How Coping Process Relates to Eating Behaviors Among Military Veterans with Posttraumatic Stress Disorder

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ABSTRACT

HOW COPING PROCESS RELATES TO EATING BEHAVIORS AMONG MILITARY VETERANS WITH POSTTRAUMATIC STRESS DISORDER

Debra Kimberlin, Ph.D.
College of Health and Human Sciences
Northern Illinois University, 2019
Beverly Henry, Director

Posttraumatic stress disorder (PTSD) is a mental health condition faced by many veterans, and veterans with PTSD have higher rates of poor health and obesity than civilians. Evidence suggests mental health issues such as PTSD may be associated with disordered eating behaviors. In addition, veterans with PTSD may select a variety of coping behaviors to manage stress and emotions, some of which may negatively impact their health. This study explored the relationships between coping process, emotion- and stress-related eating, and eating disorder risk among a sample of veterans with PTSD (n = 239) who were recruited through veteran service organizations throughout the United States.

Participants completed Carver’s 28-item Brief COPE, Ozier and colleagues’ 24-item Emotion- and Stress-Related Eating scale of the Eating and Appraisal Due to Emotions and Stress (EADES) Questionnaire, and Garner and colleagues’ 26-item Eating Attitudes Test (EAT-26). A principal components analysis (PCA) was conducted on the 14 coping processes of the Brief COPE, revealing a three-component, second-order factor structure of related coping items. Comparing responses from the Brief COPE components of the PCA and the Emotion- and Stress-Related Eating scale of the EADES Questionnaire did not reveal statistically significant relationships. However, a statistically significant relationship was observed between emotion-
focused coping (PCA Component 2) and eating disorder risk measured by the EAT-26 ($r = .257$, $p < .05$).

Further analysis of the individual Brief COPE coping processes revealed statistically significant relationships between behavioral disengagement, self-blame, and acceptance and emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire ($r’s = -.153, -.174, .207$ respectively, $p < .05$). In addition, statistically significant relationships were found between denial, venting, planning, and self-blame and eating disorder risk measured by the EAT-26 ($r’s = .179, .151, .149, \text{ and } .258$ respectively, $p < .05$). Body mass index (BMI) most strongly predicted emotion- and stress-related eating, and emotion-focused coping (PCA Component 2) and self-reported history of eating disorder (ED) diagnosis or treatment most strongly predicted eating disorder risk. Results of this study may be beneficial for obesity prevention and mental health intervention efforts for veterans with PTSD. Improving the approach to coping for these veterans may improve overall health and well-being through positive dietary habits that support them during the healing process.
HOW COPING PROCESS RELATES TO EATING BEHAVIORS AMONG MILITARY VETERANS WITH POSTTRAUMATIC STRESS DISORDER

BY

DEBRA KIMBERLIN
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A DISSERTATION SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY

COLLEGE OF HEALTH AND HUMAN SCIENCES

Doctoral Director:
Beverly Henry
ACKNOWLEDGEMENTS

I would like to express my sincerest appreciation to the many individuals who supported me throughout this doctoral journey. I would like to thank Dr. Beverly Henry, my dissertation chair and advisor, for her wisdom, patience, and encouragement. I am grateful for the many hours she spent on this project and her commitment to my success. I would also like to thank Dr. Lin Shi, Dr. Amy Ozier, and Dr. Sharon Foley, members of my committee, whose guidance and support have meant so much to me. I would like to recognize NIU, particularly the College of Health and Human Sciences, for the opportunity to grow as a scholar and a researcher.

Thank you to my many colleagues at Olivet Nazarene University for encouraging me and supporting me throughout this process. I want to extend special gratitude to my colleague, Dr. Catherine Anstrom, who provided invaluable feedback and constant encouragement. I would like to recognize Stan, Malon, and all the veteran service organizations that forwarded my survey. A special thank you to the veterans willing to participate in my study.

Finally, I would like to acknowledge my family for their love and support. To my parents, who provided the solid foundation from which I have grown. I would like to thank my brother and his family for their encouragement. I am extremely grateful for the support from my stepsons and their families. I’d be remiss if I didn’t recognize my yellow lab, Doc, for planting the seed for this topic through his volunteer service with veterans. Finally, I would like to thank my husband, Dale, for his continued love and unswerving support. His faith in me and endless encouragement kept me going throughout this entire adventure.
DEDICATION

To the brave men and women who have served in the United States military
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CHAPTER 1
INTRODUCTION

Background

Posttraumatic stress disorder (PTSD) affects up to one in five United States (U. S.) veterans who served in recent combat eras such as Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF; United States Department of Veterans Affairs, 2018c). PTSD is a mental health disorder that may develop after a life-altering event. Unique characteristics of military service such as deployment, combat, or trauma put veterans at increased risk for PTSD (United States Department of Veterans Affairs, 2018d). Unfortunately, PTSD is a potentially debilitating condition that can affect a veteran’s relationships and functional ability (Anxiety and Depression Association of America, n.d.). Furthermore, veterans with PTSD experience poorer health compared to civilians (Hoerster et al., 2012; Lehavot, Hoerster, Nelson, Jakupcak, & Simpson, 2012). Veterans with PTSD suffer from cardiovascular disease risk factors such as hypertension and dyslipidemia (Cohen, Marmar, Ren, Bertenthal, & Seal, 2009), eating disorders (Bartlett & Mitchell, 2015), alcohol use disorder (Jacobson et al., 2008), depression (Ginzburg, Ein-Dor, & Solomon, 2010), and obesity (Maguen et al., 2013; Talbot, Maguen, Epel, Metzler, & Neylan, 2013). After examining health records of veterans who sought care within the Veterans Health Administration (VHA), Kilbourne, Ignacio, Kim, and Blow (2009)
determined that veterans with PTSD died an estimated 18 years prematurely compared to veterans without PTSD. Klingaman and colleagues (2016) concluded that premature death among veterans with PTSD was partially due to obesity-related conditions such as type 2 diabetes (Boyko et al., 2013) and cardiovascular disease (Wentworth et al., 2013). The health risks of obesity are concerning, given that approximately 41% of veterans within the VHA are classified as obese (Breland, Phibbs et al., 2017), defined as having a body mass index (BMI, calculated as weight in kilograms divided by height in meters squared) ≥ 30 kg/m². The obesity rate among veterans is slightly higher than the estimated 39.8% of civilian adults classified as obese in the U. S. (Centers for Disease Control and Prevention, 2018a). Breland, Phibbs, and colleagues (2017) confirmed the highest obesity prevalence (47%) among veterans with PTSD.

Statement of the Problem

The number of veterans treated within the VHA who experience obesity has steadily increased (Raffa et al., 2016) despite attempts to reverse the trend, such as through implementation of a national weight management program (MOVE!) in 2006 (United States Department of Veterans Affairs & United States Department of Defense, 2014). Obesity increases healthcare costs and reduces quality of life. For example, the economic burden related to being overweight or obese was estimated to be at least $370 per veteran per year in additional medical and nonmedical costs (United States Department of Veterans Affairs & United States Department of Defense, 2014). Veterans with PTSD participate less often in the MOVE! program (Maguen et al., 2016), engage in less physical activity (Godfrey, Lindamer, Mostoufi, &
Afari, 2013), and have poorer dietary behaviors (Hoerster et al., 2015) compared to veterans without PTSD.

Though research examining eating behaviors of veterans is limited, evidence suggests that mental health issues may be associated with a range of disordered eating behaviors including binge eating disorder (BED). Disordered eating is characteristic of a mild, short-term change in an individual’s eating pattern that results from a stressful event, illness, or desire to modify diet for health or appearance reasons (A. M. Smith, Collene, & Spees, 2018, p. 514). BED is characterized by recurrent episodes of eating a larger amount of food than most people would eat in a discrete period of time (American Psychiatric Association, 2013).

A review of literature indicated three ways that PTSD and eating behaviors may be related. Researchers determined that depression and PTSD are associated with BED (Higgins et al., 2013; Hoerster et al., 2015; Mitchell, Rasmusson, Bartlett, & Gerber, 2014; Rosenbaum et al., 2016), PTSD is associated with higher levels of eating disorder symptomology (Forman-Hoffman, Mengeling, Booth, Torner, & Sadler, 2012; Litwack, Mitchell, Sloan, Reardon, & Miller, 2014), and stress and PTSD may be associated with emotional eating (Talbot et al., 2013). Emotional eating is defined as consuming food in response to an emotional trigger rather than physiological need (Arnow, Kenardy, & Argras, 1995). Despite these findings, the relationship between eating behaviors and PTSD in veterans is understudied, and patterns that contribute to a veteran’s weight status need to be further explored.

Researchers examining how stress and coping impact eating behaviors concluded that individuals may eat to alleviate stress and negative emotions or to boost positive emotions (Konttinen, Silventoinen, Sarlio-Lääteenkorva, Männistö, & Haukkala, 2010; Macht &
Simmons, 2011). One cross-sectional study on self-reported diet quality in civilians who experienced PTSD found that PTSD was associated with eating larger quantities of fast food and sodas (Hirth, Rahman, & Berenson, 2011). Sinha and Jasterboff (2013) speculated that poor eating behaviors among individuals with psychiatric conditions may help manage negative emotions, similar to the mechanisms involved in people who experience addiction. Mitchell and Wolf (2016) found a relationship between PTSD and food addiction symptoms as well as eating disorder symptoms in a sample of veterans.

Given the current rate of health risks and obesity among veterans, the common co-occurrence of obesity and PTSD, and the fact that individuals may eat in response to stress and negative emotions, it is imperative to explore the eating behaviors of veterans with PTSD. Currently, there is a paucity of research examining eating behaviors of veterans with PTSD. In addition, studies examining the relationship between coping process and emotion- and stress-related eating or eating disorder risk in this population are lacking. Additional evidence about the relationship between coping process and eating behaviors among veterans with PTSD may be useful for obesity prevention and mental health intervention efforts.

Conceptual Framework

In order to explore the relationship between coping process and eating behaviors for veterans with PTSD, the concepts of stress and coping must be understood. According to Lazarus and Folkman (1984), stress does not result from an event but rather from the interaction between a person and his or her environment, focusing on a set of cognitive, affective, and
coping factors. Further, they defined coping as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (p. 141). Vulnerability to a stressful event as well as an individual’s interpretation and reaction to it can influence effective or ineffective coping responses (Ozier et al., 2007, p. 620).

Lazarus and Folkman’s transactional model of stress and coping is a useful framework for evaluating the coping process during stress (Glanz, Rimer, & Viswanath, 2015). Constructs of the transactional model of stress and coping include antecedents (stressors), primary appraisal, secondary appraisal, coping efforts, and adaptational outcomes (Lazarus & Folkman, 1984). Updates to coping theory suggest considering positive psychological states that may result from meaning-based coping (strategies focusing on positive techniques to handle the stressor; Glanz et al., 2015) as well as dispositional coping styles (personality traits relatively stable over time) and social support that may moderate an individual’s perception and coping abilities (Graham, 2015). See Figure 1.

According to the transactional model of stress and coping, when faced with a stressor, an individual assesses the potential demand or threat (primary appraisal) to determine whether there is harm or benefit to his or her well-being. The individual judges whether the event is stressful, positive, controllable, challenging, or irrelevant. If a demand or threat is detected, an individual determines whether anything can be done about the stressor through a secondary appraisal (Lazarus & Folkman, 1984) through which he or she evaluates coping resources and options to determine a coping response (Glanz et al., 2015). Actual coping efforts affect adaptational
outcomes such as emotional well-being, functional status, and health behaviors (Glanz et al., 2015).

The transaction model of stress and coping describes coping processes as being established in either problem- or emotion-focused behaviors (Lazarus & Folkman, 1984). Problem-focused coping may be referred to as active, action-focused, and positive coping, while emotion-focused coping may be referred to as avoidant or negative coping (Martindale et al., 2016). Problem-focused coping involves activities tied to solving the issue or changing the perceived problem, whereas emotion-focused coping involves behavioral responses that attempt to alleviate distress rather than address the stressor itself (Folkman, Lazarus, Dunkel-Schetter,
DeLongis, & Gruen, 1986). Individuals who use problem-focused coping would define the problem and find alternative solutions, whereas those employing emotion-focused coping would avoid the situation. As such, though all individuals experience stress, the transaction model of stress and coping helps explain why individuals respond differently to stress (Lazarus & Folkman, 1984). Approaching from this view, eating behaviors can be influenced by an individual’s coping process, which highlights why some individuals overeat in response to stress while others reduce their food intake when experiencing stress (Adam & Epel, 2007).

The transactional model of stress and coping was utilized to understand coping related to various health issues including critical illness (Byers & Smyth, 1997), HIV care (Graham, 2015), breast cancer (Hack & Degner, 2004), and work-related emotional stressors among nurses working in hemodialysis units (Ashker, Penprase, & Salman, 2012). After assessing the coping process of veterans, Rodrigues and Renshaw (2010) determined that emotion-focused coping was directly related to postdeployment PTSD symptoms.

Based on the constructs of the transactional model of stress and coping and application to health issues as well as coping among veterans with PTSD, it is possible that a specific approach to coping may be related to normal or disordered eating behaviors among veterans with PTSD. Mitchell, Mazzeo, Schlesinger, Brewerton, and Smith (2012) postulated that eating disorder behaviors may be a means of disassociating oneself from upsetting thoughts and memories related to PTSD. Thus, the transactional model of stress and coping provides a useful framework to assess how coping process (problem-or emotion-focused) may relate to eating behaviors (emotion- and stress-related eating and risk of eating disorder behaviors).
Significance of the Study

Information gleaned from this study can be used to identify veterans with PTSD who are at risk of disordered eating patterns due to their coping process when dealing with stressful situations. Findings could extend the understanding of the comorbidity between PTSD and obesity. In addition, healthcare providers, including registered dietitians, who are treating veterans with PTSD can tailor treatments and provide alternative coping strategies that lead to health-promoting behaviors. Furthermore, individualized interventions could address behavior modification and decrease the risk of obesity and obesity-related health conditions among veterans, thereby reducing the economic burden on the VHA. Moreover, this study could have global implications because military service members from other countries, such as the United Kingdom, face similar rates of PTSD as are found in the U. S. (Godfrey et al., 2013). Given that veterans may keep their military experiences to themselves, this type of self-report study may also be significant in understanding the experiences of veterans with PTSD.

Purpose of the Investigation

This study was an attempt to elaborate on and clarify the relationship between coping process and eating behaviors among veterans with PTSD. More specifically, I sought to examine the relationships between a veteran’s responses on coping, emotion- and stress-related eating, and eating disorder risk measures. This research was based on the implication that improving coping process will improve overall health and well-being through positive dietary habits. It is
important for veterans with PTSD to identify and practice positive coping behaviors when
dealing with stress, which will support them in the healing process and improve their overall
health and well-being. Alternative coping strategies are crucial, given that there is evidence that
PTSD symptoms put veterans at an increased risk for obesity and obesity-related chronic
conditions (Breland, Phibbs et al., 2017; Cohen et al., 2009; Ginzburg et al., 2010; Maguen et al.,
2013).

Research Questions

This study was conducted to better understand the relationship between coping process
and eating behaviors among military veterans with PTSD. The specific research questions
central to this study were as follows:

1. What relationships exist between coping process (measured by the Brief COPE),
   emotion- and stress-related eating (measured by the Emotion- and Stress-Related Eating
   scale of the Eating and Appraisal Due to Emotions and Stress [EADES] Questionnaire),
   and eating disorder risk (measured by the Eating Attitudes Test [EAT-26]) in a sample of
   veterans with PTSD?

2. Which variables most strongly predict emotion- and stress-related eating (measured by
   the Emotion- and Stress-Related Eating scale of the EADES Questionnaire) in a sample
   of veterans with PTSD?

3. Which variables most strongly predict eating disorder risk (measured by the EAT-26) in a
   sample of veterans with PTSD?
Operational Definitions of Variables

Coping process is defined as “constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 541). Carver’s 28-item Brief COPE was used to measure veterans’ coping process. The Brief COPE consists of 14 scales (two statements per scale) to describe coping: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame (Carver, 1997). Possible scores for each of the 14 coping-process scales range from 2-8, with higher scores indicating higher frequency of use.

Emotion- and stress-related eating is defined as consuming food in response to an emotional trigger rather than physiological need (Arnow et al., 1995). To measure whether veterans are engaging in emotion- and stress-related eating, Ozier and colleagues’ (2007) Emotion- and Stress-Related Eating scale (24 items) of the EADES Questionnaire was utilized. Possible scores range from 24-120, with lower scores representing greater emotion- and stress-related eating (Ozier et al., 2007).

Eating disorder risk is defined as “a high level of concern about dieting, body weight, or problematic eating behaviors” (Garner, 2010, p. 2). To measure eating disorder risk among veterans, Garner, Olmstead, Bohr, and Garfunkel’s (1982) EAT-26 was utilized. The range of its possible scores is 0-78, with a score of 20 or above indicating higher eating disorder risk.
Limitations of the Study

Several limitations were considered when interpreting the results of this study. First, participants in this study were restricted to military veterans with PTSD, and the sample was mostly male, impacting the generalizability of the findings. Second, though many participating veteran service organizations had a PTSD-diagnosis verification protocol, using a one-question PTSD screening question to verify PTSD status rather than a validated screening tool may have impacted the findings of this study. Third, cross-sectional survey design is limited by the fact that it does not allow for establishing causality (Creswell, 2014). Finally, data collection relied on self-reporting; therefore, self-report bias may have occurred.

Definitions of Terms

Body Mass Index (BMI): Body fat measurement that is the ratio of an individual’s body weight in kilograms to height in meters squared (A. M. Smith et al., 2018).

Gulf War Era: “From August 2, 1990 through a date to be prescribed by Presidential proclamation or law” (United States Department of Veterans Affairs, 2011, p. 4); it includes Operations Desert Shield, Desert Storm, and current Operations Enduring Freedom (OEF), Iraqi Freedom (OIF) and New Dawn (OND; United States Department of Veterans Affairs, 2011).


Operation New Dawn (OND): Military operations in Iraq beginning September 2010 and meant the official end to OIF (Fisher, 2015).

Posttraumatic Stress Disorder (PTSD): A trauma and stress-related disorder that can develop after witnessing or experiencing a traumatic event, which is comprised of four types of symptoms: recurrent or intrusive memories of the traumatic event, avoidance, negative changes in mood or cognition, changes in reactivity or arousal (American Psychiatric Association, 2013).

Veteran: “A person who served in the active military, naval or air service and who was discharged or released under conditions other than dishonorable” (Pensions, bonuses and veterans’ relief, 2017, p. 151).


Summary

This chapter introduced health issues faced by veterans with PTSD. A conceptual framework was proposed in order to explore the extent to which coping process may be related to eating behaviors among veterans with PTSD. After introducing the purpose of this study, it outlined research questions, significance, and limitations. Definitions of terms were included to
aid in the understanding of key concepts. The following chapter is an in-depth literature review concerning military veterans, their health, weight status, eating behaviors, and coping behaviors.
CHAPTER 2
LITERATURE REVIEW

“To care for him who shall have borne the battle, and for his widow and his orphan”
- President Abraham Lincoln

Military Veterans

President Abraham Lincoln’s famous words during his second inaugural address on March 4, 1865 later became the United States Department of Veterans Affairs’ (VA’s) motto and part of its mission to fulfill Lincoln’s promise by serving and honoring America’s men and women veterans (United States Department of Veterans Affairs, 2017, para 1). There are estimated to be nearly 20 million military veterans (90.6% male, 9.4% female) living in the U. S. (United States Department of Veterans Affairs National Center for Veterans Analysis and Statistics, 2017). Despite the opportunities provided by military service such as a path to education and personal development, veterans are often exposed to dangerous and traumatic situations that could cause lasting physical and psychological wounds (Schnurr, Lumney, Bovin, & Marx, 2009). Thus, veterans are a crucial subpopulation for public health assessment and intervention (Hoerster et al., 2012).

Evidence suggests that military service may negatively impact long-term health through adverse health outcomes that are documented in samples of veterans from the Vietnam War era (Brooks, Laditka, & Laditka, 2008), the Gulf War era (Wagner, Wolfe, Rotnitsky, Proctor, &
Erickson, 2000), and veterans who served in Iraq (OIF) and Afghanistan (OEF; Buckley, Mozley, Bedard, Dewulf, & Grief, 2004). The wars in Iraq and Afghanistan (OIF/OEF) involved unique conditions—longer and more frequent deployments, less time between deployments, and advances in medicine that increase survival rates from battle wounds—that may foster posttraumatic psychological difficulties (Schnurr et al., 2009; Shea, Vujanovic, Mansfield, Sevin, & Liu, 2010). Consequently, researchers have placed a greater emphasis on detecting and assessing the effects of mental health concerns, particularly PTSD, among veterans who served in Iraq (OIF) and Afghanistan (OEF; Asnaani, Reddy, & Shea, 2014).

**Posttraumatic Stress Disorder**

PTSD is a psychiatric disorder that can occur after experiencing a traumatic event. If stress reactions such as jumpiness, difficulty sleeping, or upsetting memories about the traumatic event do not resolve or if they worsen, an individual may be experiencing PTSD symptomology (United States Department of Veterans Affairs, 2018d). If severe enough, PTSD can impact an individual’s ability to perform normal daily functions. The American Psychiatric Association’s (APA’s) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; 2013) asserts that in the U. S. general adult population, the lifetime prevalence rate of PTSD at age 75 is 8.7% (p. 276). However, individuals regularly exposed to trauma such as firefighters, emergency response personnel, and military veterans are at higher risk for developing PSTD (American Psychiatric Association, 2013). For veterans, being in combat, experiencing injury, or
witnessing someone be wounded or killed contribute to this risk (National Institutes of Health, 2009; Xue et al., 2015).

Health providers may conduct structured interviews or use self-report questionnaires to determine the extent of PTSD symptomology in veterans and determine appropriate treatment strategies (United States Department of Veterans Affairs, 2018d). In order to diagnose PTSD, the following symptoms must be present for at least 1 month: at least one reexperiencing symptom (i.e., flashback or upsetting dream), at least one avoidance symptom (i.e., avoiding places that remind the individual of the event or avoiding thoughts and feelings related to the event), at least two arousal and reactivity symptoms (i.e., feeling on edge, having angry episodes, or having trouble sleeping), at least two cognition and mood symptoms (i.e., negative thoughts about oneself, feelings of blame or guilt, lack of interest in enjoyable activities; National Institute of Mental Health, 2016).

Conventional treatments for PTSD include psychotherapy such as cognitive behavioral therapy (CBT), eye movement desensitization reprocessing (EMDR), or medications that act as selective serotonin reuptake inhibitors (SSRIs; United States Department of Veterans Affairs, 2019). Unconventional treatments may include complementary and alternative medicine (CAM) such as acupuncture, mind-body medicine, mindfulness, and yoga (Strauss & Lang, 2012); these treatments currently have limited evidence of efficacy and may be utilized as alternatives to conventional treatments.
PTSD Among Veterans

The psychological effects of military trauma have been noted for centuries, and formal attempts to medically address them in the U. S. date back to the Civil War (1861 to 1865) when a doctor treating soldiers with rapid heart rate, anxiety, and difficulty breathing described these cardiac symptoms as *soldiers heart or irritable heart* (Friedman, 2018). During World War I, symptoms of current-day PTSD were called *shell shock*, a term later replaced by *battle fatigue* during the World War II era. According to Friedman (2018), the APA’s first *Diagnostic and Statistical Manual: Mental Disorders* (DSM-I) included the diagnosis of *gross stress reaction* for individuals with symptoms of combat trauma, a term replaced by *adjustment reaction to adult life* in the APA’s *Diagnostic and Statistical Manual of Mental Disorders* (DSM-II). Friedman further noted that research involving trauma survivors such as veterans, Holocaust survivors, and sexual trauma victims, prompted the APA to add PTSD to its *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) in 1980. This represented a shift in philosophy that the cause was from individual weakness to a philosophy that the cause resulted from an event that happened to an individual (Friedman, 2018).

Greater attention was brought to the prevalence of PTSD among veterans when results of the National Vietnam Veterans Readjustment Study (NVVRS), conducted between 1986 and 1988, revealed that as many as 15% of Vietnam War veterans experienced PTSD (United States Department of Veterans Affairs, 2016). A 2012-2013 follow-up study of a sample of NVVRS veterans, called the National Vietnam Veterans Longitudinal Study, revealed that 11% of male and 7% of female veterans who were deployed during the Vietnam War continued to meet
diagnostic criteria for PTSD more than two decades later (Schlenger & Corry, 2015). Further, the VA (2016) estimated that 30% of Vietnam War veterans experience PTSD in their lifetime. Similar rates of PTSD were reported among veterans of more recent combat eras. The United States Department of Veterans Affairs (2018c) estimated PTSD prevalence for veterans who served during the Gulf War (Operation Desert Storm) at 12%. Likewise, the most recent wars in Iraq and Afghanistan (OIF/OEF respectively) were environments that promoted the development of posttraumatic mental health difficulties (Schnurr et al., 2009), with estimates of PTSD prevalence as high as 20% (United States Department of Veterans Affairs, 2018c).

The Health of Veterans

Several studies evaluated the self-reported health of military veterans. Hoerster and colleagues (2012) compared veteran men \( (n = 53,406) \), active duty service men \( (n = 2,144) \), National Guard/Reserve service men \( (n = 3,724) \), and civilian men \( (n = 110,116) \) on self-reported health outcomes by analyzing data from the 2010 Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is comprised of annual telephone surveys conducted to monitor health, health-risk behaviors, and use of preventative services among U. S. adults (Centers for Disease Control and Prevention, 2014). Hoerster and colleagues (2012) determined that veteran men reported poor overall health and experienced chronic health conditions such as cardiovascular disease, arthritis, cancer, depression, and anxiety more often than civilian men. In addition, male veterans reported higher rates of diabetes and obesity compared to active duty service men.
Similarly, Lehavot and colleagues (2012) compared self-reported health outcomes of female veterans \((n = 4,221)\), active duty service women \((n = 661)\), National Guard/Reserve service women \((n = 995)\), and civilian women \((n = 274,399)\) by analyzing data from the 2010 BRFSS. Researchers concluded that female veterans reported poorer general health as compared to active duty, National Guard/Reserve service, and civilian women. Additionally, veterans indicated a greater likelihood of smoking, being overweight or obese, and experiencing depressive disorders than the three other subgroups. Interestingly, even though veteran women reported poorer general health than the three other subgroups, they also reported higher education levels, higher incomes, and were more likely to have health insurance than the other three subgroups (Lehavot et al., 2012).

The United States Department of Defense (DoD) and United States Department of Veterans Affairs (VA) funded long-term prospective studies to assess the impact of military experiences on the long-term health of service members. The DoD Millennium Cohort Study includes a panel of 150,000 veterans and active duty military personnel who completed surveys every 3 years since 2001, with the goal of collecting data for 21 years (Eber et al., 2013). Samples of published findings from the DoD Millennium Cohort Study panel indicated that service members who were deployed had significantly higher rates of respiratory symptoms such as shortness of breath and persistent or recurring cough than those who had not been deployed (B. Smith, Wong, Boyko, Gacksetter, & Ryan 2009). In addition, Boyko and colleagues (2010) found that participants who experienced baseline PTSD had a 100% higher risk of type 2 diabetes. Furthermore, T. C. Smith and colleagues (2008) determined that participants who were
deployed and faced combat had a 200% higher likelihood of screening positive for PTSD compared to those who had not been deployed.

Veterans of recent wars (OIF/OEF) often faced more exposure to combat because of longer and more frequent deployments, which increased their risk of PTSD (Xue et al., 2015), anxiety, and depression (Armed Forces Health Surveillance Center, 2011), and pain or other chronic health conditions (Armed Forces Health Surveillance Center, 2012). The National Health Study for a New Generation of United States Veterans (NewGen) was a large-scale longitudinal study conducted over a 10-year period to assess the health of veterans who were deployed to OIF/OEF as compared to nondeployed veterans who served during the same era (Eber et al., 2013).

NewGen included a panel of 60,000 randomly selected veterans (30,000 deployed to OIF/OEF, 30,000 nondeployed) who served in the military between 2001 and 2008 (Eber et al., 2013). Initial data collection occurred between 2009 and 2011, with 20,563 veterans returning the 16-page, 72-item survey assessing a broad spectrum of health conditions, risk behaviors, and use of care services. After analyzing the NewGen data, Barth, Dursa, Bossarte, and Schneiderman (2016) determined that respiratory exposures, which increased the likelihood of respiratory disease, were prevalent in both deployed and nondeployed groups. In addition, the United States Department of Veterans Affairs (2018b) published findings that deployed veterans were 29% more likely to have sinusitis compared to nondeployed veterans and that 13.5% of study participants screened positive for PTSD. These studies highlight the range of physical health problems that impact military veterans, and there is a growing body of inquiry exploring the health of veterans with PTSD.
The Health of Veterans With PTSD

Evidence suggests that veterans with PTSD exhibit worse physical health outcomes than veterans without PTSD (Hoerster et al., 2012; Lehavot et al., 2012). Although research exploring the relationship between PTSD and health was conducted among older veterans of previous service eras (Brooks et al., 2008; Schnurr & Spiro, 1999), there is evidence suggesting that PTSD may be related to poorer health outcomes in younger veterans who served in recent conflicts in Iraq (OIF) and Afghanistan (OEF; Cohen et al., 2009; Schry et al., 2015). PTSD is a significant health concern for the VA, given that the healthcare burden for veterans screening positive for PTSD is an estimated $8,000 median annual cost per veteran (Asnaani et al., 2014).

In a large retrospective study of OIF/OEF veterans (88% male, 12% female) using VA healthcare services (N = 303,323), Cohen and colleagues (2009) analyzed electronic health records. Researchers concluded that veterans with a mental health diagnosis such as PTSD had a significantly higher prevalence of cardiovascular risk factors such as hyperlipidemia, tobacco use, hypertension, and obesity than those without a mental health diagnosis. In addition, researchers reported that 24% of veterans were diagnosed with PTSD, many of whom had a comorbid mental health diagnosis including depression (53%), anxiety disorder (29%), adjustment disorder (26%), alcohol use disorder (22%), and other psychiatric diagnoses (33%; Cohen et al., 2009, p. 490).

The 2009 Cohen and colleagues study extended the findings of Buckley and colleagues (2004) who also analyzed archival medical record data of veterans; however, Cohen and colleagues’ results were evaluated with age-comparable civilians. Buckley and colleagues’ study
revealed that male veterans with PTSD had higher rates of diabetes, stroke, cancer, myocardial infarction, arthritis, and cirrhosis of the liver when compared to civilian men. In addition, Buckley and colleagues determined that veterans smoked at twice the rate of civilians and exercised less frequently than civilians. Furthermore, veterans reported engaging in fewer preventative healthcare visits such as prostate and colorectal screenings (Buckley et al.).

In a longitudinal study of over 4,000 OIF/OEF veterans enrolled in VA primary care over 6 years, Possemato, Wade, Andersen, and Ouimette (2010) expanded this body of research by examining the effects of PTSD on health over time. These researchers used international classification of diseases (ICD-9) codes and determined that 29% of participants received a PTSD diagnosis, and those with PTSD experienced disease more often as time progressed than veterans without PTSD. The most commonly diagnosed diseases among these veterans were spine and knee joint issues as well as symptoms of fatigue and headache. Further, Possemato and colleagues noted digestive and nervous system disease were more common in veterans with PTSD than veterans without PTSD. This research indicated that veterans with PTSD may experience heightened declines in health over time compared to veterans without PTSD.

Schry and colleagues (2015) conducted a cross-sectional study of over 1,000 OIF/OEF veterans who were eligible for VA healthcare in order to examine the relationship between PTSD symptom severity and physical health. In the study, after controlling for age, gender, race, and combat exposure, PTSD symptom severity was positively correlated with self-reported health conditions and health symptoms. In addition, veterans with PTSD were more likely to rate their health as poor or fair compared to veterans without PTSD. Results from the Schry and colleagues’ study were consistent with research by El-Gabalawy, Blaney, Tsai, Sumner, and
Pietrzak (2018) who analyzed data from over 3,000 veterans who participated in the National Health and Resilience in Veterans Study (NHRVS). In that study, researchers determined that 6.5% of NHRVS participants met PTSD screening criteria and that PTSD was associated with increased likelihood of respiratory conditions, sleep disorder, osteoporosis or osteopenia, and migraine.

The above studies demonstrate that PTSD may be associated with a variety of negative health outcomes. Pacella, Hruska, and Delahanty (2013) asserted that a multitude of factors may explain the relationship between PTSD and physical health including the long-term activation of stress pathways on the immune system as well as cognitive-behavioral correlates such as avoidant coping or health-risk behaviors. Chwastiak, Rosenheck, and Kazis (2011) proposed that the relationship between PTSD and poorer health outcomes may partially result from health-risk behaviors that lead to obesity such as overeating or reduced physical activity.

**Obesity Among Veterans**

Weight status is another significant health concern within the VA because over 40% of veterans are classified as obese (Breland, Phibbs et al., 2017), and many of the health problems veterans experience such as cardiovascular disease, diabetes, hypertension, and dyslipidemia are associated with obesity (National Institute of Diabetes and Digestive and Kidney Diseases, 2015). The United States Department of Veterans Affairs and United States Department of Defense (2014) estimated that an additional $370 per patient per year in medical and nonmedical costs can be attributed to excess weight levels. Although service members must meet and
maintain strict body weight and fitness standards during active duty, the prevalence of obesity has increased among veterans during postdeployment and as they age (Nelson, 2006). One study found that veterans may experience a burst of weight gain shortly after military discharge (Koepsell, Littman, & Forsberg, 2012).

Within the VHA, obesity is identified through screening of height and weight measures to calculate BMI or through the presentation of obesity-related chronic health conditions (United States Department of Veterans Affairs & United States Department of Defense, 2014). The VHA National Center for Health Promotion and Disease Prevention (NCP) developed MOVE!, a large-scale, evidence-based weight management program for veterans receiving care at VHA facilities, in response to the prevalence of being overweight and obese among veterans (Arigo et al., 2015). Veterans who receive care at a VHA facility are screened for being overweight or obese and referred to MOVE! if they expressed interest in weight loss (Arigo et al., 2015). Besides a variety of services including individual, group, and telehealth counseling, veterans have access to a variety of educational materials promoting lifestyle behavior change (Jay, Mateo, Squires, Kalet, & Sherman, 2016). In addition, weight-loss medications, intensive medical management, and bariatric surgery are included in obesity-treatment protocols for those who need more intensive interventions (Kinsinger et al., 2009).

Evidence suggests that a variety of factors impact the rates of obesity among veterans. Lack of participation in the MOVE! program, lack of emphasis on healthy food choices during active duty, barriers to physical activity such as pain or injury, lack of daily structure upon discharge, overeating due to high levels of stress, and personal issues related to military service have been identified as factors (Jay et al., 2016). Similar findings were published in an earlier
study by C. Smith, Klosterbuer, and Levine (2009) in which veterans reported that patterns of food intake (binge eating) and food choices (high-fat, high-carbohydrate) during active military service influenced overeating and food cravings after military discharge. In addition, a growing body of evidence suggests that PTSD may be related to an increase in weight among veterans (Masodkar, Johnson, & Peterson, 2016).

PTSD and Obesity

The effect of PTSD on weight status is complex, and evidence confirming a link between PTSD and obesity is expanding. Hoerster et al. (2015) emphasized that this relationship includes both physiological and behavioral aspects. Further, Masodkar and colleagues (2016) asserted there is a bidirectional relationship between PTSD and obesity: those with PTSD may be more likely to develop obesity, and obese individuals may be predisposed to PTSD after experiencing trauma (p. e1253). While research identified the impact of behavioral pathways on increased weight (Hoerster et al., 2015), research identifying a pathway between mental health and obesity continues to evolve.

Pagoto and colleagues (2012) examined the relationship between PTSD and obesity by gender among a representative sample (n = 20,013) of the U. S. population who was participating in the Collaborative Psychiatric Epidemiology Surveys (CPES). The CPES included three nationally representative, cross-sectional surveys conducted between 2001 and 2003. Interestingly, Pagoto and colleagues determined that a PTSD diagnosis within the last 12 months (i.e., past year) was correlated with increased odds of being obese regardless of gender (odds
ratio, 1.51 [95% CI, 1.18 – 1.95]). Slightly more than 32% of participants who reported having PTSD within the past year were obese compared to the 24% who met obesity criteria among those with no history of PTSD. Researchers highlighted that further investigation is needed to identify whether PTSD precedes the development of obesity or if unhealthy behaviors lead to increases in weight (Pagoto et al.).

In a longitudinal study using online self-report questionnaires, Cronce, Bedard-Gilligan, Zimmerman, Hodge, and Kaysen (2017) assessed whether binge eating or alcohol use mediated the relationship between PTSD and BMI in a sample of 425 young-adult, sexual-minority women aged 18-25 years. In the study, researchers defined sexual-minority women as those who “self-identify as lesbian or bisexual or who engage in same-sex sexual behavior” (p. 801). PTSD symptomology, alcohol use, and BMI were measured at baseline. Alcohol use and frequency of binge eating during the previous year were assessed 12 months after baseline, and BMI was measured 2 years after baseline. Researchers concluded that PTSD symptomology was longitudinally associated with higher BMI measures 2 years after baseline and that binge eating was identified as a factor in the relationship between PTSD and BMI, whereas alcohol use was not (Cronce et al., p. 801).

An earlier 16-year prospective observational study by Kubzansky and colleagues (2014) assessed the correlation between PTSD and risk of obesity in a subsample of 54,224 women enrolled in the Nurses Health Study II. Researchers concluded that women who developed PTSD symptoms before entry into the study exhibited a steeper rise in BMI upon follow up than women with fewer PTSD symptoms. Further, women with a normal BMI who experienced at
least four symptoms of PTSD at baseline had increased likelihood (odds ratio, 1.36 [95% CI, 1.19-1.56]) of becoming overweight or obese (Kubzansky et al.).

The above studies establish a link between PTSD and obesity; however, additional research is needed to identify factors that mediate this relationship. Research exploring obesity among veterans with PTSD may substantiate a PTSD-obesity link.

Obesity Among Veterans With PTSD

Given the published rates of PTSD among veterans and negative health outcomes associated with PTSD, it is important to better understand the relationship between PTSD and obesity in this population. Thus far, research results are mixed. Maguen and colleagues (2013) conducted a retrospective, longitudinal cohort analysis of health records of 496,722 male (436,932) and female (59,790) Iraq and Afghanistan War veterans during a 3-year period to examine the relationship between BMI and mental health status. Researchers observed four BMI trajectory classifications: stable overweight, stable obese, overweight/obese gaining, and obese losing. They determined that veterans with PTSD and depression were at greatest risk of being obese without weight loss or overweight or obese and continuing to gain weight. Though similar BMI trajectories were noted for males and females, male veterans with PTSD and females with depression were at the highest risk for obesity (Maguen et al., 2013).

B. M. Smith, Tyzik, Neylan, and Cohen (2015) further documented the relationship between PTSD and obesity with a focus on age by conducting a cross-sectional study of 745 veterans (380 aged 60 years and older, 365 under 60 years). Researchers found that PTSD was
significantly associated with increased likelihood of being overweight or obese among all participants, but lifetime PTSD was associated significantly with obesity. In B. M. Smith et al.’s study, current and lifetime PTSD symptom frequency and severity were evaluated using the Clinician Administered PTSD Scale (CAPS). Three versions of CAPS, each corresponding to a distinct time period, allowed for the assessment of PTSD symptoms during the past week, past month, or worst month. Worst-month symptoms represent lifetime PTSD as measured by the CAPS (United States Department of Veterans Affairs, 2018a). In addition, depression was associated with significantly increased likelihood of being overweight or obese in veterans 60 years old and older. Researchers asserted that these findings support the need for further research examining PTSD and health during a lifetime.

In hopes of identifying barriers to weight loss for veterans, Klingaman and colleagues (2016) conducted a cross-sectional study of 171,884 veterans, comparing those with PTSD to those with no mental health issues. Researchers administered the MOVE!23 questionnaire, 23-items that measure general health, eating habits, exercise habits, and weight management barriers. Klingaman and colleagues determined that veterans with PTSD reported more barriers to changing eating behavior and physical activity habits, concluding that a comprehensive approach to weight loss in veterans with PTSD is warranted. These results are supported by recent research by Maguen and colleagues (2016) that assessed participation in the VHA’s MOVE! program. The researchers evaluated patient-care records of nearly 25,000 veterans who had at least one experience with MOVE! and at least one weight measurement. Maguen and colleagues determined that MOVE! participation was less likely for veterans with PTSD than veterans without PTSD.
Conversely, two studies among veterans failed to reveal a relationship between obesity and PTSD. In a retrospective chart review of 1,553 OIF/OEF veterans by Barber, Bayer, Pietrzak, and Sanders (2011), rates of being overweight in the sample of veterans were higher than in civilian samples, but obesity rates were not. In addition, BMI was not significantly associated with psychological distress (Barber et al., p. 153). Similarly, Vieweg and colleagues (2006) reviewed records of 229 predominately Vietnam War era male PTSD clinic enrollees to assess the prevalence and severity of being overweight or obese among veterans with PTSD. Researchers reported that slightly over 82% of participants in the study were either overweight or obese, surpassing civilian and non-PTSD veteran rates; however, they asserted that PTSD did not explain their findings (Vieweg et al., p. 1153). These results contradict other cross-sectional and longitudinal studies and may indicate the need to research other behavioral factors that may impact weight status among veterans such as eating behaviors.

Eating Behaviors Among Veterans

Results of a systematic review indicate that disordered eating patterns and behaviors linked with eating disorders may be more prevalent in veterans than civilians (Bartlett & Mitchell, 2015). Evidence suggests that eating behaviors adopted during active duty may influence eating habits after discharge (Breland, Donalson, Nevedal, Dinh, & Maguen, 2017; C. Smith et al., 2009). For example, having to eat a significant amount of food in a short meal period during boot camp or experiencing periods of starvation during deployment may begin a pattern of disordered eating behaviors for some veterans (Breland, Donalson et al., 2017). In
addition, mental and physical health comorbidities were found to be significant barriers to healthy eating behaviors among some veterans (Hoerster et al., 2012; Lehavot et al., 2012).

In a qualitative study by C. Smith and colleagues (2009), 64 veterans (61 male, 3 female) who served in a range of service eras participated in focus groups. The purpose of the study was to determine whether military service experiences impacted postwar eating behavior and high rates of obesity among the veteran population. Researchers determined that during basic military training, participants were exposed to large amounts of calorically dense foods, learned to adjust to short meal times (i.e., 5-15 minutes duration), and noted being served less food overall as a way to prepare them for combat when they would rely on operational rations (C. Smith et al., 2009). Furthermore, the researchers concluded that the changes in eating behavior during active duty contributed to the high prevalence of obesity (i.e., 50%) among this sample of veterans.

In a later cross-sectional study, Hoerster, Wilson, Nelson, Reiber, and Masheb (2016) examined individual, social, environmental, and physical environment influencers of diet quality among 653 male and female veterans using VA healthcare services. Researchers concluded that the most significant factors leading to poorer diet quality were more severe depression symptoms, not having others join a veteran for healthy eating, and reduced availability of low-fat foods in neighborhood stores where veterans frequently shop (p. 171). These results support the need for dietary interventions targeting a variety of factors that influence eating behaviors among veterans.

Masheb and colleagues (2015) conducted secondary data-analysis research regarding 392 overweight or obese veterans enrolled in the ASPIRE study to compare weight loss and clinical outcomes based on binge eating status. The ASPIRE study was a randomized trial to assess the
effectiveness of weight-loss treatments delivered by the VHA. Researchers found that 83.1% of participants reported binge eating behaviors. Those who reported binge eating behaviors experienced poorer weight-loss outcomes compared to those who never reported binge eating. At the 12-month follow-up period, veterans who did not report binge eating lost almost twice as much weight and reduced their waist size by more than double compared to those who reported any binge eating. Furthermore, a small percentage (6.1%) of participants who reported high-frequency binge eating (i.e., 5 or more binge eating episodes per week) gained 1.4% of their body weight and experienced a 0.3-inch increase in their waist circumference. Masheb and colleagues’ study indicated that binge eating may have negative effects on weight-loss efforts for veterans seeking treatment through the VHA.

The above studies indicate a variety of factors are associated with eating behaviors of military veterans including habits established during active service, access to healthy food, and mental health issues.

PTSD and Eating Behaviors

Because individuals may eat in response to stress and negative emotions and to enhance positive emotions (Konttinen et al., 2010; Macht & Simmons, 2011), individuals with PTSD may be at an increased risk of disordered eating behaviors. Hirth and colleagues (2011) speculated that women suffering from PTSD may exhibit unhealthy eating or weight-loss behavior to alleviate PTSD symptoms or negative emotions. Their cross-sectional study of over 3,000 civilian women aged 16-24 years revealed an increased consumption of sugary drinks and fast
food as well as more unhealthy dieting behaviors (i.e., use of diuretics, diet pills, or laxatives and smoking) by those with PTSD compared to participants who did not meet the screening criteria for PTSD (Hirth et al.). In addition, the researchers obtained height and weight measures for BMI calculations and did not find a significant relationship between PTSD and BMI. However, they speculated that unhealthy dieting behavior of those who met the screening criteria for PTSD may have prevented a weight gain.

A cross-sectional study by Talbot and colleagues (2013) examined emotional eating in a sample of adults (44 with PTSD, 49 without PTSD), some of whom were military veterans, to assess whether the participants with PTSD exhibited more emotional eating habits compared to those without PTSD. Researchers concluded that those with PTSD exhibited more frequent emotional eating habits. Talbot and colleagues’ study is significant given that emotional eating could be associated with more severe disordered eating behaviors or eating disorders (Rotella et al., 2018).

When examining binge eating, depression, stress, body image, self-efficacy for healthy eating and physical activity, and barriers to physical activity in 111 male veterans who had a BMI $\geq 25$, Rosenberger and Dorflinger (2013) found that 25.2% of participants engaged in binge eating behaviors. In addition, the researchers found that binge eating was associated with higher depression levels, along with barriers to exercise and lower self-efficacy for healthy eating and exercise. However, binge eating was not associated with body satisfaction or recent stress.

These studies provide some evidence that both civilians and veterans with PTSD may experience disordered eating patterns; therefore, it is important to further explore the extent of the relationship between PTSD and eating behaviors among veterans with PTSD.
Eating Behaviors Among Veterans With PTSD

Several researchers evaluated the relationship between PTSD and eating behaviors among veterans. Evidence suggests that veterans with PTSD may engage in disordered eating behaviors and may suffer from eating disorder symptomology. In a recent systematic review, Bartlett and Mitchell (2015) identified risk factors such as experiencing trauma and comorbid mental health disorders as likely triggers of eating disorder behaviors among veterans. Research indicates that binge eating behavior has most often been associated with PTSD among veterans.

Hoerster and colleagues (2015) conducted a cross-sectional study to assess for depression and binge eating behaviors via self-report questionnaires given to 332 U. S. Iraq (OIF) and Afghanistan (OEF) War veterans at a postdeployment clinic. Researchers concluded that PTSD and depression were associated with binge eating behavior, possibly identifying a pathway by which psychiatric conditions may contribute to the rate of being overweight or obese among veterans (Hoerster et al., 2015, p. 115). Researchers speculated that veterans with psychiatric conditions may use food to manage distress and emotions.

Utilizing secondary data analysis, Higgins and colleagues (2013) examined mental health comorbidities and eating habits of 45,477 overweight or obese veterans who completed a self-report survey evaluating medical and psychiatric comorbidities, eating habits, weight history, exercise, and motivation for change. Higgins and colleagues determined that binge eating was more frequent among male veterans than female veterans and more frequent among those who reported having type 2 diabetes. In addition, veterans who were overweight or obese who reported depression and anxiety were more likely to report binge eating (p. 901). Further,
clinically meaningful binge eating was more frequent among those with PTSD and other psychiatric disorders such as bipolar disorder, schizophrenia, and obsessive-compulsive disorder (p. 901).

Slane and colleagues (2016) evaluated the prevalence of self-reported eating problems as well as a relationship with the BMI and psychiatric disorders (i.e., alcohol abuse, PTSD, major depressive disorder [MDD]) of 298 male and 364 female (OIF/OEF/Operation New Dawn [OND]) veterans. Researchers found that female veterans reported higher rates of eating problems than their male counterparts. In addition, over 25% of both male and female veterans reported binge eating behavior, and over 20% experienced loss of control over their eating. Further, participants who reported eating disorders had higher rates of PTSD and MDD. Researchers concluded that eating disorders may be a significant issue among those who served in Iraq (OIF, OND) and Afghanistan (OEF) as well as identified an increased likelihood of comorbid mental health issues in those who experienced eating problems (Slane et al.).

Rosenbaum and colleagues (2016) investigated comorbidities in 515 female veterans as part of a larger cross-sectional study to assess whether binge eating influenced women’s prioritization of eating and weight-related treatment services for other issues. At a primary care visit, interviewers administered the eating disorder module of the Patient Health Questionnaire, the sexual harassment subscale of the Deployment Risk and Resilience Inventory, and a card-sorting exercise to identify mental-health service needs. The Patient Health Questionnaire is a self-administered questionnaire that screens for depression, anxiety, alcohol use disorder, somatoform, and eating disorders (Spitzer, Kroenke, & Williams, 1999). The Deployment Risk and Resilience Inventory is used to assess psychosocial risk and resilience factors (i.e., combat
experiences, deployment support from family and friends, etc.) for military service members deployed to hazardous environments (King, King, Vogt, Knight, & Samper, 2006). Researchers in the study discovered that rates of having psychological conditions were significantly higher among women who screened positive for BED compared to those without BED symptomology (Rosenbaum et al.).

Mitchell and colleagues (2014) conducted retrospective chart reviews of 492 female veterans and found eating disorder rates similar to civilians and that eating disorders were associated with PTSD and depressive disorders. Interestingly, depression was more strongly associated with eating disorders than PTSD. This supports the hypothesis that eating disorder behavior may be utilized to cope with negative emotions (Mitchell et al., 2014, p. 590).

Litwack and colleagues (2014) assessed eating disorder symptoms of bulimia nervosa (BN) and BED in a sample of U. S. military veterans and their intimate partners ($n = 499$) who screened positive for trauma history or probable PTSD. BN is distinguished by recurrent episodes of binge eating with subsequent compensatory behavior (i.e., self-induced vomiting, laxative use, diuretic use, excessive exercise) to prevent weight gain (A. M. Smith et al., 2018, p. 523). Researchers concluded that lifetime BED rates were comparable among men and women (4.76% and 3.69% respectively), that male veterans reported BN symptoms (0.48%) whereas female veterans did not, and that more severe PTSD symptoms were associated with higher levels of eating disorder symptomology (pp. 408-409). These results were similar to those of Forman-Hoffman and colleagues (2012) who found a relationship between PTSD, trauma, and eating disorders in a sample of over 1,000 female veterans.
While several studies assessed the relationship between PTSD and binge eating, one study examined night eating syndrome (NES) among veterans. NES is categorized as an other specified feeding or eating disorder (OSFED) in the DSM-5 and is characterized by “recurrent episodes of night eating, as manifested by eating after awakening from sleep or by excessive food consumption after the evening meal” (American Psychiatric Association, 2013, p. 354). Dorflinger, Ruser, and Masheb (2017) examined the relationship between NES and weight, insomnia, disordered eating, and psychological variables among 110 veterans who were participating in a VA weight management program. Researchers determined that night eating was associated with a higher BMI and higher scores for binge eating, emotional eating, and eating disorder symptoms. In addition, Dorflinger and colleagues found that veterans who screened for NES were significantly more likely to screen for PTSD and depression. Interestingly, veterans who screened positive for PTSD indicated the need to eat to return to sleep.

These findings indicate that veterans with PTSD may experience disordered eating patterns or eating disorder symptomology more often than veterans without mental health issues. These findings underscore how the constructs of the transactional model of stress and coping may help explain how veterans with PTSD may select a coping response that impacts their eating behaviors during the appraisal of a stressful event.
Coping Behaviors Among Veterans

Veterans learn a variety of coping strategies for overcoming the stressors of military service throughout their training. It is likely that throughout their military service, veterans coped with numerous challenging and stressful situations, especially combat-related trauma (Miller, Pedersen, & Marshall, 2017). Consequently, emotion-focused coping strategies such as avoidance may be necessary during active duty when the focus is on completing a mission; however, long-term use of this strategy could lead to maladaptive reactions such as alcohol use (Romero, Riggs, & Ruggero, 2015). Given the challenges and stressors of military life, it is important to explore how veterans cope with their service experiences. Both quantitative and qualitative research inquiries provided insight into coping behaviors among veterans, including how the appraisal of stress may frame the coping processes that impact health behaviors. These findings highlight the efficacy of the transactional model of stress and coping to improve understanding of the relationship between coping and health behaviors among veterans.

In a qualitative study, Mattocks and colleagues (2012) conducted semistructured interviews with 19 OIF/OEF female veterans to better understand how they coped with combat and military sexual trauma (MST). Female veteran participants identified combat experiences, MST, separation from family, and postdeployment reintegration problems as their major stressors. Researchers determined three major coping strategies based on postdeployment behaviors and the thoughts and perceptions of these female veterans: behavioral avoidance (i.e., replacing stressful feelings with alternative sources of satisfaction), cognitive avoidance (i.e., isolating themselves), and behavioral approach (i.e., taking action and reaching out to others; pp.
Researchers reported that some women veterans utilized behavioral avoidance coping strategies such as overeating, using prescription drugs, bingeing and purging, and excessive exercise. In addition, some of these women veterans practiced cognitive avoidance, preferring to engage in activities such as overeating in isolation. Veterans who used behavioral approaches to coping chose strategies such as exercise, listening to music, breathing exercises, and seeking support from other female veterans (p. 543). In the study, veterans who employed problem-focused coping processes such as behavioral approaches reported positive health behaviors, and those who employed emotion-focused coping processes such as avoidance reported disordered eating behaviors.

Utilizing data from the NewGen, Cyperl and colleagues (2016) wanted to better understand cigarette use among a sample (19,911) of OIF/OEF veterans. In this sample, almost one third reported being current smokers, a rate higher than the U. S. national estimate of 18%. In addition, these researchers noted service members’ reasons for the initiation of smoking which included stress relief, peer pressure, and fear of weight gain. These results were similar to those of Buckley and colleagues (2004) who determined that rates of smoking among veterans were twice those of civilians. These studies provide additional evidence of how the constructs of the transactional model of stress and coping during the appraisal of stress by these veterans framed their coping process and, subsequently, their health behaviors.

Rice and Liu (2016) conducted a cross-sectional study of 191 male and female active duty and veteran service members to investigate the relationship between coping and resilience using self-report questionnaires. Researchers found that older age in veterans was associated with greater use of religion-based coping and decreased use of self-distraction, self-blame,
substance use, and behavioral disengagement. In addition, veterans who had higher resilience scores noted using more humor, religion, active coping, planning, and less use of denial, substance abuse, and venting (Rice & Liu). The study provides evidence that veterans who exhibited a greater ability to cope with stress employed problem-focused coping processes. The Rice and Liu study, along with the previously mentioned studies on coping behaviors of veterans, underscores the need to further explore how problem-and emotion-focused coping relate to health behaviors.

These studies indicate veterans may employ a variety of coping behaviors, some of which may positively impact health and well-being, while others may negatively impact health and increase the risk for chronic health conditions. These findings highlight how the transactional model of stress and coping framework may help to explain how veterans appraise and manage the demands (stressors) placed on them by their environment through their chosen coping process and draw attention to the need to further explore coping behaviors among veterans with PTSD.

Coping Behaviors Among Veterans With PTSD

Given that veterans with PTSD are more likely to experience health problems, obesity, and disordered eating patterns, an individual might assume that negative health behaviors may be a contributing factor to a veteran’s overall health status. Evidence suggests there is a relationship between PTSD and health-risk behaviors including tobacco use, alcohol use, and substance use
among veterans (Windome et al., 2011). Consequently, there are several studies that examined the link between PTSD and negative health behaviors, especially alcohol use.

James, Strom, and Leskela (2014) assessed impulsivity and risk-taking behaviors via self-report questionnaires completed by a sample of 234 veterans who screened positive for PTSD. These researchers concluded that impulsivity, as it relates to PTSD, occurs due to negative urgency, or the tendency to engage in impulsive behaviors when feeling negative emotions, and sensation seeking, which includes the inclination to pursue activities that are exciting or new and may result in risk-taking behaviors. In addition, they found that veterans with PTSD reported more frequent risky behaviors (i.e., risky driving, substance abuse, risky sexual practices, aggression) and a greater tendency to engage in impulsive behaviors when in a negative affective state (James et al.).

Kelley and colleagues (2013) examined pathways by which trauma, both from across a lifespan and experienced during combat, and depressive symptoms affect alcohol use among male and female veterans. It appeared that alcohol use was mediated by PTSD symptoms for males who experienced noncombat or combat trauma but not for females. In addition, the researchers discovered that depressive symptoms were a significant risk factor for alcohol use among both male and female veterans (Kelley et al.).

Grosso and colleagues (2014) assessed whether action-oriented (problem-focused) and avoidant (emotion-focused) coping styles moderated the relationship between PTSD and alcohol use among 128 OIF/OEF veterans enrolled in VA care. Researchers used self-report measures and clinical interviews. They concluded that PTSD symptoms were positively associated with negative alcohol-related consequences and drinking quantity when avoidant coping was high and
action-oriented coping was low (p. 481). These findings highlight that when emotion-focused coping was utilized, these veterans engaged in negative health behaviors, supporting the hypothesis for this study that there would be an inverse relationship between action-oriented coping and negative health behaviors such as emotion- and stress-related eating and eating disorder risk behaviors. The Grosso and colleagues study also highlights the importance of providing veterans with PTSD some tools to develop an action-oriented coping process during treatment.

Godfrey and colleagues (2013) conducted a cross-sectional study of health indicators and self-reported health behaviors within a community and a military veteran sample (25 participants with PTSD and 55 participants without PTSD). Researchers determined that participants with PTSD engaged in more negative health behaviors (i.e., hazardous drinking) and fewer positive health behaviors (i.e., exercise and eating fruits) compared to participants without PTSD (p. 4). The study highlights the need to further explore why individuals with PTSD may choose to engage in negative health behaviors and whether the behaviors are related to their coping process.

The literature indicates that veterans with PTSD may engage in impulsive, risk-taking behaviors and employ coping processes that promote negative health behaviors as they deal with their stressors. Viewing this evidence through the framework of the transactional model of stress and coping, when appraising a stressor, veterans with PTSD may be at risk of choosing an emotion-focused coping process to manage their stress and emotions.
Summary

While the empirical evidence reviewed in this chapter is valuable, there remains a gap in the literature about whether coping process relates to eating behaviors among veterans with PTSD. Extending the line of inquiry to uncover this relationship could prove useful in improving the health of veterans with PTSD. The following chapter outlines the research methodology and design of this study.
CHAPTER 3

METHODS

Overview

The purpose of this study was to examine the relationships between coping process, emotion- and stress-related eating, and eating disorder risk among veterans with PTSD. The first two chapters of this dissertation introduce this study’s topic and include a review of the literature describing the health of veterans, obesity among veterans, and their eating and coping behaviors. Attention is placed on veterans with PTSD. Although descriptions of lifestyle patterns among veterans with PTSD include disordered eating behaviors, there are gaps in our understanding of whether the process of coping is linked to eating behaviors. This study could provide valuable insight because it explored how a veteran’s process of coping may be correlated with health or weight outcomes. The following section outlines the research design, research questions and hypotheses, population, sampling procedures, instrumentation, data-collection procedures, and data analyses used to explore the relationship between coping process and eating behaviors among veterans with PTSD.
Research Design

This quantitative study followed a cross-sectional survey design. Quantitative data were obtained by administering questionnaires to measure the descriptive variables of coping process, emotion- and stress-related eating, and eating disorder risk. This study utilized a correlational approach to examine the degree and direction of the relationship between the study variables (Creswell, 2014). The design of this study allowed for data collection to occur at a single time point, it allowed multiple variables to be compared, it did not place a significant burden on participants, and it may have fostered more truthful responses through the use of an anonymous survey (Creswell, 2014). Furthermore, a cross-sectional survey methodology using validated and reliable questionnaires was chosen because of its use in assessing correlations between coping and health-related behaviors among veterans with PTSD in studies conducted by Romero and colleagues (2015) and Martindale and colleagues (2016). Findings may inform health professionals of a framework for work with veterans that highlights the opportunity for clinicians to consider a veteran’s coping process when assessing health-related behaviors and to teach positive coping strategies as appropriate.

Research Questions and Hypotheses

The three research questions that guided this study were as follows:

1. What relationships exist between coping process (measured by the Brief COPE), emotion- and stress-related eating (measured by the Emotion- and Stress-Related
Eating scale of the EADES Questionnaire), and eating disorder risk (measured by the EAT-26) in a sample of veterans with PTSD?

2. Which variables most strongly predict emotion- and stress-related eating (measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire) in a sample of veterans with PTSD?

3. Which variables most strongly predict eating disorder risk (measured by the EAT-26) in a sample of veterans with PTSD?

The hypotheses are as follows:

Hypothesis 1 (H1): There will be an inverse relationship between problem/action-focused coping processes and emotion- and stress-related eating and eating disorder risk in a sample of veterans with PTSD. In other words, participants who report higher scores on the problem/action-focused coping process scales of the Brief COPE will report less emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire and be at lower risk of eating disorders as measured by the EAT-26.

Hypothesis 2 (H2): Emotion-focused coping processes from the Brief COPE will most strongly predict emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire in a sample of veterans with PTSD.

Hypothesis (H3): Emotion-focused coping processes from the Brief COPE will most strongly predict eating disorder risk as measured by the EAT-26 in a sample of veterans with PTSD.
Population and Sampling Procedures

The United States Department of Veterans Affairs (2018c) indicated that approximately one in five veterans returning from the wars in Iraq (OIF) and Afghanistan (OEF) experience PTSD. In addition, one in three Vietnam War era veterans are projected to experience PTSD in their lifetime (United States Department of Veterans Affairs, 2016). In addition, evidence suggests that coping process may impact health behaviors for veterans with PTSD (Grosso et al., 2014). Unfortunately, veterans with PTSD have poorer health outcomes than civilians (Hoerster et al., 2012; Lehavot et al., 2012), are estimated to die prematurely compared to veterans without PTSD (Kilbourne et al., 2009), experience higher rates of obesity (Raffa et al., 2016), and have poorer dietary behaviors than veterans without PTSD (Hoerster et al., 2015). Accordingly, the population for this study consisted of military veterans who experience PTSD in an effort to gain greater insight into how eating behaviors are impacted by their process of coping.

Veterans with PTSD from all geographic locations within the U. S. were eligible to participate in this study. In addition, male and female veterans of all racial and ethnic backgrounds were eligible. To limit potential confounds, exclusion criteria included civilians and veterans without PTSD. Veterans were asked to participate in this study on a volunteer basis.

Given that principal components analysis (PCA) of the 14 coping processes of the Brief COPE was considered to assess second-order factor structure of the tool with this sample population, it was estimated that a minimum of 140 participants were needed for this study. This estimation corresponds to recommendations by Nunnally (as cited in Pallant, 2016) indicating a
10:1 (10 cases to 1 variable) ratio is needed to determine minimum sample size for factor analytic techniques. As such, each of the 14 Brief COPE coping processes was treated as a variable for the PCA.

Instrumentation

Participants were asked to complete a 90-item questionnaire (see Appendix A). The questionnaire included a PTSD screening question, the Brief COPE instrument, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, the EAT-26 questionnaire, a self-rated health status question, a self-reported eating disorder diagnosis or treatment question, seven demographic questions, and self-reported height and weight. This structure placed easy-to-recall questions at the beginning of the survey, followed by questions that may require additional thought due to their sensitive nature (Fowler, 1995). This arrangement was intended to help establish a participant’s comfort and motivation to provide high-quality data (Visser, Krosnick, & Lavrakas, 2000, p. 241). The concluding section of the survey thanked veterans for their participation and provided contact information and additional resources.

To determine participant PTSD status for inclusion in this study, an initial screening question asked, “Have you been told you have PTSD by a healthcare professional?” (yes/no). Self-identified PTSD status via a one-question screening approach has been utilized previously with veteran samples. This approach is was used by Cockram, Drummond, and Lee (2010) who examined the role and treatment of maladaptive thoughts and behaviors among Vietnam War veterans with PTSD. In addition, Wolff and Mills (2016) utilized a one-question PTSD screen in
their study of the reporting of MST among veterans. Participants who answered “no” to this question were brought to the end of the survey and thanked for their willingness to participate.

Coping

The Brief COPE (Carver, 1997) was used to assess coping process. Carver, Scheier, and Weintraub (1989) developed the COPE Inventory as a comprehensive questionnaire of 60 questions assessing 15 theoretically derived coping processes. The Brief COPE was developed as an abbreviated version of the COPE Inventory to reduce participant burden. The Brief COPE is a 28-item self-report inventory consisting of two sets of 14 parallel statements; one pair assesses each coping process (see Table 1). The coping processes are self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, and self-blame. Participants were asked to respond to each statement using a 4-point Likert-type scale, indicating what they generally do and feel when experiencing stress: 1 = I have not been doing this at all, 2 = I have been doing this a little bit, 3 = I have been doing this a medium amount, 4 = I have been doing this a lot. The scores for each of the two statements corresponding to a specific coping process were summed to determine a total score for that coping process (Carver, 1997). As such, there was no overall score but rather a score ranging from 2 to 8 for each of the 14 coping processes. Higher Brief COPE scores indicate greater frequency of use.
<table>
<thead>
<tr>
<th>Brief COPE coping processes</th>
<th>Corresponding statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-distraction</td>
<td>I’ve been turning to work or other activities to take my mind off things. I’ve been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.</td>
</tr>
<tr>
<td>Active coping</td>
<td>I’ve been concentrating my efforts on doing something about the situation I’m in. I’ve been taking action to try to make the situation better.</td>
</tr>
<tr>
<td>Denial</td>
<td>I’ve been saying to myself “this isn’t real”. I’ve been refusing to believe that it has happened.</td>
</tr>
<tr>
<td>Substance use</td>
<td>I’ve been using alcohol or other drugs to make myself feel better. I’ve been using alcohol or other drugs to help me get through it.</td>
</tr>
<tr>
<td>Use of emotional support</td>
<td>I’ve been getting emotional support from others. I’ve been getting comfort and understanding from someone.</td>
</tr>
<tr>
<td>Use of instrumental support</td>
<td>I’ve been getting help and advice from other people. I’ve been trying to get advice or help from other people about what to do.</td>
</tr>
<tr>
<td>Behavioral disengagement</td>
<td>I’ve been giving up trying to deal with it. I’ve been giving up the attempt to cope.</td>
</tr>
<tr>
<td>Venting</td>
<td>I’ve been saying things to let my unpleasant feelings escape. I’ve been expressing my negative feelings.</td>
</tr>
<tr>
<td>Positive reframing</td>
<td>I’ve been trying to see it in a different light, to make it seem more positive. I’ve been looking for something good about what is happening.</td>
</tr>
<tr>
<td>Planning</td>
<td>I’ve been trying to come up with a strategy about what to do. I’ve been thinking hard about what steps to take.</td>
</tr>
<tr>
<td>Humor</td>
<td>I’ve been making jokes about it. I’ve been making fun of the situation.</td>
</tr>
<tr>
<td>Acceptance</td>
<td>I’ve been accepting the reality of the fact that it has happened. I’ve been learning to live with it.</td>
</tr>
<tr>
<td>Religion</td>
<td>I’ve been trying to find comfort in my religion or spiritual beliefs. I’ve been praying or meditating.</td>
</tr>
<tr>
<td>Self-blame</td>
<td>I’ve been criticizing myself. I’ve been blaming myself for things that happened.</td>
</tr>
</tbody>
</table>
The Brief COPE was validated in prior research with a sample of adults participating in a study of the recovery process following Hurricane Andrew in which coping was initially assessed 3 to 6 months post hurricane, 6 months later during a second assessment, and then 1 year later during a third assessment (Carver, 1997). Carver conducted exploratory factor analysis with oblique rotation and determined a factor structure similar to the original Cope Inventory. Carver noted that two coping processes (i.e., restraint coping and suppression of competing activities) from the original COPE Inventory were omitted because they had not proven useful in previous work. Additionally, the description of three coping processes was revised slightly to sharpen their focus: mental disengagement became self-distraction, focus on and venting of emotions became venting, and positive reinterpretation and growth became positive reframing. Furthermore, one coping process (i.e., self-blame) was added to the Brief COPE based on empirical evidence that self-blame may be a predictor of poor adjustment under stress (p. 95). The Brief COPE demonstrated adequate test-retest reliability. Carver asserted that internal reliability of the Brief Cope coping processes was evidenced by alpha reliabilities ranging from $\alpha = .50$ (venting) to $\alpha = .90$ (substance use; Carver, 1997).

Amoyal, Fernandez, Ng, and Fehon (2016) conducted additional psychometric analysis of the Brief COPE with 120 patients who experienced end-stage liver disease. Construct validity was evaluated by examining the relationships of the Brief COPE with validated psychosocial measures of depression (Beck Depression Inventory), anxiety (Beck Anxiety Inventory), health-related quality of life (Short Form 36 Health Survey), resilience (Connor Davidson Resilience Scale), and age and cognitive ability (Wechsler Abbreviated Scale of Intelligence). Exploratory factor analysis revealed a six-factor solution. Two factors (i.e., substance use and humor) were
consistent with the original Brief COPE assignments proposed by Carver, and the other four factors were labeled maladaptive, emotional support, active, and religious coping. The researchers reported alpha reliability scores above $\alpha = .64$ and asserted that construct validity of the six coping processes was demonstrated (Amoyal et al.).

Specifically, in the veteran population, the Brief COPE was utilized in several studies to measure coping process. Tuncay and Musabak (2015) utilized the Brief COPE to assess the coping of 107 veterans with lower-limb amputations and examined internal consistency of the 14 coping processes. In their study, alpha reliabilities ranged from $\alpha = .73$ to $\alpha = .96$. Tuncay and Musabak did not determine second-order factor structure but rather categorized the coping processes as either problem- or emotion-focused based on previous empirical findings. Romero and colleagues (2015) utilized the Brief COPE to examine the contribution of coping and family social support on symptoms of anxiety, depression, and PTSD among 136 student veterans. Researchers did not determine factor-order structure of the Brief COPE but rather focused on two factors (i.e., problem-focused and avoidant coping) of a four-factor structure that was determined in previous studies.

Martindale and colleagues (2016) determined second-order factor structure of the Brief COPE among a sample of returning war veterans through PCA with Promax rotation. These researchers noted that two factors were extracted from the PCA for the Brief COPE, which correspond to theoretically derived action- and emotion-focused coping processes (pp. 234-235). Martindale and colleagues asserted that action-focused coping included coping processes such as the self-distraction, active coping, use of emotional support, use of instrumental support, positive reframing, planning, humor, acceptance, and religion coping processes of the Brief COPE (p.
Emotion-focused coping included the denial, substance use, behavioral disengagement, venting, and self-blame coping processes of the Brief COPE (p. 235). Martindale and colleagues’ second-order factor structure of coping processes from the Brief COPE was pertinent when developing research questions and hypotheses for this study. According to Carver (2018), the entire Brief COPE tool or specific coping process scales are open for public use.

**Emotion- and Stress-Related Eating**

The Emotion- and Stress-Related Eating scale of the EADES Questionnaire was utilized to determine the degree to which veterans reported eating in response to stress and emotions (Ozier et al., 2007). The full EADES Questionnaire was developed and validated with a convenience sample of 226 male and 627 female university faculty and staff members. Ozier and colleagues conducted two PCAs: the initial PCA revealed a three-factor structure, and the second PCA was conducted by retaining the three factors while eliminating questions with low factor loadings from the initial PCA. Forty-nine questions were retained in the EADES Questionnaire, with factor loadings of 0.400 or above and a total Cronbach’s α of .949 (p. 622). Cronbach’s α of the Emotion- and Stress-Related Eating scale of the EADES Questionnaire was 0.95 (Ozier et al., 2007).

In their analysis of the psychometric properties of the EADES Questionnaire (Spanish version), Lazarevich, Irigoyen-Camacho, Valezquez-Alva, and Salinas-Avila (2015) assessed the relationship between constructs of the EADES Questionnaire and obesity among 232 university students. Researchers determined an overall Cronbach’s α of 0.92 for the EADES Questionnaire.
and Cronbach’s α of 0.88 for the questionnaire’s Emotion- and Stress-Related Eating scale. Additionally, researchers assessed test-retest stability and determined an adequate intraclass correlation coefficient (ICC = 0.88, p < 0.01). Researchers concluded good internal consistency and temporal stability of the EADES Questionnaire exist as well as high test-retest stability among Mexican university students (Lazarevich et al.). Additionally, Slane and colleagues (2016) utilized the Emotion- and Stress-Related Eating scale of the EADES Questionnaire when evaluating self-reported eating problems and the relationship with BMI level and psychiatric disorders in male and female Iraq and Afghanistan War veterans; researchers determined a Cronbach’s α of 0.96.

Items on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire are rated on a 5-point Likert-type scale, ranging from 1 = strongly disagree to 5 = strongly agree. However, 15 questions of this scale are reverse-scored, from 1 = strongly disagree to 5 = strongly agree. Questions relate to eating behavior and self-efficacy regarding eating behavior (24 items) with a possible cumulative score range of 24-120, with lower scores indicating greater emotion- and stress-related eating (Ozier et al., 2007). Sample questions include, “I use food to cope with my emotions” and “I eat to avoid dealing with problems” (Ozier et al., 2007, p. 625). Approval for use of this tool for this study was obtained on August 14, 2018.

**Eating Disorder Risk**

The EAT-26 is a widely used, validated, and reliable self-report measure of behaviors to assess risk for eating disorders (Garner et al., 1982). The EAT-26 is a modified version of the
original 40-item Eating Attitudes Test (EAT-40). Garner and colleagues (1982) used factor analysis to develop the EAT-26 with a sample of 160 patients who experienced anorexia nervosa. Anorexia nervosa is an eating disorder characterized by extreme dietary restriction that leads to low body weight, irrational fear of weight gain, and disturbed body image (American Psychiatric Association, 2013). Garner and colleagues discovered 14 items in the EAT-40 that were statistically redundant and removed them from the EAT-26. They reported the EAT-26 was highly correlated with the original EAT-40 ($r = .98$) and demonstrated good internal consistency ($\alpha = .90$). Additionally, Koslowsky and colleagues (1992) utilized the EAT-26 with a nonclinical sample of 809 females aged 18 years and concluded that reliability of this instrument is acceptable (Cronbach’s $\alpha = .83$), that factor structure was somewhat distinct from Garner and colleagues’ sample, and that the EAT-26 has criterion validity (p. 33).

Recognizing the EAT-26 was not validated based on updated eating disorder diagnosis criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV), Mintz and O’Halloran (2000) administered the EAT-26 and conducted subsequent diagnostic clinical interviews with 136 university students. Researchers noted a sensitivity of 77% and specificity of 94% of the EAT-26 with a positive predictive value of 0.79 and negative predictive value of 0.94 (p. 497). Specifically in the military population, Beekley and colleagues (2009) utilized the EAT-26 to assess risk of eating disorder behaviors among over 12,000 male and female military academy cadets over a 7-year period. Additionally, Warner and colleagues (2007) assessed risk factors for disordered eating behaviors among 1,184 male and female entry-level U. S. Army soldiers.

The EAT-26 is divided into three subscales: diet, bulimia and food preoccupation, and
oral control. For the first 25 questions, frequency measures and corresponding scores are as follows: *always* = 3; *usually* = 2; and *often* = 1; whereas *sometimes*, *rarely*, and *never* = 0. For Question 26, *always*, *usually*, and *often* = 0; *sometimes* = 1; *rarely* = 2; and *never* = 3. The total of each subscale is summed to determine a total score. The range of possible scores is 0-78, with a total score of 20 or above indicating an increased level of concern about dieting, body weight, or problematic eating disorders (Garner, 2010, p. 2). For the purpose of this study, a total EAT-26 score of 20 or above was indicative of eating disorder risk behavior. Permission to use this tool for this study was received on July 26, 2018.

Self-rated health status (excellent, very good, good, fair, poor) was collected in a manner similar to the overall health inquiry of the 2018 BRFSS questionnaire (Centers for Disease Control and Prevention, 2018b). Previous or current eating disorder diagnosis or treatment (yes/no) was collected in a manner similar to the screening question utilized by Slane and colleagues (2016). Demographic information included gender (male/female), age, ethnicity/race (American Indian/Alaska Native, Asian American, Black/African American, Hispanic/Latino, Native Hawaiian or Other Pacific Islander, White-Non-Hispanic), education level (some high school, high school/general equivalency diploma (GED), associate/technical degree, bachelor’s degree, master’s/doctorate degree, other), branch of military service (Army, Air Force, Coast Guard, Marine Corps, Navy), deployment (yes/no), and combat experience (yes/no). Self-reported height (feet and inches) and weight (pounds) measures were collected for calculation of BMI. BMI was calculated as kg/m² and categorized as < 18.5 = underweight; 18.5-24.9 = normal weight, 25-29.9 = overweight, and ≥ 30 = obese (see Appendix B).
Pilot Test of Survey Instrument

To assess the length and readability of the survey instrument for this study, a pilot test was conducted September 16th-October 4th, 2018. A sample of 6 veterans with PTSD from support organizations in Illinois were recruited for the pilot test. Participants were informed of the purpose of the pilot test and the overall study via an introductory e-mail. A link to the survey on the Qualtrics software platform was provided. Veterans recruited for the pilot study were asked to provide feedback on the survey via an open-ended question at the end of the survey. This gave me the opportunity to receive feedback on readability of the survey as well as to determine any difficulties in accessing the online survey link. In addition, the amount of time required for participants to complete the survey was used to determine average completion time. Researcher contact information was provided during the pilot test. Results of the survey’s pilot test indicated an average completion time of 13 minutes, and one participant provided feedback that the survey “is OK.” Based on pilot test feedback, the survey was not revised; however, an eating disorder diagnosis and treatment question was added along with level-of-education and deployment-status questions, based on dissertation committee suggestions. Veterans who participated in the pilot test were not part of the actual research study.

Ethical Considerations

An application for Institutional Review of Research Involving Human Subjects was submitted for approval to Northern Illinois University’s Institutional Review Board (IRB) to
ensure ethical compliance by this study. IRB approval was received on December 17, 2018 (see Appendix C). Recruitment began after IRB approval was granted and completion of survey pilot-testing. Additionally, this study was conducted in a manner that protected participant rights and in accordance with the tenets of the Belmont Report for protection of human subjects: respect for persons, beneficence, and justice (Gliner, Morgan, & Leech, 2009). This was achieved by providing voluntary participation, having informed consent, presenting contact information for me and my dissertation chairperson, providing privacy and confidentiality through the use of an anonymous survey, and providing equal opportunity to be involved in this study.

Permissions from any partnering organizations that helped with participant recruitment were obtained as appropriate. Risk was anticipated to be at a minimal level for participants involved in this study, such as uncomfortable thoughts or memories when participants answered questions about their coping process and eating behaviors. Accordingly, participants were provided with contact information for me, my dissertation chairperson, the VA National Center for PTSD website, the Veteran Crisis Line, the Vets4Warriors confidential peer-support program website, the APA website, and the National Eating Disorders Association’s website. Contact information for me and my dissertation chairperson was provided at the beginning and end of the survey.

Data Collection

Participants were recruited through an extensive process to contact a variety of
organizations that assist veterans with PTSD such as service dog, equine therapy, and outdoor adventure or recreation programs, veteran service foundations, veteran centers, PTSD veteran-support groups, or other social service organizations (a list of organizations is available upon request). This approach was similar to methods used by Zalta and colleagues (2018) who recruited participants for a study evaluating changes in PTSD and depression symptomology during a 3-week intensive outpatient program for veterans who were referred by a variety of sources including nonprofit veteran and social service organizations. Contact information for various veteran service organizations was obtained through individual organization website pages and through information published on the VA National Center for PTSD webpages or other veteran-support organization webpages. Two hundred sixty-six organizations were contacted, and 54 agreed to participate.

A liaison within each organization was identified and sent an introductory e-mail requesting assistance in recruiting participants for this study (see Appendix D). Liaisons who agreed to participate were provided with instructions and a link to this study’s online survey which was delivered via the Qualtrics software platform. Given the diversity, particularly in age, within the potential veteran sample for this study, it was anticipated that some veterans would choose not to use or would not have access to the Internet (M. Norfleet, personal communication, August 20, 2018). Therefore, a paper version of the survey was made available upon request from an organization’s liaison or individual participant. Remler and Van Ryzin (2015) endorsed the usefulness of a mixed-mode survey distribution approach for diverse populations (p. 223). In addition, researchers who used a mixed-mode distribution approach noted small and insignificant differences in their data and concluded that a two-strategy approach could be considered as a
way to reach potential participants who may prefer paper/pencil surveys to an online survey (Huyser de Bernardo & Curtis, 2012; St. Louis, 2012). For this study, offering both response options was a beneficial approach for recruiting organizations to participate. Instructions to each liaison included forwarding the online survey to veterans via e-mail or the organization’s social media page (Facebook, Instagram, LinkedIn, etc.) or provide a paper version of the survey if requested. Recruitment fliers were also provided via e-mail that could be posted within each participating organization (see Appendix D). A reminder e-mail was sent to the liaison at the midpoint of this study.

Each participant was asked to complete the survey via either the Qualtrics software platform or a paper version. Data collection took place over a 2-month period beginning January 7, 2019. Prior to taking the online survey, participants were shown an introductory page detailing the purpose of this study and requesting informed consent. The consent form indicated that any information obtained from this study would be anonymous and kept confidential. After participants gave informed consent, they were prompted to begin the online survey at the one-question PTSD screen. Anyone who did not give informed consent was brought to the end of the survey and thanked for his or her time. Paper versions of the survey were identical to the Qualtrics version, and the data of participants who answered “no” to the one-question PTSD screen or who do not give informed consent, were not included in the data-analysis procedures. Whenever a paper version of the survey was requested, a self-addressed, postage-paid envelope was provided to allow each participant to return his or her completed survey directly to me.

As an incentive for involvement in this study, participants were informed that $5 would be donated to a nonprofit charity that assists surviving children and spouses of fallen soldiers as a
result of their participation in this study. Given that 239 completed surveys were received, I donated $1,195.00 to the Tragedy Assistance Program for Survivors (TAPS) on June 1, 2019.

Data Analysis

A variety of procedures was utilized to assess the data collected in this study. Response data from the online Qualtrics survey platform were transferred into Excel, and then response data from paper surveys were added. The data were screened for errors, reviewed for missing cases, coded, and then downloaded into SPSS (version 24.0) for tabulation of the Brief COPE, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and the EAT-26 scores. Subsequently, variables were created in SPSS based on sum scores for each of the 14 individual Brief COPE coping processes, the 24-item Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and the EAT-26.

Descriptive statistics were used to determine characteristics of the categorical and continuous variables such as frequencies, measures of central tendency, and measures of variability. The next phase of data analysis involved conducting a PCA of the 14 Brief COPE coping processes in order to analyze the interrelationships among these variables and to reduce the number of related variables of the Brief COPE prior to using them in additional data analyses (Pallant, 2016).

Inferential statistics were used to test the three study hypotheses. Correlational analysis was conducted between the Brief COPE components and emotion- and stress-related eating as well as eating disorder risk. Further analysis explored the relationship between each of the 14
Brief COPE coping responses and emotion- and stress-related eating as well as eating disorder risk to provide a deeper insight into these relationships. The final stage of data analysis involved a multiple regression to determine the strongest predictors of both emotion- and stress-related eating and eating disorder risk.

Summary

As delineated previously, PTSD is an issue faced by many veterans. Mental health conditions such as PTSD may impact health, weight, and eating behaviors. In addition, veterans may engage in a variety of behaviors to cope with stress and negative emotions, some of which may adversely impact their health. Understanding how the coping process relates to eating behaviors for this population provided valuable insight into patterns that contribute to a veteran’s health and weight.
CHAPTER 4

RESULTS

The purpose of this study was to evaluate the relationships between coping process, emotion- and stress-related eating, and eating disorder risk among veterans with PTSD utilizing Carver’s 28-item Brief COPE, Ozier and colleagues’ 24-item Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and Garner and colleagues’ 26-item EAT-26. This chapter provides an overview of results discovered when analyzing the data.

Analysis Procedures

Pallant’s (2016) guide was used as a reference during data analysis. Prior to data analysis, all variables were assessed for accuracy, missing values, and multivariate assumptions. Missing values represented 3.8%-9.2% of the data and mainly appeared in a random pattern. It was noted that the largest number of missing values occurred in the latter part of the survey, indicating that some participants who started the survey did not finish it. Cases with missing data were excluded only if the data were missing for a specific analysis but were included in analyses for which the necessary information was available (Pallant, 2016, p. 58).
Of the 330 online and 18 paper responses, 239 (225 online, 14 paper) were deemed usable for this study. Regarding the 109 surveys not included in the analysis, 8 online participants did not provide consent for this study. Additionally, 68 participants who provided consent did not meet inclusion criteria due to lack of self-reported PTSD. Furthermore, 33 participants who consented to the survey and met inclusion criteria did not continue the survey beyond the PTSD question. Based on the online survey distribution method, the number of veterans who had access to the online survey is unknown; therefore, an online survey response rate could not be determined. Given that 117 paper surveys were distributed by postal mail, the 18 that were returned represented a 15% response rate.

Veterans were asked to respond to how often they utilized each of the 28 coping-related behaviors, with two statements corresponding to each of the 14 Brief COPE coping processes. Participants rated their frequency of each coping behavior by using a 4-point Likert-type scale ranging from 1 = *I haven’t been doing this at all* to 5 = *I’ve been doing this a lot*. A total score was calculated by combining responses for each of the two-statement pairs representing each Brief COPE coping process. The higher the score for each coping process indicated more frequent use of that coping process.

Veterans were also asked to report their level of agreement with 24 questions related to emotion- and stress-related eating from the EADES Questionnaire by utilizing a 5-point Likert-type scale ranging from 1 = *strongly agree* to 5 = *strongly disagree*. Fifteen questions of this scale were reverse-scored. A total score was calculated for each participant by combining scores for each question. A lower score on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire represented higher levels of emotion- and stress-related eating.
Items on the survey asked veterans to respond to 26 questions related to their frequency of behaviors regarding eating attitudes by using a 4-point Likert-type scale ranging from $0 = \text{sometimes, rarely, and never}$ to $3 = \text{always}$. One question on the EAT-26 questionnaire was reverse-scored indicating $0 = \text{always, usually, and often}$ to $3 = \text{never}$. A total score was calculated for each participant by combining scores for each question. A higher score on the EAT-26 indicated a higher level of eating disorder risk, with a score of 20 or above indicating such risk (Garner, 2010).

Descriptive statistics of demographic and other characteristics provided frequencies and percentages for the variables of gender, ethnicity/race, educational level, branch of military service, self-rated health status, eating disorder diagnosis/treatment, deployment status, combat exposure, and BMI classification. BMI classification levels were determined to assess the percentage of participants who were categorized as obese (BMI $\geq 30$). Demographic and characteristics of veterans responding to survey are presented in Table 2.

Descriptive statistics related to continuous variables provided minimum, maximum, mean, standard deviation, median, and interquartile range values from response scores relating to the Brief COPE coping processes, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, the EAT-26, as well as participant age, weight, and BMI. These results are presented in Table 3.
Table 2

Demographic and Other Characteristics of Veterans Responding to Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>% of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Rated health status (n = 230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>8</td>
<td>3.5</td>
</tr>
<tr>
<td>Very good</td>
<td>48</td>
<td>20.9</td>
</tr>
<tr>
<td>Good</td>
<td>95</td>
<td>41.3</td>
</tr>
<tr>
<td>Fair</td>
<td>65</td>
<td>28.3</td>
</tr>
<tr>
<td>Poor</td>
<td>14</td>
<td>6.1</td>
</tr>
<tr>
<td>ED diagnosis/treatment (n = 230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>3.9</td>
</tr>
<tr>
<td>No</td>
<td>221</td>
<td>96.1</td>
</tr>
<tr>
<td>Gender (n = 230)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>184</td>
<td>80</td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>20</td>
</tr>
<tr>
<td>Ethnicity (n = 229)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaska</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native</td>
<td>8</td>
<td>3.5</td>
</tr>
<tr>
<td>Asian American</td>
<td>5</td>
<td>2.2</td>
</tr>
<tr>
<td>Black/African American</td>
<td>9</td>
<td>3.9</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>11</td>
<td>4.8</td>
</tr>
<tr>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>White Non-Hispanic</td>
<td>196</td>
<td>85.6</td>
</tr>
<tr>
<td>Education (n = 230)</td>
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<td></td>
</tr>
<tr>
<td>Some high school</td>
<td>0</td>
<td>0</td>
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<tr>
<td>High school or GED</td>
<td>41</td>
<td>17.8</td>
</tr>
<tr>
<td>Associate/Technical degree</td>
<td>64</td>
<td>27.8</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>64</td>
<td>27.8</td>
</tr>
<tr>
<td>Master’s/Doctorate degree</td>
<td>50</td>
<td>21.7</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>4.8</td>
</tr>
<tr>
<td>Branch of service (n = 230)</td>
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<td></td>
</tr>
<tr>
<td>Air Force</td>
<td>27</td>
<td>11.7</td>
</tr>
<tr>
<td>Army</td>
<td>121</td>
<td>52.6</td>
</tr>
<tr>
<td>Coast Guard</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Marine Corps</td>
<td>38</td>
<td>16.5</td>
</tr>
<tr>
<td>Navy</td>
<td>43</td>
<td>18.7</td>
</tr>
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</table>

(Continued on following page)
Table 2 (continued)

<table>
<thead>
<tr>
<th>Demographic/Characteristic</th>
<th>n</th>
<th>% of participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deployment (n = 230)</td>
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<td></td>
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<tr>
<td>Yes</td>
<td>199</td>
<td>86.5</td>
</tr>
<tr>
<td>No</td>
<td>31</td>
<td>13.5</td>
</tr>
<tr>
<td>Combat exposure (n = 229)</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>185</td>
<td>80.8</td>
</tr>
<tr>
<td>No</td>
<td>44</td>
<td>19.2</td>
</tr>
<tr>
<td>BMI classification (n = 226)</td>
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<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>1</td>
<td>0.4</td>
</tr>
<tr>
<td>Normal weight</td>
<td>42</td>
<td>18.6</td>
</tr>
<tr>
<td>Overweight</td>
<td>75</td>
<td>33.2</td>
</tr>
<tr>
<td>Obese</td>
<td>108</td>
<td>47.8</td>
</tr>
</tbody>
</table>

Characteristics of the Sample Population

Nearly half of the participants rated their health as good (41.3%, n = 95), followed in descending order by fair (28.3%, n = 65), very good (20.9%, n = 48), poor (6.1%, n = 14), and excellent (3.5%, n = 8). Nine participants (3.9%) indicated they had been diagnosed with or treated for an eating disorder such as anorexia nervosa, BN or BED. Most of the participants were male (80%, n = 184) and White non-Hispanic (85.6%, n = 196). An equal number of participants (27.8%, n = 64) reported having an associate/technical degree or bachelor’s degree, 21.7% (n = 50) indicated a master’s/doctorate degree, 17.8% (n = 41) reported high school or GED, and 4.8% (n = 11) reported other. A little over half of the participants (52.6%, n = 121) served in the Army, 18.7% in the Navy (n = 43), 16.5% in the Marine Corps (n = 38), 11.7% in the Air Force (n = 27), and 1 participant (.4%) served in the Coast Guard. Most of the
Table 3
Minimum, Maximum, Mean, Standard Deviation (SD), Median, and Interquartile Range (IQR) Results for the Brief COPE, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, the EAT-26, Age, Weight, and BMI

<table>
<thead>
<tr>
<th>Variable</th>
<th>Min</th>
<th>Max</th>
<th>Mean± SD</th>
<th>Median (IQR - 25th, 75th)</th>
</tr>
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<tbody>
<tr>
<td>Brief COPE coping process</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-distraction (n = 235)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>6.00 (5.0, 7.0)</td>
</tr>
<tr>
<td>Active coping (n = 237)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>5.00 (4.0, 7.0)</td>
</tr>
<tr>
<td>Denial (n = 235)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>3.00 (2.0, 5.0)</td>
</tr>
<tr>
<td>Substance use (n = 236)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>4.00 (2.0, 6.0)</td>
</tr>
<tr>
<td>Use of emotional support (n = 237)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>5.00 (4.0, 6.0)</td>
</tr>
<tr>
<td>Use of instrumental support (n = 234)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>5.00 (4.0, 7.0)</td>
</tr>
<tr>
<td>Behavioral disengagement (n = 237)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>4.00 (2.0, 5.0)</td>
</tr>
<tr>
<td>Venting (n = 232)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>4.00 (3.25, 6.0)</td>
</tr>
<tr>
<td>Positive reframing (n = 234)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>4.00 (3.0, 6.0)</td>
</tr>
<tr>
<td>Planning (n = 230)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>5.00 (4.0, 6.0)</td>
</tr>
<tr>
<td>Humor (n = 233)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>3.00 (2.0, 5.0)</td>
</tr>
<tr>
<td>Acceptance (n = 235)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>6.00 (5.0, 8.0)</td>
</tr>
<tr>
<td>Religion (n = 234)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>4.00 (2.0, 6.0)</td>
</tr>
<tr>
<td>Self-blame (n = 235)</td>
<td>2</td>
<td>8</td>
<td>-</td>
<td>5.00 (4.0, 7.0)</td>
</tr>
<tr>
<td>Emotion- and stress-related eating scale of EADES (n = 221)</td>
<td>26</td>
<td>120</td>
<td>77.68 ± 22.57</td>
<td>-</td>
</tr>
<tr>
<td>EAT-26 (n = 217)</td>
<td>0</td>
<td>57</td>
<td>-</td>
<td>8.00 (4.0, 15.0)</td>
</tr>
<tr>
<td>Age (n = 230)</td>
<td>22</td>
<td>81</td>
<td>56.96 ± 14.62</td>
<td>-</td>
</tr>
<tr>
<td>Weight (n = 228)</td>
<td>104</td>
<td>355</td>
<td>207.24 ± 46.20</td>
<td>-</td>
</tr>
<tr>
<td>BMI (n = 226)</td>
<td>17.3</td>
<td>51.8</td>
<td>30.29 ± 5.94</td>
<td>-</td>
</tr>
</tbody>
</table>

Note. Mean and standard deviation (SD) are reported for normally distributed data. Median and interquartile range (IQR) were reported for skewed data.
participants (86.5%, n = 199) had been deployed whereas 13.5% (n = 31) had not. Over three quarters (80.8%, n = 185) experienced combat while 19.2% (n = 44) had not.

The mean age was 56.9 years ± 14.6 with a range of 22 to 81 years. The mean weight was 207.2 pounds ± 46.2 with a range of 104 pounds to 355 pounds. The mean BMI was 30.29 ± 5.9 with a range of 17.3 to 51.8. In terms of BMI, 47.8% (n = 108) were classified as obese, 33.2% (n = 75) were classified as overweight, 18.6% (n = 42) were classified as normal weight, and 0.4% (n = 1) was classified as underweight. Regarding scores on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, scores ranged from 26 to 120. This tool does not have a cutoff score; however, participants with lower scores likely engage in greater emotion- and stress-related eating. The mean and median emotion- and stress-related eating scores were 77.68 and 78.00 respectively. In this study, scores in the bottom 25th percentile of this tool ranged 26 to 60. As for the EAT-26 scores, 29 participants met the criterion for being at risk of eating disorder behavior by scoring 20 or above.

Reliability Analysis

Reliability analyses were conducted for the Brief COPE, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and the EAT-26 by assessing Cronbach’s alpha coefficient measures. In this study, the Cronbach’s alpha of the entire Brief COPE tool was .775. Internal consistency of the 14 coping processes of the Brief COPE was analyzed utilizing Cronbach’s alphas and Spearman’s Rank Order Correlation Coefficients. Given that each of the fourteen coping response scales of the Brief COPE are only two items each, Spearman’s Rank
Order Correlation coefficients allowed further assessment of the strength of intercorrelations among each of the two statement pairs. The Cronbach’s alphas and Spearman Rank Order Correlations are as follows: self-distraction ($\alpha = .365$, $n = 235$, $r = .232$), active coping ($\alpha = .691$, $n = 237$, $r = .538$), denial ($\alpha = .628$, $n = 235$, $r = .448$), substance use ($\alpha = .946$, $n = 237$, $r = .914$), use of emotional support ($\alpha = .810$, $n = 237$, $r = .678$), use of instrumental support ($\alpha = .825$, $n = 234$, $r = .710$), behavioral disengagement ($\alpha = .745$, $n = 237$, $r = .597$), venting ($\alpha = .595$, $n = 232$, $r = .410$), positive reframing ($\alpha = .653$, $n = 234$, $r = .483$), planning ($\alpha = .768$, $n = 230$, $r = .631$), humor ($\alpha = .790$, $n = 233$, $r = .679$), acceptance ($\alpha = .563$, $n = 235$, $r = .414$), religion ($\alpha = .824$, $n = 234$, $r = .707$) and self-blame ($\alpha = .739$, $n = 235$, $r = .588$).

According to Ozier and colleagues (2007), the Emotion- and Stress-Related Eating scale of the EADES Questionnaire had good internal consistency, with a Cronbach alpha coefficient of .949. In the current study, the Cronbach alpha coefficient was .968. According to Garner and colleagues (1982), the EAT-26 had a good internal consistency, with a Cronbach alpha coefficient of .90. In the current study, the Cronbach alpha coefficient was .819.

Principal Components Analysis of the Brief COPE

Given that research indicated variability in the second-order factor structure of the Brief COPE among various samples (Amoyal et al., 2016), the 14 coping processes of this tool were subjected to PCA to uncover the second-order factor structure of the Brief COPE in this sample population. As Pallant (2016) asserted, PCA can be utilized to examine correlations among the
Brief COPE statements to detect groups of interrelated variables underlying general categories of the data.

Prior to performing the PCA, the suitability of the data for this procedure was assessed by reviewing the sample size and strength of the intercorrelations. According to Nunnally (as cited in Pallant, 2016), a ratio of 10 participants to 1 variable is an appropriate sample size. For this analysis, only cases in which participants completed the entire Brief COPE survey were included, which yielded 221 participants. This represents a 15:1 ratio in this study. Factorability included inspection of the correlation matrix which revealed several coefficients of .3 and above. In addition, the Kaiser-Meyer-Olkin statistic of sampling adequacy index was .697, exceeding the recommended value of .6, and the Bartlett test of sphericity was significant, $x^2 = 789.985$, $p < .001$, further supporting the factorability of the correlation matrix (Pallant, 2016).

Factor extraction using Catell’s Scree Test provided a plot of eigenvalues for the factors (see Figure 2). The PCA revealed the presence of three components with eigenvalues above 1, explaining 24.86%, 14.87%, and 10.16% of the variance respectively.

A three-component structure was further upheld by a parallel analysis, which showed only three eigenvalues above the corresponding criterion values for a random data set of the same size (14 variables x 221 participants; Pallant, 2016, p. 194). The three-component solution of the PCA explained 49.9% of the variance. To aid in the interpretation of the three components, direct Oblimin rotation was utilized. The pattern matrix (see Table 4) was utilized to identify the highest loading items on each component to label that component (Pallant, 2016). The structure matrix (see Table 5) was utilized to assess information about the correlations between variables and components (Pallant, 2016).
Variables were created for each component based on the factor structure results by summing the scores for each coping process corresponding to each factor. Total scores for each component had normal distribution. Mean scores and standard deviations (SD) for components one, two, and three were 20.60 (SD = 5.93), 21.94 (SD = 5.66), and 24.35 (SD = 5.16) respectively. Though research supports possible groupings of coping processes as either problem- or emotion-focused, the three-component PCA solution in this study did appear to represent groupings of coping processes similar to the framework of the transactional model of stress and coping with extensions (Glanz et al., 2015; refer to Figure 1). The PCA findings in this study underscore the variability of the Brief COPE tool.
Table 4

PCA Pattern Matrix of the Brief COPE Coping Processes

<table>
<thead>
<tr>
<th>Brief COPE coping process</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of instrumental support</td>
<td>.858</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active coping</td>
<td>.775</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of emotional support</td>
<td>.762</td>
<td>.758</td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td></td>
<td>.513</td>
<td>.502</td>
</tr>
<tr>
<td>Venting</td>
<td></td>
<td>.793</td>
<td></td>
</tr>
<tr>
<td>Self-blame</td>
<td></td>
<td>.653</td>
<td></td>
</tr>
<tr>
<td>Denial</td>
<td></td>
<td></td>
<td>.613</td>
</tr>
<tr>
<td>Behavioral disengagement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use</td>
<td></td>
<td>.442</td>
<td></td>
</tr>
<tr>
<td>Self-distraction</td>
<td></td>
<td></td>
<td>.711</td>
</tr>
<tr>
<td>Positive reframing</td>
<td>.342</td>
<td>.619</td>
<td></td>
</tr>
<tr>
<td>Humor</td>
<td></td>
<td>.302</td>
<td>.550</td>
</tr>
<tr>
<td>Religion</td>
<td>.310</td>
<td></td>
<td>.417</td>
</tr>
<tr>
<td>Acceptance</td>
<td></td>
<td></td>
<td>.384</td>
</tr>
</tbody>
</table>

*Note. n = 221. Rotation method: Oblimin with Kaiser normalization. Shaded areas represent coping processes loading onto each PCA component.*

In this study, Component 1 (active coping, use of emotional support, use of instrumental support, and planning) appears to represent more problem-focused, support-seeking coping responses and were labeled as problem-focused coping processes. In previous research among veterans by Martindale and colleagues (2016) as well as Tuncay and Musabak (2015), researchers categorized these coping processes as action- or problem-focused, based on their factor analyses. The coping processes that loaded onto Component 2 in this study (denial, substance use, behavioral disengagement, venting, and self-blame) were labeled as emotion-focused, similar to results from Martindale and colleagues (2016) and Tuncay and Musabak.
Table 5

PCA Structure Matrix of the Brief COPE Coping Processes

<table>
<thead>
<tr>
<th>Brief COPE coping process</th>
<th>Component 1</th>
<th>Component 2</th>
<th>Component 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of instrumental support</td>
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<td></td>
</tr>
<tr>
<td>Active coping</td>
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<td>.795</td>
<td></td>
</tr>
<tr>
<td>Planning</td>
<td>.770</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of emotional support</td>
<td>.756</td>
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<td></td>
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<tr>
<td>Self-blame</td>
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<tr>
<td>Behavioral disengagement</td>
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<td>.640</td>
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<tr>
<td>Venting</td>
<td>.462</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substance use</td>
<td>.439</td>
<td></td>
<td></td>
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<tr>
<td>Self-distraction</td>
<td></td>
<td>.682</td>
<td></td>
</tr>
<tr>
<td>Positive reframing</td>
<td>.448</td>
<td></td>
<td>.677</td>
</tr>
<tr>
<td>Humor</td>
<td>.302</td>
<td>.525</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td>.399</td>
<td>.473</td>
<td></td>
</tr>
<tr>
<td>Acceptance</td>
<td>.362</td>
<td>.435</td>
<td></td>
</tr>
</tbody>
</table>

*Note. n = 221. Rotation Method: Oblimin with Kaiser normalization.*

(2015). The coping processes loading onto Component 3 in this study (self-distraction, positive reframing, humor, acceptance, and religion) appear to be more intrinsic in nature, highlighting the use of acceptance and attempting to make the situation more positive. Glanz and colleagues (2015) described many of these coping processes as meaning-based coping, which is how they were categorized in this study. The newly created variables representing the sum scores for each of the three PCA components were included in the data analysis procedures for hypothesis testing in this study.
Results of Hypothesis Testing

Correlations Between Coping and Eating Behaviors

Hypothesis 1 predicted that there would be an inverse relationship between problem-focused coping responses and emotion- and stress-related eating as well as eating disorder risk among this sample population. It was anticipated that veterans who reported higher scores on the theoretically derived problem-focused coping processes would report less emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire and be at lower risk of eating disorder behavior as measured by the EAT-26.

First, the relationship between each of the three PCA components and the Emotion- and Stress-Related Eating scale of the EADES Questionnaire was investigated using Pearson’s Correlation Coefficient. Due to positively skewed data for the EAT-26 scores, the relationship between the three PCA components and the (EAT-26) was investigated using Spearman’s Rank Order Correlation Coefficient. The strengths of the relationships between the variables used in this correlational analysis were measured using Cohen’s guidelines (as cited in Pallant, 2016; small: r = .10 to .29, medium: r = .30 to .49, and large: r = .50 to 1.0). There was no relationship (r = .050, p = .468) between problem-focused coping (PCA Component 1) and emotion- and stress-related eating, a small inverse relationship (r = -.133, p = .052) between emotion-focused coping (PCA Component 2) and emotion- and stress-related eating, and no relationship (r = -.005, p = .940) between meaning-based coping (PCA Component 3) and emotion- and stress-related eating. In addition, there was no relationship (r = .071, p = .308) between problem-focused coping (PCA Component 1) and eating disorder risk, a statistically significant small
positive relationship \((r = .257; p < .05)\) between emotion-focused coping (PCA Component 2) and eating disorder risk, and no relationship \((r = -.073, p = .292)\) between meaning-based coping (PCA Component 3) and eating disorder risk (see Table 6).

Table 6

<table>
<thead>
<tr>
<th>Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Component 1 (problem-focused coping; (n = 228))</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Component 2 (emotion-focused coping; (n = 227))</td>
<td>-.032</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Component 3 (meaning-based coping; (n = 229))</td>
<td>.330**</td>
<td>-.044</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Emotion- and stress-related eating scale of EADES ((n = 221))</td>
<td>.050</td>
<td>-.133</td>
<td>-.005</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>5. EAT-26 ((n = 217))</td>
<td>.071</td>
<td>.257**</td>
<td>-.073</td>
<td>-.040</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*Note.* **\(p < .01\) (2-tailed). *\(p < .05\) (2-tailed).

To further investigate how the 14 Brief COPE coping process items may relate to emotion- and stress-related eating and eating disorder risk individually versus when grouped as related items from the Brief COPE PCA, additional correlation analyses were conducted. Due to the violation of normality noted with skewed data for each of the 14 Brief COPE coping process
items, the nonparametric Spearman’s Rank Order Correlation Coefficient was chosen (Pallant, 2016).

There was a statistically significant small inverse relationship between behavioral disengagement and emotion- and stress-related eating \((r = -.153, p < .05)\), a statistically significant small inverse relationship between self-blame and emotion- and stress-related eating \((r = -.174, p < .05)\), and a statistically significant small positive relationship between acceptance and emotion- and stress-related eating \((r = .207, p < .05)\). In addition, there were statistically significant small positive relationships between denial, venting, planning, and self-blame and eating disorder risk \((r’s = .179, .151, .149, \text{ and } .258, \text{ respectively, all } p’s < .05)\). This correlation matrix is presented in Table 7.

The findings from this analysis did not support Hypothesis 1, no statistically significant relationships were found between problem-focused coping (PCA Component 1) and emotion- and stress-related eating and eating disorder risk. In this study, veterans who reported more frequent use of emotion-focused coping (PCA Component 2) had statistically significant higher scores on the EAT-26 tool measuring eating disorder risk \((r = .220, p < .05)\). When assessing Brief COPE coping process items individually, veterans who frequently utilized acceptance coping engaged in statistically significant less emotion- and stress-related eating as evidenced by higher scores on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire \((r = .207, p < .001)\). In addition, veterans who reported more frequently utilizing behavioral disengagement and self-blame coping had statistically significant higher rates of emotion- and stress-related eating as evidenced by lower scores on the Emotion- and Stress-Related Eating
Table 7

Correlation Matrix Between the Brief COPE Coping Process Scores and Two Eating Behavior Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Self-distract</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Active cope</td>
<td>.113</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Denial</td>
<td>.097</td>
<td>.000</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Substance use</td>
<td>-.030</td>
<td>-.040</td>
<td>.140*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. Emotion sup.</td>
<td>-.020</td>
<td>.456**</td>
<td>-.054</td>
<td>-.060</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Behavioral disengage.</td>
<td>.003</td>
<td>-.346**</td>
<td>.270**</td>
<td>.171**</td>
<td>-.211**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Venting</td>
<td>-.096</td>
<td>.281**</td>
<td>.160*</td>
<td>.053</td>
<td>.222**</td>
<td>.086</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Use of inst. support</td>
<td>-.020</td>
<td>.580**</td>
<td>.053</td>
<td>-.005</td>
<td>.679**</td>
<td>-.220**</td>
<td>.205**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Positive reframing</td>
<td>.198**</td>
<td>.320**</td>
<td>.096</td>
<td>-.017</td>
<td>.286**</td>
<td>-.161**</td>
<td>.019</td>
<td>.250**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Self-blame</td>
<td>.163*</td>
<td>-.026</td>
<td>.314**</td>
<td>.222**</td>
<td>-.077</td>
<td>.377**</td>
<td>.323**</td>
<td>.023</td>
<td>-.035</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Planning</td>
<td>.027</td>
<td>.586**</td>
<td>.107</td>
<td>.029</td>
<td>.355**</td>
<td>-.244**</td>
<td>.261**</td>
<td>.592**</td>
<td>.401**</td>
<td>.087</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Humor</td>
<td>.152*</td>
<td>-.055</td>
<td>.145*</td>
<td>.065</td>
<td>.025</td>
<td>.084</td>
<td>.012</td>
<td>.020</td>
<td>.188**</td>
<td>.082</td>
<td>.038</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Acceptance</td>
<td>.144*</td>
<td>.251**</td>
<td>-.214**</td>
<td>-.041</td>
<td>.248**</td>
<td>-.180**</td>
<td>.104</td>
<td>.190**</td>
<td>.289**</td>
<td>-.187**</td>
<td>.241**</td>
<td>.059</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Religion</td>
<td>.079</td>
<td>.272**</td>
<td>-.003</td>
<td>-.080</td>
<td>.221**</td>
<td>-.269**</td>
<td>-.024</td>
<td>.317**</td>
<td>.341**</td>
<td>-.109</td>
<td>.251**</td>
<td>.062</td>
<td>.207**</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. EADES***</td>
<td>-.070</td>
<td>.047</td>
<td>-.063</td>
<td>.015</td>
<td>.053</td>
<td>-.153*</td>
<td>-.021</td>
<td>.023</td>
<td>.043</td>
<td>-.174*</td>
<td>.008</td>
<td>-.103</td>
<td>.207**</td>
<td>.008</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>16. EAT-26</td>
<td>.018</td>
<td>.057</td>
<td>.179**</td>
<td>.081</td>
<td>.001</td>
<td>.124</td>
<td>.151*</td>
<td>.020</td>
<td>-.043</td>
<td>.258**</td>
<td>.149*</td>
<td>-.024</td>
<td>-.101</td>
<td>-.090</td>
<td>-.040</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: **p < .01 (2-tailed). *p < .05 (2 tailed). ***Emotion- and Stress-Related Eating scale of the EADES Questionnaire.
scale of the EADES Questionnaire (r’s = -0.153, -0.174 respectively, \( p < .05 \)). Furthermore, veterans who more frequently utilized denial, venting, and self-blame reported statistically significant higher scores on the EAT-26 questionnaire (r’s = 0.179, 0.151, 0.258, \( p < .05 \) respectively). Unexpectedly, the more frequent use of planning was also related to statistically significant higher scores on the EAT-26 (r = 0.149, \( p < .05 \)).

**Predictors of Emotion- and Stress-Related Eating**

Hypothesis 2 stated that emotion-focused coping processes as measured by the Brief COPE would most strongly predict emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale scores of the EADES Questionnaire in this sample of veterans with PTSD. Multiple linear regression was used to assess the ability of coping responses as well as demographic variables to predict emotion- and stress-related eating. This approach allowed an investigation of whether specific variables in this study were predictive of emotion- and stress-related eating in veterans with PTSD while accounting for other variables that may influence the outcome variable (Pallant, 2016).

Bivariate correlations among the three PCA component scores, demographic, and other characteristic variables were conducted in this study. Variables to include as predictors in the multiple regression model were chosen based on their relationship (\( p < .2 \); Wolf et al., 2010) with scores from the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, which was used as the outcome variable. Variables retained were emotion-focused coping (PCA Component 2), self-rated health status, weight, and BMI. The five levels of self-rated health
(excellent, very good, good, fair, and poor) were dichotomized into two levels: good health (excellent, very good, and good) and poor health (fair and poor). This variable was dummy coded as 0 = good health and 1 = poor health for use in the regression model (Pallant, 2016).

Upon conducting the multiple regression with emotion-focused coping (PCA Component 2), self-rated health status, weight, and BMI, there was a large correlation between weight and BMI ($r = .893$). Review of Variance Inflation Factor (VIF) readings for weight (VIF = 5.016), and BMI (VIF = 5.001) provided additional evidence that there was likely multicollinearity between these variables (Pallant, 2016). Based on these findings, emotion-focused coping (PCA Component 2), self-rated health status, and BMI were retained in the regression model.

Preliminary analysis was conducted using residual scatterplots to ensure assumptions (outliers, normality, linearity, homoscedasticity, and independence of residuals) were not violated (Pallant, 2016). The overall regression was then analyzed for significance, as was each predictor ($p < .05$) in order to determine significant predictors of emotion- and stress-related eating from the Emotion- and Stress-Related Eating scale of the EADES Questionnaire. Overall, the regression was significant, $F_{(3, 211)} = 13.33, p < .001, R^2 = .159$. Findings indicated that 15.9% of the variance in the Emotion- and Stress-Related Eating scale of the EADES Questionnaire scores can be explained by emotion-focused coping (PCA Component 2), self-rated health status, and BMI. Of the predictors investigated, both BMI ($\beta = -.343, t(211) = -5.423, p < .05$) and self-rated health status ($\beta = -.147, t(211) = -2.282, p < .05$) were statistically significant. BMI had the strongest unique contribution to emotion- and stress-related eating when all other variables were controlled for and made a statistically significant unique contribution. Self-rated health status had the second strongest unique contribution to emotion-
and stress-related eating. Emotion-focused coping (PCA Component 2; $\beta = -0.093$, $t(211) = -1.457, p > .05$) was not a significant predictor of emotion- and stress-related eating. These findings do not support Hypothesis 2 because emotion-focused coping processes from the Brief COPE did not most strongly predict emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire. Overall, participants predicted Emotion- and Stress-Related Eating score from the EADES Questionnaire was equal to $126.66 - 1.30 \text{ (BMI)} - 6.96 \text{ (Self-Rated Health)} - .413 \text{ (emotion-focused coping score)}$. A summary of the regression analysis for predictors of emotion- and stress-related eating is presented in Table 8.

Table 8

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Emotion- and Stress-Related Eating scale of EADES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictors</td>
<td>$B$</td>
</tr>
<tr>
<td>Emotion-focused coping (PCA Component 2)</td>
<td>-.413</td>
</tr>
<tr>
<td>BMI</td>
<td>-1.30</td>
</tr>
<tr>
<td>Self-rated health status</td>
<td>-6.958</td>
</tr>
</tbody>
</table>

*Note. $n = 211$.*
Predictors of Eating Disorder Risk

Hypothesis 3 predicted that emotion-focused coping processes as measured by the Brief COPE would most strongly predict eating disorder risk as measured by the EAT-26 in this sample of veterans with PTSD. Multiple linear regression was used to assess the ability of coping responses as well as demographic and characteristic variables to predict eating disorder risk measured by the EAT-26 scores. This approach allowed an investigation of whether specific coping processes were predictive of eating disorder risk in veterans with PTSD while accounting for other variables that may influence the outcome variable (Pallant, 2016). Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity and homoscedasticity. It was noted that the EAT-26 scores were positively skewed. Given that outcome variable data are assumed to be normally distributed, I conducted a log transformation on the EAT-26 scores to transform this data to normality (Boushey, Harris, Bruemmer, & Archer, 2008).

Bivariate correlations among the three PCA component scores, demographic, and other characteristic variables were conducted in this study. Variables to include as predictors in the multiple regression model were chosen based on their relationship ($p < .2$; Wolf et al., 2010) with scores from the EAT-26 which was used as the outcome variable. Variables retained were emotion-focused coping (PCA Component 2) self-reported health status, gender, and self-reported history of ED. The five levels of self-rated health (excellent, very good, good, fair, and poor) were dichotomized into two levels: good health (excellent, very good, and good), and poor health (fair and poor). This variable was dummy coded as 0 = good health and 1 = poor health.
Gender was dummy coded as 0 = male, 1 = female, and self-reported history of ED was dummy coded 0 = no, 1 = yes (Pallant, 2016).

Preliminary analysis was conducted using residual scatterplots to ensure assumptions (outliers, normality, linearity, homoscedasticity, and independence of residuals) were not violated (Pallant, 2016). The overall regression was then analyzed for significance, as was each predictor ($p < .05$) in order to determine significant predictors of eating disorder risk (EAT-26 scores). Overall, the regression was significant, $F(4, 202) = 5.58$, $p = .001$, $R^2 = .099$. These findings indicated that 9.9% of the variance in eating disorder risk (EAT-26) scores can be explained by emotion-focused coping (PCA Component 2), self-rated health status, gender, and self-reported history of ED. Of the predictors investigated, emotion-focused coping (PCA Component 2; $\beta = .163$, $t(202) = 2.39$, $p < .05$), and self-reported history of ED ($\beta = .163$, $t(202) = 2.36$, $p < .05$) were statistically significant. Emotion-focused coping (PCA Component 2) and self-reported history of ED had the strongest unique contributions to eating disorder risk when all other variables were controlled for and made statistically significant unique contributions. Gender was not a significant predictor of eating disorder risk ($\beta = .127$, $t(202) = 1.85$, $p = .066$), and self-rated health status was not a significant predictor of eating disorder risk ($\beta = .077$, $t(202) = 1.13$, $p = .258$). Regarding Hypothesis 3 that emotion-focused coping processes from the Brief COPE would most strongly predict eating disorder risk as measured by the EAT-26, findings from this study support this hypothesis. Overall, participants predicted log(EAT-26) scores were equal to $2.82 + .028$ (emotion-focused coping score) + $.747$ (self-rated history of ED) + $.278$ (gender) + $.142$ (self-rated health status). A summary of the regression analysis for predictors of eating disorder risk is presented in Table 9.
Table 9
Summary of Regression Analysis for Predictors of Eating Disorder Risk

<table>
<thead>
<tr>
<th>Predictors</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion-focused coping (PCA Component 2)</td>
<td>.028</td>
<td>.012</td>
<td>.163</td>
<td>.018</td>
</tr>
<tr>
<td>Self-reported history of ED</td>
<td>.747</td>
<td>.316</td>
<td>.163</td>
<td>.019</td>
</tr>
<tr>
<td>Gender</td>
<td>.278</td>
<td>.150</td>
<td>.127</td>
<td>.066</td>
</tr>
<tr>
<td>Self-rated health status</td>
<td>.142</td>
<td>.125</td>
<td>.077</td>
<td>.258</td>
</tr>
</tbody>
</table>

Note. n = 202.

Summary

The descriptive statistics resulting from this study revealed that emotion- and stress-related eating and eating disorder risk may exist among veterans with PTSD. In addition, coping processes that have theoretically been described as emotion-focused coping behaviors were related to both emotion- and stress-related eating and eating disorder risk among veterans who experience PTSD. Furthermore, findings from the PCA in this study highlights the variability in coping process among various sample populations. Though the three-component structure revealed in this study did not parallel previous factor analysis findings from veteran samples, the coping responses aligned with theoretically based problem-focused coping, emotion-focused
coping, and meaning-based coping processes as proposed by Glanz and colleagues’ (2015) transactional model of stress and coping with extensions.

Correlation coefficients indicated that there were statistically significant inverse relationships between behavioral disengagement and self-blame and emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire. There was also a statistically significant positive relationship between acceptance and emotion- and stress-related eating. In other words, veterans who utilized behavioral disengagement and self-blame more frequently to cope were more likely to eat in response to emotions and stress whereas veterans who utilized acceptance to cope were less likely to engage in emotion- and stress-related eating. In addition, veterans who utilized denial, venting, planning, and self-blame more frequently to cope may be at higher risk of eating disorder behaviors according to the EAT-26 scores obtained from veterans who participated in this study.

Furthermore, BMI and self-rated health status provided statistically significant unique contributions to the regression model pertaining to emotion- and stress-related eating whereas emotion-focused coping (PCA Component 2) was not a significant predictor. Despite this finding, the overall amount of variability in emotion- and stress-related eating accounted for by these predictors indicated a medium effect with a $R^2$ value of .159 (Cohen, 1988). Regarding eating disorder risk, emotion-focused coping (PCA Component 2), and self-reported history of ED provided statistically significant unique contributions to the regression model pertaining to eating disorder risk whereas gender and self-reported health status were not significant predictors of eating disorder risk. The overall amount of variability in eating disorder risk accounted for by these predictors indicated a small effect with a $R^2$ value of .099 (Cohen, 1988).
This chapter focused on the presentation of data analysis findings. The next chapter provides a summary of this study and a discussion of conclusions as well as implications and recommendations for future practice and research.
CHAPTER 5
DISCUSSION

Overview

This exploratory study used a quantitative survey design to investigate how coping process relates to eating behaviors among veterans with PTSD. This research was valuable given the rate of health risks and obesity among veterans, the co-occurrence of obesity and PTSD, and the fact that individuals may eat in response to stress and negative emotions. Results of this study could be beneficial for obesity prevention and mental health intervention efforts.

This chapter provides a discussion of the findings, as well as an overview of the strengths and limitations, and implications for future practice and research. This research attempted to answer the following questions:

• What relationships exist between coping process (measured by the Brief COPE), emotion- and stress-related eating (measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire), and eating disorder risk (measured by the EAT-26) in a sample of veterans with PTSD?

• Which variables most strongly predict emotion- and stress-related eating (measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire) in a sample of veterans with PTSD?
- Which variables most strongly predict eating disorder risk (measured by the EAT-26) in a sample of veterans with PTSD?

In this study, correlations between coping process and emotion- and stress-related eating and eating disorder risk were examined from a sample of 239 veterans who reported experiencing PTSD. In addition, predictors of emotion- and stress-related eating and eating disorder risk were explored.

**Study Findings and Interpretations**

The data obtained from participants in this study allowed all scores from the Brief COPE, the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and the EAT-26 to be summed and analyzed as planned. The positive support from participating veteran service organizations aided in the completion rate of these questionnaires in this study’s survey. Overall, the questionnaires performed as well as noted in prior research.

Several relevant characteristics among veterans who participated in this study were exhibited in the data. Though the majority of participants were male (80%), it is notable that 20% of participants were female. This proportion of female participants exceeded the number in many reviewed studies. C. Smith and colleagues (2009) reported a female participation rate of 4.7% in their qualitative study assessing diet quality among 64 veterans from a single urban VHA facility. In addition, Masheb and colleagues (2015) noted a 15.1% female participation rate in their study assessing binge eating among 392 veterans from two VHA facilities. It may be of interest to investigate what prompted female veterans to participate in this study. Perhaps,
utilizing service organizations for recruitment provided a more diverse pool of veteran participants. Given that the number of female veterans is projected to increase almost 7% to 16.3% by 2043 (United States Department of Veterans Affairs National Center for Veterans Analysis and Statistics, 2017), it is important for key stakeholders such as the DoD, VA, VHA, community health organizations, and health providers to fully understand the needs of all veterans. This may be accomplished with further research utilizing samples of gender-diverse groups of veterans.

Another noteworthy finding pertains to self-rated health status. Despite evidence indicating that veterans with PTSD reported poorer health than civilians (Hoerster et al., 2012; Lehavot et al., 2012), a large number of veterans in this study rated their health as good (41.3%) or very good (20.9%). Perhaps, the involvement in a veteran service organization and possible development of greater social connections positively impacted perceptions of health for veterans in this study. In a study of 98 veterans involved in group nature-based recreation programs, Duvall and Kaplan (2014) concluded that programs bringing veterans together positively impacted their perceived health.

The sample of veterans who participated in this study was diverse in age (22 to 81 years), indicating that a variety of service eras were likely represented, though service era was not identified through the survey. Data obtained on the highest level of educational attainment were comparable to data published in reviewed studies. In this study, approximately 87% of veterans reported receiving a college degree. This is notable because it highlights the necessity to gain a deeper understanding of the needs of student veterans who experience PTSD.
Regarding obesity rates among this sample of veterans, of the 226 participants who provided the self-reported height and weight measures needed to calculate BMI, 47.8% \((n = 108)\) were classified as obese \((\text{BMI} \geq 30)\). This rate is comparable to obesity rates found among veterans with PTSD published by Breland, Phibbs, and colleagues (2017), providing additional evidence that veterans with PTSD experience higher obesity rates than veterans without mental health conditions (41%; Breland, Phibbs et al.) and civilian adults (39.8%; Centers for Disease Control and Prevention, 2018a). This finding highlights the need to continue investigating the PTSD-obesity link and the significant factors leading to an increase in weight status among veterans.

Scores from each of the eating behavior assessment tools also indicated noteworthy findings. In this sample of veterans, males indicated greater emotion- and stress-related eating as indicated by a lower average score \((\text{M} = 77.34 \text{ SD} = 22.70)\) compared to females \((\text{M} = 79.00 \text{ SD} = 22.53)\) on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire. This contrasts the findings of Slane and colleagues (2016) who found female veterans had significantly higher rates of emotion- and stress-related eating compared to male veterans.

Females had higher median scores \((\text{Mdn} = 11.00)\) on the EAT-26 compared to males \((\text{Mdn} = 7.00)\) in this study. For this tool, scores of 20 or above indicate an increased eating disorder risk. Twenty-nine veterans (13%) met or exceeded the EAT-26 cutoff score. This supports the hypothesis of Bartlett and Mitchell (2015) that veterans are at equal or greater risk for eating disorders as civilians. Nine veterans (3%) reported ever being diagnosed with or treated for an eating disorder. Of these veterans, two thirds \((n = 6)\) were female, one third \((n = 3)\).
was male. These findings highlight the need for further research on disordered eating and eating disorders among veterans with PTSD.

It is also important to draw attention to unique characteristics of the PCA conducted on the Brief COPE in this study. Unlike Martindale and colleagues (2016) who extracted a two-component factor, second-order structure of the 14 coping processes of the Brief COPE and Romero and colleagues (2015) who obtained a four-component, second-order factor structure, a three-component, second-order factor structure was obtained in this study (see Table 10).

Table 10
Summary of the Three-Component, Second-Order Factor Structure of the Brief COPE

<table>
<thead>
<tr>
<th>Brief COPE PCA component</th>
<th>Coping processes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component 1 (problem-focused coping)</td>
<td>Active coping</td>
</tr>
<tr>
<td></td>
<td>Use of emotional support</td>
</tr>
<tr>
<td></td>
<td>Use of instrumental support</td>
</tr>
<tr>
<td></td>
<td>Planning</td>
</tr>
<tr>
<td>Component 2 (emotion-focused coping)</td>
<td>Denial</td>
</tr>
<tr>
<td></td>
<td>Substance use</td>
</tr>
<tr>
<td></td>
<td>Behavioral disengagement</td>
</tr>
<tr>
<td></td>
<td>Venting</td>
</tr>
<tr>
<td></td>
<td>Self-blame</td>
</tr>
<tr>
<td>Component 3 (meaning-based coping)</td>
<td>Self-distraction</td>
</tr>
<tr>
<td></td>
<td>Positive reframing</td>
</tr>
<tr>
<td></td>
<td>Humor</td>
</tr>
<tr>
<td></td>
<td>Acceptance</td>
</tr>
<tr>
<td></td>
<td>Religion</td>
</tr>
</tbody>
</table>
Coping processes based on the PCA results in this study did represent coping efforts established by the transactional model of stress and coping with extensions published by Glanz and colleagues (2015; refer to Figure 1). Based on the transactional model of stress and coping by Lazarus and Folkman (1984), coping efforts are aimed at solving an issue (problem regulation) or to alleviate distress rather than to address the stressor itself (emotion regulation). In this study, coping processes that factored onto Component 1 align with theoretically derived problem-focused coping whereas those that factored onto Component 2 align with theoretically derived emotion-focused coping efforts. It is noteworthy that many coping processes that factored onto Component 3 align with the meaning-based coping extension of the transactional model of stress and coping model published by Glanz and colleagues (2015). Meaning-based coping efforts, such as positive reframing, humor, and religion, are those utilized to produce positive emotions (Glanz et al., 2015). This is an important finding and highlights the efficacy of the model to explain coping in this sample of veterans.

Another notable finding from the PCA in this study is that venting factored onto both Component 1 (problem-focused coping) and Component 2 (emotion-focused coping). This contrasts the findings of earlier studies in which venting either loaded solely onto an emotion-focused coping component (Martindale et al., 2016), or it was categorized as such based on previous empirical findings (Romero et al., 2015; Tuncay & Musabak, 2015). This underscores the variability of the Brief COPE among different populations and the benefit of determining second-order factor structure of the tool. For this study, venting fit most appropriately with coping processes that were categorized as emotion-focused (PCA Component 2; Glanz et al., 2015), and was labeled as such for data analysis.
Hypothesis 1 Discussion

Though the first hypothesis identified no statistically significant relationships between the problem-focused coping (PCA Component 1), emotion-focused coping (PCA Component 2) and meaning-based coping (PCA Component 3) and emotion- and stress-related eating (r’s = .050, -.133, -.005, p’s = .468, .052, .940 respectively), further analysis of each Brief COPE coping process yielded significant relationships. Performing additional analysis was intended to more deeply explore the relationships between individual coping processes from the Brief COPE and emotion- and stress-related eating.

A statistically significant negative relationship occurred between behavioral disengagement and emotion- and stress-related eating (r = -.153, p < .05), as was the case with self-blame (r = -.174, p < .05). This indicates that more frequent use of giving up on the attempt to cope or engaging in self-criticism were related to greater emotion- and stress-related eating. Finally, a significant positive relationship was identified between acceptance and emotion- and stress-related eating (r = .207, p < .05), indicating that those who accepted the situation reported less emotion- and stress-related eating. From this finding, specific emotion-focused coping processes (behavioral disengagement and self-blame) are associated with greater emotion- and stress-related eating. This result is comparable to that of Kuczmarski and colleagues (2017), who found that among the over 2,000 adults in their study, those with greater frequency of using emotion-focused coping as measured by the Brief COPE had higher food intakes than participants who reported utilizing more problem-focused coping processes. In addition, these findings support the hypothesis from Talbot and colleagues (2013) that individuals with PTSD
engage in more emotional eating behaviors. Furthermore, this study had comparable findings to Hoerster and colleagues’ (2015), who speculated that veterans with psychiatric conditions use food to manage distress and emotions.

In terms of eating disorder risk as measured by the EAT-26, there was a statistically significant small positive relationship ($r = .220; p < .05$) between emotion-focused coping (PCA Component 2) and eating disorder risk. Based on this finding, veterans who utilized denial, substance use, behavioral disengagement, venting, and self-blame were at higher risk for eating disorders as measured by the EAT-26.

Further analysis was conducted to more deeply explore the individual relationships between the Brief COPE coping processes and eating disorder risk as measured by the EAT-26. This analysis revealed significant positive relationships between the Brief COPE coping processes of denial, venting, planning, and self-blame ($r’s = .179, .151, .149, .258$ respectively, all $p < .05$) and eating disorder risk (EAT-26). These findings indicate that behaviors such as refusing to believe the stress happened, expressing negative feelings, criticizing and blaming oneself, and learning to live with the situation were related to greater eating disorder risk. It was surprising to find a significant positive relationship between planning and eating disorder risk. In reviewed studies utilizing the Brief COPE, planning has been classified as a problem-focused coping process; therefore, a higher frequency of its use was not anticipated to increase eating disorder risk in this study. According to Carver (1997), devising a strategy or determining the best course of action to deal with a stressor comprise this type of coping process. Perhaps this finding relates to aspects of control behavior that may be associated with disordered eating behaviors (A. M. Smith et al., 2018) and needs to be further explored.
Hypothesis 2 Discussion

It was also hypothesized that coping responses that are theoretically described as emotion-focused would be the most significant predictors of emotion- and stress-related eating in this sample of veterans with PTSD. In this study, BMI was identified as the strongest significant predictor of emotion- and stress-related eating ($p < .05$). Perhaps this occurred due to the large proportion of participants (81.5%) in this study with an elevated BMI (BMI $\geq 25$). The relationship between emotion- and stress-related eating and BMI was noted in a study of over 800 adults by Ozier and colleagues (2008) who found that participants reporting more emotion- and stress-related eating had an increased likelihood of being overweight or obese (p. 54). In a sample of over 600 veterans, Slane and colleagues (2016) also found that veterans with a higher BMI reported greater emotion- and stress-related eating. It is of interest to further explore the direction of this relationship because the findings of Ozier and colleagues (2008) as well as Slane and colleagues highlight that greater levels of emotion- and stress-related eating are related to higher BMI levels.

Regarding self-reported health status (0 = good health, 1 = poor health) being a significant predictor ($p < .05$) of emotion- and stress-related eating, it appears that scores on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire were lower (indicating higher emotion- and stress-related eating) for those who reported poor health compared to those rating their health as good ($B = -6.96$). This highlights the importance of an individual’s perceived health status on health behaviors, particularly eating behaviors. There is strong support in the literature that veterans with PTSD have poorer health than civilians (Hoerster et
al., 2012; Lehavot et al., 2012), but as Bombak (2013) postulated, there is a complex relationship between self-rated health status and health behaviors. Further, many sociodemographic and cultural factors influence this relationship. It should be of interest to further explore the relationship between self-rated health status and eating behaviors among veterans with PTSD.

Finally, though emotion-focused coping (PCA Component 2) was not a significant predictor of emotion- and stress-related eating in this study, results indicated that veterans who had higher emotion-focused coping scores reported higher rates of emotion- and stress-related eating as evidenced by lower scores on the Emotion- and Stress-Related Eating scale of the EADES Questionnaire ($B = -.413$). This finding, along with results from the correlations between individual Brief COPE items and emotion- and stress-related eating in this study, provide support that it may be valuable to further explore the relationship between specific individual coping processes from the Brief COPE and emotion- and stress-related eating.

**Hypothesis 3 Discussion**

Testing for Hypothesis 3 aimed to determine whether coping process that is theoretically described as emotion-focused would emerge as the most significant predictor of eating disorder risk as measured by the EAT-26. Results indicated that the emotion-focused coping (PCA Component 2; denial, substance use, behavioral disengagement, venting, and self-blame) did most strongly predict eating disorder risk. Findings indicated that an increase in emotion-focused coping (PCA Component 2) would predict an increase in EAT-26 scores ($B = .028$). The amount of contribution of this variable to the $R^2$ value of .099 was small at 2.5%. Results from this
analysis also support the knowledge base that specific emotion-focused or avoidant types of coping may foster negative health behaviors. Fitzsimmons and Bardone-Cone (2011) reported that individuals with an active eating disorder or who were partially recovered from an eating disorder were more likely to utilize emotion-oriented (emotion-focused) coping processes than fully recovered individuals. This, along with the speculation that trauma may prompt eating disorder behaviors among veterans (Bartlett & Mitchell, 2015), underscores the need to consider coping process when assessing eating behaviors of veterans with PTSD.

Self-reported history of ED diagnosis or treatment was also one of the strongest predictors of eating disorder risk in this study. Findings indicated that for veterans who self-reported ever having been diagnosed or treated for an ED, there would be an increase in predicted EAT-26 scores ($B = .747$). This supports speculation from Bartlett & Mitchell (2015) that pre-existing disordered eating attitudes and behaviors may be intensified in the military or that members of the military may engage in disordered eating behaviors to meet strict weight and fitness standards imposed by the military. Findings from this study underscores the need to consider further exploration into the relationship between military service and disordered eating patterns. Such research could provide additional evidence that a comprehensive eating disorder screening and treatment program may be warranted among active duty service members and veterans.

Regarding gender as a predictor of eating disorder risk in this study, findings indicated that females had higher EAT-26 scores compared to males; however, these results were not statistically significant ($B = .278, p = .066$). Results that females reported higher eating disorder risk scores is supported by the national estimate predictions of eating disorders from the National
Eating Disorders Association (2018) that 20 million women and 10 million men will have an eating disorder during their lifetime. There is also evidence that female veterans experience disordered eating behaviors at higher rates than their male counterparts, with approximately 5%-8% of women and 0.1% of men diagnosed with an eating disorder when assessing eating disorder rates via clinical interview (Bartlett & Mitchell, 2015). Though self-rated health status was not a significant predictor of eating disorder risk, veterans who reported their health as poor had higher scores on the EAT-26 ($B = .142$) compared to those who rated their health as good, providing additional evidence that the relationship between self-rated health and eating behaviors should be further explored.

**Strengths and Limitations**

There are several noteworthy strengths to this study. The number of completed surveys was reasonably high because of the distribution method. In addition, the design of this study allowed for data to be collected at a single time point, and participants were willing to participate through a long questionnaire. Offering the option to request paper/pencil surveys also aided in the recruitment efforts of veteran service organizations, providing evidence that a mixed-mode distribution approach was useful. Furthermore, though state of residence was not collected, veteran service organizations from across the U. S. participated in this study (list available upon request); therefore, the sample of veterans with PTSD was likely extended beyond Illinois residence. Many of the reviewed studies were conducted at a single VHA facility; therefore, this study likely included a more geographically diverse group of veterans. Finally, providing my
contact information and prompting veterans to contact me if they would like to participate in future research resulted in correspondence with a small number of veterans who can be included in future studies.

This research is not without limitations that should be considered when interpreting the findings. Though correlational analysis allowed for information to be gathered on the relationships between study variables, the design did not allow for establishing causality. Restricting participants to veterans who experience PTSD limits the generalizability of the findings from this study. In addition, participants in this study were primarily White, non-Hispanic, and male. The sample was also comprised of a large percentage of veterans who served in the Army. Thus, the degree to which these findings generalize to other PTSD veteran samples is unclear. Research with a more diverse veteran sample is needed to fully examine how coping relates to eating behaviors among veterans with PTSD. Furthermore, utilizing a one-question PTSD screening protocol to verify PTSD status rather than a validated screening tool may have impacted the findings of this study. However, the recruiting involvement of many veteran service organizations that have a PTSD verification protocol should be noted. Finally, variables were based on self-report, and therefore under- or over-reporting may have occurred.

Implications

Findings from this study can be meaningful for identifying trends in coping behaviors, health behaviors, and weight status among veterans with PTSD. Information gleaned from this study may be important for practitioners who are treating veterans with PTSD and for
researchers who are dedicated to investigating factors that impact veterans’ health and well-being.

**Implications for Practice**

Veterans with PTSD may engage in specific coping processes that positively or negatively impact a variety of health behaviors. It is important for physicians, nurses, and mental health professionals—psychologists, psychiatrists, and counselors—who work with veterans experiencing PTSD to consider coping process when assessing health-related behaviors. In addition, registered dietitians who provide nutrition counseling to veterans with PTSD may need to consider coping process when assessing eating behaviors. As Girard, Russell, and Leyse-Wallace (2018) asserted, registered dietitians have an important role in treating individuals with mental health issues; they are core members of the interprofessional team of practitioners treating these individuals.

In previously described research by Bartlett and Mitchell (2015) and Slane and colleagues (2016), veterans with PTSD may be at a higher risk of disordered eating behaviors. Registered dietitians competent in treating clients with mental health disorders including PTSD and eating disorders could consider how coping process may impact eating behaviors. By identifying maladaptive coping, alternative coping strategies can be introduced or reinforced so that veterans can employ positive health behaviors that aid in the healing process.

Given that this study extended findings on the prevalence of veterans with PTSD who experience obesity, this research could guide tailored behavior modification efforts that reduce
health risks and relieve some of the economic burden on the VHA. Findings of this study underscore the need for enhanced primary, secondary, and tertiary prevention efforts. Though veterans in this study were not asked whether they seek treatment within or outside the VHA, findings may be pertinent for both VHA and community healthcare providers.

**Implications for Future Research**

The findings from this study highlight possible directions for future research. Of note, the findings suggest that specific types of coping may relate to a veteran’s eating behaviors. Studies examining the extent of PTSD symptomology through a reliable, standardized PTSD screening tool such as the CAPS may provide further insight into how PTSD symptom severity relates to coping and subsequent eating behaviors. Perhaps understanding the level of PTSD symptom severity as is measured by the CAPS or similar tool could shed light onto whether coping processes vary based on PTSD symptomology. In addition, inquiring about comorbid mental health disorders could help identify other conditions, such as depression, that may impact eating behavior, as Hoerster and colleagues (2015) discovered among veterans they surveyed. Due to the scope of this study, it was not possible to assess all factors that may be related to eating behaviors among veterans with PTSD.

Furthermore, assessing how coping process relates to other health behaviors such as physical activity, smoking, or substance use may be useful in repeating these results. This could extend the findings of Godfrey and colleagues (2013) that veterans with PTSD participate in less physical activity compared to veterans without PTSD and of Cyperl and colleagues (2016) that
smoking rates among veterans are higher than among civilians. Additional studies could explore behavior change or weight management efforts that focus on coping process and lead to the introduction of health behavior strategies that are customized based on most common types of coping. After assessing the coping process of veterans, Rodrigues and Renshaw (2010) determined that emotion-focused coping was directly related to postdeployment PTSD symptoms, so perhaps coping and eating behavior assessments could be included in military postdeployment evaluations.

Finally, qualitative research could be conducted with veterans who experience PTSD to uncover the most significant influencers of eating behavior. Results produced from this study indicate coping plays a small role in emotion- and stress-related eating as well as eating disorder risk, so it is important to determine the other factors that influence disordered eating behaviors. This type of research could extend findings from Breland, Donalson, and colleagues (2017) and C. Smith and colleagues (2009) who interviewed veterans and discovered that behaviors from active duty influenced their eating habits after military discharge. This type of research could prove useful in creating policies related to promoting positive health behaviors throughout one’s entire military career.

Conclusion

Due to gaps in the literature surrounding how coping process relates to eating behaviors among veterans with PTSD and evidence suggesting that PTSD impacts health, weight, and
eating behaviors, this study is significant. The results of this study add to the growing body of literature suggesting an association between PTSD and disordered eating behaviors.

Constructs of the transactional model of stress and coping (Lazarus & Folkman, 1984) helped explain the relationships between coping and eating behaviors among veterans with PTSD in this study. As such, when appraising their stress, veterans choose a dominant coping process that either addresses their stress (problem regulation), avoids dealing with their stress (emotion regulation) or produces positive emotions (meaning-based coping; Glanz et al., 2015). Their chosen dominant coping process affected the adaptational outcome of eating behaviors as measured in this study. This underscores the usefulness of using the transactional model of stress and coping as a framework for analyzing how coping relates to eating behaviors among veterans with PTSD.

Overall, the findings identified specific coping processes that may put a veteran at risk for abnormal eating behaviors, along with other, yet unidentified factors. In addition, BMI most strongly predicted emotion- and stress-related eating as measured by the Emotion- and Stress-Related Eating scale of the EADES Questionnaire, and theoretically derived emotion-focused coping and self-reported history of eating disorder diagnosis or treatment most strongly predicted eating disorder risk as measured by the EAT-26. Though predictors were identified, they explained a limited amount of the variance in the two eating behavior scale scores, highlighting the need to further explore variables that may impact emotion- and stress-related eating and eating disorder risk. Additional research could lead to effective evidence-based treatments that improve the quality of life for the very deserving population of veterans who experience PTSD.
REFERENCES


APPENDIX A

QUALTRICS SURVEY
Dear Participant,

You are invited to participate in a research study investigating the relationship between coping process and eating behaviors among veterans with PTSD being conducted by Debra Kimberlin, a Ph.D. in Health Sciences candidate at Northern Illinois University. You have been selected because you are a military veteran who is (or has been) involved with a veteran service organization. This online survey will take approximately 15 minutes to complete. The researcher does not anticipate that completing this survey will trigger PTSD symptoms (i.e. flashbacks, hyperarousal, etc.).

Here is information for you to understand before agreeing to answer survey questions:

I understand that if I agree to participate in this study, I will be asked to complete an online survey on coping processes and eating behaviors of veterans with PTSD. I do understand that I am requested to complete the survey honestly and completely.

I understand that information collected from this survey cannot be traced back to my responses or used to identify me and that all information gathered during this study will be kept confidential. Identification and location information will not be obtained, and all data will be stored on a password-protected computer accessible only to the researcher. I am aware that my participation is voluntary and that I may end the survey at any time and skip questions if I choose to without penalty or prejudice.

I understand that the intended benefit of this study includes a better understanding of the relationship between coping process and eating behaviors among veterans with PTSD. I have been informed that potential risks and/or discomforts I could experience during this study include negative feelings about coping and eating behavior.

If I have any additional questions concerning this study, I may contact Debra Kimberlin at dkimberlin@niu.edu or her dissertation chair, Dr. Beverly Henry at bwhenry@niu.edu. I understand that if I wish further information regarding my rights as a research participant, I may contact the Office of Research Compliance at Northern Illinois University at (815) 753-8588.

I understand that for my participation in this study $5.00 will be donated to a non-profit charity assisting children and spouses of fallen soldiers.

I have read and understand the above information. By clicking the "Yes" button to enter the survey, I am volunteering to take the survey.
Do you wish to participate in this study?

- Yes, I wish to participate in this study.
- No, I do not wish to participate in this study.

*Condition: No, I do not wish to participate is selected, Skip to: End of Survey.*

Have you been told you have PTSD by a healthcare professional?

- Yes
- No

*Condition: No, Skip To: End of Survey*
The following items deal with ways you’ve been coping with the stressors in your life. Each item says something about a particular way of coping. Use the response choices given. Try to rate each item separately in your mind from the others. Make your answers as true for you as you can.
<table>
<thead>
<tr>
<th>I haven't been doing this at all</th>
<th>I've been doing this a little bit</th>
<th>I have been doing this a medium amount</th>
<th>I've been doing this a lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have been turning to work or other activities to take my mind off things.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been concentrating my efforts on doing something about the situation I'm in.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been saying to myself “this isn’t real”.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been using alcohol or other drugs to make myself feel better.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been getting emotional support from others.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been giving up trying to deal with it.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been taking action to try to make the situation better.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been refusing to believe that it has happened.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I've been saying things to let my unpleasant feelings escape.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
I’ve been getting help and advice from other people.

I’ve been using alcohol or other drugs to help me get through it.

I’ve been trying to see it in a different light, to make it seem more positive.

I’ve been criticizing myself.

I’ve been trying to come up with a strategy about what to do.

I’ve been getting comfort and understanding from someone.

I’ve been giving up the attempt to cope.

I’ve been looking for something good in what is happening.

I’ve been making jokes about it.

I’ve been doing something to think about it less, such as going to the movies, watching TV, reading, daydreaming, sleeping or shopping.
| I've been accepting the reality of the fact that it has happened. | □ | □ | □ | □ |
| I've been expressing my negative feelings. | □ | □ | □ | □ |
| I've been trying to find comfort in my religion or spiritual beliefs. | □ | □ | □ | □ |
| I've been trying to get advice or help from other people about what to do. | □ | □ | □ | □ |
| I've been learning to live with it. | □ | □ | □ | □ |
| I've been thinking hard about what steps to take. | □ | □ | □ | □ |
| I've been blaming myself for things that happened. | □ | □ | □ | □ |
| I've been praying or meditating. | □ | □ | □ | □ |
| I've been making fun of the situation. | □ | □ | □ | □ |
The following questions will assess how you cope with and appraise stress in relation to food and eating. Please determine your level of agreement with the following statements. There are no right or wrong answers. Treat each question separately and answer as honestly as possible. It is important that you answer all questions. Choose only one answer per statement. Please respond to items 1-24 as follows:
<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am confident I can control my eating when I feel happy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I overeat when I am stressed.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I overeat when I socialize.</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I comfort myself with food.</td>
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<tr>
<td>I eat when I am upset with myself.</td>
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<tr>
<td>I am confident I can control my eating when I am tired.</td>
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<tr>
<td>I am confident I can control my eating when I am angry.</td>
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<tr>
<td>It is hard for me to stop eating when I am full.</td>
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<td></td>
</tr>
<tr>
<td>I am confident I can control my eating when I am sad.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
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<tr>
<td>---------------------------------------------------------------------------</td>
<td>-----</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I eat to avoid dealing with problems.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident I can control my eating when I am upset with myself.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am confident I can control my eating when I feel upset.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel out of control when I eat.</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>I eat when I am frustrated.</td>
<td></td>
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<tr>
<td>I use food to cope with my emotions.</td>
<td></td>
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<tr>
<td>I eat when I am tired.</td>
<td></td>
<td></td>
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<tr>
<td>I eat when I am angry.</td>
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<tr>
<td>I eat when I am sad.</td>
<td></td>
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<tr>
<td>I am confident I can control my eating when I am anxious.</td>
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<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>--------------------------------</td>
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<td>---</td>
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</tr>
<tr>
<td>I am confident I can control my eating when I am relieved.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I eat when I am anxious.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I eat when I am relieved.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do NOT have control over how much I eat.</td>
<td></td>
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</tr>
</tbody>
</table>
These questions ask about different eating behaviors. Please fill out the below questions as accurately, honestly, and completely as possible. There are no right or wrong answers.
<table>
<thead>
<tr>
<th>I am terrified about being overweight.</th>
<th>Always</th>
<th>Usually</th>
<th>Often</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid eating when I am hungry.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Find myself preoccupied with food.</td>
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<td></td>
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</tr>
<tr>
<td>Have gone on eating binges where I feel I may not be able to stop.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Cut my food into small pieces.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Aware of the calorie content of foods that I eat.</td>
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</tr>
<tr>
<td>Particularly avoid food high in carbohydrate content (bread, rice, potatoes, etc).</td>
<td></td>
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<tr>
<td>Feel that others would prefer if I ate more.</td>
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<tr>
<td>Vomit after I have eaten.</td>
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<td></td>
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<tr>
<td>Feel extremely guilty after eating.</td>
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</tr>
</tbody>
</table>
Am preoccupied with a desire to be thinner.

Think about burning up calories when I exercise.

Other people think that I am too thin.

Am preoccupied with the thought of having fat on my body.

Take longer than others to eat my meals.

Avoid foods with sugar in them.

Eat diet foods.

Feel that food controls my life.

Display self-control around food.

Feel that others pressure me to eat.

Give too much time and thought to food.
Feel uncomfortable after eating sweets.

Engage in dieting behavior.

Like my stomach to be empty.

Have the impulse to vomit after meals.

Enjoy trying new rich foods.
In general, would you say your health is

- Excellent
- Very Good
- Good
- Fair
- Poor

Have you ever been diagnosed or treated for an eating disorder such as Anorexia Nervosa, Bulimia Nervosa, or Binge Eating Disorder?

- Yes
- No

What is your gender?

- Male
- Female

What is your age in years at your last birthday?

________________________________________________________________
Which of the following ethnicity/race groups do you most strongly identify with?

- American Indian/Alaska Native
- Asian American
- Black/African American
- Hispanic/Latino
- Native Hawaiian or Other Pacific Islander
- White-Non-Hispanic

What is your highest level of educational attainment?

- Some high school
- High school/general equivalency diploma (GED)
- Associate/technical
- Bachelor’s degree
- Master’s/doctorate degree
- Other
In what branch of the military did you serve?

- Army
- Air Force
- Navy
- Coast Guard
- Marine Corps

Were you deployed during military service?

- Yes
- No

Did you experience combat exposure during military service?

- Yes
- No
What is your height in feet and inches?

Feet (select one):  4  5  6  7
Inches (select one):  0   1   2   3   4   5   6   7   8   9   0   10   11

What do you estimate your weight to be in pounds?

________________________________________________________________

END OF SURVEY SCREEN

Thank you for your time and consideration during this survey. It is much appreciated.

If you have any questions or concerns, please e-mail Debra Kimberlin at dkimberlin@niu.edu or her dissertation chair, Dr. Beverly Henry at bwhenry@niu.edu. If you would be interested in completing future surveys or be part of interviews for future research studies, please e-mail Debra Kimberlin at dkimberlin@niu.edu.

If you feel you would like more information on resources for veterans with PTSD, you may find the following information helpful:

The National Center for PTSD: https://www.ptsd.va.gov/index.asp

The Veteran Crisis Line: 1-800-273-8255 (Press 1)

Vets 4 Warriors (Confidential Peer Support): https://www.vets4warriors.com

For more information on disordered eating or eating disorders, you may find the following websites helpful:

The National Eating Disorders Association: http://www.nationaleatingdisorders.org

The American Psychological Association: www.apa.org

For more information from the VA National Center for Health Promotion and Disease Prevention on coping with stress, you may find the following document helpful:
Manage Stress Healthy Living Message Handout
APPENDIX B

DEFINITIONS AND MEASUREMENT TOOLS FOR STUDY VARIABLES
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description/Definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coping</td>
<td>Constantly changing cognitive and behavioral efforts to manage specific external and/or internal stressors that are appraised as taxing or exceeding the resources of the person (Lazarus &amp; Folkman, 1984, p. 141)</td>
<td>Brief COPE (28 items) measuring 14 scales of coping (Carver, 1997; see below). Scores range from 2 to 8 for each scale.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self-Distraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active Coping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Denial</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Substance Use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of Emotional Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of Instrumental Support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Behavioral Disengagement</td>
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<tr>
<td></td>
<td></td>
<td>Venting</td>
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<td></td>
<td></td>
<td>Positive Reframing</td>
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<tr>
<td></td>
<td></td>
<td>Planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Humor</td>
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<td></td>
<td></td>
<td>Acceptance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Religion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Self-Blame</td>
</tr>
<tr>
<td>Eating Disorder Risk</td>
<td>“a high level of concern about dieting, body weight, or problematic eating behaviors” (Garner, 2010, p. 2)</td>
<td>EAT-26 (26 items). A score of 20 or above indicates higher eating disorder risk (Garner, 2010).</td>
</tr>
<tr>
<td>General health</td>
<td>“State of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 2019, para 1)</td>
<td>Excellent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fair</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Poor</td>
</tr>
<tr>
<td>Sex/Gender</td>
<td>Sex/gender of the participant</td>
<td>Male</td>
</tr>
<tr>
<td>Age</td>
<td>Age of participant</td>
<td>Female</td>
</tr>
</tbody>
</table>
<pre><code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
</code></pre>
(Continue on following page)
<table>
<thead>
<tr>
<th>Ethnicity/Race</th>
<th>Ethnic origin/racial group in which an individual identifies.</th>
<th>American Indian/Alaska Native Asian American Black/African American Hispanic/Latino Native Hawaiian or Other Pacific Islander White-Non-Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>Highest level of educational attainment</td>
<td>Some High School High School/General Equivalency Diploma (GED) Associate/Technical Degree Bachelor’s Degree Master’s Degree/Doctorate Other</td>
</tr>
<tr>
<td>Branch of Military Service</td>
<td>Uniformed service department as identified by the United States Armed Forces (United States Department of Defense, n.d.)</td>
<td>Army Air Force Coast Guard Marine Corp National Guard Navy</td>
</tr>
<tr>
<td>Deployment</td>
<td>“Were you deployed during military service?”</td>
<td>Yes No</td>
</tr>
<tr>
<td>Combat Experience</td>
<td>Ever served in a combat or war zone (Stefanovics, Potenza, &amp; Pietrzak, 2018)</td>
<td>Yes No</td>
</tr>
<tr>
<td>Body Mass Index (BMI)</td>
<td>Body fat measurement that is the ratio of one’s body weight in kilograms to height in meters squared (A. M. Smith, Collene, &amp; Spees, 2018).</td>
<td>&lt; 18.5 = underweight 18.5-24.9 = normal weight 25-29.9 = overweight ≥ 30 = obese</td>
</tr>
</tbody>
</table>
APPENDIX C

IRB APPROVAL
Approval Notice
Initial Review

17-Dec-2018

TO: Debra Kimberlin
College of Health and Human Sciences

RE: Protocol # HS18-0304 “How coping process relates to eating behaviors among military veterans with posttraumatic stress disorder”

Your Initial Review submission was reviewed and approved under Expedited procedures by Institutional Review Board #1 on 17-Dec-2018. Please note the following information about your approved research protocol:

Protocol Approval period: 17-Dec-2018 - 16-Dec-2019

If your project will continue beyond that date, or if you intend to make modifications to the study, you will need additional approval and should contact the Office of Research Compliance and Integrity for assistance. Continuing review of the project, conducted at least annually, will be necessary until you no longer retain any identifiers that could link the subjects to the data collected. Please remember to use your protocol number (HS18-0304) on any documents or correspondence with the IRB concerning your research protocol.

Please note that the IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

Unless you have been approved for a waiver of the written signature of informed consent, this notice includes a date-stamped copy of the approved consent form for your use. NIU policy requires that informed consent documents given to subjects participating in non-exempt research bear the approval stamp of the NIU IRB. This stamped document is the only consent form that may be photocopied for distribution to study participants.

It is important for you to note that as a research investigator involved with human subjects, you are responsible for ensuring that this project has current IRB approval at all times, and for retaining the signed consent forms obtained from your subjects for a minimum of three years after the study is concluded. If consent for the study is being given by proxy (guardian, etc.), it is your responsibility to document the
APPENDIX D

RECRUITMENT MATERIALS
Sample Recruiting Letter to Service Organization Liaison

Date
Liaison Name
Title
Organization

Dear (Name of Liaison):

I have obtained your contact information through your organization’s website. I am writing to inform you of an opportunity for veterans within your organization to participate in a research study titled “How Coping Process Relates to Eating Behaviors Among Military Veterans with Posttraumatic Stress Disorder”. I am conducting this study for completion of a Doctor of Philosophy in Health Sciences degree at Northern Illinois University.

The purpose of this study is to examine how a veteran’s process of coping is related to his or her eating behaviors, particularly emotion- and stress-related eating and eating disorder risk. Participants consist of military veterans who experience PTSD. Participants will take a short, 15-minute survey consisting of coping process, eating behavior, and demographic questions. The survey will be available for one month via Qualtrics, an online software survey platform. A paper copy of the survey is also available upon request and will be sent via mail with a postage paid return envelope for any participant who does not have access to the Internet. A reminder e-mail will be sent two weeks into this study, reminding participants they have two weeks to complete the survey. Results of this study will be provided via a report upon conclusion of this study.

By agreeing to participate, you, as your organization’s liaison, agree to announce this study to veterans within your organization and provide them with the link to the survey via e-mail or your organization’s social media outlet.

Please provide confirmation or denial of participation in this study by e-mail response no later than (date). Upon confirmation of your participation, e-mail instructions, a recruitment flyer and survey link will be provided.

For any additional information about this study, please feel free to contact me via e-mail at dkimberlin@niu.edu or by phone at (815) 922-0660. You may also contact my dissertation chair, Dr. Beverly Henry, at bwhenry@niu.edu if you have any questions or concerns.

Thank you in advance for your time and consideration for forwarding the survey link for this research study.

Sincerely,
Debra Kimberlin, MS, RDN, LDN
Ph.D. in Health Sciences Candidate
Northern Illinois University
Sample Instructional E-mail for Participating Liaisons

Date

Liaison Name
Title
Organization

Dear (Name of Liaison):

Thank you for agreeing to help promote Debra Kimberlin’s dissertation research study titled “How Coping Process Relates to Eating Behaviors Among Military Veterans with Posttraumatic Stress Disorder”.

Again, the purpose of this study is to examine how a veteran’s process of coping is related to his or her eating behaviors, particularly emotion- and stress-related eating and eating disorder risk. Participants consist of military veterans who experience PTSD. Participants will take a short, 15-minute survey consisting of coping process, eating behavior, and demographic questions. The survey will be available for one month via Qualtrics, an online software survey platform. A paper copy of the survey is also available upon request and will be sent via mail with a postage paid return envelope for any participant who does not have access to the Internet.

As the liaison for your organization, you agree to announce this study to veterans within your organization and provide them with the link to the survey via e-mail or your organization’s social media outlet.

Attached you will find an e-mail announcement you can use to promote this study which contains the link to the online survey. In addition, I’ve attached a recruitment flyer containing details of the study and the survey link. Please feel free to e-mail the announcement at your earliest convenience and post the flyer in appropriate areas of your organization.

In two weeks, I will send you a reminder e-mail that can be forwarded, reminding participants they have two weeks to take the survey. I will notify you via e-mail when the survey has closed in one month’s time.

Thank you again for your willingness to participate and promote this study to veterans within your organization. I appreciate it very much. If you have any questions or concerns, please feel free to contact me via e-mail at dkimberlin@niu.edu or by phone at (815) 922-0660. You may also contact my dissertation chair, Dr. Beverly Henry, at bwhenry@niu.edu.

Sincerely,
Debra Kimberlin, MS, RDN, LDN
Ph.D. in Health Sciences Candidate
Northern Illinois University
Sample Announcement Liaison Can Forward to Potential Participants

Date

Veterans,

My name is Debra Kimberlin, a doctoral candidate in the Health Sciences program at Northern Illinois University. I am recruiting participants for my dissertation research under the supervision of my dissertation chair, Dr. Beverly Henry. This study investigates coping process and eating behaviors of veterans with PTSD. You are invited to participate in a short, 15-minute research survey via the following secure link: https://niu.az1.qualtrics.com/jfe/form/SV_b7M7iibOizlb113 The survey is available now and will remain available until 11:59pm CST on (date).

No identifying information will be asked of participants in this study. Completed surveys will be kept in a secure location where only the researcher and dissertation chair will have access to them. Feel free to withdraw from the survey at any time with no penalty. There are no foreseeable risks involved with this study.

If you have questions, please contact me at dkimberlin@niu.edu or (815) 922-0660. You may also contact my dissertation chair, Dr. Beverly Henry, at bwhenry@niu.edu.

Thank you for your valuable time and thank you for your service.

Sincerely,
Debra Kimberlin, MS, RDN, LDN
Ph.D. in Health Sciences Candidate
Northern Illinois University
Military Veterans

You are invited to take a short, 15-minute research survey at the following link:

This survey will be open from [date] until 11:59pm CST on [date]

For every completed survey, $5 will be donated to a non-profit charity assisting surviving children and spouses of fallen soldiers.

For questions or for additional information, please contact Debra Kimberlin at dkimberlin@niu.edu
Reminder E-mail Liaison can forward to participants (sent at midpoint of survey)

Dear Veterans,

This is a reminder to please consider taking a short, 15-minute online survey via the following secure link: [https://niu.az1.qualtrics.com/jfe/form/SV_b7M7iibO1zlbl13](https://niu.az1.qualtrics.com/jfe/form/SV_b7M7iibO1zlbl13)

Your participation in this survey will help a graduate student at Northern Illinois University complete a Doctor of Philosophy Degree in Health Sciences. The survey is available now until it closes at 11:59pm CST on (date).

If you have questions, please contact me at dkimberlin@niu.edu or (815) 922-0660. You may also contact my dissertation chair, Dr. Beverly Henry, at bwhenry@niu.edu.

Thank you for your time and your service.

Sincerely,
Debra Kimberlin, MS, RDN, LDN
Ph.D. in Health Sciences Candidate
Northern Illinois University
Liaison Thank You E-mail for Notification of Close of the Survey

Dear Liaison,

Thank you for your support of my dissertation research by forwarding the survey for my study to veterans within your organization. The survey is now closed.

Your participation in this survey will help me complete a Doctor of Philosophy Degree in Health Sciences at Northern Illinois University.

If you have questions, please contact me at dkimberlin@niu.edu or (815)922-0660. You may also contact my dissertation chair, Dr. Beverly Henry, at bwhenry@niu.edu.

Thank you for your time and willingness to assist me in my research.

Sincerely,
Debra Kimberlin, MS, RDN, LDN
Ph.D. in Health Sciences Candidate
Northern Illinois University