014). *The Effect of Diet and Exercise Frequency on Respiratory Sinus Arrhythmia during the Tower of London Task.* Poster accepted for presentation at the 2014 Society for Advancement of Hispanics/Chicanos and Native American in Science Annual Conference, Los Angeles, CA
3. Green, E., under supervision of Dr. Dana Byrd (2014). *The Effect of Diet and Exercise Frequency on Respiratory Sinus Arrhythmia during the Tower of London Task.* Poster accepted for presentation at the 2014 Honors College Senior Research Symposium, Kingsville, TX
4. Green, E., under supervision of Dr. Dana Byrd (2014). *The Effect of Diet and Exercise Frequency on Respiratory Sinus Arrhythmia during the Tower of London Task.* Poster presented at the 2014 President's Undergraduate Research Program Presentation, Kingsville, TX

HONORS AND AWARDS

Graduate Student Liaison, Sam Houston State University (2016 – Present)
College of Humanities and Social Sciences Special Graduate Scholarship Award, Sam Houston State University (2015 – 2017)
Travel Stipend for Study Abroad Course in New Zealand, Texas A&M University-Kingsville, (2015)
Summa Cum Laude, Texas A&M University-Kingsville (2014)
Who's Who Among Students in American Universities and Colleges, Texas A&M University-Kingsville (2014)
Travel Scholarship, Society for Advancement of Hispanics/Chicanos and Native Americans in Science (2014)
President's Undergraduate Research Program Grant, Texas A&M University-Kingsville (2014)
President's List, Texas A&M University-Kingsville (2011 – 2014)
Golden Key International Honour Society, Texas A&M University-Kingsville (2014 – Present)
Honors College, Texas A&M University-Kingsville (2011 – 2014)
Presidential Scholarship, Texas A&M University-Kingsville (2011 – 2014)
Nordheim Education Foundation Scholarship, Nordheim ISD (2013 – 2015)

SERVICE

Media Citations & Interviews

1. Interviewed for "Expanding Horizons" on the New Zealand Global Studies show on the South Texas Radio station. Texas A&M University-Kingsville. Sep 2017