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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

UNDERSTANDING THE EFFECTS OF A MINDFUL YOGA  
INTERVENTION ON THE PSYCHOLOGICAL  
WELL-BEING OF STUDENT VETERANS.

Dissertation Submitted for Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Philosophy

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College of Natural and Health Sciences

School of Sport and Exercise Science

August 2019

This Dissertation by: María del Mar Chavarría Soto

Entitled: *Understanding the effects of a mindful yoga intervention on the psychological well-being of student veterans*

has been approved as meeting the requirement for the Degree of Doctor of Philosophy in the College of Education and Behavioral Sciences in the Department of Applied Statistics and Research Methods.

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## ABSTRACT

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Transitioning from military culture to a civilian and student environment can become a challenge for many military members. Additionally, high levels of anxiety, depression, PTSD and elevated percentages of suicidal thoughts have been increasing for this population (Rudd, Goulding, & Bryan, 2011). These social concerns and mental health struggles for this population highlight the urgency in the provision of more resources and efforts to address their psychological well-being (PWB) and increase the chances of success in the college environment. The purpose of this study was to gain a deeper understanding of the influence of a mindful yoga intervention on the psychological well-being of student veterans. This study also examined the initial characteristics of participants and their motivation during the mindful yoga intervention, as possible influences on the effects of the intervention for their psychological well-being. An embedded mixed methods design was used to structure this research. Participants in this study were seven undergraduate level student veterans, with a mean age of 27.2 years. An 8-week yoga intervention was delivered by the researcher. Interviews were conducted individually before and after the intervention, as well as an assessment of PWB. Instruments assessing motivation were applied weekly after each yoga session. The main finding from this study was that the participants perceived that the mindful yoga intervention had a favorable effect on their PWB. Differences in

perceived outcomes did not seem to exist among the participants in relation to their initial motives for participation and their motivation levels. Authorities in higher education settings, including Veteran Services and Recreation departments should consider the particular needs, including strengthening the need for structure and a sense of relatedness, in this population when designing programs for student veterans to contribute to their improved well-being and increase the possibilities of their success as members of the college community.

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## **CHAPTER I**

### **INTRODUCTION**

Many veterans and active duty military members utilize educational benefits from the U.S. Department of Veterans Affairs (VA) as a form of assistance in pursuing a college education. In many cases, the possibility of financial assistance for education is one of the main reasons to join the military service. However, transitioning from military culture to a civilian and student environment can become a struggle for many military members.

Traditional college students encounter challenges from academic demands, social situations, and future personal and career path options, but challenges for student veterans extend beyond these demands. Student veterans face additional, unique situations including the management of conflicting identities as students and as military members and difficulties in negotiating academic and military cultures. For example, leaving a highly structured and hierarchical military culture can conflict with a less organized civilian life. Military culture focuses on group cohesion and collective missions, while individual progress and independence are valued in academic settings (Livingston & Bauman, 2013).

Student veterans are usually also older than traditional students and this age gap can become an impediment to social interactions. Additionally, integrating with students who are not familiarized with what military service entails and the contexts in which

deployments and returns occur can complicate social relationships with anyone lacking military experience.

The transition from military life to college life can also be challenging due to the mental health issues and trauma experiences that are more common in student veterans. For example, post-traumatic stress disorder (PTSD) is common among military members returning from Iraq and Afghanistan. Sayer et al. (2010) conducted a study to determine the prevalence and types of community reintegration problems among Iraq and Afghanistan combat veterans who receive U.S. Department of Veterans Affairs (VA) medical care and found that about 41% of veterans in their sample screened positive for PTSD. This percentage is expected to be actually higher, considering that many veterans have undiagnosed conditions. Probable PTSD has been associated with reporting more readjustment difficulties and needing more mental health services among veterans (Sayer et al., 2010).

Circumstances like witnessing the death of fellow soldiers, participation in intense combat, living in a state of constant hyperawareness and daily threat evaluation are among the experiences that can create a high stress response that becomes normal to many military members. This high stress state can have a detrimental effect on their psychological well-being over time (Parks & Walker, 2014).

Returning soldiers can also experience a sense of isolation struggling with the perception that they don't fit in with people who didn't go through combat or deployment experiences. Lack of social support and poor coping mechanisms make PTSD and other mental health issues more likely to develop among veteran population (Parks & Walker, 2014). Responses from a survey conducted with over 500 student veterans in the United

States indicated high levels of anxiety (25%), depression (35%) and PTSD (46%) along with elevated percentages of suicidal thoughts (46%) among this population (Rudd, Goulding, & Bryan, 2011). These social concerns and psychological struggles for the student veteran population highlight the urgency in the provision of more resources and efforts to address their psychological well-being.

Psychological well-being is best understood as a multidimensional construct that goes beyond the absence of mental illness and includes optimal functioning and constant personal growth along with positive social interactions (Ryan & Deci, 2001). There are two principal approaches to defining well-being, the hedonic and eudaimonic approach. The hedonic perspective focuses on subjective happiness and has used subjective well-being as the main assessment, which involves three major components: satisfaction with life, the presence of positive mood, and the absence of negative mood (Ryan & Deci, 2001; Deci & Ryan, 2008a). The Eudaimonic perspective considers psychological well-being as more than just a measure of happiness, and involves living in concordance to one's true self, meaning that there is congruence between one's actions and values. A eudaimonic approach to psychological well-being includes the dimensions of self-acceptance, positive relationships with other people, autonomy, environmental mastery, purpose in life, and personal growth. (Ryff, 1995).

Involvement in physical activity has been regarded as a beneficial avenue for improving psychological well-being, along with physical health. Traditionally, military culture has focused on physical activity for the purposes of fitness and performance outcomes. However, the U.S. Department of Defense has recently directed attention to the need to emphasize the overall well-being of veterans and the need for structured and

integrated approaches for service members and their families that move beyond a fitness focus and more toward the goal of overall well-being (Haibach et al., 2017). Physical activity has also been utilized as a supplemental treatment for specific mental health conditions experienced by veterans, such as PTSD (Dustin, Bricker, Arave, Wall, & West, 2011; Otter & Currie, 2004)

A small body of research has been generated on the effects of various types of on the mental health of military veterans. Caddick and Smith (2014) conducted a systematic literature review of the impact of sport and physical activity on the psychological well-being of combat veterans who had experienced some sort of physical or psychological combat trauma. Seven qualitative studies and four quantitative studies were included through a search of key databases. Different types of physical activity were found to be beneficial in improving veterans' psychological health and reducing PTSD symptoms. These activities included outdoor recreational activities such as hiking and kayaking, as well as participation in organized exercise and adapted sports. PTSD symptoms were reduced and affective experiences were more positive following physical activity across the eleven selected studies. Their findings also revealed that well-being in veterans was enhanced by using physical activity as a positive coping mechanism.

Another form of physical activity that has recently received attention as being effective in improving psychological well-being involves mindfulness practices integrated into exercise and sport contexts. Mindfulness can be described as paying attention, non-judgmentally to the present moment (Langer, 2002). Mindfulness is a skill that can be trained independently, but movement itself can also be mindful. One of the most common forms of mindful movement is yoga.



Yoga interventions have been recently employed for the purpose of reducing PTSD symptomatology. Jindani and Khalsa (2015) conducted an 8-week yoga program with the primary goal of understanding the effects on people with PTSD symptoms. Participants in this study included 31 female and 9 male adults with PTSD who attended 90-minute yoga sessions, once a week for 8 weeks and were interviewed at the end of the 8-week period. The researchers found that yoga helped improve self-care skills and heightened awareness that could help participants respond better to stressful situations (Jindani & Khalsa, 2015).

Stoller, Greuel, Cimini, Fowler and Koomar (2012) examined the effects of an intensive 3-week yoga program with 70 military members who had been deployed to Iraq. The researchers measured anxiety levels using the State and Trait Anxiety Inventory (STAI; Spielberger, 1983) and sensory processing characteristics using the Adult Sensory profile instrument (AASP; Brown & Dunn, 2002) prior to, and following, the intervention. Military members participating in the study also completed a self-report questionnaire developed by the researchers (Stoller et al., 2012) to explore quality of life through occupational performance, hyperarousal symptoms of PTSD, mood, interpersonal relations, and cognitive functioning issues. The yoga intervention was found to be effective in reducing both state and trait anxiety. The participants also reported improvements in quality of life and 54% of the participants reported better sleep despite the ongoing environmental disruptions in deployment settings as well as better anger management and increased feelings of calmness (Stoller et al., 2012). The researchers concluded that a regular yoga intervention was a viable and effective nonpharmaceutical option to enhance quality of life among active military personnel.

Staples, Hamilton and Uddo (2013) also examined the use of yoga as a method for treating PTSD with veterans 58 through 64 years of age, through a six-week intervention. The researchers measured PTSD symptoms with the PTSD checklist-military version, (PCL-M; Weathers et al., 2013); sleep patterns through The Pittsburgh Sleep Quality Index (PSQI; Buysse, Reynolds, Monk, Berman, & Kupfer, 1989); and the State Anger Expression Inventory (STAXI-2; Spielberger, 1999) to assess state anger. The researchers found significant reductions in PTSD hyperarousal symptoms and improvements in overall sleep quality following the intervention as well as good levels of adherence and acceptance of the intervention from the participants (Staples et al., 2013).

Cushing, Braun, Alden, and Katz (2018) examined the effectiveness of a yoga intervention on PTSD symptomology on a sample of veterans with ages ranging from 26 to 62 years. Following six weeks of a once a week, 60-minute yoga practice sessions, PTSD symptoms were found to be significantly lower among participants, as assessed by the PCL-M (Weathers et al., 2013). Cushing et al. (2018) proposed that yoga could be used independently or as an adjunctive therapy for PTSD with military population. The researchers also emphasized the need for interventions to be tailored according to knowledge of military culture in order to realize desired outcomes (Cushing et al., 2018).

Hurst et al. (2018) conducted interviews to explore the attitudes, perspectives, and preferences of military personnel and veterans toward yoga as a therapeutic modality, with the additional goal of gaining knowledge about appropriate design of yoga interventions for this population. Participants included twenty-four individuals with both yoga experience and current or past military service as well as twelve instructors who had taught yoga for military personnel and/or veterans. The content analysis revealed that the

participants perceived that mental and physical health benefits can result from yoga practice designed for veterans. In addition, the participants experienced the belief that there is a stigma about yoga in the military and emphasized that instructors need to be sensitive to the unique mental health issues and perspectives of the veteran population.

The main purpose of the present study was to generate a greater understanding of the influence that a mindful physical activity intervention, through yoga, can have on the psychological well-being of student veterans. An additional goal was to explore motivational characteristics of student veterans participating in this study and the possible influence of these motivational characteristics on the psychological well-being outcomes that they experienced through the mindful yoga intervention.

While knowledge concerning mindful physical activity and the veteran population is still relatively recent, this knowledge has the potential to have a strong impact on new methods for addressing the mental health issues of veteran population. The present study is intended to contribute to the knowledge base in this area of interest. The primary goal of this study was to gain a deeper understanding of the effectiveness of a mindful yoga intervention on the psychological well-being of student veterans. This study also examined the initial characteristics of participants and their motivation during the mindful yoga intervention, as possible influences on the effects of the intervention for their psychological well-being.

An embedded mixed methods design was used to structure this research. A mixed method design, applied to a multiple case format, allowed the researcher to expand on the understanding of the processes and experiences of the participants. In this study, the purpose was to better understand the varied experiences of participants and the

psychological well-being outcomes resulting from the mindful yoga intervention. The research design included two phases of qualitative data collection through semi-structured interviews at pre-and post-intervention. The initial interview phase intended to explore participant's context and participatory motives in relation to the participants' backgrounds and to their previous and/or current experience with physical activity and yoga. Interviews conducted subsequent to the intervention allowed for an examination of the participants' experiences and the perceived outcomes of the mindful yoga practice.

Ryff's Psychological Well-Being scale (Ryff & Singer 2006) was used to assess PWB at pre and post intervention. The Situational Motivational Scale (SIMS-Guay, Vallerand, & Blanchard, 2000) and the Basic Psychological Needs in Exercise Scale (BPNES-Vlachopoulos & Michailidou, 2006) were administered to the participants after each yoga session for a period of 8 weeks. The data obtained through these instruments was used for descriptive purposes and with the goal of providing a better understanding of motivational and psychological well-being characteristics of the participants in the study.

The research study was designed to address the following question:

Q1            How does a mindful yoga intervention affect psychological well-being in student veterans?

Additionally, the intention was to address the follow-up question of: Do the motivational characteristics of participants for engaging in the mindful yoga practice influence the nature of the outcomes that they experience?

Tailoring positive physical activity interventions that may benefit veterans' psychological well-being may alleviate some of the issues that military student members experience in college settings. It is essential to make an effort to understand the

individual experiences and unique background of military veterans, before assuming physical activity as something that is beneficial to all in the same way.

Being culturally responsive and inclusive is a need in both college environments, as in greater social settings. Understanding the military culture and the unique demands it creates for military service members is a matter of multicultural competence (Romero, Riggs, & Ruggero, 2015). Findings from this study are intended to strengthen this cultural understanding and can lead to the establishment of mindful physical activity alternatives for enhancing well-being for the student veteran population.

### **Limitations**

Limitations from any multiple case study design include limits to the generalizability of the findings outside of the context in which the research was conducted. Another limitation was that the main researcher will conduct both the interview process and the direction of the yoga intervention. This could result in higher levels of social desirability among participants in their responses. An additional limitation involved the geographic and sample characteristics, since participants were recruited only from Greeley, Colorado.

### **Definition of Terms**

The following terms are discussed throughout this dissertation.

**Veterans:** A veteran is someone with a history of service in any military branch, which includes Army, Navy, Marine, Air Force, and/or Coast Guard. They can be active duty service members or those who have served in in the reserves and National Guard experiencing deployment (Danish & Antonides, 2009). Any current or

former military member attending a college or university is referred to as a “student service member” or “student veteran”.

**Psychological Well-Being (PWB):** For this study, PWB will be referred to as optimal psychological functioning and experience (Ryan & Deci, 2001). Psychological well-being is construed as growth and human fulfillment, influenced by the surrounding contexts of people’s lives (Ryff & Singer, 2008).

**Physical activity:** Physical activity can be understood as any bodily movement produced by the skeletal muscles that requires energy expenditure (Caspersen, Powell, & Christenson, 1985). For the purpose of this study, the term physical activity will be utilized to refer to various modes of exercise and sport that have been reviewed in the literature and will also be used to describe the intervention activity.

**Mindfulness:** Mindfulness is a psychological state that can be described as paying attention, non-judgmentally to the present moment (Langer, 2002).

**Yoga:** Yoga is a sanskrit word that when translated can be understood as union (Iyengar, 2005). When utilizing yoga in this study, the term will refer to the thousand-year-old practice developed in India that emphasizes the integration of mind, body and spirit. A yoga practice traditionally incorporates postures (*asanas*), breathing techniques (*pranayama*), and meditation (Stephens, 2010).

In summary, this study sought to gain a deeper understanding of the influence of a mindful yoga intervention on the psychological well-being of student veterans and their motivational characteristics through the intervention. A tailored physical activity program can benefit student veterans’ psychological well-being and alleviate some of the difficulties this population experienced in their transition to college settings.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

Understanding the role of physical activity in contributing to mental health and Psychological Well-Being (PWB) has been a challenging area of study. The WHO webpage defines mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to her or his community” (WHO, 2014, para.1). This conception of mental health involves a holistic approach, in which the individual has an active role and highlights the idea of improving people’s lives to be a core element of health. PWB is regarded as a core element of quality of life and should be interpreted in the sociocultural context of each person. PWB should also be conceived of as more of a spectrum of expression in a dynamic way rather than a fixed condition.

The goal of this research was to generate understanding of how a mindful physical activity intervention could influence the psychological well-being of student veterans. An additional goal was to better understand the individual motivational characteristics of participants in this project and if variations in these characteristics could affect their experience and perceptions of PWB as it is shaped by mindful movement.

Student veterans are faced with constant stressful demands. Pressure from academic demands and adjustments to social situations, as well as doubts about future decisions concerning personal and career options are common (Ross, Niebling, & Heckert, 1999) and can affect their psychological and emotional health. However, student

veterans face additional challenges, including the transition from combat to civilian life, or alternating between these two, while adapting to expectations of the college lifestyle (Romero, Riggs, & Ruggero, 2015) and adhering to the norms of their own military culture. Returning to school after serving in the military can become a struggle because veterans typically are nontraditional students. Usually veterans are older, already have families or have difficulties finding community as a minority group in academic settings that usually cater to traditional students (Whitley, Tschudi, & Gieber, 2013).

Rudd et al. (2011) conducted a national survey in the United States to examine the frequency and severity of mental health issues among student veterans. Responses from over 500 students demonstrated high incidence of anxiety (25%), depression (35%) and post-traumatic stress disorder (46%) along with elevated percentages of suicidal thoughts (46%) among this population (Rudd et al., 2011). Vacchi (2012) concluded that 40% of student enrolling in educational institutions veterans had been diagnosed with physical and mental health concerns.

Post-traumatic stress disorder (PTSD) has been identified by the House Committee on Veterans Affairs as one of the most prevalent conditions experienced by veterans returning home from combat (Staples et al., 2013). PTSD includes a hyperarousal symptom cluster component that includes heightened anger and hyper vigilance which can lead to sleep disturbances. PTSD also includes an avoidance and numbing symptom cluster, which involves a persistent avoidance of stimuli associated with the trauma, and a numbing of general responsiveness in ways that were uncharacteristic of the individual prior to the trauma experience. In veterans, the



hyperarousal symptom cluster has been identified as having a strong negative impact on overall functioning and quality of life (Staples et al., 2013).

Within military culture, seeking help can still be stigmatized as a sign of weakness (Danish & Antonides, 2009). The military trains and develops leadership and initiative and duty is marked by high levels of discipline and teamwork. A consequence of extended exposure to this environment is that military members do not want to be perceived as the weak link on a team. Failure is not considered to be an option for military members and this can translate to added pressure when transitioning to college settings. Additionally, asking for help can make some student veterans feel like a burden to professors or campus administrators and therefore becomes something student veterans will try to avoid (Vacchi, 2012). These difficulties of asking for help, can intensify psychological and emotional struggles for student veterans. Also, even though counseling services may be accessible to military members and veteran students, these services may not be perceived by the students as sufficiently welcoming to them or as having an appropriate level of military cultural understanding and counseling competence.

The sense of a lack of connection to campus services can exacerbate many unidentified mental health conditions as well. Thomas et al. (2018) conducted a study to examine rates of diagnosed depression and symptoms of undiagnosed depression in a campus-wide sample at a private, four-year liberal arts college. The researchers developed an online survey instrument that focused on student veteran mental health and self-reported satisfaction with campus services. Ninety-nine student veterans responded and 44.9 percent reported being diagnosed with a mental health condition of mild, moderate, or major severity, while 14.8 percent noted the presence of symptoms that

indicated undiagnosed depression of mild, moderate, or major severity (Thomas et al., 2018).

Demers (2011) conducted a qualitative study with 45 male active duty soldiers and veterans, ages 19-51, to explore the challenges of reintegration into civilian life following their military service. Knowledge obtained through focus groups included narratives from the participants regarding the experiences of basic training, deployment and returning home. The description of military experience emphasized the need to shift the focus away from the self to the mission and the members of the military unit and of sacrificing one's needs for the group. Compartmentalizing or completely avoiding most emotions (except anger) had typically been emphasized during the military experience. Veterans in this study also expressed struggles with identity upon returning from military duties (Demers, 2011). Themes related to identity conflicts included not feeling that one had a clear purpose in life after leaving their military duties; holding oneself to different standards than civilians; having different behavioral expectations in everyday interactions; and feeling misunderstood by people who had not experienced military culture.

Gregg, Howell, & Shordike (2016) examined the experiences of student veterans transitioning from active military duty to postsecondary education. Semi structured interviews were conducted with thirteen student veterans (9 male, 4 female) who had transitioned from military deployment to postsecondary education. All of the participants were undergraduate students. Data analysis from the interviews resulted in three themes. The first theme pertained to using skills learned in the military to adapt to student life. Some skills, such as discipline, were positively perceived by participants in their

transition experience, while other cultural characteristics, such as collectivism and hierarchical organization resulted in frustration when interacting outside of military environments. A second theme was related to creating an identity as a civilian. Accomplishments attained during the military life were perceived as less valued in the everyday student life, and being nontraditional students led to these veterans' perceptions that they did not belong in the campus culture. The third theme identified by Gregg et al. (2016) was social participation. Students in this study shared experiences of struggle when interacting with other students and faculty, as well as a constant need to demonstrate they met the standards and values they perceived to be expected of them.

Social experiences, like the ones described by student veterans in the research reflect the unique needs of this population and how different expectations and daily functioning can complicate integration and help seeking behaviors. Additionally, the distinct cultural characteristics of student veterans evidence the need for more resources and proactive approaches to help improve the psychological well-being of this population.

The focus of this chapter will be upon the current understanding of physical activity in contributing to Psychological Well-Being in student veterans. Traditionally, psychological research and practice emphasized the diagnosis and treatments of mental health issues in a clinical setting, following a prevailing medical model of disease and cure. After World War II, psychological research and application shifted even more towards damage control in the mental health area, prioritizing the treatment of illness rather than facilitating human strengths. Positive Psychology emerged as a counterweight to the prevailing psychological view, and is characterized by stimulating people's

potential instead of being concerned with treatment of disease, weakness and damage.

Positive Psychology is both a scientific and applied field that focuses on human strength and virtue (Seligman, 2002). Another pillar of Positive Psychology is the conception of humans as active agents in the construction of their health. From this perspective, peoples' experiences should also be understood as nested in a social context.

Seligman and Csikszentmihalyi (2000) have highlighted the importance of human strength and resilience and the buffering effect these capacities can have on mental illness. Studying human capabilities has been a key step in moving towards a conception that values the entire human experience. Many areas of research and intervention have derived from the Positive Psychology paradigm, such as the study of resilience, flow, mindfulness, emotional well-being and gratitude (Snyder & Lopez, 2002). Positive Psychology has also had a noticeable impact on the psychology of sport and physical activity.

Physical activity is regarded as an effective approach to strengthen physical and mental health. Recently, greater emphasis has been directed to achieving higher levels of psychological well-being through well-structured physical activity and sport experiences. Promoting higher levels of quality of life among athletes, fostering positive youth development through sport participation, and enhancing psychological well-being through physical activity for the general population have become increasingly common topics of research in the field of sport and exercise psychology. In the current study, mindful physical activity is considered as one potential form of influence on the psychological well-being of student veterans.

## Psychological Well-Being

Psychological well-being is probably best understood as a multidimensional phenomenon that can include both hedonic and eudaimonic conceptions of well-being (Ryan & Deci, 2001). The origins of the eudaimonic perspective of well-being can be traced as far back as Aristotle, who proposed that happiness is not a passive state, but rather a virtuous act from the soul that corresponds with one's life purpose (Aristotle translated by Reeve, 1992). *Eudaimon* can be understood as the presence of good (*eu*) spiritit (*daimon*), which with conscious action, can lead humans towards the achievement of the highest good (Aristotle translated by Reeve, 1992). The key aspect of this perspective is the action component, which will vary according to each person's capacity. Happiness requires exercise and discipline of one's unique capacities, and is not granted by chance (Aristotle translated by Reeve, 1992).

The hedonic perspective on PWB is oriented towards the conceptualization of well-being as subjective happiness and the experience of pleasure as opposed to displeasure (Ryan & Deci, 2001). This perspective is rooted in Aristippus's expectation that experiencing pleasure was life's greatest goal (Ryan & Deci, 2001). Subjective Well-Being (SWB) has been the most commonly used terminology for favorable psychological outcomes within this perspective and is based on three major components: satisfaction with life, the presence of positive mood, and the absence of negative mood (Diener, 1984; Deci & Ryan, 2008a; Ryan & Deci, 2001). There is a social component to the concept of subjective well-being. SWB is not only an individual construct, but rather one that extends to entire societies. The combination of changing cultural characteristics and the influence of socioeconomic factors can profoundly impact people's interpretation of

happiness. Additionally, if a culture tends towards more individualistic or collectivist lifestyles, the definition of happiness may be very different among members of that culture (Diener, Oishi, & Lucas, 2003). Thus, the term subjective well-being and Psychological Well-Being reflect different conceptualizations of Well-Being.

In the conceptualization of Psychological Well-Being from a eudaimonic perspective, well-being is not considered to be an outcome, but a process, which involves fulfilling one's true nature and living accordingly (Deci & Ryan, 2008a; Ryan & Deci, 2001; Waterman, 1993). Well-being from the eudaimonic perspective involves more than the presence of positive affect or satisfaction, since experiencing these emotions is not always equivalent to being psychologically well (Deci & Ryan, 2008a).

Ryff and Singer's (2008) model of PWB is consistent with the eudaimonic conceptualization of PWB. Ryff and Singer (2008) took the Aristotelian approach to happiness and complemented it with the theoretical contributions of developmental and humanistic psychologists. Erikson's theory (1959) was incorporated by integrating his focus on personal development across the experiences of individuals through the different stages of life. Rogers's (1961) theories of self-actualization and integration were also included, as well as Maslow's theory (1968) and on the basic human needs and priorities. Additionally, Frankl (1985) work highlighting the human ability to find meaning and purpose, even during experiences of adversity and challenge, was also a key consideration.

Ryff and Singer (2008) identified the main points of convergence among various psychological and philosophical perspectives and developed a model that contained a theoretical integration of six dimensions that reflect the components of a eudaimonic way

of living and which can be measured. The six dimensions proposed were: self-acceptance, purpose in life, environmental mastery, positive relationships with others, personal growth and autonomy (Ryff & Singer, 2008).

The self-acceptance dimension of Ryff and Singer's model (2008) involves increased self-awareness. Greater awareness is expected to lead to identification of both personal strengths and weaknesses, but most of all having a high regard for oneself. The component of purpose in life for Ryff and Singer (2008) derives from existential currents, such as Frankl's (1985). This characteristic is related to the human capability for creating meaning and direction for one's life, even when encountering high levels of difficulty, suffering or absurdity. It also involves the ability to continuously adapt and adjust throughout the different stages of one's life and to meet the changing goals of each moment, which requires resilience as well as creativity and cognitive and emotional integration (Ryff & Singer, 2008).

The environmental mastery dimension in Ryff and Singer's (2008) model refers to one's sense of competence in finding and/or creating surrounding circumstances that match the individual's personal, psychological and developmental needs. This dimension involves the active role of each person within their environment and the exercise of capacities such as control, discernment and decision making. This dimension can also be associated with the individual's social nature.

The personal growth dimension is considered by Ryff and Singer (2008) to be the component closest to the original meaning of eudaimonia. Personal growth is considered to be representative of self-realization, which only occurs through overcoming challenges and reflects the capacity of continuous development (Ryff & Singer, 2008). A fifth

dimension of Ryff and Singer's model (2008) is the ability to establish empathic interpersonal connections. Positive interpersonal relationships involve a dynamic process that requires constant investment and balance of the self and the need for others.

The final component of Ryff and Singer's model (2008) is autonomy, which is an essential aspect to well-being across different theoretical perspective. Rogers (1961) described the highly functional individual as one who did not seek approval from others, but one who was able to find this validation from within. Ryan and Deci (2001) considered autonomy as a basic and universal human need and as a central component of their Self-Determination Theory (Ryan & Deci, 2001). The qualities of self-regulation, independence of thought and freedom from social pressure associated with autonomy are all highly regarded in current western societies (Ryff & Singer, 2008; Goleman & Davidson, 2017).

### **Veterans' Physical Activity and Psychological Well-Being**

The psychological benefits of physical activity and exercise include improvements in mood, stress reduction, self-concept, and quality of life (Berger, 1996). Physical activity has been identified as a method for intervention to aid in the psychological well-being and the mental health of veterans. Physical activity interventions have also been utilized as a supplemental treatment for specific conditions experienced by veterans, such as PTSD.

Caddick and Smith (2014) conducted a systematic literature review to examine the potential impact of sport and physical activity upon the subjective and psychological well-being of combat veterans who had experienced physical or psychological combat trauma. Databases were searched for research that included sport and/or physical activity



interventions designed for the purpose of contributing to positive psychological outcomes for combat veterans. Eleven studies met the inclusion criteria, of which seven were inductive/qualitative studies and four were deductive/quantitative studies. Content analysis was used to summarize the findings.

The literature review conducted by Caddick and Smith (2014) included research by Dustin et al. (2011), which examined the effects of a four day “river running” (kayaking) and camping experience with thirteen male and female veterans in Colorado. The researchers recorded observations along the trip and asked the participants to journal their experience with thoughts, anecdotes and observational reports. After the trip, the researchers analyzed the journals via a series of meetings involving the Veterans Administration staff and University faculty members who were also present on the kayaking trip. Analysis involved identifying recurring themes in the reported experiences, specifically related to PTSD symptomatology. The results revealed that the outdoor experience resulted in PTSD symptom reduction, for both the hyperarousal symptom cluster as well as for the avoidance and numbing symptom clusters. The shared experiences demonstrated that the customary feelings of hyperarousal were counteracted by the fatiguing effects of heightened physical activity and the veterans’ reports of feelings of calmness in peaceful outdoor surroundings. The veterans’ journal entries also described how the river trip led to a feeling of greater engagement with the present moment and a diminishment of the numbing symptoms.

Otter and Currie’s (2004) study was also included in the review conducted by Caddick and Smith (2014). Otter and Currie (2004) examined the outcomes of a 40 week, supervised aerobic exercise program with fourteen Australian Vietnam War veterans who

had been diagnosed with PTSD. These participants attended exercise classes consisting of sixty minutes of low to moderate intensity exercise to music, twice a week. The exercise classes were designed to be similar to regular aerobic group fitness classes offered at fitness clubs, with the difference that these classes were for veterans only. A series of three focus groups were conducted with the participants to assess their exercise experience at 10 weeks into the program, 25 weeks and at the end of the 40-week intervention period. All 14 veterans participated in the first and third focus group, and 12 of them participated in the second focus group session. Content analysis was used to interpret data collected from the focus groups.

The veterans reported through the focus group interviews that they experienced decreased anger levels, increased mental awareness, higher energy levels and daily resilience, as well as increased perceived social support. The participating veterans described themselves as having poor motivational levels and not being regularly involved in any social program in their community, which made this program an exception from their routine and made it a meaningful experience. Improved lifestyle habits, including eating behaviors and social interaction patterns were also identified as positive outcomes of the exercise intervention (Otter & Currie, 2004).

Psychosocial outcomes of an inclusive adapted sport and adventurous 5-day residential and training course were examined by Carless, Peacock, McKenna and Cooke (2013). The participants were 11 male military personnel, ages 20-43 from the United Kingdom who had physical and/or mental health impairments associated with their time deployed in military service. The researchers collected data over six weeks of this intervention program. Participants would be introduced each day to a psychological

strategy, concept, or model (e.g. relaxation, goal setting) and then would they participate in a variety of sports, including wheelchair basketball, wheelchair badminton, seated volleyball, archery, bowling, and adventure-like physical activities such as indoor rock climbing and kayaking. The researchers were participant observers throughout the six weeks for each of the courses. Narrative life story interviews were conducted with the eleven participants and a thematic analysis was subsequently implemented. The researchers found that the participants enjoyed gaining physical competence through the activities, which was expressed by the participants as “doing things again”. This expression meant that the participants returned to being physically and mentally active through physically demanding tasks and sports, which contrasted with their usual experiences of inactivity that followed the injury and trauma experiences. This active engagement was considered one of the most positive aspects of the intervention by the participants.

Another theme that emerged from the study conducted by Carless et al. (2013) was the participants reported that they felt greater purpose in life. The participants expressed how involvement in the adapted physical activity course brought back a meaningful experience to their daily lives and contributed to a sense of purpose that had been lacking since the injury/trauma occurrence. A final theme identified was reconnection to others, which replaced the sense of isolation that the participants felt after their trauma or injury (Carless et al., 2013).

### **Mindfulness-Based Interventions**

Mindfulness-based interventions have been implemented in recent years as a way to improve psychological well-being. The interventions have included cognitive therapy,

mindful meditation (Kabat-Zinn, 2003) and mindfulness-based stress reduction programs (Deci & Ryan, 2008b). Mindfulness-based interventions have been recently integrated into military settings, and adopted as strategies to enhance the psychological well-being of veterans (Crawford et al., 2013).

Understanding the potential favorable influence of mindful physical activity on the PWB of student veterans is the central component to this study. The effectiveness of mindfulness training has been a topic of interest within Positive Psychology and the process of mindfulness can be described as paying attention, in a non-judgmental way to the present moment. (Langer, 2002). Mindfulness involves a direct experience of the events in the mind and body, which implies releasing attention from elaborative thinking and makes more cognitive resources available for processing the current experience (Bishop et al., 2004). A mindful experience also implies having a flexible state of mind, subject to changes according to contextual variations and novelties (Langer, 2002) and can lead to a feeling of alertness to what is occurring in the here-and-now, often described as a feeling of being fully present (Bishop et al., 2004).

Goldstein et al. (2018) assessed the effectiveness of an integrative exercise intervention that included mindfulness training in a study that was conducted with 47 participating veterans. The participants ranged in age from 18 to 69 years and all met the diagnosis for PTSD or partial PTSD. Participants were assigned to an integrative exercise group, that received exercise sessions of one hour duration, over 12 weeks at the local YMCA or they were assigned to a control group waitlist. The integrative exercise group practiced aerobic and resistance exercise, with mindfulness-based practices tailored to veterans with PTSD. The Clinician-Administered PTSD Scale (CAPS; Blake, Weathers,

Nagy, Kaloupek, Gusman, Charney,...& Keane (1995) was used to measure PTSD symptoms and the World Health Organization Quality of Life Scale was also administered to participants to assess physical and psychological quality of life. After the completion of the intervention, participants in the integrative exercise group were found to have a clinically significant reduction in PTSD symptom severity and a moderate improvement of psychological quality of life when compared to the control group.

Mindfulness can be strengthened through various forms of physical activity, and physical activity can be mindful itself. Yoga is one of the most common activities that involves both physical and mindfulness skills. Yoga is a thousand-year-old practice developed in India that emphasizes the integration of mind, body and spirit. A yoga practice traditionally incorporates physical postures (*asanas*), breathing techniques (*pranayama*), and meditation moments designed to promote physical and psychological well-being. A yoga practice can be led in a way such that the movement itself can be mindful. The practice of yoga as a tool for enhancing well-being has become more common over time and its implementation has extended into the areas of clinical treatment, education and sport psychology. However, research on the psychological benefits of yoga-based practices is still considered to be in its infancy (Butzer, Bury, Telles, & Khalsa, 2016; Frank, Bose, & Schrobenhauser-Clonan, 2014).

Favorable physical and mental health outcomes of yoga practice have been identified by researchers. Ross and Thomas (2010) conducted a comprehensive literature review with the purpose of comparing the effects of exercise and yoga interventions on a variety of health outcomes. Eighty-one studies met the inclusion criteria of using yoga as an intervention to improve health, but only twelve studies compared the effects of yoga to

other exercise modalities, such as walking, running, dancing, stationary bicycling and stretching. Of these twelve studies, nine were focused on adults and three on seniors. The results of the study revealed that yoga interventions yielded positive results for both healthy and diseased populations.

The relative effectiveness of daily yoga asana and pranayama practice and exercise involvement was compared by Duraiswamy, Thirthalli, Nagendra, and Gangadhar (2007) and was included in the review by Ross and Thomas (2010). In this four-month study, the effectiveness of walking, jogging, seated and standing yoga exercises on symptoms of psychosis in 61 schizophrenic patients were examined. The yoga and exercise groups improved, but the yoga group scored significantly better than the exercise group in social and occupational functioning and on the psychologic, social, and environmental subscales of quality of life as measured on the World Health Organization Quality of Life form (WHOQOL-BREF – T., 1998).

Yurtkuran, Alp, Yurtkuran, and Dilek (2007) compared the effects of yoga practice with gentle range-of-motion exercises on symptoms related to hemodialysis in 37 renal failure patients. The participants completed three months of twice per week sessions consisting primarily of standing and seated yoga postures and meditation practice and the yoga group exhibited significant reductions in pain (37%), fatigue (55%), and sleep disturbance (25%) as measured by visual analog scales. These changes were significantly better than those experienced by individuals in the gentle exercise group. Yoga practice has also been recommended as an intervention to increase awareness of internal states and to reorganize physiological responses (Hall, Beattie, Lau, East, & Anne Biro, 2016). Sauer-Zavala, Walsh, Eisenlohr-Moul and Lykins (2016) compared

three types of meditative practices including yoga, body scan and seated meditation with undergraduate college students. Participants in the three modalities attended one hour, weekly sessions and were assessed pre-and post-intervention with the Ryff PWB scale (1989) and a rumination/reflection instrument and the Five Faceted Mindful Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The emphasis of the yoga sessions was upon mindful practice through which the participants could enhance their body awareness. The results revealed that the psychological well-being of the yoga group participants improved more than the other groups involved in the other two practices. Sauer-Zavala et al. (2016) proposed that the physical nature of yoga could be one of the main reasons why well-being is enhanced through yoga practice. The behavioral component of competence and mastery of skills can easily become a source of positive affect and heightened well-being.

The effectiveness of yoga practice on PTSD symptomology has also been examined. Jindani and Khalsa (2015) implemented an eight-week yoga program with 40 female and male participants between the ages of 18 and 63 who had self-reported symptoms of Post-Traumatic Stress Disorder (PTSD). After completing eight weeks of 90-minute weekly yoga sessions, participants were interviewed about change in their symptoms, emotions and behaviors. Interviews were then transcribed and content analysis was applied. Three major themes were identified by the participants as a consequence of their involvement in the yoga intervention: self-observed changes, greater awareness, and perceptions of the yoga program. Self-observed changes included changes in mood, feelings of increased competence and of increased overall wellness. The theme of greater awareness referred to feelings of greater control of thought patterns

and mental clarity and positive perceptions of the program was a theme that reflected generally positive behaviors at program completion. Participants expressed that they were trying to reformulate their prior traumatic experiences including increasing self-compassion and seeing difficult moments as opportunities for growth instead of struggle. Thirty-nine participants reported greater awareness of life experiences and an increased perception of the mind-body relationship. The researchers concluded that yoga had improved participants' self-care skills and heightened their awareness through the practice of using strategies used to slow down, and through increased awareness of thought and emotional patterns. These new skills were expected to help participants respond better to stressful situations (Jindani & Khalsa, 2015).

Stoller et al. (2012) examined the effects of an intensive 3-week yoga program on 70 military personnel who had been deployed to Iraq. With a two-group randomized design, the researchers measured anxiety through the State and Trait Anxiety Inventory (STAI; Spielberger, 1983) and sensory processing using the Adult Sensory profile instrument (AASP; Brown & Dunn, 2002) in a pre-and post-design. The study also included a quality of life assessment through a self-report questionnaire developed by the researchers to explore occupational performance, hyperarousal, mood, interpersonal relations, and cognitive functioning issues. Thirty-five of the military participants received 75-minute-long sessions of sensory-enhanced yoga over three consecutive weeks and thirty-five of them did not engage in any form of yoga practice. Sensory enhancement was provided through practicing particular postures as well as through the use of props, including a strap and wooden blocks to assist in their practice.



The yoga intervention was effective in reducing both state and trait anxiety even for those individuals with low levels of anxiety on the pretest (Stoller et al., 2012). The military personnel who participated in the intervention also reported improvements in quality of life with 54% of the participants reporting better sleep despite the ongoing environmental disruptions. The participants also reported better anger management and feelings of calmness (Stoller et al., 2012). The researchers concluded that a regular yoga intervention was a viable and effective non-pharmaceutical option to enhance quality of life among active military personnel.

The possible benefits of a yoga practice with the veteran population were also examined by Staples et al. (2013). The purpose of their study was to evaluate the feasibility and effectiveness of yoga practice as an adjunctive therapy for improving post-traumatic stress disorder (PTSD) symptoms with veterans. Twelve veterans, ages 58-64, participated in this study and underwent a 6-week, hourly yoga intervention held twice a week. PTSD symptoms were measured using the PTSD checklist-military version, (PCL-M; Weathers et al., 2013), The Pittsburgh Sleep Quality Index (PSQI; Buysse et al., 1989) and the State Anger Expression Inventory, (STAXI-2; Spielberger, 1999) which were completed by the participants at pre-and post-intervention. After the intervention was completed, the veterans experienced a significant improvement in PTSD hyperarousal symptoms. Improvements in overall sleep quality along with good adherence and acceptance from the participants towards the yoga program was also identified as desirable outcomes (Staples et al., 2013).

Cushing et al. (2018) continued with this line of research and examined the influence that yoga practice had on PTSD symptoms for eighteen post 9/11 veterans with

ages ranging from 26 to 62. Outcome variables included PTSD symptom assessment using the PCL-M (Weathers et al., 2013), a health symptom assessment questionnaire, the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), the Pittsburgh Sleep Quality Index (Buysse et al., 1989), and the Mindful Attention Awareness Scale (Brown & Ryan, 2003) and these instruments were all completed prior to, and following, the intervention. The veterans participated in 60-min weekly yoga sessions for 6 weeks taught by a trained yoga instructor who was also a post 9/11 veteran. The yoga sessions incorporated Vinyasa-style yoga and a trauma-sensitive, military-culture informed approach. The trauma-sensitive approach included no hands-on adjustment of participants' postures during the classes as well as the avoidance of potentially vulnerable yoga position and modification options in certain postures for participants with combat related wounds, traumatic injuries, and other health concerns. Additionally, an instructor with knowledge about military culture and experiences helped to build trust among the participants and to provide a welcoming space for the sessions.

Data for this study was collected at baseline and again after seven weeks. The results from the post-intervention analyses showed decreased PTSD symptomatology in the three-symptom clusters assessed by the PCL-M (hyperarousal, re-experiencing, and avoidance). Participants also improved in their mindfulness scores and reported decreased levels of insomnia, depression, and anxiety symptoms (Cushing et al., 2018). The researchers concluded that a yoga practice could be used on itself or as an adjunctive therapy for this population. The results provided support for the expectation that it would be beneficial to have the intervention led by a 9/11 veteran with specific knowledge of military culture.

Several studies have been conducted to understand the mechanisms and reasons behind the frequently reported benefits of mindful practice. Roberts-Wolfe, Sachett, Hastings, Roth and Britton (2012) proposed that positive outcomes of mindfulness-based interventions could be associated with the component of present moment awareness and the effect this awareness has on people's responses.

Roberts-Wolfe et al. (2012) examined mindful meditation and its effects on psychological well-being. The logic for this research was that the greater body awareness achieved through meditation should be directly related to decreased distraction, translating into greater attentional ability and capacity to direct attention towards one's goals. Participants were fifty-eight university students, who underwent a 12-week mindful meditation intervention or were assigned to a control condition of 12-week music or religious studies. Meditation sessions were scheduled for one hour three times per week and included lecture time and approximately thirty minutes of a specific contemplative practice. Music education was chosen as the control condition because of a similar format of lecture and practice time and religious studies as was taught by the same instructor as the meditation sessions. Participants completed the Mood and Anxiety Symptom Questionnaire (MASQ; Clark & Watson, 1991) and the Psychological Well-Being Scale (Ryff, 1989) at the beginning and at the end of the 12-week course.

The pre-and post-analyses revealed that the participants in the meditation group had significantly greater enhancements of psychological well-being than those in the control groups. The researchers also proposed that increased attention regulation in the form of greater awareness of everyday experiences could be related to higher levels of positive affect. Additionally, the researchers proposed that outcomes related to decreases

in negative affect could be related to the development of a more accepting or open attitude to experiences previously perceived as unpleasant.

Wisner et al. (2015) conducted a mindfulness skill training program, using meditation practice, with 14 student veterans at a university campus. The mindfulness skills group was offered for three consecutive semesters at the university campus in 2011–2012 and each weekly session involved a check-in exercise, a review of mindfulness skills and ideas for improving these skills, as well as 20-minute seated mindful meditation exercises with discussion time. Pre–post measures were collected through interviews and focus groups during the first session and the last session of each group. The responses from the post-intervention questionnaires and from the focus group transcriptions were analyzed together and coded into themes. The themes that emerged from the veterans' responses included feeling that their involvement in the intervention improved emotional and physical coping; had positive changes in personal functioning; improved organizational capabilities; and helped them to develop better stress management skills.

Hurst and colleagues (2018) conducted a qualitative study with males and females who were active duty military personnel, veterans, or who had direct experience with military culture. The goal of this study was to understand the experience, preferences and perspectives of military personnel towards yoga as a therapeutic modality. Criteria for inclusion required having taken (or taught) 5 or more yoga classes in the past 2 months. Total participants for the study included 24 male and female yoga students and 12 yoga instructors, 5 of whom were veterans and 7 of whom had experience teaching to military population. Semi-structured interviews were conducted with all 36 individuals followed

by content analysis. Themes that emerged from the interview analyses included favorable perspectives regarding the mental health benefits of the yoga practice such as emotional well-being and cognitive functioning outcomes. Physical benefits that were commonly reported included reduced pain sensation along with feelings of increased strength, balance and flexibility as a result of the regular yoga practice. The researchers also identified some barriers among veterans to the initiation of a yoga practice. They concluded that yoga may be resisted as a form of self-care by military members because yoga is traditionally not perceived as typical of the type of endurance or physical training demands that are traditionally carried out in the military, and therefore it may not be considered as important or as part of the military culture.

Hurst et al. (2018) proposed that the presence of significant others and greater access to this type of physical activity practice in personally accessible spaces (bases, hospitals, veteran services, campus) could facilitate participation in yoga practice for veterans. Barriers for involvement could include not feeling comfortable around other people who are not military affiliated and the awareness that the purposes and value of yoga may not be completely understood by many in this population. It is therefore necessary to consider motives for participation and individual motivational characteristics around the engagement in a mindful physical activity practice.

The motivational characteristics of individuals considering involvement in a mindful yoga program, including initial motives for participating in the activity and type of motivation during the participation are considerations that will be addressed in the present study. The intent is to consider the motivational characteristics of student

veterans and how the variations in these characteristics may influence the psychological well-being outcomes experienced through the mindful yoga intervention.

### **Motivation and Self-Determination Theory**

The research on motivation in psychology of physical activity is vast and has been focused on understanding motives for participation and persistence and the psychological outcomes associated with this involvement. Elements of choice, effort and persistence in an activity must be considered and understood as a product of the person's interaction with their current sociocultural context (Deci & Ryan, 2008b). The focus on motivation and psychological well-being will be addressed within this study from a socio-cultural perspective and the discussion for this study will be focused on Self-Determination Theory (Deci & Ryan, 2000), which is one of the main motivational theories applicable to sport and exercise psychology.

Self-Determination Theory (SDT) (Deci & Ryan, 2000; 2008b) is a macro theory of motivation. A central premise of this theory is that the type of motivation is more important than the amount of motivation when understanding a person's motivational outcomes and overall psychological well-being (Deci & Ryan, 2008b). In Self-Determination Theory there are two general categories of motivation: autonomous motivation, which involves a person's active choice; and controlled motivation, in which behavior responds to pressure or demands from sources perceived as external to the individual (Deci & Ryan, 2008b). Not all behaviors are going to be autonomously regulated for everyone, but will vary between more intrinsic and extrinsic levels, which can be expressed in a continuum of different degrees of integration (Deci & Ryan, 2000).

External and introjected regulations are considered more controlled motivation, whereas identified, integrated and intrinsic levels are forms of a more autonomous motivation (Deci & Ryan, 2008b). The difference between these types of motivation will result from the interaction of people's active nature and their social environments, and whether these environments support or hinder people's needs.

Another central component of SDT is the focus on basic psychological needs. Although cultural contexts shape and impact people's thoughts and actions, there are universal psychological needs that require satisfaction across cultural differences (Deci & Ryan, 2008b). According to SDT, people will pursue activities, contexts and goals that allow for the satisfaction of these needs, which aligns with the Positive Psychology principle of the active role that humans have in their search for improved well-being.

The three needs identified by SDT are autonomy, competence and relatedness. Autonomy refers to a person's capacity for choice and self-organization according in a way that is consistent with one's true sense of self (Deci & Ryan, 2000). Someone who feels that their actions are self-initiated, under their control and guided by a coherence to their overall life goals, is more likely to display intrinsically-motivated behaviors (Deci & Ryan, 2000). Competence can be understood as the human need to be effective in the way we influence the environment, but also reflects a sense of capacity towards attaining valued outcomes (Deci & Ryan, 2000). Relatedness can be understood as is the necessity to feel connected to other people. Intrinsic motivation will most likely increase in contexts where the person experiences a fulfilment of this need (Deci & Ryan, 2000).

SDT has been considered an appropriate framework for understanding patterns of exercise behavior and well-being outcomes associated with exercise participation, as well

as the development of more adaptive behaviors towards exercise (Wilson, Mack, & Grattan, 2008). Edmunds, Ntoumanis and Duda (2006) used SDT as a framework to examine outcomes experienced by participants in organized fitness classes and their perceptions of autonomy support provided by the fitness instructors. One hundred and six male and female group fitness participants, between the ages of 16 and 62, completed the Behavioral Regulation in Exercise Questionnaire (BREQ; Mullan, Markland, & Ingledew, 1997), Basic Need Satisfaction Scale (Deci et al., 2001) and the Godin Leisure Time Exercise Questionnaire (GLTEQ; Godin & Shepard, 1985). The results revealed that that fulfilment of competence, autonomy and relatedness was associated with more self-determined regulation and positively related to more strenuous exercise involvement and total exercise behaviors (Edmunds, Ntoumanis, & Duda, 2006).

The role of motivational influence in mindfulness practices has been infrequently examined. Roberts-Wolfe et al. (2012) proposed that the positive effects on well-being of mindfulness training may only occur for people who are intrinsically motivated to do this mindfulness training. This consideration is relevant to the present study as it addresses the influence of motivational type on the relative effectiveness of yoga practice.

Gaiswinkler and Unterrainer (2016) conducted a study with yoga practitioners and gymnasts, with the aim of determining if different levels of yoga involvement were related to mental health outcomes. 362 yoga practitioners (327 females) rated their degree of yoga involvement on the Yoga Immersion Scale (Gaiswinkler, Unterrainer, Fink, & Kapfhammer, H.P.,2015). A control group was comprised of 93 gymnastics practitioners (83 females). All participants completed the Multidimensional Inventory for Religious/Spiritual Well-Being (Unterrainer, Huber, Ladenhauf, Wallner, & Liebmann,



2010), the Freiburger Mindfulness Inventory (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006) and the Brief Symptom Inventory for psychiatric symptoms (Derogatis, 2000). The researchers found that those participants who practiced yoga had increased levels of psychological well-being, but only in situations where high levels of immersion existed, meaning that psychological well-being was only increased when the yoga practice was strongly aligned with a person's beliefs and was a strong priority in their life. Gaiswinkler and Unterrainer (2016) concluded that in the absence of this deep involvement, the effects on well-being of a yoga practice might not be different than any other body-oriented physical activity. This position is novel, as it does not generalize the positive effects of yoga, and rather highlights how the impact of yoga on the practitioners' subjective well-being might be dependent on the degree of involvement the person has towards the practice.

The influence of the nature of a person's involvement in yoga on psychological outcomes was also examined by Carbonneau, Vallerand and Massicotte (2010). The researchers focused on the influence of passion on the outcomes of the yoga practice. Passionate involvement can be harmonious and is present when an individual engages in an activity in a voluntary way and without creating conflict with other areas of their life, despite taking up a significant amount of time and energy (Vallerand & Houliort, 2003). Passion can also be obsessive, characterized by an individual who feels obligated to participate in an activity, and suffers a high emotional and cognitive cost when they do not achieve their goal (Rip, Fortin, & Vallerand, 2006).

The influence of the type of passionate involvement on the psychological outcomes of a yoga practice was examined by Carbonneau et al. (2010) in a study

conducted with 89 Canadian citizens (77 females and 12 males) ages 18-62 who had practiced yoga regularly for an average of five years. The Passion Scale (Vallerand et al., 2003) was used to assess passionate involvement type for yoga and participants also completed the State-Trait Anxiety Inventory (STAI-Y1; Spielberger, 1983) to assess anxiety levels. Affective responses were measured using items from the PANAS scale (Watson, Clark, & Tellegen, 1988) that were considered to be relevant to the yoga practice and a physical symptom scale including questions on how often they had experienced certain symptoms (e.g., headaches, dizziness, and sleep disorders) was also completed by the participants.

Carbonneau et al. (2010) found that different types of passionate engagement led to different outcomes for the yoga practitioners. Involvement that was driven by harmonious passion was found by the participants to be positively associated with psychological and physical benefits, along with a greater overall psychological well-being at a three-month follow-up. Obsessive passion, to the contrary, led people to behave in ways that thwarted the potential benefits of the practice, and some participants reported increased negative affect while practicing yoga (Carbonneau et al., 2010). These findings indicate that the benefits of a positively perceived practice, such as yoga, may be dependent on individual motivational characteristics and characteristics of involvement.

Cultural understanding of specific populations, such as student veterans is crucial to design a competent intervention with greater chance of providing successful contributions to participants' well-being. As Romero, Riggs and Ruggero (2015) emphasized, student veterans can tend to feel detached from college settings, due to

perceived unaccommodating school policies, and difficulty interacting with civilian students or faculty

At the University of Northern Colorado there are approximately 600 student veterans, yet most veterans' services and resources available to these students on campus are related to financial options, use of military benefits as well as administrative help with school processes, and some counseling options. However, few options exist that address veterans' specific needs relative to physical and psychological well-being. In addition, the options provided to the general student population are underutilized by student veterans.

The focus of this study was on the role of mindful yoga practice in contributing to the psychological well-being of student veterans. Specifically, the goal was to obtain a deeper understanding of the effects of a structured mindful yoga intervention on the psychological well-being of military affiliated college students. An additional consideration involved the initial motivational characteristics of the veterans and the influence of these characteristics on PWB outcomes.

It was proposed that an 8-week mindful yoga intervention could positively influence the PWB of student veterans. Considering motivational characteristics and the possible influence of these characteristics on the effects that the mindful yoga intervention can have on the PWB of student veterans provided a novel approach. A multiple case study methodological approach was conducted, implementing both qualitative and quantitative methods of data collection.

Knowledge obtained in this study could aid in the design of culturally-responsive and beneficial programs for this population. Tailoring positive interventions that benefit

student veterans' psychological well-being through physical activity should facilitate physical activity adherence.

In a moment when being culturally responsive and inclusive is a need in both college environments, as in greater social settings, understanding the military culture and the demands it places on military service members is a matter of multicultural competence (Romero, Riggs, & Ruggero, 2015). Findings from this study could contribute to this understanding and translate to the establishment of remedial and preventive psychological well-being alternatives or interventions for student veteran population that address their specific needs and challenges.

### **CHAPTER III**

#### **METHODOLOGY**

This chapter presents an explanation of the methodology used in the current research study. The study is a mixed method, multiple case study that examined the perceived influence of a mindful yoga intervention on the psychological well-being of student veterans. The primary purpose was to determine whether the mindful yoga intervention was beneficial to the psychological well-being of these student veterans and to identify any specific benefits that resulted for these participants. In addition, there was the intention to gain a deeper understanding of the experience of each participant and to identify if their background, initial participatory motives and motivational characteristics across the sessions influenced the effectiveness of the mindful yoga intervention. This knowledge could help to structure similar interventions with other student veterans.

The main question guiding this process was:

Q1 How does a mindful yoga intervention affect the Psychological Well-Being in student veterans?

As a follow-up question to Q1, this study also intended to explore if the motivational characteristics of participants influenced the outcomes of the mindful yoga practice.

#### **Participants**

A veteran is defined as someone with a history of service in any military branch, which includes Army, Navy, Marine, Air Force, and/or Coast Guard. They can be active duty service members or have served in in the reserves and National Guard experiencing

deployment (Danish & Antonides, 2009). Participants in this study were seven undergraduate level student veterans, with a mean age of 27.2 years, +/- 3.75 years. All participants attended The University of Northern Colorado in Greeley, Colorado. This University has a Gold Status rating as a military friendly school and has an Veteran Services center especially dedicated to the attention of student veterans.

Gender identity, ethnicity or socioeconomic background were not be considered as criteria for inclusion or exclusion of participation. Participants were asked their preferred gender identification out of respect and as part of demographic and contextual information. Of the seven participants, three preferred the use of he/him/his pronouns, three preferred she/her/hers and one participant started the study using the pronouns she/her/hers and by the end of the 8 weeks chose to be addressed in a gender neutral way with pronouns they/them/theirs. All manifestations of diversity and intersectionality among participants were welcome and recognized as representative of this population and relevant to their experience. Of the seven participants, two were married and the rest were not and had never been. None of them were parents.

Narrative descriptions of each participant's background and experience with the yoga program are presented in Chapter IV. A brief characterization of each participant is presented in this section as a general overview. Real names have been changed in order to guarantee confidentiality to the participants.

Anthony (he/him/his) was 24 years old at the start of the study. He has Mexican American heritage and was a member of the U.S. Air Force for 6 years, where he served as policeman. His general perception of the time he served in the military was not positive. He started this program as a junior in the Nutrition & Dietetics program at UNC.

At the end of the yoga program, he decided he wanted to change his major. He had had few experience with yoga before this program and had done physical activity including boxing and weight lifting. He held some physical injuries from his service. Prior to beginning the intervention he was hoping to learn more about mindful physical activity and to find a way to structure this into his current schedule.

Tom (he/him/his), 26 year old, Caucasian, was a senior student in Sport and Exercise Science during his participation in the study. He served in the U.S. Marine Corps as an infantry assault man and then joined the National Guard. He had an overall positive appraisal of his military experience, including the challenging aspects. He had a regular physical activity practice including weight lifting, which he associated to staying strong in order to help others. He had also done some yoga regularly at the Campus recreation center the previous semester. He was interested in getting back to this habit and to try different ways of moving and being more mindful.

Sienna (she/her/hers) 25 years old, was a member of the U.S. Army for 6 years. Her perception of the military experience was both positive and negative, but she was very explicit about not having her identity only associated to that period of her life. At the start of this study she was a junior in the Audiology program. Born and raised in CA, her parents are from India and she has strong appreciation of her culture. Although she had done different types of physical activity, she did not have a structured physical activity practice at the moment we began the program. She had recurring back pain and hearing loss due to her military service and was hoping the yoga practice to achieve relief of tension around her neck and back, as well as just decrease her stress levels.

Hannah (she/her/hers), 31 years old, Caucasian, was part of the U.S. Navy for 6 years, where she worked as a linguist. Her perception of serving in the military was mostly challenging, but she valued a sense of purpose it gave her. She also met her husband during her service. She was also a senior in the Audiology program during the participation in the study and had some previous experience with meditation. She enjoyed physical activity, but struggled with scheduling it regularly. She hoped the yoga program would help her regain a regular habit of physical activity and meditation.

Amanda (she/her/hers), 29 years old, Caucasian, was going to school for Sport & Exercise Science, while also working as a Certified Nurse Assistant. She was in the U.S. Air Force for 5 and a half years, where she served as part of the medical staff. Her overall perception of the military was very positive. She also met her husband, in the service, on the very first day, as she recalled. Amanda had a long history of being physically active, mostly with high intensity exercise. She was hoping for the yoga program to help her improve her flexibility and also relieve some tension and relax.

Karen (they/them/theirs), Caucasian and a Colorado native was 24 years old when we started the study. They were in the U.S. Navy for 2 years, but had an early discharge early due to injuries. They expressed the military had broken them and the only benefit was that now they received payment for school and medical care. Karen had been on different medications that diffculted the regular practice of physical activity, but was tried to stay active with walking to campus as much as possible. Karen was a student in Sport & Exercise Science, hoping to graduate in December of 2019. They had some experience with yoga and a positive perception of this type of PA, so the goal was to return to this type of practice and get stronger.



Markus (he/him/his), 24, Caucasian, was a new student this school year to UNC in the school of Sport & Exercise Science. He served in the U.S. Marine Corps for 4 years as an infantry assault man. Physical activity was a priority for him and he credited the military for his interest in being active, which was one of the biggest takeaways from this part of his life. He had tried a few yoga classes the previous semester at the Campus Recreation Center at UNC and wanted to get back into that practice and hopefully increase his flexibility as well.

### **Recruitment Procedures**

**Selective sampling process.** Recruitment was carried out through the Veteran Services Office of AIMS Community College and the University of Northern Colorado in Greeley, Colorado with help from the Director of Veteran Services in each location. An electronic survey with basic demographic information questions and questions derived from selected subscales from the Ryff Scale of PWB was sent out to all student veterans via email. Out of 533 sent emails, 47 responses were received and given the option to participate in the yoga intervention of these initial responses, 14 students demonstrated interest in participating. Students were contacted by the researcher and explained the details of the study. Specifics about the intervention, such as the structure and schedule of the sessions, physical requirements, time commitment requirements, the probable benefits and risks, as well as the option to discontinue participation at any time were explained. In total, 7 students agreed to participate and followed through with all the requirements for participation.

Following a full description of the study, and the nature of their involvement in the study, these participants had the opportunity to ask any questions or request

clarification from the researcher about any aspects of their participation. Participants were provided with IRB approved consent forms. Information on additional resources available to them regarding recreation, psychological and emotional support on campus was also be provided to participants.

### **Intervention**

The intervention for the study consisted of sessions of mindful movement through yoga, including physical postures, breathing techniques and short meditations. One 75-minute session per week will be conducted from February 20<sup>th</sup> to April 18<sup>th</sup> of 2019. Sessions were at two convenient locations and schedules for students on a weekly basis: Wednesdays at 8:00am in Gunter Gym and Thursdays at 12:30pm in the Campus Commons Building, both at the University of Northern Colorado. Sessions were held guaranteeing privacy for participants, as rooms were reserved exclusively for this activity. All the necessary equipment for the sessions, including mats, blocks and additional yoga props like meditation cushions were provided.

Rogers (2013) suggested an optimal duration of 75-minute sessions with a young adult population, since her experience with longer classes indicated that students tend to get restless or lose interest (Rogers, 2013). Although her intervention was focused on mindful meditation without a movement component, a typical yoga class is usually structured for 60 to 90 minutes, so a 75-minute length session provided enough time to go through the physical postures and more meditative components without a rush.

### **Researcher Stance and Trustworthiness**

Trustworthiness is a term used frequently in qualitative research instead of validity, to establish the credibility of results obtained (Creswell, 2007). One technique to

enhance credibility of a study is to build rapport between the interviewer and the participant. Having the researcher lead the yoga sessions and conduct the interviews allowed this rapport to be established and to grow throughout the 8 weeks. This made participants feel more comfortable discussing their overall experiences with the researcher.

All 8 yoga intervention sessions were led by the researcher, a certified yoga instructor with over 20 years of experience leading groups in exercise and movement formats. The researcher has also been part of the Veteran Services Staff at the University of Northern Colorado for over a year, and a familiar face at this office for the past 3 years, which has provided opportunity for greater cultural immersion and understanding of issues that may be of specific concern to student veterans.

The researcher has also received training for cultural considerations with this population, including trauma informed yoga and trauma informed mindfulness workshops. Trauma informed practices acknowledge the impact of trauma and help identify the symptoms and signs that may manifest in participants while seeking to actively resist re-traumatization (Treleaven, 2018). While mindfulness practice can strengthen awareness and increase the regulation of emotions, which is positive for trauma recovery, it can also bring awareness to emotions and memories that may not be pleasant. Being informed of these possible situations, the practice must be lead with sensitivity and consideration of triggering language and postures. It is also essential for the practice to be led by someone with knowledge of additional resources available to help anyone who may need support for processing these experiences. Information on resources on campus through Counseling Services and Veteran Services, as well as

through local organizations, such as the Veteran of Foreign Wars office (VFW) and the Northern Colorado Veteran Services were provided in case they were necessary for participants.

All yoga sessions included a reminder from the instructor that the most important part of the yoga practice was the connection and awareness to the breathing, and not the postures. There was an encouragement to attempt the postures modifying if needed to make them more accessible and taking the variation that felt comfortable for participants. Additionally, at the end of each session, there was an encouragement to practice the breathing whenever needed, on or off the mat and remind participants the mindfulness aspect of the yoga practice were always available to them.

### **Research Design and Procedures**

The research design employed was an Embedded Mixed Methods. An Embedded Mixed Methods Design uses both quantitative and qualitative data collection, but one of these processes plays a supplemental role within the overall design (Creswell, 2007). When there is a need to include qualitative or quantitative data to answer or explain a research question within a predominantly quantitative or qualitative study, this is the method of choice. In the present study, the main purpose was to examine how a mindful movement intervention, through yoga, affects the well-being of student veterans. Qualitative methods allowed a more in depth understanding of the experiences participants go through. Initial interviews focused on participants' unique stories, military and personal backgrounds and well-being perception prior to the intervention. After the 8 weeks of yoga sessions, the participants were then interviewed about the effects of the yoga sessions in relation to their feelings of psychological well-being once the

intervention concluded. Participants' motivational approaches to PA involvement in general, and in relation mindfulness or mindful movement were also discussed during the interviews. The use of quantitative methods, through self-reported questionnaires, applied weekly provided supplemental data to the knowledge gained through the interviews.

The case study format is a comprehensive research strategy (Yin, 2003). While each individual case can be considered a "whole" study, a multiple case design allows to expand on the relationship between different stories and outcomes regarding the range of outcomes that can be experienced through mindful movement. This strategy can also help to understand varied experiences within the same population.

### **Interviews**

The mixed methods research design included two phases of qualitative data collection through face to face semi structured interviews. The first phase took place before the mindful yoga intervention, which was justified by the need to explore the initial participatory motives in greater depth and in relation to the participants' contexts and their current environment. Interviews were conducted at the Veterans Services office at the University of Northern Colorado and at the researcher's office in Gunter Hall, at the University of Northern Colorado and lasted between 30 and 60 minutes on average. This phase allowed for a comprehensive assessment of baseline information concerning motives and barriers to physical activity participation, initial motivational levels and state of psychological well-being. Specifically, the purpose was to gain a better understanding for the participants in their current circumstances. Why were they participating? What was their personal history with physical activity and mindful physical activity, if any? Did they have any expectations regarding the intervention? These are some examples of

inquiries that were touched upon in the initial interviews as an overview of the pre-intervention state of participants. A semi-structured format was chosen in order to allow conversation to flow organically (Denzin & Lincoln, 2000) and allow participants to say potentially relevant information that might not otherwise be obtained if interviews are fully structured or if data were only collected through a written questionnaire

Semi structured interviews were also conducted subsequently to the intervention. All of these interviews were conducted at the University of Northern Colorado. This post-phase allowed an examination of how the participants viewed and experienced the results of the intervention and any changes in the PWB subscales. The participants were asked to complete the PWB subscales at this interview session, this time allowing participants questions or comments to the researcher about the questionnaire if needed. The primary focus of these interviews was on a case-by-case basis, with descriptions of individual results. The interview at post-intervention provided salient information to help determine if initial motives and backgrounds affected the perceived outcomes of each participant. The responses obtained from this phase were also be supplemented by information that may emerge from the survey instruments that will be completed by participants every week, to have a greater indication of the motivational characteristics and need fulfillment outcomes and how these factors could help explain and understand the PWB outcomes experienced by the participants. The instruments are described further along in this chapter. Additionally, this phase could allow the assessment of any differences between the types of motivational characteristics and the outcomes obtained across cases.

The researcher developed a guide for the interviews. Interviews conducted before the intervention included inquiry on basic information of the participants and their

military history. These interviews addressed motives for participation in this research project, previous physical activity experience and any perceived barriers to participation in physical activity as well as on experience with mindfulness and mindful movement if any. Interview sessions conducted after the 8-week intervention included participants' reflection on the mindful yoga experience, perceived benefits and challenges, and completing the questionnaire items of Ryff's PWB scale that refer to the dimensions of Personal Growth, Purpose in Life, Self-Acceptance and Positive Relations. The interview process was flexible in structure to adapt to the particular stories of each participant's experience, while maintaining a common ground of topics to explore psychological well-being and perceived outcomes of the intervention for all participants.

Pilot interviews were conducted prior to the start of the project. The purpose was to test question and guiding themes structure, and to confirm the topic choice and focus of the questions as aids in providing relevant information and contributing to the clarity or any additional practical issues that may require re-formulation. All interviews were conducted by the main investigator, audio recorded and subsequently transcribed by the main researcher.

The proposed method approach intended to provide an atmosphere in which the participants felt valued and understood (Rodriguez, Schwartz, Lahman, & Geist, 2011). The main researcher underwent trainings specific to the uniqueness of military culture, and is part of the Veteran Services staff at University of Northern Colorado, learning how to provide a respectful intervention with student veterans, which should prove beneficial in establishing a positive rapport with the participants.

## **Instruments**

**Psychological Well-Being instrument** (RPWB- Ryff & Singer, 2006). The eudaimonic theory of psychological well-being will structure the quantitatively-based assessment of psychological well-being. The RPWB Scale (2006) provides an assessment of the six dimensions of psychological well-being, which include: self-acceptance, positive relationships to others, autonomy, environmental mastery, purpose in life and personal growth. The initial development process of the questionnaire involved self-descriptive items that would fit with the theoretical definitions of each dimension in hope that they would be applicable to adults of any age and gender. Initial drafts of approximately 80 items for each scale were filtered according to ambiguity or redundancy of item, lack of fit of item with scale definition, lack of distinctiveness of item with items from other scales, and inability of item to produce a variable response. After being tested with 321 young, middle, and older-aged adults from the United States the first questionnaire version was finalized with a reduction of 20 items per dimension, for a total of 120 items (Ryff, 1989).

Shorter versions of the RPWB consisting of 84 items, 54 items, 42 items and 18 items have subsequently been used in research (Abbott et al., 2010). Ryff and Keyes (1995) conducted a confirmatory factor analysis for an 18-item version with telephone interviews of 1108 adults from three different age groups in the United States. Results provided support for the proposed factor structure of the model. Clarke, Marshall, Ryff and Wheaton (2001) also conducted analyses of the 18-item version with over 4500 Canadian seniors for the Canadian study of health and aging (CSHA), and obtained support for the 6-dimension measurement instrument.



The scale has also been evaluated in differing cultural contexts. Van Dierendonck (2004) examined construct validity of the 84 item RPWB scale with two Dutch samples, one of college students and the other of community members. Henn, Hill and Jorgensen (2016) conducted exploratory and confirmatory factor analysis on the 84-item version as well, in a study with a South African adult population. For this research study, the subscales of Personal Growth, Self-Acceptance, and Environmental Mastery in Life from the 42-item version of the RPWB scale will be used as part of a collaborative interview format prior and subsequently to the intervention. The total items derived from this scale that were used for the present study were 28.

**Situational Motivational Scale (SIMS- Guay, Vallerand, & Blanchard, 2000).**

Situational motivation refers to the motivation a person experiences while engaging in an activity: the “here and now” of motivation for that event (Vallerand, 1997). The Situational Motivational Scale is a 16-item self-report inventory that was constructed to measure intrinsic motivation, identified regulation, external regulation, and amotivation in accordance with the framework of self-determination theory. Standage, Duda, Treasure and Prusak (2003) examined the validity and reliability of this instrument across different physical activity contexts and populations in two different studies. These studies youth soccer players, 7<sup>th</sup> and 8<sup>th</sup> graders in Physical Education lessons, and participants in college PA courses. These researchers found support for the construct validity of the instrument in each context. The analysis supported internal consistency of the SIMS subscales in each physical activity context and the researchers concluded that the SIMS instrument was a valid tool that can be used to assess motivation in both field and experimental contexts (Standage et al., 2003). The participants completed the SIMS

questionnaire once per week for eight weeks immediately following the completion of the yoga sessions. The purpose was to obtain a profile for each participant over the eight weeks and to use this information to help determine if there were changes in their motivation towards the yoga sessions as well as if their individual response affected their PWB characteristics at the end of the intervention

**Basic Psychological Needs in Exercise Scale (BPNES-Vlachopoulos & Michailidou, 2006).** The BPNES is a self-report instrument designed to assess the perceived satisfaction of individuals' innate needs for autonomy, competence, and relatedness (Deci & Ryan, 2000) in exercise settings. According to Self-Determination theory (Deci & Ryan, 2000; 2008b), the support and fulfillment of the basic psychological needs is essential for motivation and psychological growth. The scale was initially developed and tested on Greek speaking men and women who were regular recreational exercisers. The results supported internal consistency, and test-retest reliability over a 4-week period (Vlachopoulos & Michailidou, 2006). The scale also has been demonstrated to have an adequate factor structure, internal consistency and both discriminant and predictive validity in its English version (Vlachopoulos, Ntoumanis, & Smith, 2010). Researchers collected data from different health center participants across a period of two months and identified cross-cultural equivalency for the instrument, indicating that people from diverse cultural groups (i.e. English and Greek), associated the same items with the same constructs. Stability of scores across time was also found and no alterations that could be attributed to social desirability (Vlachopoulos & Michailidou, 2006). For the purposes of this study, the BPNES instrument was completed every week, for eight weeks after the yoga session. The purpose of implementing this

instrument was to obtain an individual profile of need satisfaction across the eight weeks of the intervention and to use this information to complement the understanding of the PWB outcomes of the intervention.

Figure 1 shows the proposed research design and how it stemmed from the guiding questions, as well as probable research implications that can derive from the completed process such as a deeper understanding of the process. This design may also serve as a possible aid in the proper and culturally responsive design of future interventions for this population and if outcomes are perceived as positive, the possibility of creating more options of mindful movement to improve PWB and physical health for this population.

Figure 2 shows the logic behind the design choice, highlighting in a different color the previous experiences and motives with which participants could have arrived to the intervention, and how this can impact the person's experience and perceived outcome. The emphasis is on how this consideration can contribute to greater understanding of the intervention experience, instead of only following a format of an intervention-outcome measurement. It also shows how the different data collection strategies contribute to the understanding of the moments prior and posterior to the intervention.

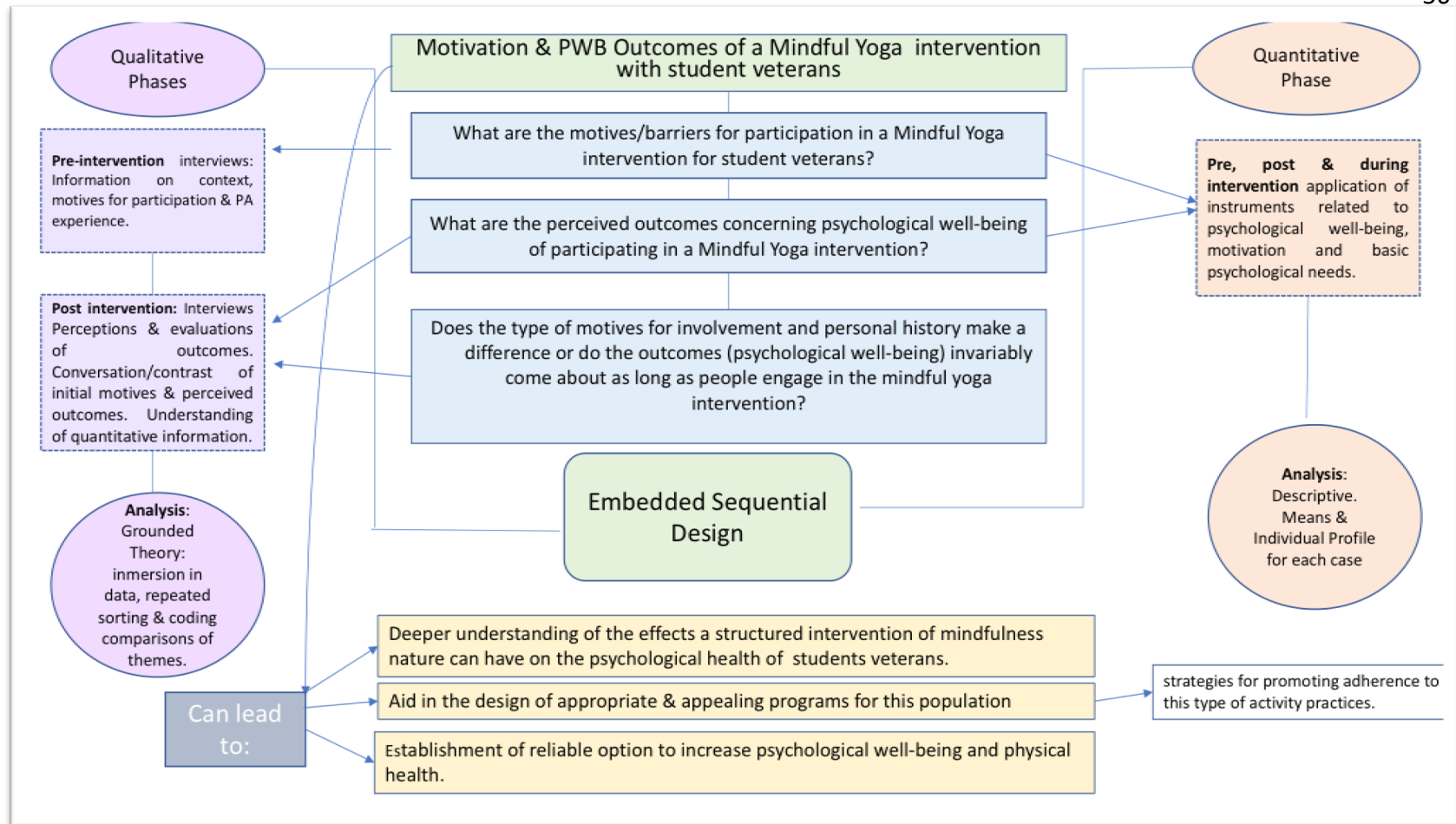


Figure 1. Proposed mixed-methods research design diagram

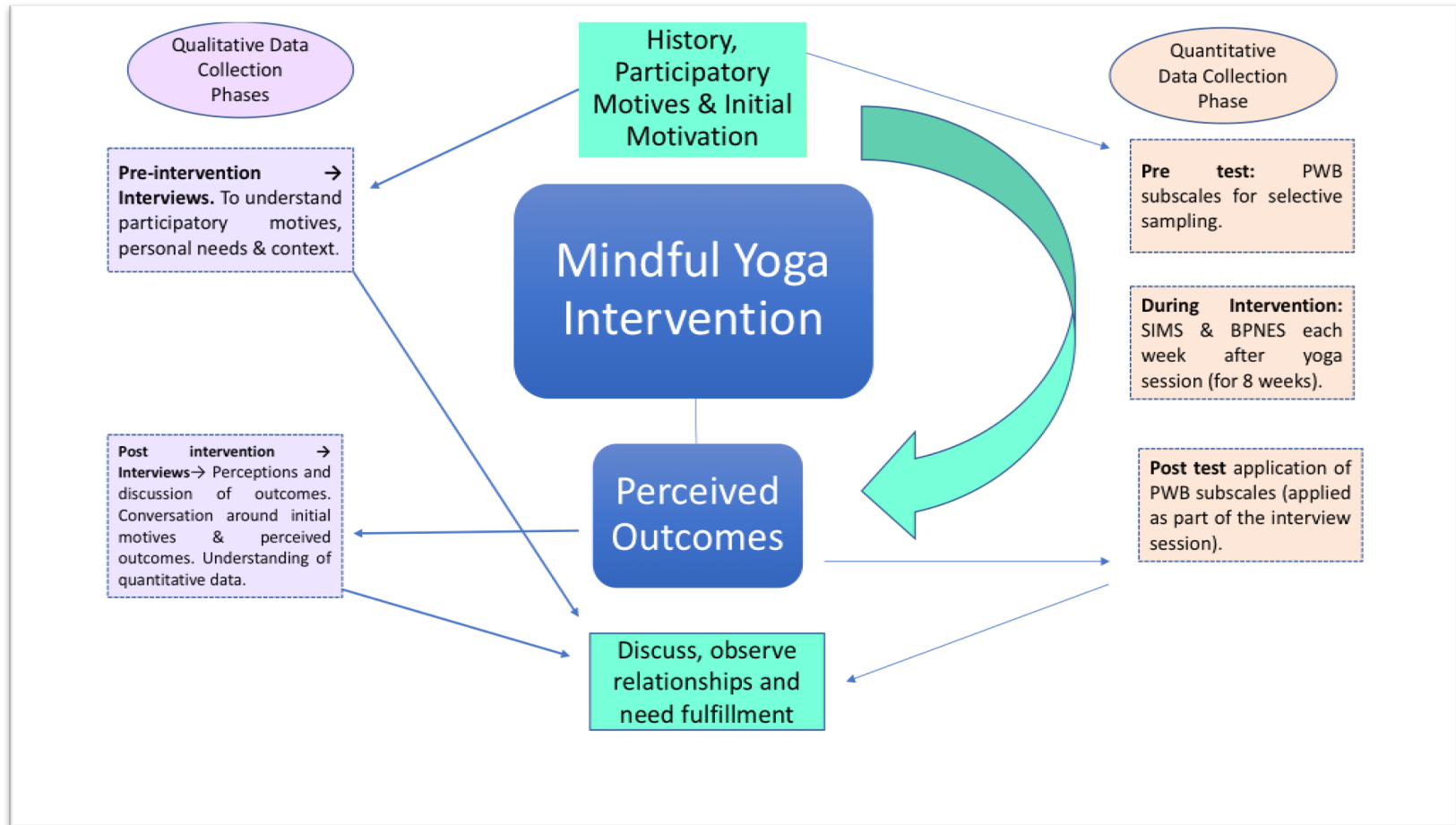


Figure 2. Processes design and information relationships for each phase of data collection

### **Data Analyses**

The main focus of analysis was a case-by-case approach, describing the individual experiences and variations in PWB and motivational characteristics for each participant throughout and after completing the intervention. Interpretation of qualitative data was ongoing during the interviews and involved the preparation of follow up questions and the examination of all the experience in relation to the research goals and questions (Rubin & Rubin, 2005). A formal procedure for the qualitative data consisted of preparing and organizing verbatim transcripts for each case from the interviews at pre-and post-intervention. A descriptive strategy was followed for each case, using a written narrative format for each participant's story, since the overall purpose was to understand the experience of each student throughout the intervention. Quotes and information for each case are presented in an attempt to provide a voice for the participants regarding their own experience.

The researcher also identified common themes across all participants' narratives. Transcripts were also peer checked to identify and validate the theme findings across all seven cases. The descriptive approach was used to identify and explain the perceived outcomes of the intervention and to link it to the quantitative descriptive information as well (Yin, 2003). Descriptions also included verbal transcripts from the conversations with the participant, nonverbal communication perceptions and notes taken by the researcher along the interviews.

The quantitative data and the narratives were then examined in relation to Self-Determination Theory (Deci & Ryan, 2000, 2008b) and Ryff's (1995) theory on psychological well-being. This framework guided the data collection plan, so it helped

to organize and focus on relevant information, highlighting how each participant's experiences confirmed or diverted from theoretical propositions. Additionally, the use of this theory helped to expand the understanding of outcomes for each case and the relationship between the factors unique to each case.

Finally, there was an examination, guided by theory, across the multiple cases, to identify patterns or themes that emerged. This phase required a process of revising and condensing the text transcripts for salient categories of information (Creswell, 2007). Analyses across cases can strengthen findings, whether these refer to commonalities or individual discoveries.

In an embedded mixed methods design, the premise is that a single data set is not sufficient to answer all the questions or inquiries that are being researched (Creswell, 2007). In this study, quantitative data obtained from the questionnaires served as a source of expanding the information from the narratives to the theory, and how it contributed to the understanding of each individual experience.

Quantitative data was used for descriptive purposes only. A profile of motivation levels and basic psychological need fulfilment was generated for each individual case. Knowledge obtained from the questionnaires and any variations or tendencies in motivational characteristics and need fulfillment that can be inferred were used to gain further insights into the understanding of the participants' experience and their PWB outcomes. The use of validated instruments provided an opportunity for a better understanding of the nature of this population in relation to the measured variables and served as a reference point for similar studies that have been conducted. It also provided

insight for future directions and implications regarding PWB measurements and possible future program designs.



## CHAPTER IV

### RESULTS

This chapter presents the findings in relation to the principal research questions of this study. The first research question was focused upon gaining a greater depth of understanding of the effects of mindful yoga practice on the psychological well-being of student veterans. A follow-up question was to examine the role of motivational variations and characteristics on the perceived PWB outcomes of the participants.

The psychological well-being outcomes were assessed through narrative interviews conducted at pre and post-intervention, as well as through Ryff's PWB Scale (Ryff & Singer 2006,), also applied at pre and post-intervention. Narrative interviews were conducted as a means of gaining depth of understanding into the participants' experiences of mindful yoga practice. A narrative has been described as a type of qualitative design in which written text is used to provide a chronologically connected account of actions or a series of actions. Connelly and Clandinin (1990) emphasized how "humans are storytelling organisms, who individually and socially lived storied lives", therefore narrative inquiry could be understood as the study of how humans experience the world (Connelly & Clandinin, 1990).

The Psychological Well-Being Scale (*PWB*: Ryff & Singer, 2006) was sent to all 533 student veterans who had been identified by the Veteran Services Office at the University of Northern Colorado. From this population of potential respondents, 46 people completed the survey and 13 expressed an interest in participating in the study.

7 of these individuals participated in the 8-week yoga intervention and full research protocol.

The response rate to the recruitment effort can be understood in relation to what Parks, Pikowsky and Hayes (2014) discussed about how student veterans may tend to avoid identifying themselves as military service members because they want to pass unnoticed in their process of trying to successfully integrate into the college setting. Some do not want any extra attention because they have served or are purposefully trying to leave their military identity behind and would prefer to be treated like a regular student. Other students do not want to have to live up to cultural expectations of what is depicted in popular culture as stereotypes of military members.

The narratives of the seven participants' experiences are presented in this chapter, describing their experiences prior to, and after, the 8-week yoga intervention.. Individual profiles for weekly Situational Motivation Scales (SIMS- Guay, Vallerand, & Blanchard, 2000) and Basic Psychological Need fulfillment (BPNES-Vlachopoulos & Michailidou, 2006) are also presented for each of the participants, as are results from the PWB subscales pre- and post- intervention. Each case is presented individually and common themes across the seven cases are presented at the end of this chapter.

### **Narrative Summaries**

#### **Anthony**

Anthony (he/him/his) is 24 years old and began the intervention as a junior in the Nutrition & Dietetics program at UNC. At the end of the yoga program, he decided he wanted to change his major to Political Science or Philosophy and was currently in the process of figuring that out.

Anthony grew up in California and remembers moving around a lot with his brother, sister and his parents, who are from Mexico. His moving continued when he was in the military as well. Anthony served in the Air Force for six years and was deployed to Korea and England, and ended his service in Nebraska. When talking about his service he joked about how the best part was finishing his obligations, and then he explained that his military job taught him what he didn't want to be and made him realize he needed to choose another career.

...being in a job I really didn't like taught me to be constantly looking for what I wanted to do while I was there and at first I had thought about staying in the military 20 years, but I would tell myself I would only do it if I changed my job, and I was attempting to change my job and it wasn't going to work out. The job opportunities that I had to change to would be maybe be similar as bad as that one or not the direction I wanted to go so I decided to just finish it and pursue my education which is why I started the military in the first place.

After completing his service, Anthony mentioned it was hard to experience the lack of structure he was used to having in the military. He commented that he needed to find activities and how he got a dog and a "civilian" job to help him fill his schedule but still found civilian life to be very unstructured.

I always had something I had to do and our lives are like pretty structured in the military. We have an organizational structure and also have to live by their military lifestyle. There's always someone telling us what to do and now I had a lot of "freedom" to do whatever I wanted to do and at first I was like, 'I don't know what to do with this'.

Anthony explained that he experienced this constant structure as “pressure” because he never really felt that he left his job or his identity as a military member during his service:

...there was something like a task that I was always supposed to be doing or some kind of role that I was always supposed to be playing. Because at any time during the military you might go home for a while from work but you had a task or a role that if something happens you know you were supposed to do or get your things together and go.

He explained that he perceives the skills he learned in the military were not particularly helpful for his transition back to college, because his job was more “hands-on”. He chose the Nutrition and Dietetics program due to a personal interest in health and as a way to influence others to be healthier as well. He had considered the Sport & Exercise Science major to be aligned with his career choice as well but wasn’t sure his injuries would allow him to be physically active all the time. However, he enjoys physical activity and tries to stay active regularly.

I have an injury in my back and I feel like I have to lay down. My back needs to not have any weight on it. So during those times I usually still work out but I might go and lay down more. I also like to go on the pullup bar and just hang to like decompress the spine. Other barriers, I think time is my biggest barrier, because I end up needing to do homework or I need to do some kind of event or something and that takes up a little more time... but I’ve been able to keep a very good schedule.

Anthony shared that he had some experience with yoga before joining this study and he had a positive experience through this experience which contributed to stress reduction and feeling that he was in the present moment when he first departed the military.

I've done some yoga and did practice some meditation. I did more when I just got out of the military because I had a little more time on my hands and also because I felt some stress because I was constantly thinking of, 'what do I do now?' and yoga helped me pull myself back to being present instead of being scattered in all these thoughts and stressors.

His expectations for participating in the study were to have a consistent yoga practice and a structured time set for it. He attended sessions consistently throughout the 8-week period and over the time in between sessions he commented on how he had started to practice meditation and had become more aware of the way he communicated his thoughts and feelings to others. Anthony experienced benefits from the yoga practice that extended beyond the physical aspect. In our interview session after the intervention, he emphasized that he gained greater capacity for present moment awareness and that had been an important takeaway from the experience.

...usually it [the yoga class] would be right after my class and sometimes I would have something afterwards, and it just helped me realize that whatever I'm doing it's just what I'm doing and I should just enjoy it, instead of trying to get through it and rush through it to get to something else... and maybe something had started at the beginning of the week, like for example my tuition stuff that wasn't being paid for a long time and I would worry about it and I was

talking to the VA and the Registrar's (Office) and I was keeping my mind on it every week or every day sometimes, but when I went to yoga I felt like "ok I'm doing what I need to" and felt a lot better.

Anthony expressed how this awareness of the present moment was different than what he experienced in the military. Although the military service has a detail oriented philosophy, it didn't apply to everything. For example with the physical training, which pushed him to go past his physical limits and not really be aware of them.

In the military they say to 'pay attention to detail' and they push you to that.

However, they don't do that physically, because physically they just push you.

So this [the yoga] was really good, because we were doing the opposite, we were paying attention to our body and everything, which is something that the military pulls away from you.

Another aspect from the yoga intervention that Anthony discussed was how yoga practice was beneficial for overcoming the need for authority and structure that seems normal to the military population. He had described this lack of structure or purpose as one of the greatest challenges in the pre-intervention interview and he found that yoga helped him understand that he had autonomy over his health and life choices. He emphasized learning how to appreciate his current situation without thinking about being ready for the next task.

I really liked the idea of being present and being mindful, because when I got out of the military I had this feeling of how I was supposed to be doing something, not having someone telling me what to do or that mission from the base, or task or anything. This [yoga] helped me realize that I'm here and it's up

to me what I want to do. It showed me I can pursue improving my health, practicing that and just practicing enjoying what I'm doing. Whatever that is, be ok with it.

Additionally, he commented on how he believed that it was important to make his health a priority, which could be something easy to neglect. He perceived that other veterans also struggle with this issue as military service is all about serving others and not oneself. He commented that the yoga practice could help other students like himself bring awareness to their body and their health.

I feel that most veterans have that same mentality of not taking care of their body, they're more about having to do things, one after the other, getting money or that, because in the military you have a task to complete, a mission, and that's your goal, so your health, even though you might want to think about it, you don't always have a chance to work on it, because you have to get ready for one thing or be on call, so you put yourself last.

Anthony reported that practicing with other student veterans was a positive outcome of the study. He is very social by nature and enjoys meeting new people, but he expressed that sometimes in other settings he did not feel that there is time to connect with people on a deeper level. Knowing some of the people he was practicing with during this intervention helped him feel more comfortable and inspired.

It's important to create a space you feel comfortable in. I know sometimes I go to a class and may talk to others a bit, but it might not be in depth, while if I'm more comfortable with the people it might be more likely to happen and to encourage me more.

When asked if he would be willing to continue with the yoga practice after the study was done, his answer was a definite “yes”. The regular practice helped him set weekly time aside for yoga, which was one of his initial goals and he expressed a desire to continue.

Eventually I felt better and better and less stressed from when I first started practicing and towards the end, and I’m just better at how I do things so I think I should continue to practice yoga.

For Anthony, seeing his own progress, both mentally and physically, motivated his persistence in the program.

I think that doing it every week, and being able to see, like, specifically with the handstands, but with any exercise, just getting better at it or being able to see or be more mindful of how my body is. And realizing I didn’t know I could do it this far, and then try for a little more, or doing the breathing better so I’m not feeling pain or I’m not pushing it...at first I would push it as far as I could instead of like releasing into it and that was something that I learned, so it was something that I started to practice and it felt a lot better. Doing it every week helped me with that.

He perceived the sessions to also help him manage his schoolwork and stress. Feeling grounded and more relaxed were part of the effects he felt after the yoga sessions. He described looking forward to the sessions every week:

I enjoyed it a lot. It’s something I really wanted to do. Do yoga very routinely and I enjoyed it a lot and looked forward to it and just felt great to kind of, like if



I felt all over the place or kind of uneasy, I went to yoga and did this and afterwards I just felt good.

Finally, Anthony described his biggest takeaway as the practice of taking things one day at a time. He also searched for more information, found books on meditation and tried to continue the practice outside of the yoga sessions as well. He said he would recommend other students like him to try or start a yoga practice, as he had seen the benefits in just eight weeks.

My biggest takeaway is to do things little by little and also be present. That's really big. I felt like before, I was looking forward to things and not enjoying what I was doing and I was going through days to get to something else. Now, I've enjoyed things more or been more present instead of being distracted and taking care of things better. I appreciated the space, the study and I think it would help veterans a lot.

### **Psychological Well-Being and Motivation Descriptive Results for Anthony**

The purpose of collecting data from the PWB (Ryff & Singer, 2006) and motivation (reference the specific scales) scales was to provide additional descriptive information about the participants' responses to the yoga practice. Scores on the PWB scale were calculated pre- and post-intervention and compared. For Anthony, two of the four subscale totals were lower at post-intervention than at pre-intervention: Personal Growth decreased notably (5 point gain) and Purpose in Life decreased slightly (1 point). The Self-Acceptance scale stayed the same with the highest score possible score of 42 and Environmental Mastery increased by 1 point (See Figure 1). It is interesting that the Personal Growth and Purpose In Life subscale scores were lower, since

Anthony's perception of how he became more aware of his self and felt more in control of his decisions. He expressed how this new found autonomy actually helped him counteract the lack of purpose he felt when he had recently left the military.

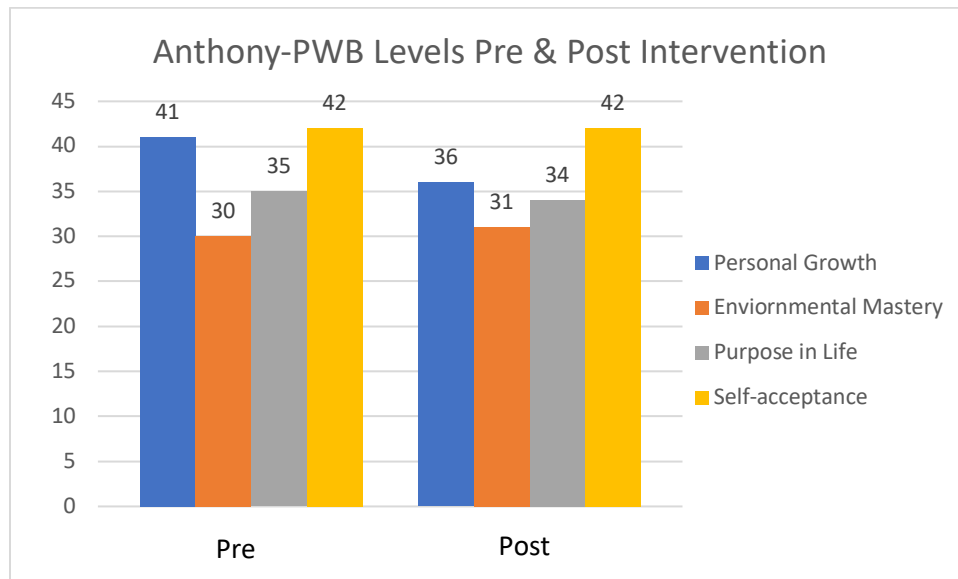


Figure 3. Anthony's Psychological well-being Subscale scores. Pre & Post Intervention.

The Situational Motivational Scale (SIMS- Guay, Vallerand, & Blanchard, 2000) and the Basic Psychological Needs in Exercise Scale (BPNES- Vlachopoulos & Michailidou, 2006) were completed once each week following the yoga intervention. The scores for each of these instruments were calculated as means for assessing change. Anthony's profile for these results across the eight weeks is presented in Figures 2 and 3. Autonomous Motivation, represented by the Intrinsic and Identified dimensions in the SIMS were consistently high throughout the eight weeks, and Controlled Motivation, represented by the Extrinsic and Amotivation dimensions were consistently low. Extrinsic motivation dropped at Week 3 and stayed at the lowest score of 1 along with amotivation for the rest of the program (Figure 2). This profile exemplifies a highly

autonomous motivation for Anthony across all sessions, which is consistent with his narrative regarding the experience.

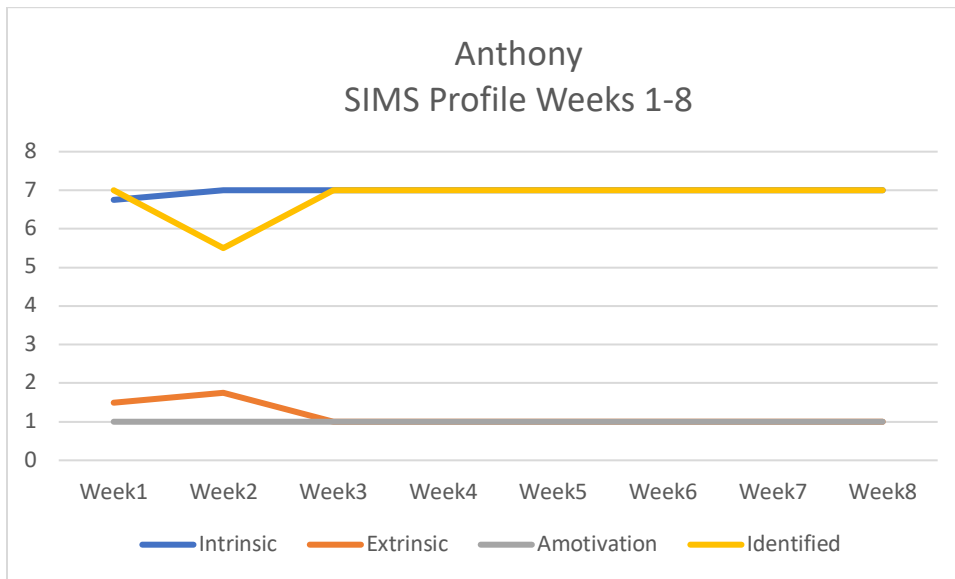


Figure 4. SIMS Profile for Anthony. Weeks 1-8.

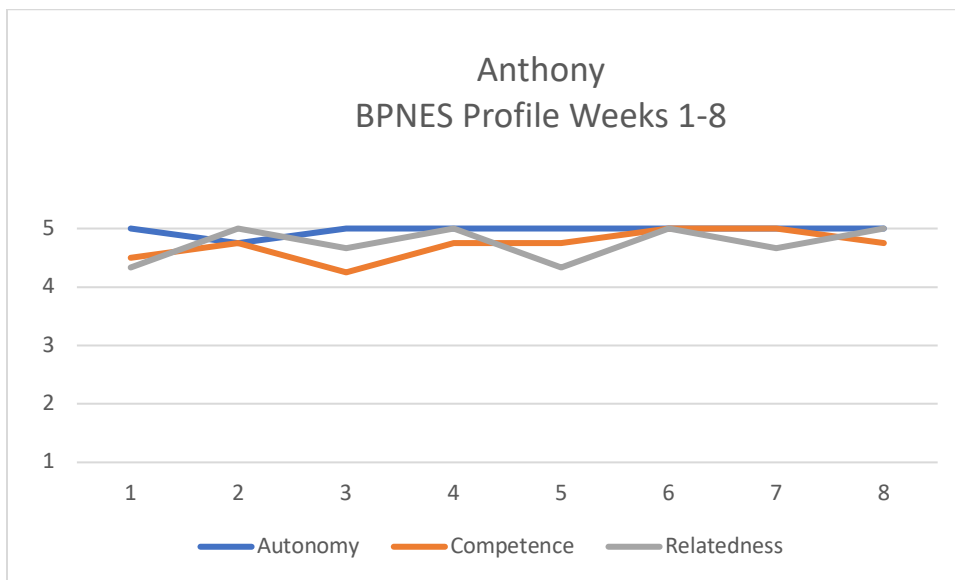


Figure 5. Basic Psychological Need Fulfillment Profile for Anthony. Weeks 1-8 of Yoga Intervention

All three basic psychological needs were in the “high” range, with the lowest score being 4.25 on a 1-5 scale . The fulfilment of the need of autonomy was the highest

throughout the eight weeks, which corresponds to Anthony's understanding of how he was in charge of his decisions, and didn't need to get orders from others. Feelings of competence dropped slightly but increased again after Week 3 (Figure 3). He mentioned he had an injury during this week that made the practice of some postures challenging, however he found awareness during this process and modifications to continue and expressed experiencing benefits through the challenge as well.

I had a toe injury and I could feel it in my downward dogs and I used to hop up, but then I started walking up... and even then it was good. It was working around it and doing it differently.

There were small variations in relatedness scores over the course of the study. Overall, the enjoyment Anthony described aligned with the descriptive data obtained through the scales regarding motivation and basic psychological need fulfillment.

### **Tom**

Tom (he/him/his) is a 26 year old senior student in Sport and Exercise Science. I met Tom while I was an instructor of the Motor Learning and Development class and found him to be a serious, quiet and very responsible student and he also came to a couple of yoga classes that I taught at the Campus Recreation Center. I later had a chance to see him more frequently at the Veteran Services Cottage at UNC, where he also kept to himself before he decided to participate in this study.

Tom was raised in Houston, TX and moved to Colorado with his family around 2007. His father was in the oil industry and his mother was a stay at home mom or as Tom says, did "mom things and took care of us". He joined the Marine Corps at age 19, in 2011, and served as an infantry assault man. He did a couple of deployments

including Okinawa and Australia, but describes it as “nothing crazy”. He emphasizes it was a rigorous and physically demanding job “running around, digging holes, carrying weight, stuff like that” which was sometimes hard to handle, but also, an experience that made him better.

...a lot of it was just, you know, your typical military stuff like getting yelled at, staying up late, being in a hole at 2 am on a Saturday in the rain, it's not really exciting. Or getting up at 4 am to go hike for 10-15 miles is .. it's just a real bummer. Not something you think as a great idea or as “I'm so glad I signed up for this”... But still, it was definitely a good thing. It was definitely, instrumental in the way of how I see things now. It was challenging and there was this kind of like suffering but then you look back on it and its like, “you know that wasn't so bad”. It made me kind of better and made me develop kind of an appreciation for the suffering I guess in recognizing that its helpful, it makes you better.

In 2015, Tom left the Marine Corps and became part of the National Guard, working as an imagery analyst, which he perceived as less demanding, and then he left the service completely and enrolled in school for a Sport & Exercise Science major. He perceived his time in the military as helpful for his return to civilian life and his transition to college, because it gave him perspective on sacrifice and achievement and a healthy competition or drive to want to be better.

Kind of being in that environment (the military) where you are surrounded by people always trying to be better. This kind of competition and that drive has helped me be as successful as I am. Just trying to always be better and learn more. And then recognizing that you might have to be uncomfortable and need

to sacrifice a little bit of comfort to achieve what you want to, but at the end of the day and in the long term, that achievement is going to be more satisfying than in the short term.

Tom also stated that another source of his current motivation stemmed from his desire to avoid falling into the stereotype of the veteran who never moved past his military identity.

Like the whole 'homeless veteran' thing. Not that I anticipate being that but going down that road, being the veteran that only talks about what he did 10 years ago and hasn't done anything since. There's kind of that drive to NOT go down that path.

The military lifestyle was also an influence for Tom in choosing the career path he is now pursuing. His interest in the study of sport and exercise science started more as a desire towards getting stronger and in better shape, since the infantry is an environment where weakness is frowned upon. He didn't expect the training in the military to be as hard as he found it to be and noticed that there was also an utility component to being stronger, which he mentioned a couple of times during our first interview:

People can't depend on you, to get them out of a dangerous situation or something [if you are weak], so its kind of looked down upon". "There's a quote that says, "stronger people are more useful and harder to kill" and that kind of just stuck with me.

He had an idea that the military was not going to be his career path for life and helping others with strength and conditioning seemed like something he would like to

do. However, recently his interest has shifted away from sports and more into a preventive and health-related approach to physical activity. Tom's goal now is to get into Physical Therapy School after he graduates.

I have become less enamored with sports and things like that and I'd like to do something that's useful, something that I can look back on and be like, "you know what I did was something meaningful and useful". So then I kind of changed gears a little bit and go into physical therapy, so that's my goal right now, to try to get into physical therapy school after this, go do that.

Tom enjoys practicing regular physical activity and lifting weights, since he values the utility value of staying physically strong. He also admits there's a small aesthetic component that he admires in weight lifters, and would like to achieve as well. He has made physical activity a priority and given it a place in his schedule so that he stays consistent. His drive to continuously improve and learn keeps him motivated to stay active as does the fear of regression and losing the capabilities he has now. Keeping in touch with his military friends helps him keep a fresh perspective thanks to those who are doing well and those who not so much.

He had tried a few yoga classes before his participation in this program, and pointed out how the challenge of a different type of movement was interesting to him, as were the mental components of being present and relaxing. He also felt motivated to help out with the research.

...just the idea of putting myself in a different experience and different movement patterns I guess. Balance stuff and reinforcing better breathing a well

as kind of the relaxing aspect of it also and the being in the moment is kind of appealing to me.

He explained he didn't expect to see many changes at the end of the sessions since he considered himself to be at a good place emotionally and physically when the intervention started. He did however, perceive his experience to be positive and shared his perceived improvements. He also shared how he would like to continue practicing yoga and had some suggestions for the future design of programs.

I thought it was good, I feel like I definitely made some improvements you know. I really think I improved my self-efficacy, and with the yoga, especially some things like the headstands and things like that, that I usually don't do. And like I know yoga is not supposed to be competitive, but I don't know the other gentleman's name who was there... but I think there was a couple of times that I'd think "yeah, I'll probably just sit here" but then I'd see he was going for it and I'd be like "oh f\*\*\*. I gotta try it, if he's doing it, I can". So there was that, it was good. It was also very relaxing, as it always is...I mean the benefits of meditation on like focusing and just kind of dialing in to the present. I think yoga can help kind of facilitate that and in developing that skill, and I think it's something I should probably develop a bit more, because I definitely get away from that and stress about: the future and things like that, so maybe a little more frequency could be helpful.

Tom expressed clearly that practicing with other veterans made him feel comfortable. He also expressed how it helped him break down stereotypes around yoga



and could help other student veterans do the same. He would definitely recommend this activity to others.

Like I think if you were looking to help people in the veteran community or even develop that community, you know, it's useful to be surrounded by people who are like minded and you can then facilitate having that "Veteran Yoga Group". You have the Veteran commonality and we're all doing yoga together. I think another thing, for me, was maybe like a barrier for getting into yoga, was I'd show up to these morning classes and it was just a bunch of freshman girls, which made me a little more self-conscious. I'd feel kind of weird, kind of stick out. So, I think that if it was geared towards just veterans then I think it reduced that barrier a bit...so, like to see someone like me or Markus or Anthony [the 2 other male participants] participating, then that would help draw people in, or people might be more receptive to that.

### **Psychological Well-Being and Motivation Descriptive Results For Tom**

In the initial PWB survey, Tom's had his highest score on the dimension of Personal Growth, with a total score of 40, out of 42 possible. The dimensions of Purpose In Life followed with 38 and Self-Acceptance with 36. Environmental Mastery was the lowest, with a score of 30 (Figure 4). Variations on these subscale scores on post-test were minimal, with a slight increase in the dimensions of Purpose In Life and Environmental Mastery, and decreases in Personal Growth and Self-Acceptance.

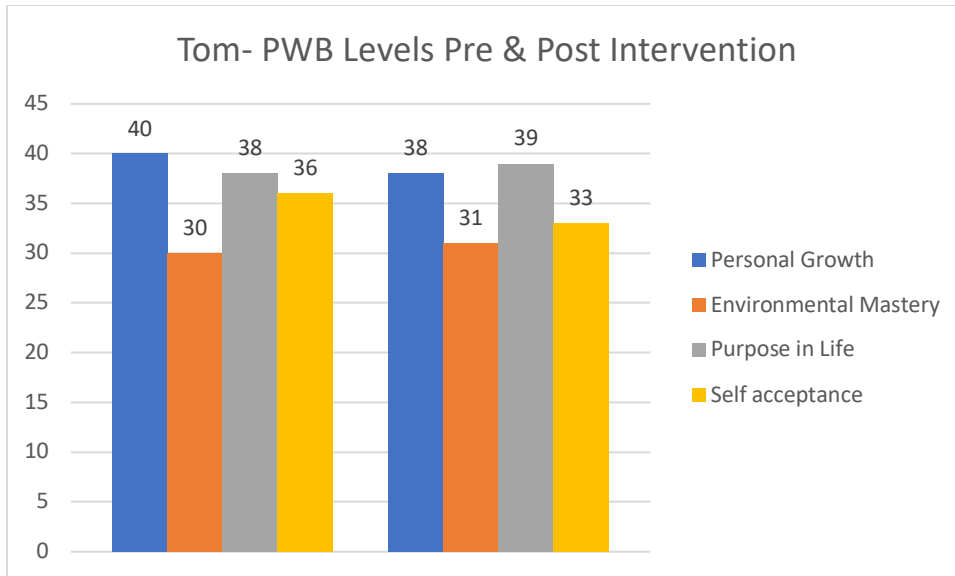


Figure 6. Tom's Psychological well-being Subscale scores. Pre & Post Intervention.

Autonomous levels of motivation for Tom, represented by the Intrinsic and Identified subscales stayed high across all eight weeks of the intervention, with a slight increase in Identified Motivation during Week 4. Controlled Motivation levels, represented by the Amotivation and Extrinsic motivation subscales of the SIMS (Guay, Vallerand, & Blanchard, 2000) decreased slightly for Weeks 2 and 3, with extrinsic motivation staying at the lowest score possible and amotivation having slight increases and decreases (Figure 5). These tendencies align with Tom's narrative that yoga wasn't a priority for him, but he was still committed to the study and enjoyed it.

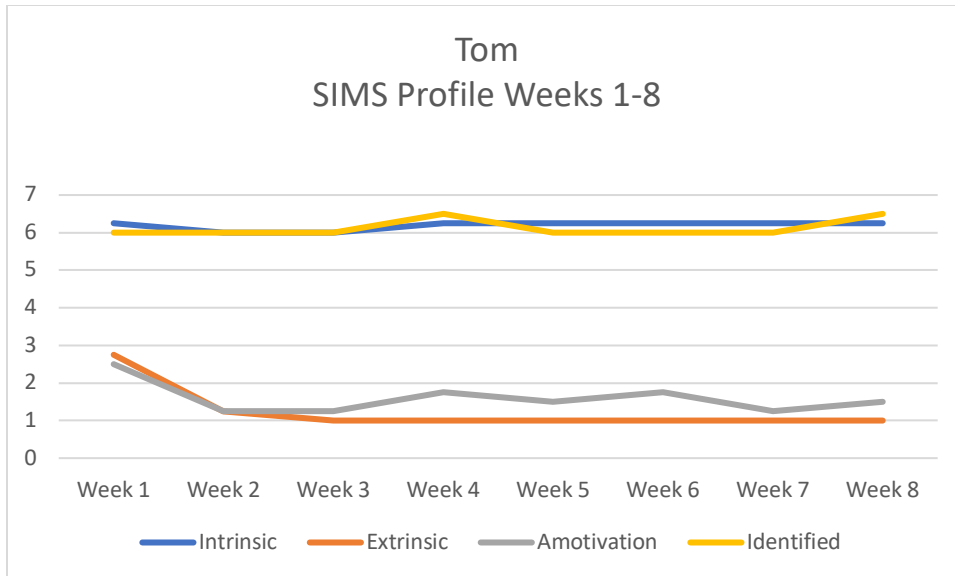


Figure 7. Situational Motivational Profile for Tom's Yoga practice in weeks 1-4

Figure 6 illustrates the profile for Autonomy, Competence and Relatedness need fulfillment levels across the eight weeks of the yoga intervention measured through the BPNES (Vlachopoulos & Michailidou, 2006). Overall, need fulfillment increased during Week 4. Scores for Competence had a steady increase across the 8-week period, which matches Tom's narrative on how he felt he improved in performing the yoga poses and on his self-efficacy. Autonomy increased the most from weeks 3 to 5, and stayed at a mean of 4.75 for the rest of the intervention. Relatedness was lowest at Week 5, which was right after spring break, and increased again slightly for the last three weeks.

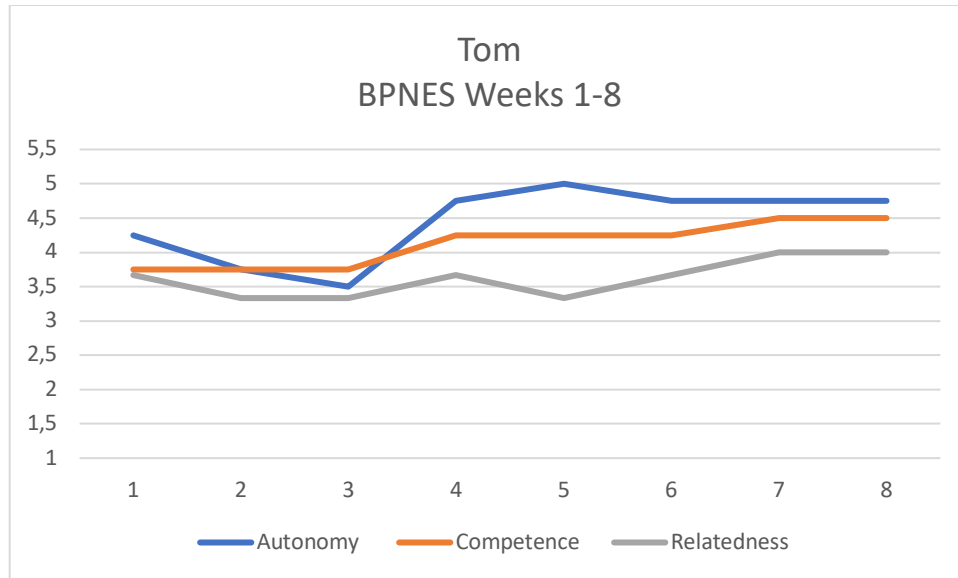


Figure 8. Basic Psychological Need Fulfillment Profile for Tom. Weeks 1-4 of Yoga Intervention.

### Hannah

Hannah (she/her/hers) is a 30 year old senior student with a major in Audiology. She had a degree in Linguistics before she joined the military and she is an outstanding student who recently got accepted into all five of her graduate school program options. Hannah has been recognized on campus on several occasions for her academic achievements and excellence. She was born in New England and shared that she moved around a lot but spent most of her time in Connecticut.

She explained that she joined the military “on a whim” mostly because she was out of money and then served in the Navy as a linguist for 6 years. She spent this part of her life mostly in California and Georgia and left the service to come back to school.

Hannah expresses a sense of happiness that the military service is over, but also recognizes she appreciated the sense of purpose and belonging it gave her while she was a service member.

What I enjoyed the most was that sense of purpose when I went into work every day, um kind of that sense of community. I had a tight team that I worked with on day shift and night shift, through good times and bad times, and we went through a lot together so I felt like I had a good connection to the people I saw every day. I didn't necessarily like them but I did feel a good connection to them and I felt like what I was doing was important. So even when I didn't want to go into work someday, I knew I needed to... and being needed is really nice you know.

The greatest challenges Hannah experienced during her military service were related to the secrecy and high pressure she felt constantly in her job.

A big part of my job was working with intelligence, so everything I worked with was top secret so I couldn't go home and talk to my husband about what I did that day or if I had a really bad day and everything went sideways then that just has to sit in here [points to chest] and that's where it [strong emotions] lives..

Regarding her transition out of the military and her return to school she expressed that it helped her with actual schoolwork and tasks but not necessarily with the social experience.

...I do think it makes you a different kind of student. For the language training I received (in the military) that was an intensive school based experience. I was 9 to 5 in school every day, plus a few hours of homework plus PT and stuff and all

that, so I was prepared for an intensive learning environment. And then I show back in undergrad and I'm like... I'm what the kids call "extra".

Choosing her career path was definitely influenced by her military experience, both because it made her aware of health needs, but also because she was sure she did not want to stay in the military longer and wanted a different path that would make her feel better, while also feeling she was doing something meaningful.

I knew speech pathology was a field but I didn't know anything about audiology and then I started to see other service members with hearing aids from noise exposure and stuff and I just got interested in it...also I thought I'm not happy with what I was doing now [military] and I know that I could stay here and make money and stay on as a contractor and keep doing what I'm doing for a lot more money but I didn't like the person I was becoming if that makes sense... so I thought how can I get back to the person I was before all this and enjoy my life. Which of these tracks appeal to me and I saw speech pathology and audiology and thought, 'I could do that!'

Her previous experience with physical activity included running and hiking, which she described as stress relieving avenues. She was captain of a running team in the Navy and has tried to stay with this habit, even if time or school duties make it challenging. While she had no formal yoga experience, she had practiced mindfulness in the form of meditation when she was in the Navy and had found this practice to be beneficial for her anxiety and sense of well-being. She also expressed how meditation gave her the awareness to realize that meditation was something she needed in order to really take advantage of the mindful experience.

Meditation actually really helped me realize that there was like a barrier that my brain just couldn't overcome and that pushed me to seek meditation, which made my life so much better. The meditation just gives me a chance, like that extra moment to take a breath between and exciting event or something ...that reaction period. It gives me an extra moment to let the mindfulness practice intervene.

Her expectations for joining the program were to return to that practice of mindfulness and to, hopefully, make a habit of it again. She felt having this responsibility of being part of a study would help her stick to the routine and it did. She emphasized how the structured time helped her be consistent with her practice, but also discover how she could overcome any barriers she had thought of in order to include PA in her weekly schedule. She also explained how she had enjoyed and even rediscovered the enjoyment of group format classes.

I forgot how fun it is and how much I enjoy it and that it's worth the slight hassle of having to prepare and like for example bringing a towel to shower and packing a bag, I realized I was just making excuses. It really isn't that hard.

Hannah expressed how practicing with this group of student veterans, most of whom she knew through the Office of Veteran Services, had made an important difference in her sessions. The social component became a priority and a source of enjoyment for her. She also credits this program with sparking her interest and confidence in signing up for yoga classes at the Campus Recreation Center.

Well, I really enjoyed it, it was a nice kind of structured way to not only exercise and get some refreshed energy, but also to get to see a bunch of people that I

liked... Sometimes you can fall in a trap in group classes of comparing your progress to the other people in it and maybe it's just where I am in my time in life, or maybe it's the group that we were in, that was totally not an issue. We were all just kind of doing our own personal best and not there to compete, just there to like be doing it together, which was perfect for me. I was with people I felt absolutely comfortable falling on my face on, as I did frequently.

For Hannah, the yoga practice was something she took with her outside of our sessions as well. She practiced the physical postures, letting me know she had completed 100 sun salutations once, but also practiced the mindfulness components. She expressed that the sessions helped her to manage anxiety situations related to both academic and social situations.

For me, yoga has never been about the postures. Those are really helpful for getting into the space of connecting your mind and your body and following your breath so that's always been the main challenge for me, and the main lesson to take away too. That sense of presence and connection... and I guess that having that weekly reminder of connecting to your breath and if you need a moment, take a moment, that kind of emotional regulation definitely helped with some of the stressors of the semester. For example that was definitely in my brain before I did my presentation at the conference and just honestly remembering to breathe during my presentation helped a lot.

She expressed that, in her opinion, other student veterans would definitely benefit from this practice. She once again highlighted the community aspect of this particular program as well.



Absolutely. On every level, all of us have knee pain, all of us have bad backs. Even if you don't get into the headspace where you are connecting with your breath, or where you're doing this for you, at least do it for your joints you know? And yes, it gave me the confidence to go and participate in yoga with other groups, and that's still fun, just not as fun as doing it with my buddies.

### **Psychological Well-Being and Motivation Descriptive Results For Hannah**

Hannah's PWB profile at pre- and post-intervention showed the same values for the dimension of Personal Growth and a 4 and 5 point score improvement for the dimensions of Environmental Mastery and Self-Acceptance, respectively. The score for Purpose in Life was slightly lower on the post-intervention survey score (Figure 7).

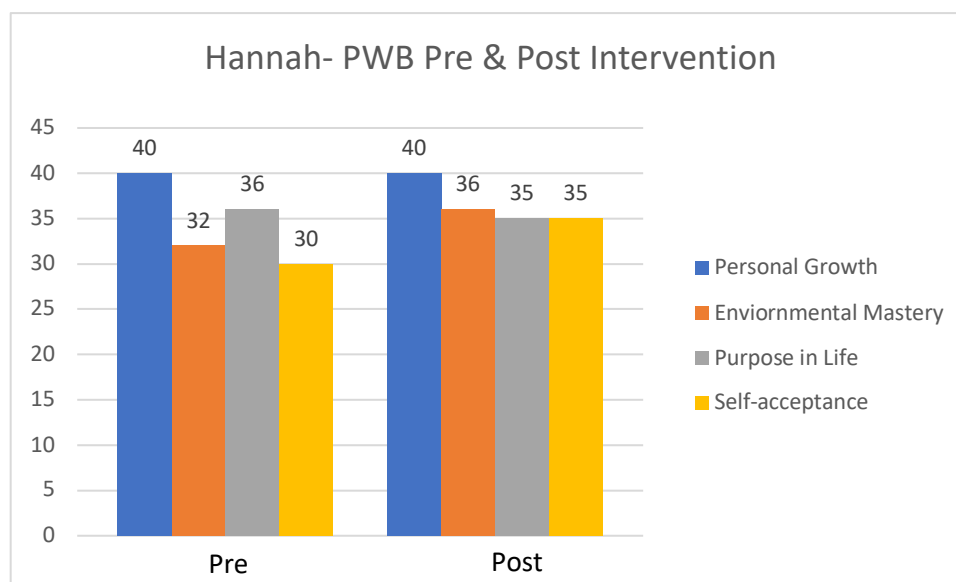


Figure 9. Hannah's Psychological well-being Subscale scores. Pre & Post Intervention

Hannah's profile, measured with the SIMS (Guay, Vallerand, & Blanchard, 2000) and represented in Figure 8, included consistently high autonomous motivation, with both Intrinsic and Identified dimensions at the highest possible score of 7 across all eight weeks. Controlled Motivation was consistently low across all eight weeks, with the dimension of Extrinsic Motivation starting at 2.5 and then decreasing in the first 3 weeks, and Amotivation at the lowest possible score of 1 all throughout the eight weeks.

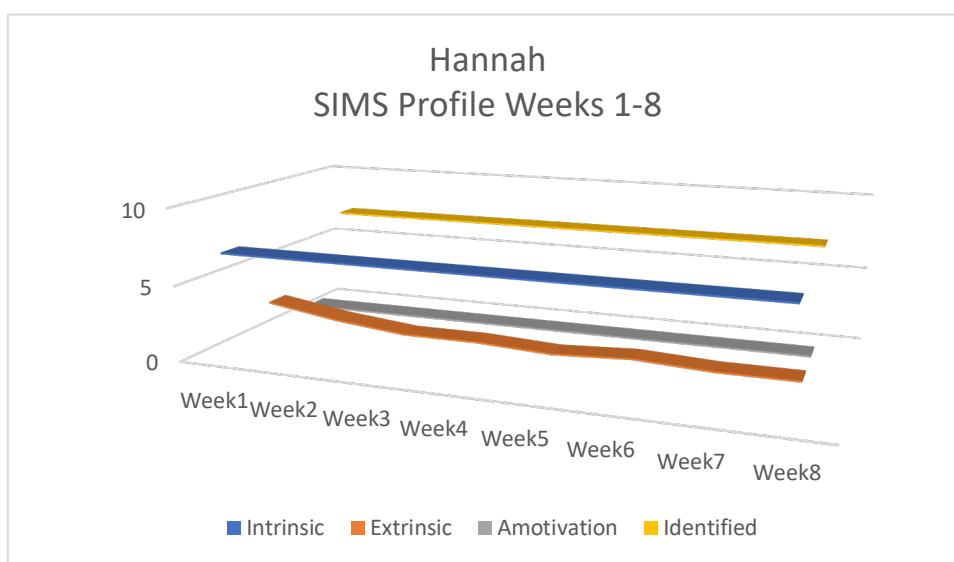


Figure 10. Hannah's SIMS Profile for weeks 1-8

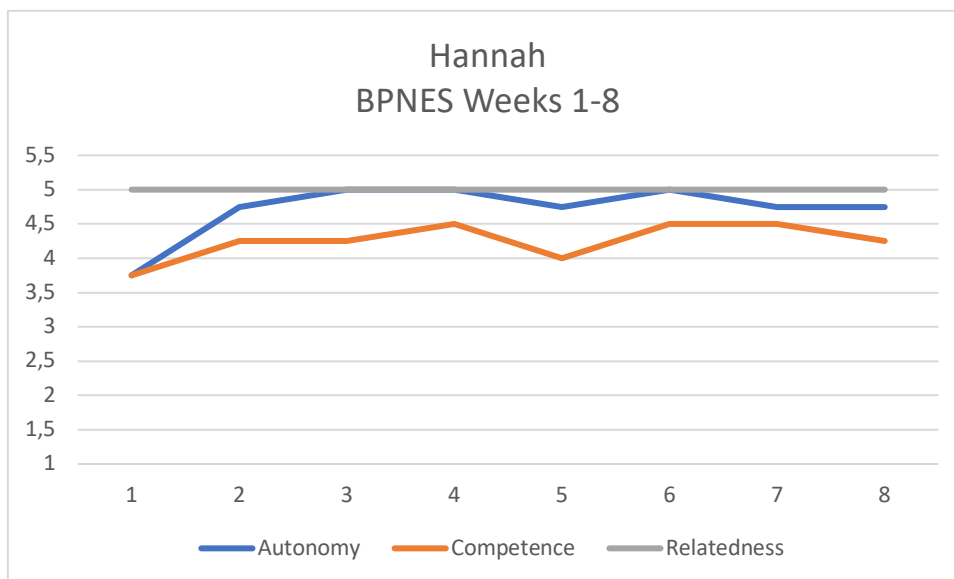


Figure 11. Hannah's BPNES Profile for weeks 1-8

Hannah's Basic Psychological Needs profile, depicted in Figure 9, shows a slight and consistent increase for Competence and Autonomy through weeks 1-4 and then a slight dip in those values during Week 5, which coincided with the introduction of new and challenging postures to the program. Hannah explained that she appreciated the autonomy in having the option to choose how far to go in each practice. She also expressed how she felt competent enough to start a yoga practice outside of her comfort zone. After Week 6, both autonomy and competence went up again, and there were small variations in the following weeks.

A consistent maximum high score across the eight weeks could be observed for relatedness, which matched Hannah's explanation on how the support and comfort she felt from the group was her biggest takeaway and what made a difference in her yoga practice.

I guess I learned it's really fun to do things in groups again. Especially this semester, and thanks to the yoga, it got me to connect with folks outside of work more. I had been kind of reclusive, and for the last three semesters I was just like drive out to Greeley for class and then drive back home. I don't even know anything about Greeley except where campus is, so the value of doing things in groups was a great takeaway.

### **Sienna**

Sienna (she/her/hers) is 25 years old. She is a junior in the Audiology degree program. Although born and raised in California, her family is from India, so she grew up surrounded by both traditional Indian and U.S. culture. Her Indian name means "Princess Warrior", but she has gotten used to having a nickname and feels uncomfortable using her real name. Sienna is the oldest sibling to one brother and two sisters and sees herself as outgoing, very direct, competitive and hardworking.

She joined the Army in 2013 at age 18 and served four years as active duty and then served two years in the National Guard Reserves. She completed all of her military responsibilities in January, 2019 and celebrated her "release". Overall, she has both positive and conflicting memories of her military experience, including resilience and growth outcomes as outcomes from this period of her life.

I realized that I am mentally stronger than I thought I was and I can deal with stuff way better than 18 year old me would have thought. So I think that having that experience gave me, I don't know how to describe it, I think it's not that it has given me a leg up, but it has made me a better version of me for what I'm

doing now, for school and stuff... because yes, school is stressful and it hard, but it's not as hard as having other people's lives rely on you.

Sienna was very vocal about having to deal with high stress and the additional challenges of being a female while in the service, and she also recognized some struggles after her exit, including injuries to her back, her knees and hearing problems related to her job as a helicopter pilot and aircraft maintenance duties.

...I mean I was just frustrated a lot with being there and then just certain situations that I guess is typical, just being one of the few girls in a maintenance job [Aircraft maintenance]. So, there are times when you can't say what you want to say...

She identified some difficulties integrating into the college lifestyle, but also expressed how the Office of Veteran Services on campus has been very helpful for her college experience.

...sometimes I think it's harder to connect with my classmates because I'm older than some of them. It's little stuff, like when you want to get together for studying and sometimes they just want to 'B.S.' and I don't have time for 'B.S'ing... I just want to study. And so I think that makes it a little harder. I mean I still have friends outside of The Cottage [UNC Veteran services] because I'm social but...most of the people that I talk to or that I know are through The Cottage, because I can relate to them, out of life experiences, even though our experiences have been different.

Her military experience and its structured culture and her own injuries may have influenced her current career choice as an audiologist. She initially thought she would go into speech pathology, but then changed her mind.

...because audiology is more of a puzzle, like all the pieces fit, and if they don't fit, you know why they don't fit. It's very categorical and I need structure, and speech does but not when it comes to actual therapy and stuff because every kid is different and ever therapy, result is going to be different. I like more structure than that.

Regarding physical activity, Sienna had tried many types of exercise, including running, CrossFit and some yoga, prior to her involvement in this project. She said she stopped running because she had used it as a coping mechanism while in the Army, so she associated it with that period of her life and felt angry every time she ran.. CrossFit was not enjoyable for her, either, because of her injuries, so she stopped that activity as well. Her experience with yoga had been different because she practiced at home, right after she got out of the Army and explained how the yoga practice made her feel better during this transition time when she spent time in California with her sister.

Going from being active duty and being all sorts of stuff to just being a stay at home caregiver...that was a straight up depressing time. And I don't think I've ever been really depressed, but I was during that time period. I felt like, "What am I doing?"

And that's when I started doing yoga, I didn't like feeling that way [depressed] and I didn't want it to get any worse.

When asked if it was the need for physical activity or for structure or if it was the yoga practice itself that had been helpful for her, Sienna explained how it was specifically the yoga practice that made things better, because it was a mental practice as well and not an avoidance mechanism, but a practice that made her aware of her thoughts and helped her work through them.

I think yoga helps with your mental space. Because I mean, I tried running and stuff, and hiking and I liked hiking but running was obviously not fun. Running helps you get out of your mental space for a bit, but I feel that yoga is one of those few exercise things that helps you change the headspace you have. That's what you need not to get out of it for a while only, because that's just avoidance and I don't want to avoid, I want to work through it.

Regarding her expectations and reasons to participate in this study, she expressed a desire to build a habit and relieve stress from her neck area and also to get stronger physically. She emphasized the importance of practicing within a community she felt comfortable with, which was not something she felt at other recreation or exercise facilities on campus.

It's gonna feel just more if you feel like you can fit in, if you have a community... and going to the rec center doesn't feel like community. But if we're doing a small activity at the cottage or like with other veterans, then that's my community.

Sienna was very clear about her experience throughout the eight weeks and constantly shared how she was feeling. From the first session she explained that she had noticed physical improvements. Her goals for joining the program were met and even

surpassed. When asked about her back pain, she didn't even remember it, and it was something that she used to experience every day according to our initial conversation.

Actually, it [the back] hasn't hurt in a while, I kind of forgot when was the last time it actually hurt. I mean I still have bad posture sometimes because I slouch, but, yeah, my chiropractor was really surprised with how much improvement I had with us just doing the once a week practice, because he didn't expect that to help. But it did... a lot.

We had also talked about how she experienced ringing in her ears, and that also seemed to improve with the yoga intervention. Being an Audiology major, she explained why, and it made perfect sense connecting it to the mindfulness component of being in the present moment.

So that really stopped, well without my hearing aid, the only time I noticed *that* not being a problem was when we were practicing. Because the ringing in your ears is really just your brain hallucinating, it's trying to fill in spots where there needs to be something. My brain constantly does that because I am an over stressor, so that's why yoga really helped with the ringing to not happen, because we were focused on just relaxing or meditating.

For Sienna, adherence to the practice became easy. She made it a part of her schedule, but noticed how she could continue to do it whenever she needed it. She described this as one of her biggest takeaways.

You don't need a lot of time to do something that's going to be beneficial for you overall. That was nice. Because if working out or doing something physically active is not a part of your everyday life then it can be really easy to



make excuses to not do stuff at all. But I think it's so easy to get a lot of benefits with this practice. I can now be like, 'oh I'm really stressed, I'm going to go try this headstand or a something different a couple of times'. And it doesn't take a lot of time but you get better every time you try... and it's too easy to just practice this because literally the floor is everywhere.

Seeing her physical strength improve, but also noticing mental benefits like stress relief kept Sienna motivated. She was able to see improvement in other areas of her life using the skills she learned in the yoga sessions.

It also helps with hockey, which is important to me. All the balance, oh my god, I fall much less now and I still push myself and try to get better but like I fall less. Because like for sports, like hockey, they say that if you're skating you need to have a tight core right? And I didn't really know or understand what that mean until now, until we were doing like the headstands and stuff I understood what that felt like, especially when I was able to do it on my own... it also translates to like other school stuff you know, it doesn't take a lot. You just need a little bit of effort here and there and that still matters, you don't have to like have an hour a day. Five minutes is still better than no minutes... something else I noticed too, I spent way less time being a jerk to myself in the mirror... It's not that there have been a lot of changes physically, but it's just mentally.

Practicing yoga in a small group was also something important for her. She also explained how it had been different from other types of group PA.

Having just a smaller group of people and how we got to know each other so that it's not just... I don't know how to explain, I mean group activities have a

way of making people feel like they're in a competition with other people, whether they want to or not, it's like subconsciously people get competitive. But I think it's less likely to happen if you're doing things in a smaller group and with people that you know. Everyone was just encouraging and congrats, you don't feel like it's a competition.

Sienna was able to make a meaningful connection from the yoga practice to her overall lifestyle. She also expressed that she perceived other student veterans would benefit from this type of activity.

I think it's definitely a good thing because I mean society just tries to break people down as a whole, that's what I feel happens, this social pressure breaks people down and if you find something that doesn't do that but actually makes you feel good about yourself it's going to be a good enough reason to try to share and pass on with other people. People need that, people need stuff that makes them feel good because there are many many things that make people feel bad about everything; about who they are, how they look like, all of it.

### **Psychological Well-Being and Motivation Descriptive Results for Sienna**

Sienna's PWB scores, depicted in Figure 10, remained the same at pre- and post-intervention for the Personal Growth dimension. The most noticeable change was the increase in the Environmental Mastery subscale score, with a 6 point difference from pre- to post-measurements. Self-Acceptance scores increased slightly and Purpose In Life decreased slightly at the post-intervention measurement.

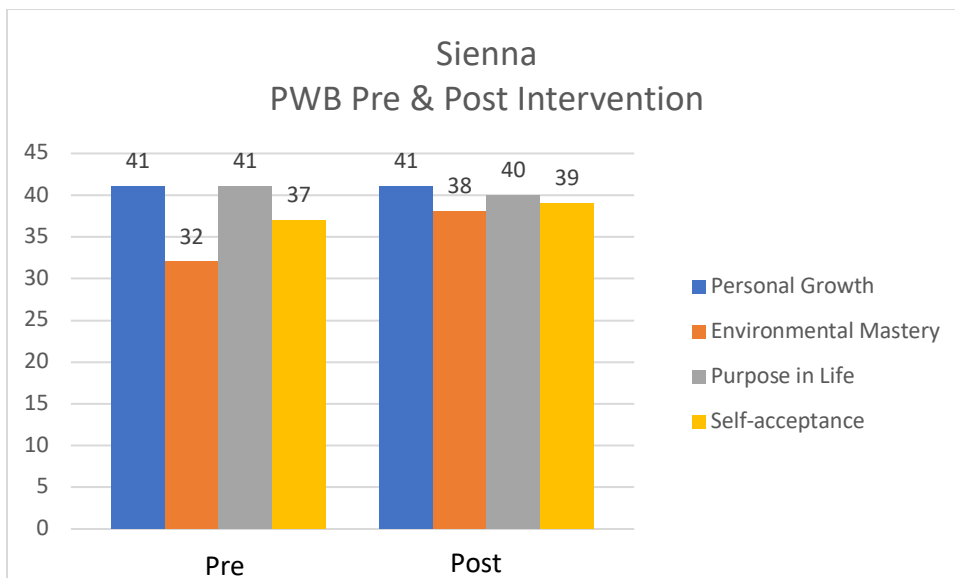


Figure 12. Sienna's PWB Scores Pre & Post Intervention

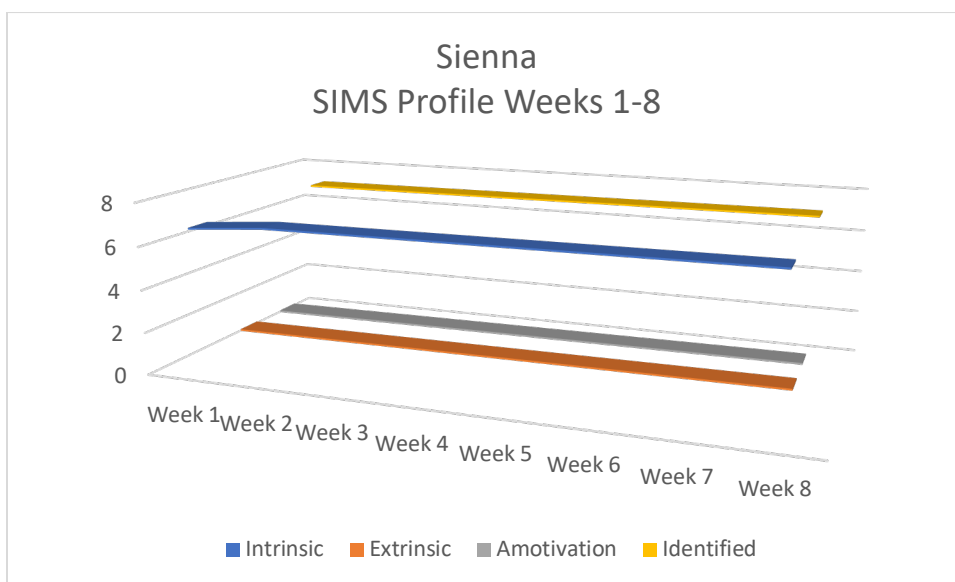


Figure 13. SIMS Profile for Sienna. Weeks 1-8

Sienna's motivational profile stayed consistent throughout the eight weeks, with high scores for autonomous motivation and low scores for Controlled Motivation.

Intrinsic Motivation remained relatively high throughout as seen in Figure 11.

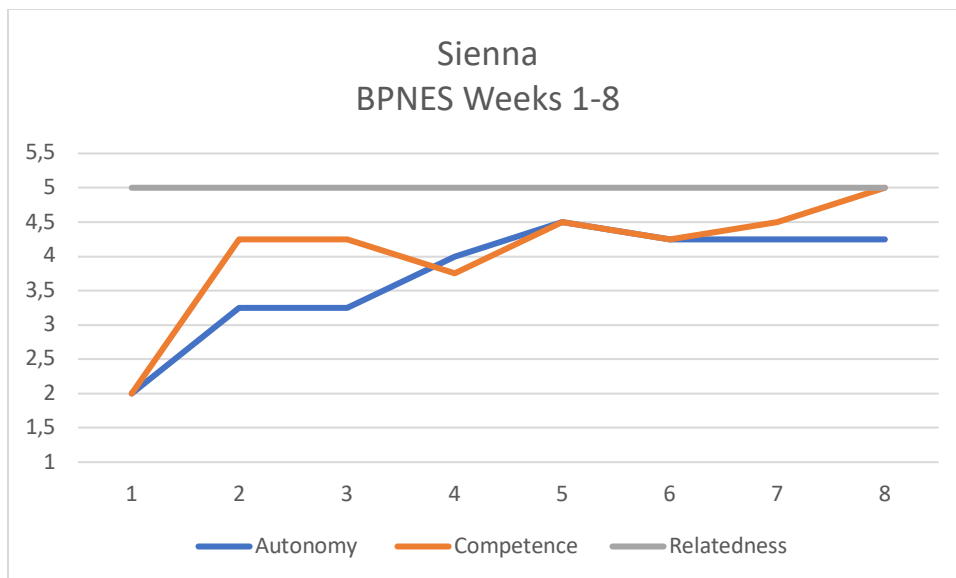


Figure 14. BPNES Profile for Sienna. Weeks 1-8.

There was a noticeable increase in both the fulfillment for the needs of autonomy and competence for Sienna, as can be observed in Figure 12. This increase was evident in Sienna's behavior as well. She constantly commented on how she was proud of how she was that she was getting better and shared her excitement around her progress with me and the other participants. Relatedness was at the maximum score all throughout the eight weeks, which also matched her comments on how practicing with veterans made her feel like she belonged in this environment.

### **Amanda**

Amanda (she/her/hers) is a tall, 29 year old woman with long dark hair, which she explains, comes from a family composed of mostly women. She is a junior with a major in Sport & Exercise Science and also a Certified Nurse Assistant (CNA), working at the local hospital almost every night after school and on the weekends.

She was in the Air Force from July 2008 through November 2013, which she explains was a departure that was a little earlier than anticipated because the Air Force

was cutting back on personnel and she had expressed the desire to go to college, so they came to an agreement and let her out early. She has a very positive perspective of her military experience, expressing it taught her respect, stress management skills and it helped her mature.

Before I had more difficulty with it [stress] and now I can look at things and think, 'I should not get stressed about this because it's not as important as ... what I had to do while in the service'.

She explained that her time in the military helped her become very organized and how it made the transition easy, helping her with class registration and paperwork. However, the transition to civilian lifestyle was more challenging, especially the lack of structure she perceived in others. She said that trying to put herself in other people's situations was helpful, but still a struggle.

I guess you are so used to that specific culture, and people think differently in the military and I feel like common sense is used a lot more. And as you get into the civilian world and its different... and I basically had to re-learn to work with other people, and how to handle working with other people that are not as organized as I am and didn't have that structured way of thinking.

Her interest in her career stemmed from her job in the medical field of the Air Force, which had first led her to think it was nursing what she wanted but working alongside physical therapists as a CNA, she discovered that's what she really wanted to do.

Nursing is a lot of pain management and they do a lot of wound care as well and I realized that was about it and you weren't really involved in the healing process. And I noticed that Physical Therapy was something that I naturally had a knack for. Working with the therapists, I could see them when they came in and I could see the progression of patients completely to the end and I knew that felt better and it was what I wanted to do.

She also credited the Air Force for stimulating her love for physical activity. She emphasized the influence this experience had on her career choice.

The Air Force just made me fall in love with being physically active. Because you're on a schedule, you're doing it every single day and eventually it becomes second nature, so when I got out I was like, 'I don't want to stop doing this'.

This is something I really love. SO that's when I started figuring how can I get this into a profession as well and that's when I was like, 'Lightbulb! Physical Therapy'.

Amanda is very active. She does it all from running, to weight lifting, cycling, swimming, and is currently getting her certification to become a group fitness instructor. Her organizational skills help her make physical activity a part of her day, working around challenges like making time for school, work and family.

Home life is difficult because my husband is kind of the exact opposite of me. His job is physically demanding so he doesn't like to do workouts. He'll do hockey but he doesn't like to work out...so I really try like to figure out with each semester like when do I have the time and he and I try to block that time and stay consistent..

Open to new experiences and since she had been adding heavier weights to her training routine, Amanda joined the study with the hopes of increasing her flexibility and also as a way to hopefully relieve some stress and tension in her back. At our post-intervention interview she confirmed she had achieved these goals and also expanded on the benefits she had perceived to gain beyond the physical aspects.

The yoga I had done before was not like that, it was more like YogaFit® or something, but I do like this style a little bit more. I just feel like I get more out of it, the mindfulness part.

Amanda developed an interest for the yoga practice that extended to her other activities, both academically and personally. Her final project for her Biomechanics class was on yoga, specifically on inversion postures such as headstand, crow and handstand. She also demonstrated a scientific curiosity towards yoga practice.

I would have never even discovered inversion yoga if it weren't for this program, and now I'm addicted to that stuff and I keep recommending it like to everyone. Also, every single time I think about something to do like with exercising or anything I'm like, 'I bet inversions could help with that'... I definitely want more research done with it. I was looking up more stuff and had trouble finding articles and I was like... why isn't this being studied more, why isn't this being recommended for like treatment in the health field, why? Drives me nuts.

When asked about her biggest takeaway she expressed it had definitely been the mindfulness aspect. She shared how this skill had helped with her overall life perspective.

I would have days when I would just get really busy and I would get like overwhelmed and stressed a little bit and I'd be like... 'ok, I need to take a moment and I need to calm down and be a little bit more present and stop worrying about what other stuff is going on, two weeks down the road' or anything like that.

I tend to be so focused on the future that sometimes I forget that you need to take it one day at a time and you need to focus on what's happening right now and I like that yoga does that for me.

Amanda started to attend yoga classes at the Campus Recreation Center halfway through the intervention. She also emphasized that the small group setting of our intervention was something that made her feel more comfortable.

I thought that I actually felt more comfortable in that environment because I knew everybody and everyone had pretty much the same level of experience that I do, you know? We didn't have like super advanced people, you know. We all had just some sort of experience with it and I just felt more comfortable that I could joke around if I was having trouble with a pose or something and people were not going to look at me like, oh you're not supposed to talk.

She expressed how, in her perception, other student veterans would benefit from this type of physical activity. She also provided ideas and suggestions for bringing more people to these type of programs.

I think it would be really good for students, I think that it would just help them in the same way that it helped me realize that sometimes you need to be in the present moment, you need to focus on that moment instead of always worrying



about the future...I think offering, like a vet fit program and helping them to get something free or discounted to do, so that way they can come and be around other vets and it would be a good atmosphere and it would help them be more physically active, because I know that most veterans when they're out they start doing the sedentary lifestyle, so I think that would be fun.

She attended every session, even though she had a heavy exercise load in addition to the yoga sessions. However, she emphasized the difference she had perceived between the yoga practice and other types of physical activity.

I mean yoga is one of those that's different, because if you do boot camp or that type of training it can be more intimidating for a lot of people, especially when they typically are physically active and yoga has a way of just being welcoming to everybody and it has a way of not being as intimidating.

### **Psychological Well-Being and Motivation Descriptive Results for Amanda**

Amanda's PWB scores at post-intervention were higher for the dimensions of Personal Growth and Environmental Mastery. However they were lower for Purpose In Life and Self-Acceptance as can be seen in Figure 13.

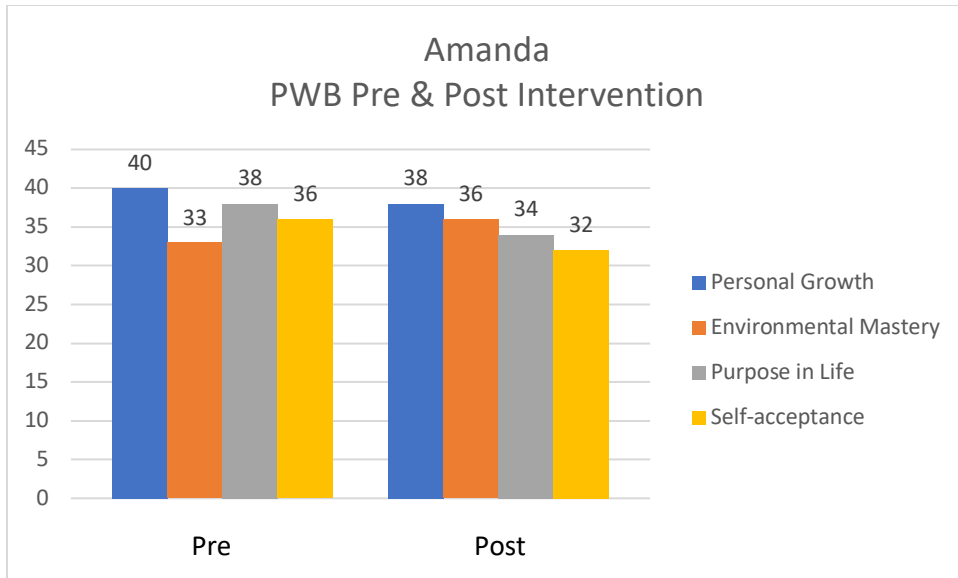


Figure 15. Amanda’s PWB Scores Pre & Post Intervention

Amanda’s motivational profile was essentially constant across the eight weeks. Scores for autonomous motivation remained at the highest score and controlled motivation stayed at the lowest score possible across all the eight weeks. There were no fluctuations in her responses to this scale as can be seen in Figure 14.

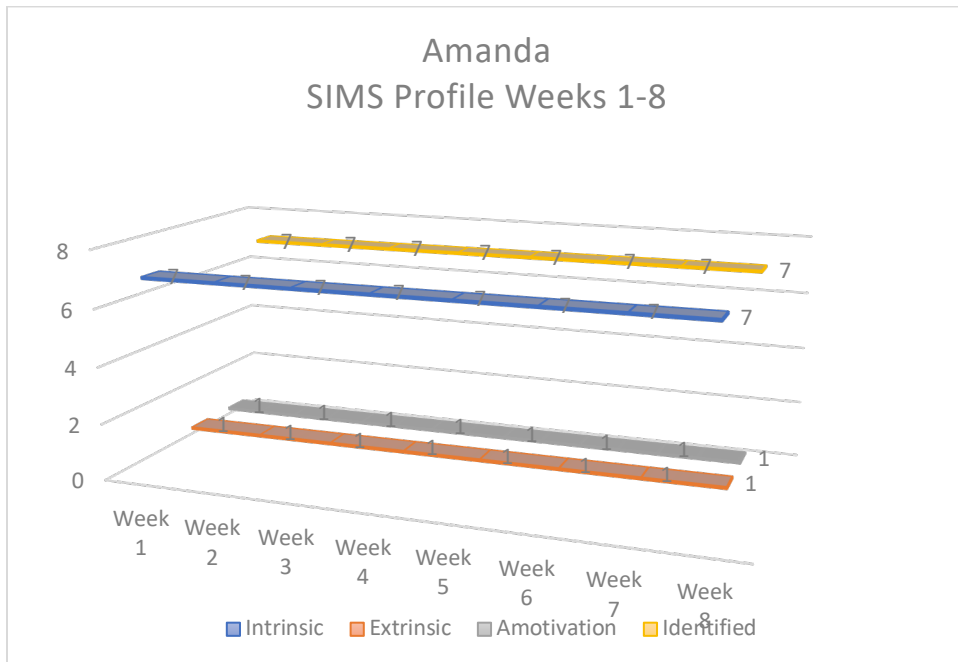


Figure 16. SIMS Profile for Amanda. Weeks 1-8

The BPNES (Vlachopoulos & Michailidou, 2006) scores for Amanda remained at the highest possible level for the needs of autonomy and relatedness as can be seen in Figure 15. Competence increased slightly at Week 5, had small decrease again in Week 7 and then reached the highest score at Week 8.

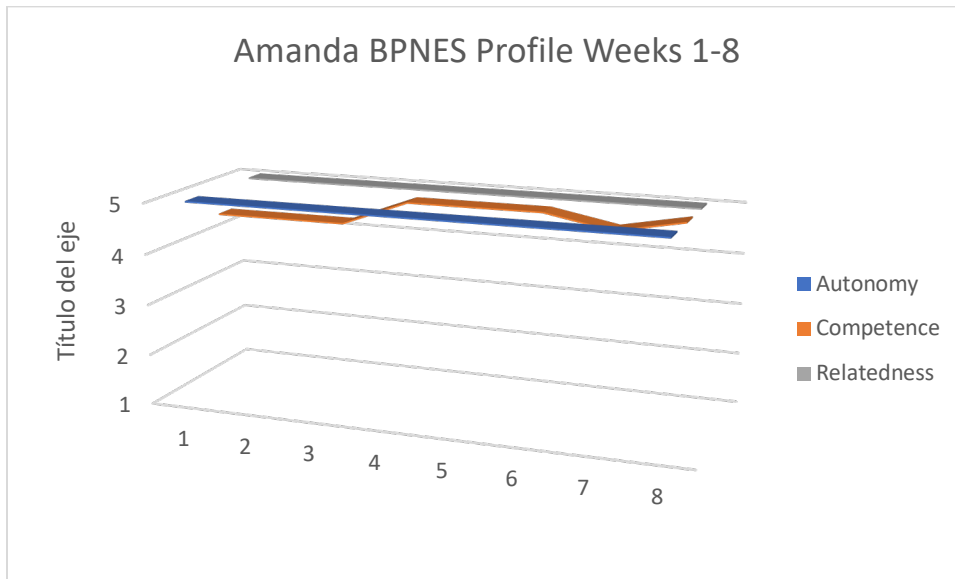


Figure 17. BPNES Profile for Amanda. Weeks 1-8.

### **Karen**

Karen (they/them/theirs) started the program with the pronouns she/her/hers but by the end of the intervention chose to be called by gender neutral pronouns of they/them/theirs. For that reason I will refer to Karen as they/them/theirs throughout the Results and Discussion section. Karen arrived at the first interview with their service dog, who has been their companion for almost four years and who also joined us for all eight weeks of the yoga sessions. Karen is 24 years old and a college senior and is just waiting to start their internship and really looking forward to that opportunity. Born and raised in Colorado, their experience in the military and after has been filled with many challenges.

They were in the Navy for two years and had a job as an electrician, but constantly referred to not completing the six years (or more) of service because The Navy “broke” them. They identify as a disabled veteran and has both physical and mental challenges after their service, and although they are on medication to help them control their symptoms, the changes in medication also interfere with their college studies and mood frequently. Filled with sarcasm, they begin to describe their military experience in this way:

I was planning on doing six years of a nuclear contract, but they broke me, so since I did the kind of regular electrician training, they just booted me out back to normal people land and then they didn't want me back because you know... broken... but hey, it works because now the VA [Veteran Affairs] pays me to live and its super exciting.

They recognize that the structure and organization they learned while in the Navy were positive skills, but that they were really too young when they decided to join and didn't really know what they were getting into.

I went in it for the money, for the glory, for the, “Oh, I'm going to go into the Navy and travel” conveniently ignoring that I can't swim that well. There was a lot of it because of my family was in the Navy and I thought I could use it to travel and for college. I didn't think this is the military and once you get in you are never coming out until they destroy your body. So it was just a lot of uninformed decisions...

Their transition back to college was also challenging, especially when they started taking classes related to their major, which was Athletic Training at the time.

They described experiencing discrimination from professors and feeling really angry and unmotivated to continue, which led them to taking a time off from their academic program.

Karen started classes in their major during the Fall of 2015 and felt it was going well because it was mostly entry level and basic courses. When they started taking classes related to their intended major they had an experience they perceived as direct discrimination due to their physical disability. Karen tore their ACL twice in the Navy and relied upon a service dog and a cane for stability. They expressed that a professor had told them that because of that, they could not participate in the class.

Karen explained how feeling mistreated by this professor made them feel terrible, and how they were not offered the possibility to try the program and see if they could keep up with it, but rather were just told they would not be able to do it. After this, Karen left her program and attended Metro State University (MSU) in Denver for a few classes and Front Range, where they got an Associate's degree in Science.

I was having some real struggles that semester and after that, I had a lot of real sh\*t grades, Cs... so I dropped out of going to UNC after that and took a couple of classes that semester to get my associates from Front Range. Then I came back here last Spring, I think, probably...I don't remember. I got a brain injury from the Navy, so I cannot remember jacks\*\*t.

They say some of the classes they took at MSU made them think about wanting to return to UNC, but focusing on a different area of exercise, more related to healing and preventing injury.

I don't want to be in the diagnosing and treatment area of the field, I want to do more prevention and rehabilitation... So I thought, ok, lets shift over to the Exercise Science Field and I took a couple of really cool classes at MSU and that kind of sealed what I wanted to do and so I came back here and just kept going.

They still think their time in the military gave them discipline that is useful for school now, but also made it harder because of all her injuries. These injuries and the medication to cope with them has also influenced their relationship with physical activity.

I think it's kind of 50/50. Because I have the discipline now, but I've had a lot of issues with concentration and issues that the military caused that it's like now trying to focus on school is a little difficult. But now I walk to class... The VA has told me I have to be healthy and so I'm like... well, might as well.. but right now with the mood issues it's been really hard to try and get out and actually just do stuff.

However, despite the limitations, Karen makes physical activity a priority and tries to stick to a schedule. They know it's beneficial for them now and for a healthier aging process, thanks to some facts they have also learned in the SES program.

Knowing that I have some other disorders that run in the family like I know for example that "Oh, this research shows that physical activity prevents Alzheimer's" and early onset Alzheimer's is a huge thing in my family, so it's that motivation of maybe I don't want to do it now but I want that compression of mortality later..

Karen's desire to participate came from one stress management class they took while at MSU, which they enjoyed very much and involved some basic meditation and mindfulness. She also emphasizes the need of tailoring programs for student veterans and considering their unique needs.

There are programs but they aren't tailored as well. They don't make the effort to actually engage the veterans half of the time. Like there's one place in Denver that does 'Veteran Yoga' once a month, but it's in Santa Fe in downtown Denver... how many vets who need yoga are going to actually be driving down there. I tried it once and I'm decently integrated into society and I couldn't...then they use the excuse of "no one shows up".. well yeah, it's not veteran friendly!!

Karen showed up every week and even took up some extra classes at the Campus Recreation Center that I taught. Knowing the limitations and effort required, they demonstrated high levels of commitment and also enjoyment for the practice. Karen pointed out their enjoyment of a physical challenge through yoga and the possibility to take the classes at their own pace, as well as the improvements they had noticed through the eight weeks of practice on a physical level.

I liked that it was physically challenging sometimes. It gave me something to work towards, because I couldn't always do all of the positions, but I modified it in my own way...I think my balance has gotten a little better. My balance has always been really awful since my TBI (traumatic brain injury), it's like I get that neurologic sway, so that was something I could work for. Trying to increase

my balance like by a little bit, for like a functional thing, so that when I'm standing I'm not automatically tipping over.

Karen also expressed that the yoga practice helped them on aspects not necessarily related to yoga itself. The mindfulness component was something they considered a big takeaway from the experience.

It put more of a focus on being mindful, because I didn't have to go the class, I didn't *have* to work on my breathing, I didn't have to, but I did it and now it's helping me to focus like in other places, so that's great. I also started meds (medication) that would cause me to react a lot and I'd jump into being frustrated a lot easier with things and that helped me like take a step back and re-evaluate why am I feeling like this.

They also expressed how the mindfulness component would be beneficial for other student veterans, in their perspective. The small group size was also brought up in our conversation as a positive component of the yoga intervention.

I really think it would help, like the mindfulness, because I think that's one of the biggest issues we have is that we're so focused on like trying to get to classes, or trying to integrate from military into civilian stuff that it just gives you a break...well, at least you're like with other vets, and for the guys its nice seeing that there were multiple guys there in class and that they weren't giggling or being awkward about it because we're all vets and it's not like a hippy yoga class or really young people that are gonna laugh at how we can't do the poses as well because we have war injuries and stuff.



Karen also brought up additional considerations they enjoyed from the sessions. They also expressed a desire to continue practicing yoga as part of their regular lifestyle.

I feel that it was nice we got to face the doors during class, so that even if someone happens to wander in, nobody would be coming up from behind from where we were practicing, we were facing towards where people might come in and that helps at least with some of the uneasiness.

### **Psychological Well-Being and Motivation Descriptive Results for Karen**

Karen's PWB score profile improved on three out of the four dimensions measured: Environmental Mastery, Purpose In Life and Self-Acceptance. The dimension of Personal Growth remained the same at 40 points at pre- and post-intervention measurements as can be seen in Figure 16.

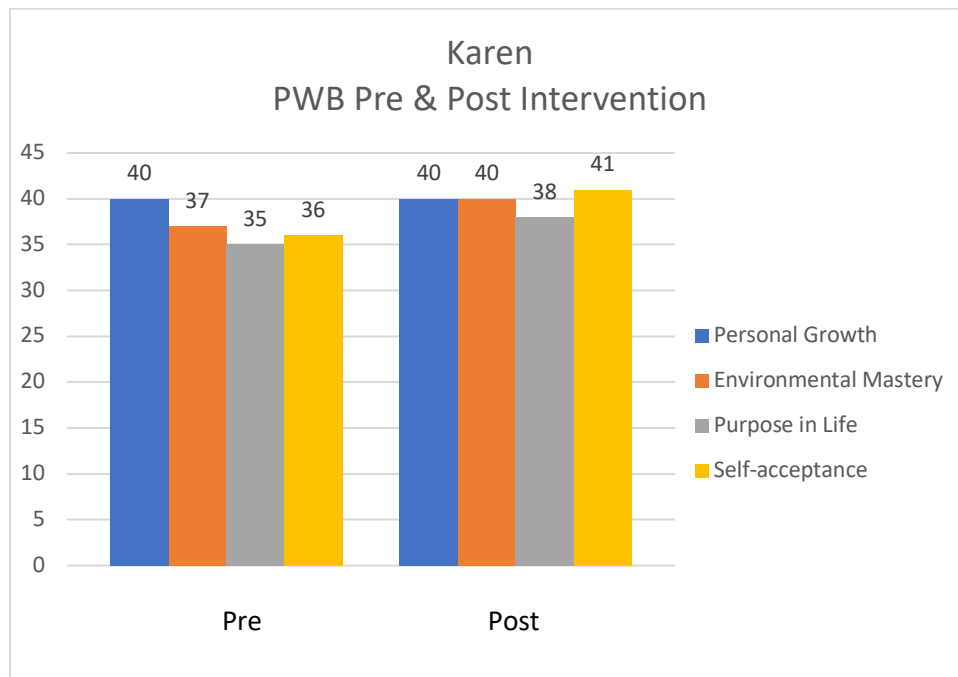


Figure 18. Karen's PWB scores at pre and post intervention.

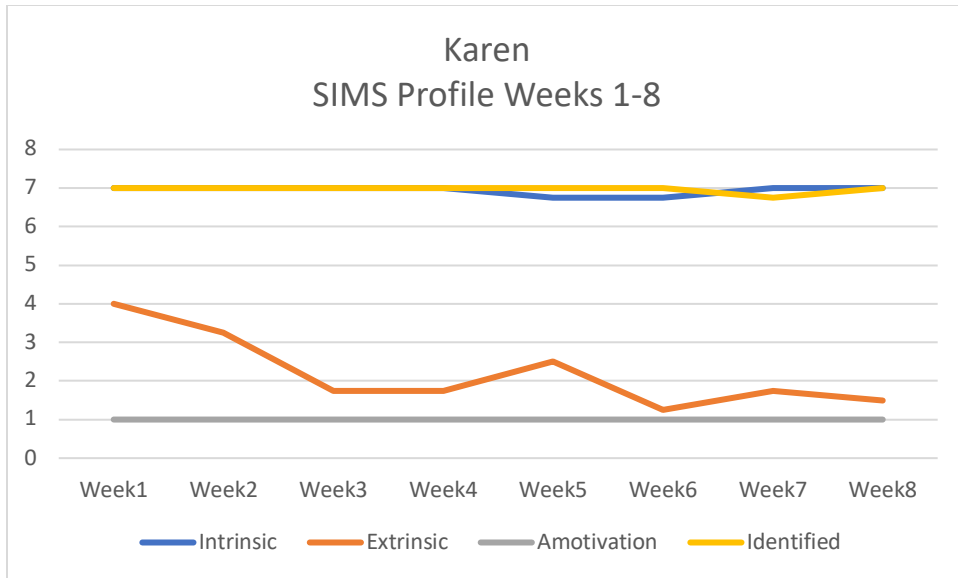


Figure 19. Karen's SIMS Profile for weeks 1-8.

Karen's Situational Motivation Profile showed a stable and high level for both Intrinsic and Identified Motivation. Amotivation remained at the lowest possible score across all eight weeks and Extrinsic Motivation started at a score of 4 and fluctuated towards lower levels across the eight weeks, with the lowest mean values at Week 6 with 1.25 and at Week 8 with a value of 1.5.

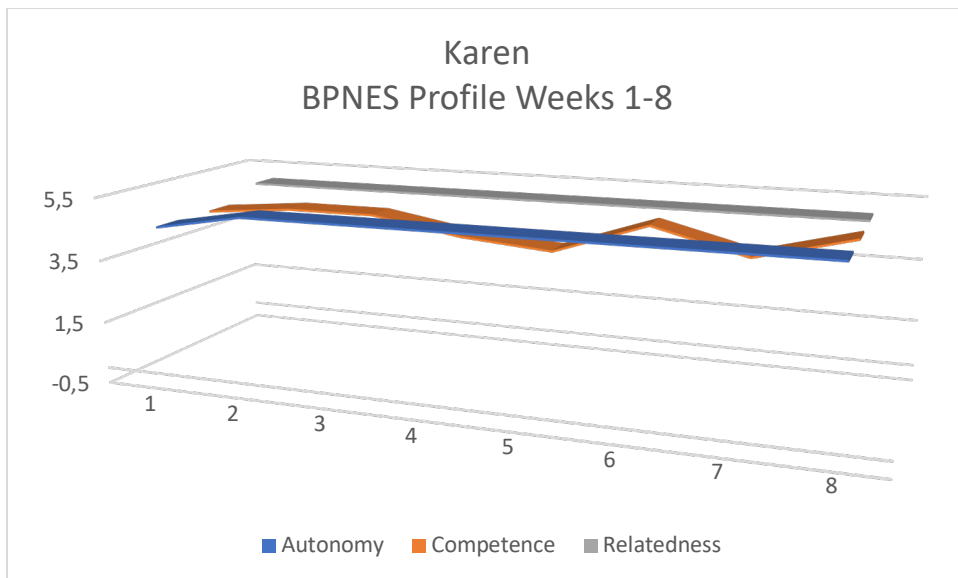


Figure 20. Karen's BPNES Profile for Weeks 1-8

Karen's BPNES (Vlachopoulos & Michailidou, 2006) profile (Figure 8) across the eight weeks shows a stable high score of 5 for Relatedness and a small increase in Autonomy from Week one at 4.5 to 5 for the remaining seven weeks. Competence scores were close to the 4 mark all weeks, and reached the highest score of 5 at weeks 6 and 8.

### **Markus**

Markus (he/him/his) is 24 and a freshman in Sport and Exercise Science. He appears to be very shy at first, but is very friendly once he feels comfortable with others. Markus grew up in Wisconsin with a big family, he has 7 siblings and 4 of them are also military members.

Markus served for four years in the Marine Corps, from 2014 to 2018, as an infantry man. When talking about the positive aspects from this period of his life, he mentioned lots of physical activity training, mostly rucking, which is part of the Special Forces training, involving running while carrying a weighted pack on your back. He explained that

The physical training made him aware of how if he really put his mind and effort into things he could accomplish them. He also expressed that there were also many mental challenges along with the physical demands.

Just being able to put up with a lot of different stuff...I would say that everything is just mentally challenging. You never know what's going on, you never know when you're gonna get out of work, when you're going to have to do anything really... that's really unstructured, well it's like structurally unstructured if that makes sense.

The transition from the military into civilian life was also a challenge for Markus, even if he had tried to prepare for it. The lack of structure he encountered in his new lifestyle was one of the biggest challenges he encountered after he left the service. He also felt his sense of purpose was not clear, even if he knew he wanted to go to school.

So coming out of the military, one second you're in and then the next second you're not and then you're just a regular civilian and it can be hard to transition. They give you all these seminars and counseling but nothing really prepares you for that. I didn't know that, so coming back, you lose your sense of purpose I would say and that was the biggest thing for me.

As strategies to overcome these difficulties, he explained that he had lots of support from family and close friends. He also mentioned that engaging in exercise was a positive outlet that enabled him to feel better during this period. The only struggle with staying active was dealing with injuries he had developed during his military service.

I also tried to work out a lot, wake up in the morning go work out, come back, do my thing a bit.. I have to say that keeping that routine of working out helped me out a lot, just also helping me 'vent out' through exercise. The only problem of doing that is that because of the military I got pretty banged up and just all the injuries that will stay with me probably for a while, so that's actually been pretty hard, coping with that and kind of going off this transitioning out path, that's a big thing that kind of sticks with me.

Markus explained that for him, staying in shape and being physically active is very important, so when he can't exercise as much as he wants to it's very frustrating. This interest in physical activity led him to choose his career path in the area of exercise science and he expressed how much he enjoys everything he has learned so far. He also said how this knowledge helps him understand his own physical injuries and his possible recovery. He remarked that, "That is a really big part of it, as I'm learning I'm thinking how I can apply this to my own life and maybe do things differently or try to fix something".

When discussing his transition into college, he thinks that the military taught him valuable skills, such as strengthening his work ethic and time management capacities. He also expressed that being older now is probably better for prioritizing his school work, instead of wasting his time on other things. He also feels an additional responsibility to do well, because his military benefits cover his school expenses.

Especially being on the GI bill, school is like the number one thing ... they're paying for it so I'm going to do the best that I can... I had a good work ethic before the military, but I'd say that it just helped a lot in transitioning to school.

He also spoke about how the Veterans Services Center on campus had been very helpful and welcoming and benefited him socially. Markus visits Veterans Services weekly, as a study space or just to hang out and get some coffee in between classes. This resource center has also helped him find out about other available programs on campus he was interested in, including Campus Recreation clubs and classes.

Markus shared that he was a member of the climbing club on campus and how he had made climbing his primary physical activity. He had tried a couple of yoga

classes last semester at the Campus Recreation Center and enjoyed the mindfulness component of the yoga practice. He discussed wanting to practice regularly again to find the relaxation and mindfulness outcomes he experienced from yoga practice. He also expressed his desire to improve his flexibility, since he perceived this could benefit his climbing skills, “definitely, flexibility and then more mindfulness. Trying to get back to being in that mental state I was starting to get into. I definitely want to try to just get more out of it”.

When we talked at our post-intervention interview he expressed how the practice of mindful yoga had helped with climbing and that he had also found improvement in his balance. He shared that he had felt he made progress throughout the different weeks and that the yoga practice also helped him with habits for school and other responsibilities.

I felt a little stressed at first, but then the more it went along, it felt good to wake up and be active in the morning. It kind of got me to start waking up around 7-8 every day and that was nice for me because I could do some school or read. At first I didn't care much for the balance because it got me kind of sweaty before the day, but then I started liking it more because I started getting it more. The headstand kind of thing, I saw that it was neat to know you're improving so... I liked that. I definitely like the parts where we do like the really good stretching because that's what I feel like I need the most.

Markus also shared that he believed other student veterans could benefit from this type of physical activity practice. He highlighted the small group setting and the physical benefits he received from the practice of yoga.

I felt more comfortable in our group, it was most of the time just us four. I don't like big groups. The rec center is fine, but those are pretty big groups and usually I'm the only guy if I go to the rec center room so I feel kind of awkward. In this group I felt like it was more personal and I could do my practice a little better. It also kind of helped my body enough to feel less beat up, and I'm sure most veterans deal with that. And then it also helped my mindfulness just kind of being able to control my thoughts a little better and just be more aware. I think that was very helpful.

Markus also made a connection between what he practiced during yoga and his climbing, especially highlighting the mindfulness aspects. He also shared his desire to continue to practice yoga more frequently.

So I'd say climbing and yoga are very similar since you have to be very aware of where everything is going. I mean yoga helps with being aware and with your flexibility and then especially the breathing aspect because sometimes when I'm climbing I'll be up there and you're at a hard part and you don't want to fall or swing into the wall. So having that mindfulness and that awareness kind of helps out and being aware of everything around you, because you can get stuck on a spot and you can't see what's next. So, it's like pulling yourself out for a moment and looking around and be like 'ok... I know what to do now'. And then the focus on breathing is a big one, especially for climbing. A lot of people will hold their breath when they go up and it's not good. Just having the ability of 'ok, I'm breathing in and out'. It helps you continue climbing and also to not get so fatigued.

Markus suggested that having a yoga group for veterans only could be an important benefit if the intention was to keep these types of programs scheduled regularly. Relating to others and breaking down some myths around yoga were among his reasons for this suggestion.

I think it might actually benefit to have our own program (military students) because if more veterans came, you might get a bigger mix of like, guys and girls, and guys wouldn't feel as awkward and then you know I think most of them will just feel more comfortable. I know sometimes I don't feel as comfortable in the other groups because, A, I'm the only guy and, B, also being around civilians that might not understand everything that we had to go through. I think it would be easier to relate to the group and maybe be a little more comfortable.

### **Psychological Well-Being and Motivation Descriptive Results For Markus**

Markus's PWB profile scores increased across three of the four dimensions measured: Personal Growth, Purpose In Life and Self-Acceptance, as can be seen on Figure 19. Environmental Mastery decreased by 2 points, going from 35 to 33.



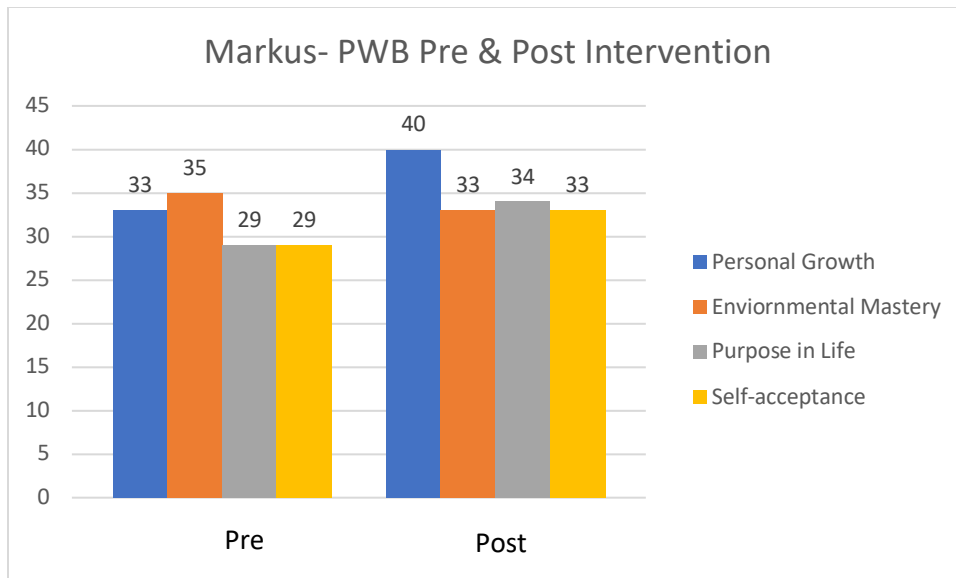


Figure 21. Markus's PWB Score Profile at pre and post intervention.

The SIMS (Guay, Vallerand, & Blanchard, 2000) scores profile for Markus included a maximum score for the Identified Motivation scale across all eight weeks and the lowest score for the Amotivation scale the eight weeks as well. Extrinsic motivation levels stayed at the lowest score for Weeks 1-4 and had a small increase for Weeks 5-7 returning to the lowest possible score of 1 during the final session. Intrinsic motivation had greater fluctuations across the eight weeks, with scores still on the high spectrum from ranging from 5 to 5.75. (Figure 20)

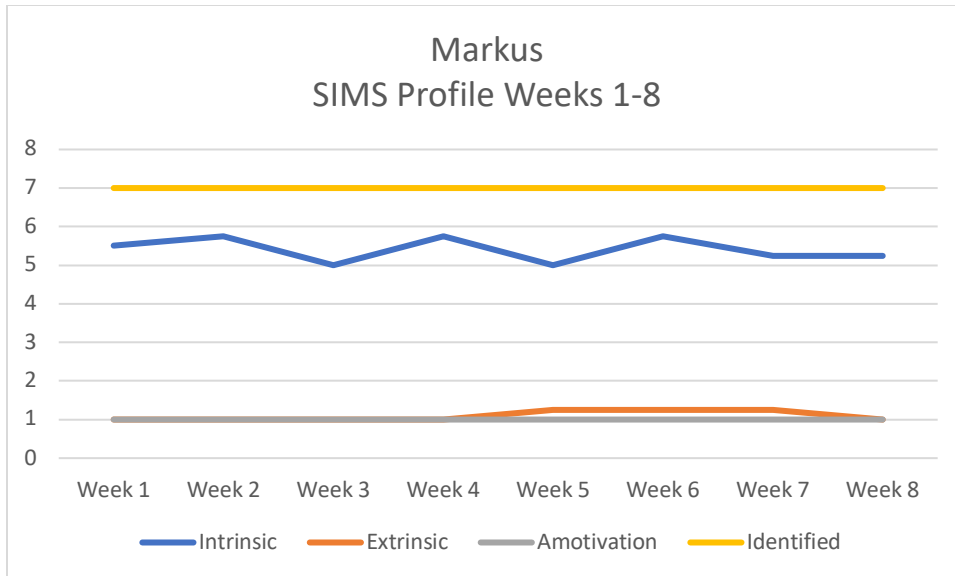


Figure 22. SIMS Profile for Markus. Weeks 1-8.

Results for Markus regarding Basic Psychological Need fulfilment can be seen on Figure 21. Competence levels had a progressive increase from week 1 at a score of 2.25 to a score of 3.75 at Week 8. Autonomy levels fluctuated between 3.75 as the lowest score and 4.25 at the highest score. Relatedness decreased at the end of the eight weeks with a score of 3.33.

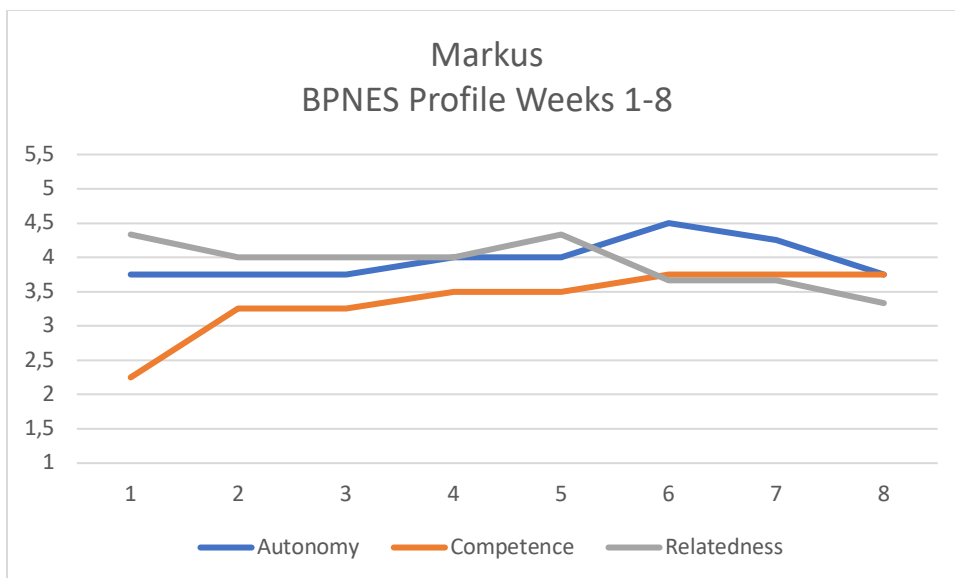


Figure 23. BPNES Profile for Markus weeks 1-8.

### **Identification of Common Themes**

The primary focus of the study was to gain a depth of understanding of the effects of the practice of mindful yoga on psychological outcomes for student veterans. Common themes as expressed by the participants were identified as they reflected similar outcomes. Identification of these themes also can provide insight into the perceptions of the student veteran population and may be useful in the design of similar future intervention programs intended to meet the needs of this population.

Common themes across the participant narratives were identified by the main researcher in collaboration with peers. This review process involved two independent third-party examiners (doctoral students in related programs) to review and discuss findings from the original interview transcripts (Creswell & Poth, 2018). There was consistency across evaluators on the content of the themes and their relationship to the well-being of the participating student veterans. Debriefing conversations were conducted to finalize agreement on the number of themes and the labels to be assigned to these themes. Five themes were identified in relation to the experience of the participating student veterans in relation to their experience with the yoga intervention and perceptions of well-being.

*Need for structure* was the first theme identified from the interviews. Across all seven participants' narratives, the need for structure was perceived as the greatest challenge to adapting to a life outside of the military and this theme was consistently identified by the participants in the pre-intervention interviews. For all of the participants, the military either developed or promoted a sense of organization and the utility of structure, which was something that the participants reported that they kept

searching for in either school or work as a way to alleviate their stress once they transitioned into civilian life. The structured weekly yoga sessions contributed to satisfying this feeling of organization and also made the practice of this type of physical activity enjoyable for them, while keeping them feeling that they were accountable to their goals. Consequently, the practice of mindful yoga was beneficial in meeting this need for structure in the student veterans' transition to their civilian lives.

The second theme identified was *improved perception of physical well-being*, referring to how the mindful yoga sessions helped several participants feel better physically. This perception of physical improvement was shared with joy and pride as a perceived accomplishment by these individuals. The participants commonly identified this theme in the pre-intervention interviews and they typically discussed some sort of difficult consequence that they experienced as a result of their military service. Five of them described physical injuries that had limited them in their physical abilities or activities in which they were previously engaged and one mentioned facing discrimination because of these injuries. The regular yoga practice contributed to the alleviation of the physical discomfort of the physical injuries and reduced the psychological and emotional burden of sustaining these injuries as well. Participants felt that their physical improvements made them feel better emotionally and also contributed to their motivation to engage in physical activity.

A third theme identified was *psycho-social improvements*. This theme related to the psycho-social difficulties and the subsequent growth experiences lived by participants while in the military and throughout their transition into their new lives as students. Three participants discussed emotional and psychological difficulties

including not liking the person they felt that they were becoming while in the military service. Six out of the seven participants described struggling with fitting into civilian life on a personal level after leaving the military.

Nevertheless, five participants also expressed positive takeaways from their time in the military as well. These positive lessons included learning to develop a new perspective and recognizing that the challenges they currently faced were not as overwhelming as some of the situations they had to face in their military service. As Sienna stated, “It’s (civilian life) not as hard as having people depend on you” (Sienna, pre-intervention interview, February 2019). The military service taught some students about their strength and resilience. Their descriptions included insights referring to the common perception that if they could deal with the military, they could deal with most of school or civilian life stress. The mindful yoga practice strengthened the students’ perceptions of their psychosocial skills and helped them focus on the challenges they faced moment-to-moment as well as helped them to not feel overwhelmed by their current situations. The mindfulness practice improved the students’ ability to accept and understand that their efforts and actions were valuable.

*A strengthened sense of relatedness* was the fourth theme identified. At the pre-intervention interviews, four participants mentioned a need for feeling needed or useful and a need of feeling like they belonged to a community. At the end of the yoga program, the seven participants expressed the intervention group made them feel comfortable and helped fulfill this sense of community for them. The yoga sessions also helped the students feel comfortable enough to engage in other group physical activities like the campus recreation programs or self-initiated recreation activities.

Another common theme identified was *the perception of yoga as a unique type of physical activity*, especially because of the mindfulness component. All seven participants strongly valued physical activity for various reasons including perceiving that physical activity involvement served as an excellent coping mechanism for stress, or because physical fitness had functional or aesthetic value. Barriers for staying consistent with physical activity identified at the pre-intervention interviews had included time for the majority of participants and they hoped the yoga intervention would help them find that regular physical activity practice. At the conclusion of the intervention, participants expressed yoga had helped them increase their enjoyment of physical activity and that it was an activity that differed because they felt no need to compete with each other. Another difference perceived was that yoga was a type of activity that helped them work through their difficulties instead of avoiding them. “Running helps you get out of your mental space for a bit, but I feel yoga helps you change the headspace you have ” (Sienna, post-intervention interview, April 2019).

Two other common themes were identified in relation to the backgrounds and experiences of student veterans. These themes will not be discussed in depth in Chapter 5 because they were not related to the yoga sessions, but could help understand the realities of students from this population. The first of these themes was *moving past the military identity*. Two participants specifically mentioned their intention to not feel stuck in their military identity or living off their past as military members. Sienna expressed how she wanted to feel that she was a person, not just a military member and didn't want that to be her presentation card. Tom made a very strong emphasis on wanting to take a different route from the reality of many veterans. This is relevant

information to understand why there may be resistance from some student veterans in participating in certain programs, if they do not want to be continuously identified as former military members.

The other theme related to these student veteran's current situation was their *career choices in healing or helping professions*. The seven participants had initially chosen healing professions or career paths. Two were in Audiology and Speech pathology, four were in Sport and Exercise Science with goals of Physical Therapy and prevention fields, one started in Dietetics and then changed to Political Science, motivated to have an impact on social justice issues. This common interest in healing careers was interesting since the participants' experience in the military, whether perceived overall as positive or difficult pushed them to want to serve and help others. This theme is an interesting consideration for program development for student veterans and for understanding that this population also has a need to be of service to others and to feel they are needed. "...being needed is really nice you know" (Hannah, pre-intervention interview, February, 2019).

Highlighting the common themes across the cases helps provide a deeper understanding of the experiences student veterans may go through in their transition to college life and their experience as participants of a mindful yoga intervention. The purpose was to show how shared perceptions add value to the findings of this study. These common themes can also serve as a reference for future research and for future program development directed at that this population, including the importance of the needs for structure, relatedness and service that these students have.

## **CHAPTER V**

### **DISCUSSION**

In this chapter the central questions guiding the purpose of this study are addressed. The goal of this research study was to understand the influence of a mindful yoga intervention on psychological well-being (PWB) in student veterans. An additional goal was to better understand the individual motivational characteristics of participants in this study to determine if variations in these characteristics affected the nature of their experience and their well-being.

There has been increasing concern for the well-being of student veterans because there has been a notable increase in the number of military veterans experiencing post-traumatic stress disorder, traumatic brain injury, pain conditions and other mental health difficulties (Hurst et al., 2018). Additionally, the transition to college can add to the stress experienced by student veterans because of incongruencies between military and civilian cultures and the struggle to build a new identity as college students. Previous researchers (Caddick & Smith, 2014) had identified physical activity as a method for intervention to aid in the psychological well-being and the mental health of veterans, yet there was a need to understand more in depth the role of mindful physical activity in the perceptions of PWB for this population.

The main finding from this study was that the participants perceived that the mindful yoga intervention had a favorable effect on their PWB. For some of the participants, the nature of this improvement was related to physical health outcomes in



enabling them to better deal with injuries that they had incurred during their military service. In addition, some participants perceived that the mindfulness skills that they learned through the yoga practice were beneficial in their daily life, including school demands, personal interactions and everyday decisions. Other perceived benefits included the provision of structure into their schedule through the weekly yoga sessions and a restored sense of belonging to a community.

In regards to motivation, the participants maintained high levels of autonomous motivation and low levels of controlled motivation throughout the intervention. The yoga practice helped the student veterans to fulfill the basic needs for competence, autonomy and relatedness which, in turn, contributed to increased physical activity enjoyment and psychological well-being. Finally, differences in outcomes and perceived benefits did not seem to exist among the participants in relation to their initial motives for participation.

### **Psychological Well-Being Outcomes**

A common theme across participants was the need for structure and organization in their lives after leaving their military service. Student veterans tend to experience frustration during their transition to civilian life that is a result of a lack of collectivism and structure when interacting outside of military environments (Gregg et al., 2016; Livingston & Bauman, 2013). Some participants found the yoga sessions to be a means to help alleviate some of this frustration. The participants reported that having a weekly scheduled time for the yoga sessions helped them to find comfort and enjoyment in organizing their time, but also helped them commit to a structured physical activity program. This commitment was beneficial because it also increased their enjoyment of

physical activity and helped them to overcome the perceived barriers of limited time and opportunity to practice this type of activity.

One of the main benefits of the yoga practice for participants' PWB was related to their improved perceptions of physical well-being. Participants expressed that the practice of mindful yoga enabled them to better deal with injuries that they incurred during their military service. Research indicates that injuries affect student veterans by limiting their physical capacities, but can also contribute to these students' perception of not fitting in with other college peers who don't have combat or military experiences, and therefore can't relate to this type of consequence (Parks & Walker, 2014). Feeling that they could better deal with their injuries made participants less self-conscious of this situation and they reported that this outcome improved their physical and mental state.

Five participants stated that the physical improvements that they experienced through the yoga intervention were noticeable and meaningful. Sienna reported that she was able to surmount her back pain, which had been a daily concern and impediment for her physical activity and daily routines. She was surprised by this outcome as she had expected to obtain mental health benefits from the yoga practice but did not anticipate meaningful physical health benefits. Karen and Markus both expressed that they had improved the balance and strength of their legs which, in turn, improved their ability to function effectively in daily life and in other types of physical activity. Amanda expressed that she perceived physical strength gains as a consequence of her involvement with the mindful yoga practice. All of these physical improvements were associated with increased perceptions of well-being by the participants.

### **Mindfulness Benefits and Psychological Well-Being Perceptions**

For some participants, the changes associated with their reported PWB were related to the mindfulness components of the yoga practice. Bishop et al. (2004) emphasized that increased mindfulness can lead to a feeling of awareness to what is occurring in the here-and-now, often described as a feeling of being fully present. For Anthony and Amanda, this was the most important take-away from the yoga experience. Both of these students expressed they had a tendency to be anxious about future decisions and that the yoga sessions helped them slow down their thoughts and focus on the present moment. The mindful yoga practice contrasted with the focus that is experienced in military service. Participants expressed that their military training emphasized paying attention to detail but more towards external factors rather than one's own experiences. Participants also discussed that military culture emphasized having a plan and a mission to follow, instead of an openness or mental flexibility, while mindfulness is oriented toward experiencing present circumstances (Brown & Ryan, 2003). This new approach was a change in perspective for many of them but was perceived by these students in a positive way, and as part of their personal growth and improved well-being. This finding coincides with what theorists have stated with regard to how psychological well-being should not be considered to be an outcome, but rather a process, that involves fulfilling one's nature and living accordingly (Deci & Ryan, 2008a; Ryan & Deci, 2001; Waterman, 1993).

Hannah, Karen and Markus also linked the mindfulness component of greater present moment awareness in the yoga practice to their perceived improvements in well-

being. These three participants explained that learning to be present in the moment was the greatest lesson that they learned from the yoga practice and that this process had helped them think more fully about their personal situations and to more effectively function in each moment. These participants reported that they managed to transfer their mindfulness skills to different contexts, including school work, presentations, other types of physical activity and daily interactions with others. These students practiced continuing the carrying the lessons from their yoga practice outside of class as well. By adding increased clarity and vividness to any experience, mindfulness practice may contribute to well-being in a direct way (Brown & Ryan, 2003).

### **Motivational Characteristics and Psychological Well-Being Perceptions**

A secondary goal of this study was to determine if the type of initial motives for participation in the study led to different perceived outcomes for participants. This inquiry stemmed from previous research conducted by Carbonneau et al. (2010) who found that different types of passionate engagement led to different outcomes for yoga practitioners regarding PWB.

According to the principles of Self-Determination Theory, there are two general categories of motivation: autonomous motivation, which involves active choice and controlled motivation, in which behavior is initiated in response to influences external to the person (Deci & Ryan, 2008b). However, more self-regulated behaviors are associated to greater levels of well-being.

In regards to motivational characteristics for participants in this study, the seven students maintained high levels of autonomous motivation and low levels of controlled

motivation throughout the intervention. These results were reflected in both in the SIMS instrument (Guay, Vallerand, & Blanchard, 2000) scores and participants' narratives, which detailed their active choice for engaging in the yoga practice. For example, Karen expressed, "I didn't *have* to go the class, I didn't *have* to work on my breathing, I didn't *have* to, but I did it" (Karen, post-intervention interview, April 2019). This statement exemplified how Karen's actions and decisions regarding the yoga sessions were voluntary and reflected intrinsic motivation. Intrinsically motivated people will perform activities because of the positive feelings resulting from the activities themselves (Deci & Ryan, 2008a), and this outcome is associated with increased well-being, greater persistence in an activity and more positive affect.

### **Psychological Need Fulfillment Outcomes**

Another consideration related to motivational characteristics was the possibility of satisfying the basic psychological needs through the yoga practice. According to self-determination theorists (Deci & Ryan, 2008b), the satisfaction of the universal psychological needs of competence, autonomy, and relatedness is also necessary for optimal psychological health and functioning. According to this perspective, people will also tend to pursue activities, contexts, and goals that allow for the satisfaction of these needs, which reinforces the importance of individuals taking an active role in their search for personal improvement. The increase in satisfaction of the basic psychological needs was reflected in participants' narratives and from the descriptive information contained in the individual BPNES Scale (Vlachopoulos & Michailidou, 2006) responses. Each participant perceived one of these need's satisfaction as more salient in their process through the intervention, but they all found fulfillment of these needs as

part of their improved perceptions of well-being. As stated by Deci and Ryan (2008a) "the way the needs tend to get satisfied may differ by culture, but the fact of their needing to be satisfied for people to experience optimal well-being does not depend on culture".

As stated by SDT theorists (Deci & Ryan, 2008c), integrated and autonomous functioning is dependent upon an appropriate level of awareness. Mindfulness practice, which includes an emphasis on heightened awareness and attention, has been associated with autonomous motivation and the fulfillment of individuals' need for autonomy (Deci & Ryan, 2008c). Autonomy satisfaction was an important benefit of this practice for Anthony and Karen. They reported that by devoting greater attention to what was happening with them and around them in their mindfulness practice helped them to feel greater control over their behavioral choices. What began as an apparently simple action in their yoga sessions, regarding paying attention to their breath and to their body sensations in every posture, later transferred to being meaningful in other areas of their life, including choosing new career paths, communicating with others and choosing activities that increased their physical and mental health. Awareness derived from mindfulness has been linked to increased attention to prompts arising from basic needs, making people more likely to regulate behavior in a way that is oriented towards fulfilling such needs (Brown & Ryan, 2003). The findings from this study seem to indicate that the emphasis on awareness in the mindful yoga intervention transferred in a positive way to other life contexts.

Student veterans can face difficulties with social integration, once they enter a civilian lifestyle (Gregg et al., 2016). For some of the student veterans in this study,

their participation the yoga program contributed to an increased sense of community. The fact that they participated in a structured research study also helped these student veterans feel needed and strengthened their sense of purpose. Feelings of personal growth, self-acceptance, environmental mastery and purpose in life are dimensions of PWB from a eudaimonic perspective. Improvements on these characteristics as a result of the yoga sessions were important findings that also involved motivational characteristics.

The satisfaction of the need for relatedness was associated to this need for community and collectivism that is strong in the military. Strengthening the relatedness component is crucial for increasing the well-being of student veteran population. Returning soldiers can experience a sense of isolation struggling with the perception that they don't fit in with people who didn't go through combat or deployment experiences. Student veterans can also feel a lack of connection to other students because of age differences or because they feel that those not familiarized with what military service entails and the contexts in which deployments and returns occur will not understand them (Parks & Walker, 2014).

The mindful yoga intervention was important in fulfilling this need, as mentioned by several participants. Hannah, Tom, Markus and Karen explicitly highlighted satisfaction of the relatedness need through mindful yoga practice. These four participants also mentioned the importance of breaking down stereotypes regarding yoga practice. As Hurst et al. (2018) explained, engagement in yoga practice may be resisted by military members because it is traditionally not perceived as conforming with the type of endurance or physical training demands that are valued in the military.

There are also gender-related stereotypes surrounding yoga practice. However, the participants in this study expressed enjoyment and less concern about these factors, when they saw others like themselves participate in the yoga sessions. For these participants, there was a heightened sense of enjoyment in practicing this type of physical activity with other veterans.

The mindful yoga practice also had a favorable effect upon the satisfaction of competence needs for four of the participants. These feelings of satisfaction came mostly through mastering the challenges of the physical aspects of the yoga sessions, including more advanced postures like headstands. Mastering these challenges allowed them to discover capabilities and strengths that they were not aware of before, and increased their enjoyment of the yoga practice, and even led them to increase their practice time outside of the scheduled sessions. Deci and Ryan (2008b) stated that people must feel responsible for their competent performance in order for it to have positive effects on intrinsic motivation and this sense of personal accomplishment was present for these participants. Although their intrinsic motivation levels were high to begin the study, the yoga practice further contributed to their intrinsic motivation to practice yoga.

After the study concluded, some participants felt comfortable enough to take the yoga practice to other settings, including the Campus Recreation Center and other group-fitness settings. These students expressed that feeling competent in the sessions during the intervention contributed to their interest in continuing their yoga practice in other contexts.



### **Initial Participatory Motives and Psychological Well-Being Outcomes**

A component of the follow-up research question was to determine whether differences in initial motives for participation, had an influence on their perceived outcomes of the yoga practice for the student veterans in this study. The initial motives participants expressed as having towards the intervention did not have an differentiating effect on perceived outcomes, since all participants had positive perceptions of the outcomes they found through the yoga sessions regardless of their initial motives for participating. Indistinctly of whether they approached the yoga sessions looking for physical benefits such as muscular flexibility of mental benefits such as stress relief, all the participants perceived the outcomes of the intervention as positive. While for some cases, the intervention fulfilled their initial expectations, for other participants, the yoga sessions led to unexpected benefits such as meaningful relief regarding injuries or noticing how impactful the mindfulness practice had been in improving their everyday life. For example, Sienna never expected to experience the physical improvements that she obtained and even get to a point of forgetting about her back pain. Amanda was surprised by the mindfulness aspects of the yoga sessions and how they benefited her overall approach to life. Hannah expected benefits from being mindful, but never expected the social benefits to be so personally meaningful.

With the findings of this study, it can't be suggested that the initial approach to the program affected the type of benefits perceived as obtained through the yoga intervention. Unlike the study by Carbonneau et al. (2010), in which the positive effects of yoga were thwarted if participants expressed high levels of obsessive passion, there

were no negative outcomes associated with differences in motivation types or initial motives for these seven participants. It is possible to suggest that the way a person initially approached the physical activity intervention can affect the detail of the perception of the benefits after the program is over, but For example, Markus described himself as someone who didn't usually notice the complete benefits of any activity until after quite some time had passed. Tom expressed he thought he was at a good place physically and mentally when he started and therefore didn't expect major changes with the intervention. Nevertheless, they both perceived the experience as positive and enhancing of their PWB.

The variability encountered across participants' experiences highlights the need to consider individual difference factors when conducting research and designing interventions with the goal of improving well-being. This study included conversations with participants about their expectations and their life history, which led to designing the yoga session in a way that the particular characteristics of these students were addressed. The process of designing the intervention for this study involved considering injuries, goals the students wanted to meet such as increased strength or flexibility, or decreasing stress, and these needs were purposefully integrated into the yoga sessions. The positive outcomes regarding increased self-determined motivation and improved perceptions of well-being support the importance of considering the particular needs of a population when designing physical activity or any type of program intended to improve physical and mental health.

### **Implications and Future Directions**

This study builds on the current knowledge base supporting that the expectation that mindful physical activity can contribute to increased well-being in student veterans. Specifically, results support that a structured weekly yoga practice has beneficial psychological and physical effects for student veterans. Thus, there is a lot of promise to this area of applied work and further systematic research could be very beneficial in addressing the physical health and mental health needs of student veterans.

Understanding military culture and the unique demands it creates for former service members is a matter of multicultural competence (Romero, Riggs, & Ruggero, 2015). Findings from this study contribute to the need to pay attention to this cultural understanding. Additionally, results from this study show how this consideration can lead to the establishment of mindful physical activity alternatives that can enhance well-being for student veteran population.

Specific considerations like the need for structure is vital to the well-being perceptions of student veterans. A civilian lifestyle can appear to be much unstructured to a former veteran. This becomes a source of anxiety for former military members, sometimes associated with a sense of lacking purpose for these students, who were used to a very hierarchical structure and collectivist culture in the military (Livingston & Bauman, 2013). Having a weekly structured physical activity session was found to be helpful in filling this need for structure and organization for these students and can be a useful strategy to help improve well-being and satisfy the need for structure of this population. . Structure does not mean lack of autonomy, on the contrary, structure in this context implies an organization of time and accountability that is associated to

enjoyment and can lead to increased autonomy during the practice of the mindful physical activity.

The perceptions of improved physical and mental well-being through mindful physical activity for these students highlight the importance of these type of interventions as tools for any leaders of physical activity initiatives or Veteran Services offices on college campuses that have the influence to create a more positive environment for student veterans. High levels of anxiety, depression, PTSD and elevated rates of suicidal thoughts and suicides among this population in the United States has brought attention to the urgency of improving the psychological and physical well-being of student veterans (Rudd, Goulding, & Bryan, 2011). This study shows that a mindful yoga practice can improve the perceptions of both physical and mental well-being for this population, without the need for great investments or costs for the universities.

Considering that one of the main struggles that student veterans experience is the lack of feeling connected to other college students due to the differences in age and life experiences, it becomes highly salient to explore the possibility of having programs that directly provide opportunities to strengthen the sense of relatedness. Increasing the fulfillment of this need through mindful physical activity programs, such as yoga, is an accessible option to increase student veterans' psychological well-being. This need can be satisfied by having a physical activity program set up only for veteran students, to strengthen this feeling of trust and relatedness.

Results from this study also support the value of narrative research and the potential benefits of individual stories to understand the influence of physical activity

programs on the well-being of participants. Well-designed qualitative approaches can provide a deeper understanding of the role of physical activity in contributing to well-being.

This study also brings attention to the need of including more ways to assess well-being. The current conceptions and quantitative instruments for assessing PWB do not consider characteristics related to mindfulness and how outcomes of increased mindfulness can improve psychological well-being. Although these instruments are not designed for individual level cases, the definitions of some dimensions of PWB regarding purpose in life or self-acceptance can seem contradictory of the principles of mindfulness, such as living moment-by-moment and without a set plan for the future. While the purpose of using quantitative scales in this study was to gain descriptive information, it brings up a consideration for future research with larger sample sizes to consider if this scale is truly representative of PWB.

### **Limitations**

Limitations from this study, as in any multiple case study design include limits to the generalizability of the findings outside of the context in which the research was conducted. Results can only be interpreted as part of the narratives of these seven participants, yet they represent valuable contributions to the understanding of processes other similar students and can be used as a reference for future research.

Another limitation is that the main researcher conducted both the interview process and the direction of the yoga sessions. This double role of the researcher could have resulted in higher levels of bias and social desirability among participants when providing their responses. However, it also led to the establishment of a strong rapport

and trust that helped participants be open and honest in their narratives. The results included discussion of increased mindfulness as a result of the yoga sessions. This information was obtained through the narratives, but there was no formal measurement of mindfulness levels in this study, so that is a methodological limitation. A final limitation involves the geographic and sample characteristics, since participants were recruited only from one university in Colorado. Greater diversity in this regard should be considered for future studies.

### **Conclusions**

A mindful yoga intervention resulted in positive perceptions of psychological well-being among student veterans. Special considerations in designing the intervention for this population were key for obtaining these results. There is not a one-size fits all approach regarding physical activity interventions and for student veterans the need for structure and the strengthening of relatedness are a priority. Authorities in higher education settings, including Veteran Services and Recreation departments should consider these needs when designing programs for student veterans to contribute to their improved well-being and increase the possibilities of these students' success as members of the college community. Providing mindful physical activity in spaces that are perceived as safe for student veterans and facilitated by instructors that are sensitive to the military culture and can help strengthen the sense of competence and relatedness of these students is essential.

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**APPENDIX A**  
**INSTITUTIONAL REVIEW BOARD**  
**INFORMED CONSENT AND APPROVAL**



CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH  
UNIVERSITY OF NORTHERN COLORADO

Project Title: Understanding the effects of a mindful yoga intervention on the psychological well-being of student veterans

Researcher: María del Mar Chavarría Soto Ph.D., Candidate, School of Sport and Exercise Science  
Phone: 970-405-9392 E-mail: [chav6625@bears.unco.edu](mailto:chav6625@bears.unco.edu)

Research Advisor: Robert Brustad, PhD. School of Sport and Exercise Science. Email: [bob.brustad@unco.edu](mailto:bob.brustad@unco.edu)

**Purpose and Description:** The primary purpose of this study is to generate a greater understanding of how yoga-based mindful physical activity may influence the psychological well-being of student veterans. Over eight weeks you will be a participant in a 75 minute yoga class at a location that is convenient to all participants. Classes will likely include breathing exercises, short meditation practice and basic yoga postures. Comfortable clothing is recommended. You will be provided with equipment (yoga mats, blocks, meditation cushions) for the yoga practice.

In the week prior to the start of the yoga sessions, you will be asked to complete an interview with the lead investigator. Interviews will be scheduled at your convenience. The content of the interview questions will include basic demographic questions and open-ended questions about your military experience and your previous history of involvement in physical activity. Interviews will last roughly up to 60 minutes. You will also be requested to complete set of two Likert-scale questionnaires after the each of yoga sessions, over the eight weeks that the process will last.

At the end of the eight-week period, you will be asked to complete a follow up interview about the experience of the yoga practice and how you perceived its outcomes. Interviews will last roughly up to 60 minutes and will be scheduled at your convenience.

At the completion of this study, we would like to confirm that our interpretation of your experiences was accurate and we will contact you to determine if you would be willing to review our interpretation of your interview data. We will take every precaution in order to protect your anonymity. Your name will not be shared and only the lead investigator will know the name connected with your assigned pseudonym when the data is summarized. Data collected for this study will be kept where it is only accessible by the researcher.

Potential risks in this project are minimal. As with any physical activity, possible risks include fatigue, localized muscle soreness, and the potential for strains and sprains of joints of the extremities. The sessions will be led by a certified yoga instructor who will provide instructions, modifications and feedback to promote safety for participants. In addition, if you become too fatigued or uncomfortable, you may choose to stop and rest at any time. In the unlikely event of an injury, the instructor is CPR and first aid certified, and will contact appropriate medical authorities if necessary.

Questions or prompts for data recollection through interviews are designed to let the participants tell their story as they see fit, and serious risks are not anticipated. Some minimal risks may include feelings of discomfort in telling a personal story that involves challenge or adversity. There may be some discomfort in sharing these stories with others but the amount of information that you decide to share is entirely your decision.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not have any consequences or imply any loss of benefits you have already acquired.

Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Nicole Morse, Office of Research, Kepner Hall, University of Northern Colorado Greeley, CO 80639 at 970-351-1910.

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Participant's Signature

Date

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Researcher's Signature

Date



*Institutional Review Board*

DATE: January 29, 2019

TO: Maria Chavarria  
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1359242-2] UNDERSTANDING THE INFLUENCE OF A MINDFUL YOGA INTERVENTION ON THE PSYCHOLOGICAL WELL-BEING OF STUDENT VETERANS

SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS

DECISION DATE: January 29, 2019

EXPIRATION DATE: January 29, 2023

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

*Thank you for your patience with the UNC IRB process. Provision of your narrative and recruitment materials complete your application which is now verified/approved exempt.*

*Best wishes with your research and don't hesitate to contact me with any IRB-related questions or concerns. Sincerely,*

*Dr. Megan Stellino, UNC IRB Co-Chair*

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Nicole Morse at 970-351-1910 or [nicole.morse@unco.edu](mailto:nicole.morse@unco.edu). Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.



**APPENDIX B**  
**DATA COLLECTION**  
**QUESTIONNAIRES**

**BPNES Scale Adaptation**

Instructions. The following sentences refer to your overall experiences in this yoga practice. Using the 1-5 scale below, please indicate the extent to which you agree with these statements by circling one number for each statement.

	<b>I don't agree at all</b>	<b>I agree a little bit</b>	<b>I somewhat agree</b>	<b>I agree a lot</b>	<b>I completely agree</b>
1. I feel I have made a lot of progress in relation to the goal I want to achieve.	1	2	3	4	5
2. The way I practice yoga agrees with my choices and interests.	1	2	3	4	5
3. I feel I perform successfully the activities of this yoga program.	1	2	3	4	5
4. My relationships with the people I practice yoga with are very friendly.	1	2	3	4	5
5. I feel that the way I practice yoga is the way I want to.	1	2	3	4	5
6. I feel yoga is an activity which I do very well.	1	2	3	4	5
7. I feel I have excellent communication with the people I practice yoga with	1	2	3	4	5
8. I feel that the way I practice yoga is a true expression of who I am.	1	2	3	4	5
9. I am able to meet the requirements of this yoga program	1	2	3	4	5
10. My relationships with the people I practice yoga with are close.	1	2	3	4	5

11. I feel that I have the opportunity to make choices with regard to the way I practice yoga.	1	2	3	4	5
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### SIMS Scale

Directions: Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently engaged in this activity. Answer each item according to the following scale: 1: corresponds not all; 2: corresponds a very little; 3: corresponds a little; 4: corresponds moderately; 5: corresponds enough; 6: corresponds a lot; 7: corresponds exactly

#### Why are you currently engaged in this activity?

- |   |                     |
|---|---------------------|
| 1. Because I think that this activity is interesting                                | 7. 6. 5. 4. 3. 2. 1 |
| 2. Because I am doing it for my own good  | 7. 6. 5. 4. 3. 2. 1 |
| 3. Because I am supposed to do it   | 7. 6. 5. 4. 3. 2. 1 |
| 4. There may be good reasons to do this activity,<br>but personally I don't see any | 7. 6. 5. 4. 3. 2. 1 |
| 5. Because I think that this activity is pleasant                                   | 7. 6. 5. 4. 3. 2. 1 |
| 6. Because I think that this activity is good for me                                | 7. 6. 5. 4. 3. 2. 1 |
| 7. Because it is something that I have to do  | 7. 6. 5. 4. 3. 2. 1 |
| 8. I do this activity but I am not sure if it is worth it                           | 7. 6. 5. 4. 3. 2. 1 |
| 9. Because this activity is fun   | 7. 6. 5. 4. 3. 2. 1 |
| 10. By personal decision  | 7. 6. 5. 4. 3. 2. 1 |
| 11. Because I don't have any choice   | 7. 6. 5. 4. 3. 2. 1 |
| 12. I don't know; I don't see what this activity brings me                          | 7. 6. 5. 4. 3. 2. 1 |
| 13. Because I feel good when doing this activity                                    | 7. 6. 5. 4. 3. 2. 1 |
| 14. Because I believe that this activity is important for me                        | 7. 6. 5. 4. 3. 2. 1 |
| 15. Because I feel that I have to do it   | 7. 6. 5. 4. 3. 2. 1 |
| 16. I do this activity,<br>but I am not sure it is a good thing to pursue it        | 7. 6. 5. 4. 3. 2. 1 |

**APPENDIX C**  
**INTERVIEW GUIDES**

## **Interview Guide**

### **Pre-Intervention**

- Name – Date of birth – Preferred pronouns (he/him/his, she/her/hers, they/them/theirs )
- Where are you from?
- Family composition
- What is your military affiliation? (Branch? how long did you serve? Until when did you serve?)
- Tell me more about your service. How would you describe, overall, this part of your life? Biggest take-aways? Greatest challenges?
- What was your experience like when finishing your service and returning to a “civilian” life?
- Describe your return to school after (or alongside, if still in) your military service. Have there been any particular challenges you feel you have encountered? (examples?)
  - o If so, what are strategies you have used to cope with/overcome these challenges.
- What is your major in school? Why did you choose this career path?
- What are your future plans/goals once you complete your degree?
- What is your experience with physical activity?
  - o (Do you practice any PA regularly? What types of PA do you enjoy the most? Why?)
- What are some barriers you perceive for engaging in regular PA?
- Do you use/participate in any of the recreation facilities/programs on campus?  
(Why/why not)
- Do you have any experience with mindfulness or mindfulness related activity?  
(Describe)

- Why did you decide to participate in this study? What do you expect to gain from your participation?
- Any questions for me?

**Interview guide.****Post intervention**

- How would you describe your experience after these 8 weeks of yoga practice?
- What did you enjoy? Why?
- What did you find challenging? Why?
- Do you perceive any change in yourself after these 8 weeks? Do you feel any different than when you started the participation in this study? Physically or mentally?
- Would you continue this type of physical activity now that the research study concluded? Why/why not?
- What would you consider important for other student veterans like yourself to continue/or start to participate in mindful PA programs?
- Do you think this type of programs could be beneficial for coping with the demands of the college lifestyle? Why?
- What do you feel are some of the most important needs of student veterans that need to be taken into account to benefit the mental and physical health of veterans?
- What specific services might you wish to see made available to student veterans?
- What was your biggest take away from this experience?

\*Provide PWB subscales to complete, along with openness to conversation about the questions on the instrument.