THE EFFECT OF TOP ROPE CLIMBING ON
SELF-ESTEEM AND SELF-EFFICACY
IN COLLEGE STUDENTS

By

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IN COLLEGE STUDENTS

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Title of Study: THE EFFECT OF TOP ROPE CLIMBING ON SELF-ESTEEM AND SELF-EFFICACY IN COLLEGE STUDENTS

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Abstract: This case report study focused on two undergraduate students’ perceptions of their global self-esteem and self-efficacy before and after participating in a 60-minute, once-weekly, 4-session indoor top rope climbing intervention. Pretest-posttest data from the Rosenberg Self-Esteem Scale (RSES) and General Self-Efficacy Scale (GSE) was collected at a climbing wall located within the Oklahoma State University campus recreational facility. Results of the study suggest that indoor top rope climbing may increase college students’ perceptions of their overall self-esteem and self-efficacy, particularly in relation to the physical aspects of both topics. This study adds to the current literature regarding the viability of top rope climbing as an intervention for improving or maintaining self-esteem and self-efficacy in non-clinical adult populations.
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Rationale for the Study

Research on Adventure Therapy (AT) as a treatment modality has gained traction within the last three decades (Dobud & Harper, 2018). Nevertheless, researchers arguably have more questions than answers regarding the practice of AT and how it works (Bowen & Neill, 2013; Dobud & Harper, 2018; Frühauf et al., 2019). This uncertainty is primarily due to poor research design combined with ambiguous or nonexistent methodology in how studies are conducted (Bettmann et al., 2016; Bowen & Neill, 2013; Dobud & Harper, 2018; Frühauf et al., 2019). Previous studies tend to measure multiple AT modalities at once and/or include psychotherapeutic elements, both of which make it unclear which intervention may have produced change in which outcome (Bettmann et al., 2016; Bowen & Neill, 2013; Karg et al., 2020; Luttenberger et al., 2015, 2021). Furthermore, research regarding indoor climbing interventions focusing on psychosocial outcomes in nonclinical samples is scarce. Additional research is needed to address current gaps in the literature, namely whether an indoor top rope climbing intervention could improve aspects of mental health in college students.
Statement of the Problem

Recreational Therapy (RT) continues to expand, both as a profession and as a topic of research (Austin et al., 2015; Carter & Van Andel, 2019). Though some treatment modalities used in RT have been effectively legitimized as evidence-based practice (EBP) in the literature, AT is utilized in practice primarily due to anecdotal evidence (Bettmann et al., 2016; Bowen & Neill, 2013; Dobud & Harper, 2018; Frühauf et al., 2019). Further research is necessary to determine the viability of various methods used in AT, specifically, within the scope of RT. Therefore, the goal of this study was to contribute to the literature centered on an indoor climbing intervention in the context of RT practice.

Purpose and Significance of the Study

The purpose of this study was to investigate the effects of a 4-session indoor top rope climbing intervention on college students’ perceptions of their global self-esteem and self-efficacy. As stated previously, prior research surrounding this topic often: (1) utilizes multiple AT activities simultaneously, (2) integrates psychotherapy into the intervention, or (3) is only applicable to clinical samples. The first two situations make it challenging to pinpoint whether the activity of top rope climbing by itself can be an effective modality of treatment for specific areas of mental health. Attempting to investigate this question, this study focused on a non-clinical sample to add to the discussion of whether this type of intervention could be useful in RT practice, specifically in non-clinical settings.

Hypotheses
H₁: Participant’s self-esteem scores on the Rosenberg Self-Esteem Scale (RSES) will increase from pretest to posttest.

H₀: There will be no difference in participant’s RSES scores when comparing pretest and posttest scores.

H₂: Participant’s self-efficacy scores on the General Self-Efficacy Scale (GSE) will increase from pretest to posttest.

H₀: There will be no difference in participant’s GSE scores when comparing pretest and posttest scores.

Limitations

There are many limitations within this study. Firstly, since the study was designed as a case report, the study sample is very small. This makes it unlikely that the results can be generalized to large groups of people. Study participants volunteered to participate in the study which may increase the chance of sampling bias. Additionally, the research design did not control for certain variables that could skew data, i.e., mental health diagnoses or other health conditions. The assessments used in this study only relied on self-report data, which is susceptible to various types of reporting bias. This study did not include a formalized control group for comparison. Lastly, the research design is very simplistic, utilizing a pretest-posttest design. No follow-up measure of outcome variables was conducted.

Definition of Terms
• **Mental Health** – A state of mental wellbeing that encompasses the ability to form and maintain social relationships, feel positive emotions towards oneself and others, understand, express, and manage one’s emotions, demonstrate agency and autonomy to create change, practice empathy, cope with adversity, and demonstrate various cognitive skills that allow an individual to function within and/or adapt to their environment (Bhugra et al., 2013; Galderisi et al., 2015; Iasiello & Van Agteren, 2020; Manwell et al., 2015).

• **Self-concept** – Thoughts of oneself, things associated with the self, and self-beliefs of who a person is, who they used to be, and who they will become (Maddux & Gosselin, 2012; Wehrle & Fasbender, 2019).

• **Self-esteem** – An individual’s “subjective evaluation of their worth as a person” (Orth & Robins, 2014, p. 381).

• **Self-efficacy** – The belief that one has the capability to complete new or challenging tasks and perform those tasks to a degree that meets one’s expectations (Lin et al., 2020; Schönfeld et al., 2016; Schwarzer & Warner, 2013).

• **Adventure Therapy (AT)** – A treatment modality that employs the use of group experiential and/or wilderness activities (Bowen & Neill, 2013; Norton et al., 2014).

• **Recreational Therapy (RT)** – A holistic process that implements recreation and experiential interventions to bring about changes in social, emotional, cognitive, physical, or spiritual domains and to maintain and improve health status, functional capabilities, and quality of life (Carter & Van Andel, 2019).
• **Top Rope Climbing** – A type of climbing in which the climber climbs upward using fixed anchors while attached to a belay device fastened at the top of the rock or climbing wall and held for safety by an individual on the ground below (Aras & Ewert, 2016; Harmer, n.d.; Phillips et al., 2012).

• **Clinical Significance** – The most minimal change in an outcome variable that is still considered meaningful by a researcher, patient, and/or clinician and that would result in changing clinical practice (Schober et al., 2018).
CHAPTER II

REVIEW OF LITERATURE

Mental Health

The World Health Organization (WHO) (2022b) defines mental health as “a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community” (para. 1). Galderisi and colleagues (2015) proposed a different definition, suggesting that a more comprehensive description of mental health would be:

A dynamic state of internal equilibrium which enables individuals to use their abilities in harmony with universal values of society. [This includes] basic cognitive and social skills; [the] ability to recognize, express, and modulate one's own emotions, as well as empathize with others; flexibility and ability to cope with adverse life events and function in social roles; and harmonious relationship between body and mind represent important components of mental health which contribute, to varying degrees, to the state of internal equilibrium (p. 231-232).

The core concepts that constitute mental health may differ depending on the source, creating obstacles in the pursuit of research, public policy, and clinical practice (Iasiello & Van Agteren, 2020; Manwell et al., 2015; Orpana et al., 2016).
Even so, it is generally agreed upon that mental health encompasses more than just the absence of mental illness and is a dynamic continuum that varies from person to person, both with how mental health is experienced and in physical, cognitive, social, and clinical outcomes (Bhugra et al., 2013; Galderisi et al., 2015; Manwell et al., 2015; WHO, 2022). Broadly speaking, mental health has been associated with the ability to form and maintain social relationships, feel positive emotions towards oneself and others, understand, express, and manage one’s emotions, demonstrate agency and autonomy to create change, practice empathy, cope with adversity, and demonstrate various cognitive skills that allow an individual to function within and/or adapt to their environment (Bhugra et al., 2013; Galderisi et al., 2015; Iasiello & Van Agteren, 2020; Manwell et al., 2015). Mental health is also commonly related to analogous concepts such as the capacity for personal growth, identification of life purpose, self-actualization, general satisfaction with life, resilience, and assorted character strengths or virtues (Iasiello & Van Agteren, 2020). Despite differing conceptualizations of what exactly mental health should entail, mental health is widely recognized as an integral component of overall health and well-being (Bhugra et al., 2013; Iasiello & Van Agteren, 2020).

Like mental health, mental illness can be influenced by biological, psychological, social, and environmental factors (Bhugra et al., 2013; Manwell et al., 2015). According to the National Institute of Mental Health (NIMH), mental illness is defined as any mental, behavioral, or emotional disorder resulting in varying levels of functional impairment that significantly limit or interfere with major life activities (National Institute of Mental Health [HIMH], 2021). Mental illnesses of all types are regarded as a global health concern, estimated to effect 51.5 million adults in the United States alone,
equating to over 20% of the total U.S. population (Substance Abuse and Mental Health Services Administration [SAMHSA], 2020). The most prevalent global mental health conditions include anxiety and mood disorders. There are several types of anxiety disorders such as generalized anxiety disorder or social anxiety disorder, both characterized by excessive fear and worry regarding everyday situations or interpersonal interactions, respectively. Depressive disorders account for most mood disorder diagnoses. Symptomology across different diagnoses of depression have common themes, including a general depressed mood, which may be marked by persistent feelings of sadness, irritability, emptiness, hopelessness, guilt, low self-worth, and lack of satisfaction derived from previously enjoyed activities (WHO, 2022a).

Most, if not all, of the above-mentioned symptoms associated with anxiety and mood disorders are associated with poor mental health (Schotanus-Dijkstra et al., 2019; WHO, 2022a). Poor mental health is often associated with mental illness, though researchers are inclined to describe both concepts as being closely related yet not mutually exclusive. Mental health exists on a continuum in which at any given time, an individual may exhibit traits indicative of positive and negative mental health. For example, an individual who is mentally ill may also concurrently report or display qualities associated with positive mental health (Schotanus-Dijkstra et al., 2019). Similarly, some researchers posit that not all components included in definitions of mental health must be equal or even at a functional level for an individual to attain positive mental health. Components of mental health in which an individual is more adept or developed can compensate for functional impairments in emotional, psychological, cognitive, and social capacities. For example, a person who is very empathetic may offset
varying degrees of cognitive impairment to achieve and maintain a state of positive mental health (Galderisi et al., 2015).

Traits that embody positive mental health can be described as sub-categories of overall wellbeing, such as emotional and spiritual wellbeing. Orpana and colleagues (2016) introduced a conceptual framework of positive mental health indicators that comprised of experiencing happiness or other positive emotions, self-reports of mental health, life satisfaction, psychological wellbeing, and social wellbeing. Determinants of positive mental health included twenty-five categories across four contextual domains—individual, family, community, and society. Some of these concepts included resilience, self-control and self-efficacy, spirituality, coping skills, social support, and overall health status (Orpana et al., 2016). While researchers have not reached a consensus on what the exact components of mental health are, there are several psychological concepts that are commonly included in definitions of mental health (Bhugra et al., 2013; Galderisi et al., 2015; Iasiello & Van Agteren, 2020; Manwell et al., 2015; Orpana et al., 2016). One such term of relevance to the proposed study is self-esteem alongside adjacent terminology such as self-concept and self-efficacy.

Self-Esteem

The concept of self-esteem is one of the most extensively studied variables in psychological research (Orth & Robins, 2022). Self-esteem is conceptualized as the feelings one attributes to themselves, whether they be positive, negative, or neutral. (Rosenberg et al., 1995; Stets & Burke, 2014). As described by Orth & Robins (2014), “Self-esteem refers to an individual’s subjective evaluation of their worth as a person” (p.
Put simply, self-esteem involves accepting and respecting oneself; of feeling that one is valuable or “good enough” (Orth & Robins, 2014, 2020; Rosenberg, 1965; Stets & Burke, 2014). Notably, because self-esteem stems from one’s own subjective evaluation of themselves, self-esteem may not be indicative of an individual’s own perceived talents and capabilities or how they are regarded by others (Orth & Robins, 2014, 2020; Rosenberg et al., 1995). Therefore, it is possible for an individual to be gifted in one or several domains and be well-regarded by others yet have low self-esteem. Likewise, an individual may be viewed poorly by others and perceive themselves as having few strengths, and still have high self-esteem (Rosenberg, 1965; Rosenberg et al., 1995).

High Self-Esteem vs Narcissism

Having high self-esteem is not synonymous with an individual viewing themselves as superior to others, as in the case of narcissism (Brummelman et al., 2016; Orth & Robins, 2014; Rosenberg, 1965). Narcissism, in its most simple terms, can be described as inflated and “entitled self-importance” (Krizan & Herlache, 2018). While high self-esteem and narcissism both feature positive appraisal of oneself, the basis of that self-appraisal is attributable to different motives (Crowe et al., 2018; Hyatt et al., 2018). An individual with high self-esteem appreciates who they are as a person; they accept and respect themselves (Brummelman et al., 2016; Rosenberg et al., 1995). Conversely, a narcissistic individual is more concerned about external validation and how they compare to other people; viewing others as less intelligent, competent, or unique than themselves (Brummelman et al., 2016). These differences are highlighted by low to moderate correlations and a nonlinear association between the two constructs in which higher levels of self-esteem do not result in higher narcissism (Crowe et al., 2018; Hyatt
et al., 2018). Thus, high self-esteem should not be equated with narcissism (Brummelman et al., 2016; Crowe et al., 2018; Hyatt et al., 2018; Krizan & Herlache, 2018; Orth & Robins, 2014, 2020; Rosenberg, 1965; Rosenberg et al., 1995).

**Self-Concept**

Self-esteem is thought to be a component of a person’s overarching self-concept—their knowledge of who they are—which includes their “tendencies, thoughts, preferences, habits, hobbies, skills, and areas of weakness” alongside other qualities unique to that person (Ackerman, 2018, para. 13; Maddux & Gosselin, 2012). Self-concept encompasses thoughts of oneself, what is associated with the self, and self-beliefs of who a person is, who they used to be, and who they will become (Maddux & Gosselin, 2012; Wehrle & Fasbender, 2019). Like self-esteem, an individual’s self-concept may appear stable, but can change over time depending on contextual factors and life experiences (Ackerman, 2018; Wehrle & Fasbender, 2019). For example, becoming more proficient in challenging tasks, taking calculated risks, and receiving praise and encouragement from social relationships may enhance self-concept (Lubans et al., 2012). Developing and being aware of one’s self-concept is important for a variety of reasons that go beyond just fostering one’s identity. Self-concept determines how external information is filtered and processed, helping people to define themselves through distinctive roles and within various contexts. This in turn directs an individual’s behavior, doing so in a way that affirms their self-perceived identity (Wehrle & Fasbender, 2019). Just as self-esteem is merely one component of the broader construct of self-concept, self-efficacy is another similar term that dictates how a person views themselves.
Self-Efficacy

Some researchers conceptualize self-esteem as being two-dimensional, rather than entirely focused on a person’s positive feelings towards themselves and perception of their worth, otherwise known as global self-esteem (Stets & Burke, 2014). In this two-dimensional model, self-esteem is the combined product of self-worth and self-efficacy. This perspective is supported by findings that increasing self-efficacy positively correlates with higher levels of global self-esteem (Ouyang et al., 2020; Wagnsson et al., 2014). Self-efficacy is the belief that one has the capability to complete new or challenging tasks and perform those tasks to a degree that meets one’s expectations (Lin et al., 2020; Schönfeld et al., 2016; Schwarzer & Warner, 2013). In other words, self-efficacy is akin to having confidence in one’s abilities and feeling competent in various activities. Self-efficacy is theorized to be a determinant of initiating and persisting with certain behaviors, and can dictate how people think, feel, and motivate themselves (Bandura, 1994; Bandura, 1997; Maddux & Gosselin, 2012; Schwarzer & Warner, 2013). Beliefs about skill mastery and competence—both of which are associated with self-efficacy—are important components of self-concept and self-esteem. If an individual perceives themselves as being proficient in a skill, especially a skill that is integral to their identity, this plays a role in increasing self-esteem and influencing self-concept. As with high self-esteem and positive self-concept, having high self-efficacy does not assure optimal wellbeing and positive mental health (Lin et al., 2020; Maddux & Gosselin, 2012; Schönfeld et al., 2016). Rather, all these terms influence mental health through their impact on psychological states like anxiety, depression, and the initiation and
maintenance of adaptive and coping behaviors (Bandura, 1994; Bandura, 1997; Maddux & Gosselin, 2012; Schönfeld et al., 2016).

**Self-Esteem, Self-Efficacy, and Mental Health**

Correlational studies provide evidence for a relationship between self-concept, self-esteem, self-efficacy, and various aspects of mental health. The relationship between both self-esteem and mental health as well as self-efficacy and mental health are well documented (Bajaj et al., 2016; Cooper et al., 2017; Guillamón et al., 2013; Kershaw et al., 2015; Lin et al., 2020; Maddux & Gosselin, 2012; Mao et al., 2020; Schönfeld et al., 2016; Sowislo & Orth, 2013). According to a meta-analysis by Sowislo & Orth (2013), research shows that high self-esteem is likely to benefit an individual’s overall wellbeing and that low self-esteem is a risk factor for poor mental health and other negative outcomes. The literature demonstrates that there is a significant relationship between levels of self-esteem and depression, in which low self-esteem predicts depressive symptoms. This same relationship is found pertaining to various anxiety disorders (Bajaj et al., 2016; Cooper et al., 2017; Mao et al., 2020; Sowislo & Orth, 2013). Beyond measures of mental health that only assess depression and anxiety levels, other studies provide further evidence that self-esteem is vital to several facets of psychological functioning (Orth & Robins, 2014; Ouyang et al., 2020; Stets & Burke, 2014; Wagnsson et al., 2014). An individual’s self-esteem has implications for resilience and how they experience and respond to psychological distress. Higher self-esteem is correlated with higher levels of resilience, life satisfaction, self-control, optimism, and improved psychological adjustment (Liu et al., 2014; Mao et al., 2020; Martínez-Martí, & Ruch, 2017; Yang et al., 2019).
Some studies have found a sizable relationship when examining low self-esteem and one’s prevalence of experiencing negative emotions like hopelessness, shame, and guilt (Dogan et al., 2013; Velotti at al., 2017). Velotti and colleagues (2017) note that the frequency of negative emotional experiences is indicative of higher levels of verbal and physical aggression, lack of self-confidence, and general psychological distress. Though experiencing negative emotions on occasion is believed to be a universal phenomenon, how people manage these feelings has strong implications for several attributes associated with mental health and overall wellbeing (Dogan et al., 2013; Velotti at al., 2017). One such concept that is related to how feelings and emotions are managed, while also being linked to self-esteem, is emotional intelligence (Kong et al., 2012; Resurrección et al., 2014). An operational definition of emotional intelligence may include emotional perception, understanding, expression, reasoning, and regulation (Extremera et al., 2018; Kong et al., 2012). Emotional intelligence is a vital component of mental health due to its negative relationship with psychological maladjustment such as internalization and lack of adequate coping skills (Extremera et al., 2018; Kong et al., 2012; Resurrección et al., 2014). Accordingly, greater emotional intelligence is associated with higher self-esteem and social support, both of which mediate perceived stress, propensity for risky behavior, and emotional disturbance (Kong et al., 2012; Resurrección et al., 2014).

Another key aspect that impacts mental health and wellbeing is the existence and quality of social relationships and social support. There is an abundance of research describing how the absence of positive social relationships can result in higher rates of various forms of morbidity and mortality (Beller & Wagner, 2018; Cacioppo &
Cacioppo, 2014; Hämmig, 2019; Holt-Lunstad, 2020). Feelings of loneliness and social isolation are significant risk factors for depression, anxiety, dementia, suicide, as well as impairments in sleep quality, executive functioning, cardiovascular health, and immune function (Beller & Wagner, 2018; Cacioppo & Cacioppo, 2014; Cho et al., 2015; Holt-Lunstad et al., 2015; Holt-Lunstad, 2020; Lee & Way, 2019; Leigh-Hunt et al., 2017; Son et al., 2020). Literature on the topic of perceived social support indicates that self-esteem may act as a buffer and partly mediate the prevalence and severity of various health impairments (Creemers et al, 2012; Harris & Orth, 2020; Kleiman & Riskind, 2013; Lee & Way, 2019; Rossi et al., 2020). Low self-esteem strongly predicts higher subjective ratings of loneliness regardless of actual frequency of social interaction. Conversely, high self-esteem is correlated with higher quality and quantity of social interactions, social support, and lower ratings of perceived loneliness (Al Khatib, 2012; Cacioppo & Cacioppo, 2014; Creemers et al, 2012; Rossi et al., 2020; Vanhalst et al., 2013). Due to the theoretical framework that self-esteem encompasses other facets of psychological health, researchers have reported many similarities when comparing self-esteem and self-efficacy. Because self-efficacy is believed to be a specific aspect of the broader category of self-esteem, research findings for self-esteem are often synonymous with self-efficacy (Al Khatib, 2012; Dogan et al., 2013; Mao et al., 2020; Ouyang et al., 2020; Wagnsson et al., 2014; Yang et al., 2019).

Self-efficacy is an integral component of Bandura’s (1986) social cognitive theory (SCT). According to SCT, behavior is dictated directly and indirectly by one’s goals, self-efficacy, outcome expectations, and sociocultural factors (Bandura, 1986, 1994). Outcome expectations are beliefs that a certain behavior will lead to a specific outcome
(Bandura, 1986; French, 2015). Sociocultural factors may include various barriers and facilitators to goal achievement such as financial resources and social support (French, 2015).

**Figure 1**

*Illustration of how self-efficacy and other social cognitive concepts influence motivation and behavior*


Hoffart (2017) proposed that there are five primary sources that influence self-efficacy: mastery experiences (successfully performing a task), verbal persuasion (receiving encouragement from another person), vicarious learning (seeing another person attempt a task), imaginal enactment (imagining oneself performing an action), and emotional and/or physiological feedback. Though self-efficacy can be influenced by any of the sources above, researchers assert that mastery experiences are the most effective in shaping self-efficacy (Bandura, 1997; French, 2015; Hoffart, 2017). Drawing on past
successes and failures is the most convincing basis of information used to determine beliefs about how one will perform in the future (Bandura, 1997; Hoffart, 2017).

Bandura (1994) theorized that self-efficacy plays a pivotal role in regulating an individual’s maladaptive thought processes and mental health. People with higher self-efficacy may be better at coping with stressors and seeking social support, giving them an advantage over people with low perceived self-efficacy. This in turn results in additional coping options and resources, increasing the likelihood that problems will be dealt with in a more adaptable and practical way (Mato & Tsukasaki, 2019). People who strongly believe in their ability to effectively cope and control their thoughts are more successful in reducing their levels of depression, anxiety, stress, and avoidant behavior (Bandura 1994; Guillamón et al., 2013; Lin et al., 2020; Schönfeld et al., 2016). A study conducted by Guillamón and colleagues (2013), examined the relationship of self-efficacy and coping strategies in respect to life satisfaction, physical health, depression, and anxiety in parents of children with cerebral palsy. The findings highlighted the importance of high self-efficacy as a personal coping resource, with the results showing that self-efficacy had a more significant relationship with all the variables assessed compared to coping strategies. Parents who scored high in self-efficacy rated themselves as being more physically healthy, having better mental health as evidenced by lower depression and anxiety scores, and higher life satisfaction. These findings are in line with other studies that measured the effect of self-efficacy on dimensions of physical and mental health outcomes (Azizli et al., 2015; Kershaw et al., 2015; Lin et al., 2020; Schönfeld et al., 2016; Tagay et al., 2016).
When looking specifically at concepts that are often incorporated into definitions of mental health—resilience, autonomy, interpersonal relationships, and emotional regulation—research has shown that self-efficacy may contribute to these aspects as well (Martínez-Martí, & Ruch, 2017; Schwarzer & Warner, 2013; Yang et al., 2019). Past literature suggests that there is a significant correlation between resilience and self-efficacy, indicating that individuals with higher levels of resilience are more likely to have higher levels of self-efficacy and vice versa (Li et al., 2018; Martínez-Martí, & Ruch, 2017; Tagay et al., 2016; Yang et al., 2019). Self-efficacy and autonomy share a similar relationship; the more autonomy an individual perceives themselves to have, the more self-efficacious they feel (Lemos et al., 2017; Skaalvik & Skaalvik, 2014; Sousa et al., 2012). Both concepts have also been shown to increase motivation and positive affect, and decrease emotional exhaustion, stress levels, and burnout (Lemos et al., 2017; Li et al., 2018; Martínez-Martí, & Ruch, 2017; Skaalvik & Skaalvik, 2014; Sousa et al., 2012; Tagay et al., 2016; Yang et al., 2019). Having low self-efficacy, specifically low social self-efficacy, is related to social anxiety, loneliness, and dissatisfaction with social relationships. Doubting one’s abilities to form and maintain interpersonal relationships is a risk factor for several adverse psychological outcomes (Ahmad et al., 2014; Bakioğlu, 2020). Research has also shown that self-efficacy, especially regarding one’s ability to cope, plays a significant role in emotional regulation (Heath et al., 2016; Luberto et al., 2014; Midkiff et al., 2018). Luberto and colleagues (2014) found that coping self-efficacy shares a positive correlation with various mindfulness skills and is negatively correlated with emotional regulation difficulties, such as awareness and avoidance of emotions.
Additionally, individuals with higher levels of coping self-efficacy report fewer self-injurious behaviors (Heath et al., 2016; Midkiff et al., 2018).

**Physical Activity and Mental Health**

As has been previously discussed, both self-esteem and self-efficacy are integral to maintaining positive mental health and wellbeing. Consequently, it is necessary to evaluate various methods that can promote higher levels of self-esteem and self-efficacy. A simple approach that can facilitate change in self-concept is through physical activity (Jekauc et al., 2017; Lubans et al., 2012). It is well known that participating in physical activity is beneficial for various aspects of physical and mental health (Paluska & Schwenk, 2000; Richardson et al., 2005; Reiner et al., 2013; Gallotta et al., 2015). Some studies have also investigated different mechanisms that may contribute to the reported health benefits of these activities. For example, there is evidence to suggest that group physical activity is more effective than solo activities, especially for certain mental health populations (Burke et al., 2006; Luttenberger et al., 2015; Yorks et al., 2017).

Additionally, participating in physical activity provides a means to pursue mastery experiences and social support, both of which are integral to the process of improving overall self-concept and wellbeing (Bandura, 1994, 1997; Jekauc et al., 2017). As Jekauc and colleagues (2017) describe, an individual’s motor abilities are a component of their self-concept; proficiency in motor abilities is the result of skill mastery and usually precedes positive feedback from others, in turn reinforcing a more positive self-image. This process can be further encouraged by opportunities for physical activity with an emphasis on mastery experiences and peer support for the purpose of
achieving greater overall mental health and wellbeing. One such treatment option that meets all these criteria is recreational therapy.

**Recreational Therapy**

Recreational Therapy (RT) is a holistic process that implements recreation and experiential interventions to bring about changes, whether social, emotional, cognitive, physical, or spiritual, to maintain and improve health status, functional capabilities, and quality of life. RT is characterized by processes that use recreation as a modality to help achieve predetermined goals and objectives (Carter & Van Andel, 2019). The primary goals inherent to RT are the restoration of client health through utilizing appropriate coping mechanisms and introducing leisure activities as a catalyst for personal growth, self-actualization, and attaining the highest level of wellness (Austin et al., 2015). In most instances, RT processes are assumed to bring about change as a direct result of therapist facilitation (Austin et al., 2015; Fleischer et al., 2017). One treatment modality in which the intervention is thought to be just as important as the therapist themselves is adventure therapy (AT). In AT, the experience of the activity is believed to take on some of the therapeutic role that initiates change, rather than the therapist alone (Fleischer et al., 2017).

**Adventure Therapy**

AT, sometimes referred to interchangeably with wilderness therapy, is a treatment modality that employs the use of group experiential and wilderness activities to meet clients’ therapeutic needs (Bowen & Neill, 2013; Norton et al., 2014). AT is a popular intervention for many different populations but has been found to be most widely used
with clients in psychiatric treatment, especially at-risk youth, young adults, and veterans (Bettmann et al., 2016; Bowen & Neill, 2013; DeMille et al., 2018; Norton et al., 2014). Bowen and colleagues (2016) describe the process of AT as “providing fun and engaging activities that involve real obstacles which, although often appearing to be impossible to overcome, are attainable. Activities are sequenced for success to provide participants with a sense of self-efficacy and mastery” (pp. 50). Expanding on this further, Gass (1993) introduced the foundation of the models and core components that inform the practice of AT, as shown in Figure 2.

**Figure 2**

*Characteristics of Adventure Therapy Programs*

<table>
<thead>
<tr>
<th>Action-centered intervention(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>An unfamiliar environment</td>
</tr>
<tr>
<td>Assessment of participant's capabilities</td>
</tr>
<tr>
<td>Promote a climate of change</td>
</tr>
<tr>
<td>Emphasize group development</td>
</tr>
<tr>
<td>Focus on individual strengths</td>
</tr>
<tr>
<td>Therapist should serve a nontraditional role</td>
</tr>
</tbody>
</table>

*Note.* Adapted from *Adventure Therapy: Therapeutic Applications of Adventure Programming* (1st ed.), by M. Gass, 1993, Kendall Hunt Publishing Co.

AT features the implementation of various group activities such as problem-solving games, ropes courses, rock climbing, and canoeing. Practice settings may include
front country land, or outdoor spaces easily accessible by vehicle, and backcountry land, or outdoor spaces farther from civilization that are less accessible by vehicles (Fleischer et al., 2017). The benefits from participating in adventure activities are believed to be reinforced by the structure of the activities. Successfully completing activities often results in participants feeling a sense of accomplishment. These activities promote improvements in social skills such as cooperation, communication, and trust between participants though the group activities (DeMille et al., 2018; Schell et al., 2012). The activities used are adapted to fit all abilities, which in turn can increase awareness of an individual’s self-concept (Austin et al., 2015). Numerous studies show that AT interventions go beyond fostering a greater awareness of one’s self concept and can also facilitate self-esteem and self-efficacy development (Bettmann et al., 2016; Bowen & Neill, 2013; Bowen et al., 2016; DeMille et al., 2018; Fleischer et al., 2017).

**Top Rope Rock Climbing**

Top rope climbing is considered one of the safest and easiest methods of rock climbing, making it a great fit for beginners (Phillips et al., 2012). As with other subcategories of indoor climbing, the climbing wall contains a variety of purposefully fixed hand and foot holds, otherwise known as anchors (Aras & Ewert, 2016). In top rope climbing, a rope is threaded through an anchor set up at the top of the rock or rock wall. One end of the rope is tied to a harness attached to the climber, while the other end is attached to the individual on the ground controlling the rope slack with a belay device, an act referred to as belaying. The anchor system put in place while top rope climbing assures that the climber can only fall the length of slack given by the belayer, resulting in the occurrence of major falls being very rare (Harmer, n.d.; Phillips et al., 2012; Schöffl
et al. 2013). When a climber reaches the top of the rock or wall, the length of rope is approximately half of the length that it started out as. Should the climber fall at any point during the climb, the belayer and belay device will stop the rope, halting the climber’s fall. Because the climber is secured with a taut rope during the entire climb, fall distance is usually relegated to only a few feet (Harmer, n.d.,). Due to the ease and convenience of top rope climbing, indoor climbing gyms have helped make top rope climbing the most popular way to climb (Harmer, n.d.; Phillips et al., 2012).

**Climbing, Self-Esteem, and Self-Efficacy**

Climbing shares many of the same benefits as other adventure-based activities under the umbrella of AT (De Vita & Rosa, 2018; Fleischer et al., 2017). De Vita and Rosa (2018) explain that climbing therapies and interventions can “…strengthen self-esteem, individual empowerment, self-confidence, and knowledge of one’s own limitations and potentialities, while also providing the opportunity to learn how to tolerate a defeat” (p. 69). Overcoming a fear of heights or falling by climbing or reaching the top of the wall can promote improvement in perceptions of self-efficacy (De Vita & Rosa, 2018). There is evidence that climbing interventions may be more effective in improving global self-esteem and body image when compared to other types of physical activity such as Nordic walking (Karg et al., 2020). Past studies on climbing and its effects on facets of self-concept tend to focus on task specific self-efficacy i.e., belaying and climbing self-efficacy rather than general self-efficacy (Krüger & Seng, 2019). Moreover, studies that do measure general self-efficacy as an outcome variable combine climbing activities with psychotherapy elements, making it difficult to identify which intervention, if not both, were responsible for self-efficacy improvement (Luttenberger et
According to a meta-analysis by Frühauf and colleagues (2019), climbing therapies and interventions have become an increasingly popular activity in the treatment of mental health and behavioral disorders despite a lack of empirical evidence that climbing interventions are effective treatment options. This is compounded by the fact that the studies that are currently available on this topic are prone to methodology issues, a problem commonly cited in AT research (Bettmann et al., 2016; Bowen & Neill, 2013; Dobud & Harper, 2018; Frühauf et al., 2019).

**Instruments**

*Rosenberg Self-Esteem Scale (RSES)*

The Rosenberg Self-Esteem Scale (RSES) is a standardized assessment created by Morris Rosenberg that measures global self-esteem (Rosenberg, 1965). The RSES was originally developed for and administered to high school students but has since been recognized as a valid scale for use with other populations, becoming the most widely used measure of self-esteem (Donnellan et al., 2015; Rosenberg, 1965). The RSES is a 10-item self-report assessment with half of the items represented as positive statements and the other half expressed as negative statements. RSES items are categorized as assessing one of two dimensions of global self-esteem: self-liking and self-competence (García et al., 2019; Rosenberg, 1965). When the scale was first created, the item statements were scored on a Guttman scale, with respondents choosing “agree” or “disagree” on each item. According to DePoy and Gitlin (2016), “[In a Guttman scale] …the items are hierarchically arranged so that endorsement of one item means an endorsement of those items below it, which are expressed at less intensity. Knowledge of
the total score is predictive of the individual's responses to each item” (p. 233). The RSES was designed as a Guttman scale to ensure a unidimensional continuum in which test-takers would be ranked by their scores ranging from very low to very high self-esteem (Rosenberg, 1965).

The RSES was developed largely based on face validity rather than actual psychometric properties (Rosenberg, 1965; Yamasaki, 2019). This decision further explains the use of a Guttman scale survey since assessment items were created to be predictive of one another, giving the impression of content and construct validity (Yamasaki, 2019). Rosenberg (1979) later included that the RSES can also be scored as a Likert scale within the scoring instructions for the RSES. Scoring the RSES as a Likert scale allows for more variability in participant responses and mean scores (UMD-SOCY, 2021). Consequently, scoring the RSES using a Guttman scale is very uncommon in the literature, with most researchers choosing to score the items on a 5- or 7-point Likert scale instead (Donnellan et al., 2015; University of Maryland Department of Sociology [UMD-SOCY], 2021). Unlike a Likert scale, items on a Guttman scale are not all weighted to the same degree. For example, items 1, 8, and 10 are the only items scored individually on the RSES. All the other items are scored by grouping items that fulfill a requirement of “correct” responses, i.e., answering “agree” or “strongly agree” at least once on items 2 and 6 (Rosenberg, 1979).

Depending on the study, the Likert scale usually includes the following response options: strongly disagree, disagree, agree, or strongly agree, though some also include a neutral response option (Donnellan et al., 2015). Scores on the RSES usually range from 0-30 or 10-40/50 depending on the study and how the responses were coded and
summed, i.e., responses with values ranging 0-3 vs 1-4/5. Items 1, 2, 4, 6, and 7 are positive statements and are therefore scored in such a way that: strongly agree = 3, agree = 2, disagree = 1, and strongly disagree = 0. Items 3, 5, 8, 9, and 10 are reverse keyed to reflect that they are negative statements and are scored as follows: strongly agree = 0, agree = 1, disagree = 2, and strongly disagree = 3. A score of 0 denotes the lowest possible score, while a score of 30 represents the highest possible score. Studies that assign values of 1-4 or 1-5 instead of 0-3 on item responses can replace the corresponding values so that the lowest possible score is a 10 while the highest possible score is 40 or 50 (Sinclair et al., 2010; UMD-SOCY, 2021).

The RSES has been validated for use with individuals 12 years of age and older. Modified versions of the scale have been developed for children 7-12 and 8-18 years old. These modified scales are composed of 6-10 items and use simplified language to enhance comprehension in the younger population being tested (Wood et al., 2021). The RSES has been used extensively in psychological research and has repeatedly demonstrated strong psychometric properties. Depending on the study, Cronbach alpha coefficients for the RSES usually range from $\alpha = .80$ to $.90$ (Donnellan et al., 2015). A study by Schmitt and Allik (2005) examined cross cultural comparisons of the RSES in 53 countries, finding an average alpha coefficient of .81 in a sample of 16,998. Sinclair and colleagues (2010) assessed a sample intended to be representative of adults in the United States, reporting $\alpha = .91$ across different demographics. Additionally, some more recent studies have reported even greater reliability, citing ranges of $\alpha = .93$ to $\alpha = .97$ (Westaway et al., 2015) and $\alpha = .95$ and $\alpha = .93$ (Eklund et al., 2018) respectively. The RSES also appears to have adequate test-retest reliability, with correlation coefficients
usually ranging from 0.69-0.89 depending on the source (Donnellan et al., 2015; Eklund et al., 2018; Rosenberg, 1965).

The RSES has also been scrutinized regarding different types of validity measures. The RSES correlates highly with other global self-esteem assessments, such as the State Self-Esteem Scale (SSES) \( (r = .71) \), the Self-Liking/Self-Competence Scale-Revised (SLCS-R) \( (r = .90) \) for the self-liking statements and \( (r = .71) \) for the self-competence statements, and the general self-esteem subscale on the Self-Description Questionnaire (SDQ-III) \( (r = .87) \) (Donnellan et al., 2015). Tinakon and Nahathai (2012) investigated construct validity of the RSES by conducting a confirmatory factor analysis of the assessment, reporting high factor loading values \( (> 0.4) \) for most scale items with values ranging from 0.277-0.808. These results indicate that most items on the assessment are effective measures of the construct of self-esteem.

**The General Self-Efficacy Scale (GSE)**

The General Self-Efficacy Scale (GSE) developed by Schwarzer and Jerusalem (1995), is a standardized scale measuring global perceived self-efficacy, used to predict coping behaviors and adaptations when faced with stressful life events. The GSE was originally developed in German in 1978 but has since been translated and modified for use with 33 other languages (Jerusalem & Schwarzer, 1986; Scholz et al., 2002; Schwarzer & Jerusalem, 1995). Schwarzer (1992) asserted that the GSE measures the construct of perceived self-efficacy as an optimistic self-belief that one can perform new and daunting tasks and sufficiently cope with adversity. Perceived self-efficacy is indicative of goal setting, effort expended, persistence when faced with obstacles, and
recovery after failure when attempting a new or challenging task (Schwarzer, 1992; Schwarzer & Jerusalem, 1995).

The GSE consists of 10 self-report items with each response typically scored on a 4-point Likert scale. The Likert scale includes the following response options: (1) not at all true, (2) hardly true, (3) moderately true, and (4) exactly true yielding a total score of 10-40. Item scores are summed with higher total scores indicating higher self-efficacy beliefs (Schwarzer & Jerusalem, 1995). The GSE is a valid measurement for adults and adolescents ages 12 and up (Jerusalem & Schwarzer, 1986; Schwarzer & Jerusalem, 1995). The GSE has been utilized significantly in psychological and personality research and reports satisfactory psychometric properties (De las Cuevas & Peñate, 2015; Luszczynska et al., 2005; Mystakidou et al., 2013; Scholz et al., 2002). Sholz and colleagues (2002) surveyed samples from 25 countries, finding that Cronbach alpha coefficients ranged from .75 to .91 with a mean of .86. A more recent study conducted by Zeng and colleagues (2022) reported adequate internal consistency in a large-scale sample of 9578 school age and college students in China, $\alpha = .91$. Internal consistency for the GSE appears to remain high in specialized populations as well such as in cancer patients $\alpha = .927$ (Mystakidou et al., 2013) and psychiatric outpatients $\alpha = .90$ (De las Cuevas & Peñate, 2015).

Test-retest reliability intraclass correlation coefficients ranged from .69 to .80 (Nilsson et al., 2015; Ohno et al., 2017) for brief time frames (i.e., two weeks) and .47 to .75 for longer time periods between six months and two years (Scholz et al., 2002). The GSE has shown discriminant and convergent validity with other personality traits and mental health concepts (Schwarzer & Warner, 2013). Previous studies found low to
moderate positive correlations between the GSE and self-esteem, optimism, hope, and positive affect (Alarcon et al., 2013; Luszczynska et al., 2005). Negative correlations have been found for depression, anxiety, stress, and negative affect (Lazić et al., 2021; Luszczynska et al., 2005). Romppel and colleagues (2013) investigated construct validity of the GSE by conducting a confirmatory factor analysis of the assessment, reporting high factor loading values (> 0.5) for all scale items with values between 0.52 and 0.77. These results indicate that the assessment items are effective measures of the construct of general self-efficacy.
CHAPTER III

METHODOLOGY

Study Design

This study followed the format of two case reports focusing on quantitative data derived from pretest-posttest scores on two standardized assessments: the Rosenberg Self-Esteem Scale (RSES) and General Self-Efficacy Scale (GSE). The study was quasi-experimental in nature, due to lack of a control group. Instead, each participant acted as their own control, through comparison of mean outcome variable scores before and after the intervention.

Pretest-Posttest Case Report Research Design

A pretest-posttest case report research design was utilized in this study to ascertain the merit of a climbing intervention focused on broad outcome variables. A pretest-posttest design is commonly used in research to evaluate the effects of an intervention by measuring change in outcome variables (Alessandri et al., 2017).

Given that the focus of this study was to collect outcome data at two separate points in time, in two different participants, a case report design was deemed a good fit. Case reports are defined as a research design that examines various aspects of one or two individual cases (El-Gilany, 2018; Nissen & Wynn, 2014).
This is contrasted with case series or case series reports, which typically examine between three and ten individual cases (Nissen & Wynn, 2014).

Case reports can be especially useful for evaluating novel therapeutic approaches and highlighting the personal impact of an intervention. Additionally, case report findings are often used to progress and guide clinical practice in a variety of fields and help with formulating hypotheses to be investigated in future research (El-Gilany, 2018). Due to the lack of published research centered around top rope climbing and the reported impact on general self-esteem and self-efficacy, this study may serve as a precursor to more methodologically complex studies to be conducted in the future.

Participants

Participants in this study consisted of two undergraduate students currently attending a large public research university located in the southwest United States. Participants were recruited online through Sona Systems software. Sona Systems is an online research management tool that streamlines the process of study recruitment for researchers and participants. Both participants were compensated for their participation with extra credit points that could be applied to any classes requiring Sona participation that they were enrolled in during the spring 2024 semester.

Data Collection

All participants who agreed to participate in the study by signing an informed consent form took part in the intervention. Participants answered basic demographic information and reported their current physical activity level and climbing experience prior to taking part in the study. Physical activity level was based on the 2020 World
Health Organization (WHO) guidelines on physical activity and sedentary behavior in adults, which classifies physical activity levels as follows: low (fewer than 150 minutes of moderate intensity or 75 minutes of vigorous exercise per week), moderate (between 150-300 minutes of moderate intensity exercise or 75-150 minutes of vigorous intensity exercise per week), and high (over 300 minutes of moderate intensity exercise or over 150 minutes of vigorous intensity exercises per week) (WHO, 2020). Since there were no established climbing experience measures deemed appropriate for this study, the researcher decided to base climbing experience on how often participants had climbed prior to the study. The categories were classified as follows: beginner (previously climbed 1-10 times), intermediate (previously climbed 11-20 times), and advanced (previously climbed 21+ times).

Study participants were sent an email link and instructed to complete the Qualtrics online pretest survey before arriving at the climbing wall to participate in the first session of the study. The online survey contained the RSES and GSE assessments which were then calculated to determine baseline scores of these variables prior to engaging in the study intervention. Immediately after the conclusion of the final session of the intervention, the researcher provided a QR code for the participants that contained a link to the online posttest survey and were told that they could leave the climbing wall once they had finished the survey. While working on the posttest survey, participants once again completed the RSES and GSE measures. During the intervention, participants engaged in a 60-minute belay clinic during the first session of the study. The second, third, and fourth sessions each consisted of 60 minutes of free climbing once a week. The first three sessions were scheduled once weekly. The fourth session was scheduled two
weeks after the third session due to scheduled conflicts associated with the timing of the University’s spring break. The top rope climbing intervention was instructed by a certified Climbing Wall Instructor employed by Outdoor Adventure, a division of campus recreation and the Department of Wellness of the University the intervention was held at.

*Top Rope Climbing Intervention*

The first session of the top rope climbing intervention focused on introducing the basics of climbing to the participants. This included familiarizing participants with the climbing wall, learning about the gear and tools used in top rope climbing, practicing tying common knots used in climbing, and instructing the participants on how to belay a climber. The session began with the participants being instructed on how to wear and secure a harness, how to set up a belay device using a figure eight knot, and how to belay. When practicing belaying, participants began by belaying a sandbag until they were comfortable with the task before moving on and belaying one another. The climbing instructor taught participants the basic movements of climbing including various holds, grips, and how to visualize climbing routes. Participants were also taught about and practiced proper body positioning and different footwork techniques. The subsequent sessions after the first were designated for free climbing, in which participants had the opportunity to practice all the skills that they learned throughout the belay clinic during the first session of the study. During these sessions, the participants were instructed to top rope climb as much as they were able for the entire duration of each session. This included belaying one another, being belayed by OA staff, and/or using the auto belay. The only time that the participants were not actively climbing or preparing to climb was when they needed a short rest. The fourth climbing session ended with a closing
discussion where the climbing instructor provided information about resources available for future climbing opportunities. Immediately after the end of the fourth session, participants completed the posttest surveys.

During all sessions of the climbing intervention, participants received coaching and encouragement from OA staff, the researcher, and/or one another if they attended the same session. The participants attended the first and fourth session together but scheduled different sessions in between for the second and third sessions. The lack of consistency in each climbing session may have undermined the internal validity of the research design and influenced the results of the study. Additionally, participants were advised to only climb once a week during the sessions they had signed up for, but the researcher was unable to verify and control whether the participants had climbed outside of the study sessions on their own. Overall, the climbing sessions in this study did not take place in a highly controlled environment and the general happenings of each session varied depending on outside factors such as what staff was available and the presence of other climbers that did not take part in the study.

**Data Analysis**

Demographic information was collected from the pretest survey to compare differences in mean assessment scores between the two participants. Analyzing data within quantitative case report studies commonly relies on graphically mapping out data points collected from different points in time, i.e. before and after the intervention. Survey response data was obtained from Qualtrics and imported to Microsoft Excel. The researcher input a scoring key into the Qualtrics survey for the GSE as well as a reverse
scoring key for the RSES that automatically summed assessment scores for each measure. Once the Qualtrics survey data was imported into Excel, the researcher calculated the differences in the total scores of the RSES and GSE between the pretest and posttest measurements.

Clinical significance was used to determine whether the top rope climbing intervention may have impacted participant’s global self-esteem and self-efficacy. Clinical significance can be defined as the most minimal change in an outcome variable that is still considered meaningful by a researcher, patient, and/or clinician and that would result in modifying clinical practice (Schober et al., 2018). Though statistical significance is more widely reported in various types of research, this study emphasized clinical significance to produce more thorough findings (Schober et al., 2018). This decision was made for three reasons: (1) given the small number of participants, the accuracy of measures of statistical significance are more likely to be compromised, (2) statistical significance alone should not be referred to as the only indicator of whether study outcomes can inform and be applicable to clinical practice, and (3) statistical and clinical significance are not always congruent (Page, 2014; Schober et al., 2018).

Statistical significance is limited to identifying whether there are differences between groups. Cronbach’s alpha or a $P$-value by itself does not include information about the direction nor magnitude of potential treatment effects (Page, 2014). Therefore, it is imperative to evaluate study design, effect size, and the size of the study sample alongside the $P$-value when considering statistical significance (Page, 2014; Schober et al., 2018). Page (2014), encourages evidence-based practitioners and clinicians to interpret whether research outcomes are relevant in a clinical setting in tandem with
reports of statistical significance. The parameters that dictate what is considered clinically significant are not well established and are often subjective to what the researcher, practitioner, and/or patient deems acceptable (Page, 2014; Schober et al., 2018).

For this study, an increase of mean scores on the RSES and GSE by ≥ 2 points when comparing pretest and posttest scores would be considered clinically significant. If the participant’s mean RSES and GSE scores decreased or stayed the same when comparing pretest and posttest scores, the intervention would be considered clinically insignificant, and therefore, ineffective. These benchmarks were determined with the guidance of what has been regarded as statistically significant in prior climbing studies that measured self-esteem and self-efficacy using the RSES and/or GSE (Karg et al., 2020; Krüger & Seng, 2019; Luttenberger et al., 2015, 2021).

Instruments

The instruments that were used in this study were the Rosenberg Self-Esteem Scale (RSES) and the General Self-Efficacy Scale (GSE). The RSES and GSE scales were administered twice to each participant, once before taking part in the intervention and once immediately after conclusion of the 4-session intervention. Examples of items found on the RSES and GSE are included below.

Rosenberg Self-Esteem Scale (RSES)

Please record the appropriate answer for each item, depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

1 = Strongly agree
2 = Agree
3 = Neither agree nor disagree
4 = Disagree
5 = Strongly disagree

_____ 1. On the whole, I am satisfied with myself.

_____ 2. At times I think I am no good at all.

_____ 3. I feel that I have a number of good qualities.

_____ 4. I am able to do things as well as most other people.

General Self-Efficacy Scale (GSE)

Please record the appropriate answer for each item, depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

1 = Strongly disagree
2 = Somewhat disagree
3 = Neither agree nor disagree
4 = Somewhat agree
5 = Strongly agree

_____ 1. I can always manage to solve difficult problems if I try hard enough.

_____ 2. If someone opposes me, I can find means and ways to get what I want.

_____ 3. It is easy for me to stick to my aims and accomplish my goals.
4. I am confident that I could deal efficiently with unexpected events.
CHAPTER IV

FINDINGS

Demographics

Participant A

Participant A was a 21-year-old Hispanic female full-time undergraduate student at the University where the study took place. The participant reported their average physical activity level to be moderate (between 150-300 minutes of moderate intensity exercise or 75-150 minutes of vigorous intensity exercise per week) and their climbing experience as beginner, never having top rope climbed before the start of the study. Notably, the participant verbally expressed a fear of heights and falling during the first session of the study.

Participant B

Participant B was a 22-year-old white male full-time undergraduate student at the University where the study took place. The participant reported their average physical activity level to be moderate (between 150-300 minutes of moderate intensity exercise or 75-150 minutes of vigorous intensity exercise per week) climbing experience as being intermediate, having top rope climbed between 11 and 20 times, before the start of the study.
Hypothesis 1

The first hypothesis stated that participant’s self-esteem scores on the RSES would increase from pretest to posttest, with the null hypothesis stating that there would be no difference in participant’s RSES scores when comparing pretest and posttest scores.

Figure 3

Rosenberg Self-Esteem (RSES) Pretest-Posttest Scores Comparison

Figure 3 illustrates the difference of total scores on the RSES completed before and after the top rope climbing intervention. Both participants RSES pretest scores were in the “moderate self-esteem” range before and after the intervention according to the assessment cut off scores. Cutoff scores have been established for the RSES that utilizes a 0-3, 4-point Likert scale (UMD-SOCY, 2021). Because this study utilized a 5-point
Likert scale with item response scores ranging from 1-5, equivalent cutoff scores were calculated under these parameters (Donnellan et al., 2015; UMD-SOCY, 2021). RSES score ranges for this study are as follows: A score of 10-25 denotes low self-esteem, 26-40 denotes moderate self-esteem, and 41-50 denotes high self-esteem. Both participants increased their total RSES scores by the end of the study, though the increases were variable. Participant A’s RSES score increased by a single point, while participant B showed a much larger 6-point increase. By the end of the study, participant B’s RSES score had almost risen enough to be considered in the high self-esteem range. Additionally, participant B’s RSES score increase was considered clinically significant while participant A’s RSES score was not. As a result of these findings, the null hypothesis was rejected.

**Hypothesis 2**

This study’s second hypothesis stated that participant’s self-efficacy scores on the GSE would increase from pretest to posttest, with the null hypothesis stating that there would be no difference in participant’s GSE scores when comparing pretest and posttest scores.

**Figure 4**

*General Self-Efficacy (GSE) Pretest-Posttest Comparison*
Figure 4 illustrates the difference of total scores on the GSE completed before and after the top rope climbing intervention. As is shown above, while both participants increased their scores by the end of the study, neither participant’s scores varied greatly from pretest to posttest. To the researcher’s knowledge, the GSE does not have established cutoff scores that identify levels of self-efficacy. Similarly, to the RSES, higher scores on the GSE denote higher self-efficacy. Given that the highest possible score is 50, it can be inferred that both participants pretest scores were on the upper end of moderate self-efficacy. Participant B potentially scored in the high self-efficacy range by the end of the study. Contrary to the results of the pretest-posttest RSES scores, participant A’s GSE score increase was the only one to achieve clinical significance. As a result of these findings, the null hypothesis was rejected.
Figure 5

Comparison of RSES & GSE Pretest-Posttest Scores

Figure 5 shows both participants total scores on the RSES and GSE before and after partaking in the intervention. The similarity in scores on both assessments as well as the positive relationship shown above supports the notion that the constructs of self-esteem and self-efficacy measured in the RSES and GSE are distinctly interconnected, as has been stated in prior research (Al Khatib, 2012; Alarcon et al., 2013; Dogan et al., 2013; Donnellan et al., 2015; Luszczynska et al., 2005; Mao et al., 2020; Ouyang et al., 2020; Wagnsson et al., 2014; Yang et al., 2019).

At the conclusion of the final climbing session, participant A offered some thoughts about the intervention, stating, “[The top rope climbing intervention] made me confident in my body image and physical abilities. I’m a lot stronger than I thought I was.”
Additionally, participant A also claimed that their fear of heights “had gotten better,” and that they were “not nearly as afraid of falling,” after the intervention. Conversely, though participant B had a larger posttest increase in their RSES score, they made no comments regarding the intervention and its effectiveness or lack thereof.
CHAPTER V

DISCUSSION

Significance of the Study and Practical Implications

This study aimed to address gaps in the current research involving the efficacy of climbing interventions in producing change in psychosocial outcomes. This study adds to the literature concerning the question of whether a top rope climbing intervention could impact global self-esteem and self-efficacy in a non-clinical, college-age demographic. While this study was small in scale, both participants increased their RSES and GSE scores by the conclusion of the study. These results suggest that participating in top rope climbing may improve aspects of self-esteem and self-efficacy, specifically regarding body image and physical capabilities, as was mentioned by one of the study participants. These comments are in line with findings from prior research that focused on different types of climbing such as bouldering and physical domains of both self-esteem and self-efficacy (Karg et al., 2020; Luttenberger et al., 2022; Ouyang et al., 2020). Participant A’s comments about their fear of heights in conjunction with their improved scores on both assessments lends support to the process described by De Vita & Rosa (2018), in which an individual improves their perceptions of self-efficacy by challenging their fears.
While not included in the hypotheses, it was assumed that differences in pretest-posttest assessment scores would be influenced by the participant’s reports of climbing experience prior to the study. This was inferred due to information consistent with Bandura’s (1986) SCT regarding mastery experiences, which states that learning and mastering new skills has a significant effect on an individual’s perception of self-efficacy.

Surprisingly, previous climbing experience did not appear to have a noticeable impact on assessment scores. This may be partly explained by participant A’s comments pertaining to perceptions of improvements in purely physical aspects of self-efficacy and self-esteem, neither of which were well represented in either assessment utilized in this study.

Though improvement in participant RSES and GSE scores were not always deemed clinically significant, both participants reported improvements in their self-esteem and self-efficacy by the end of the study. Thus, the results of this study provide evidence that top rope climbing may facilitate improvements in certain aspects of mental health in nonclinical populations. These observations are particularly relevant for RT’s that work in community settings with clientele that could benefit from maintaining and/or improving self-esteem and self-efficacy.

Future Directions

This study focused on two individuals’ experiences participating in a 4-session top rope climbing intervention. Further research could expand on the ideas presented in this study in a multitude of ways. Firstly, it would be beneficial to implement a more complex research design in future studies. The small sample size inherent to case reports,
while useful for documenting changes on an individual level, are not suitable for generalizing findings for the population being studied. Obtaining a larger sample size would produce more robust evidence about whether this climbing intervention could be a viable treatment option for more diverse groups. Similarly, it would be prudent for future studies to implement other study designs that include more opportunities for data collection, such as adding more sessions, assessing score differences after each session, and conducting a follow-up to determine whether the results remain consistent after the completion of the intervention. Of the four sessions included in this study, only three were entirely dedicated to physically climbing the wall. The first session was mainly focused on becoming familiar with the climbing wall and learning about safety procedures. Consequently, it is possible that the first session may have impacted self-esteem and self-efficacy alongside the top rope climbing intervention itself. Another useful addition for future studies to consider would be to include a control group. This would allow further comparison beyond participant’s baseline score to later measurements and would enhance the internal validity of the study.

This study relied on quantitative data in the form of two self-report assessments focused on psychosocial outcomes. Consequently, participant behavioral observations and qualitative data was not included in data collection, limiting information that could potentially provide insight about other factors that could influence outcomes beyond what is included in the RSES and GSE measures. Though this study lacked a true qualitative component, the comments shared by one participant provided pertinent information that would not have otherwise been gathered from the assessment scores alone. This lends credence to the need for more studies surrounding climbing and other AT interventions to
utilize mixed-method research designs. Furthermore, the comments highlighted the physical aspects of self-esteem and self-efficacy, neither of which were directly measured in the RSES and GSE. Future studies may want to investigate other measurements of global self-esteem and self-efficacy, specifically ones that involve subscales of the various dimensions that are then combined into overall measures of these topics.

Regarding recreational therapy, future studies should modify the study sessions to include more time for the practitioner/researcher to process and debrief during the interventions, emphasizing the connections between top rope climbing and how it can help improve self-esteem and self-efficacy.

**Conclusion**

Self-esteem and self-efficacy are two interrelated aspects of mental health that largely impact the way an individual feels about themselves; where their strengths and weaknesses lie, and whether they feel as though they are competent and “good enough”. This study investigated whether a 4-session top rope climbing intervention could improve global self-esteem and self-efficacy in two college-aged students. The findings of this study were promising but also limited. Both participants reported increases in global self-esteem and self-efficacy from before the climbing intervention to after the last session of the study. Future studies should consider implementing larger scale, mixed-methods research designs to increase the information gathered and generalizability of the results, something that this study was unable to accomplish due to its case report design. Looking ahead more broadly, future studies should also continue to address gaps in the literature involving the use of AT as treatment in fields such as RT.
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Oklahoma State University Institutional Review Board

Date: 12/20/2023
Application Number: IRB-23-568
Proposal Title: The Effect of Top Rope Climbing on Self-esteem and Self-efficacy in College Students
Principal Investigator: Myranda Billington
Co-Investigator(s):
Faculty Adviser: Tim Passmore
Project Coordinator:
Research Assistant(s):
Processed as: Exempt
Exempt Category:

Status Recommended by Reviewer(s): Approved

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in 45CFR46.

This study meets criteria in the Revised Common Rule, as well as, one or more of the circumstances for which continuing review is not required. As Principal Investigator of this research, you will be required to submit a status report to the IRB triennially.

The final versions of any recruitment, consent and assent documents bearing the IRB approval stamp are available for download from IRBmanager. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:
1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be approved by the IRB. Protocol modifications requiring approval may include changes to the title, PI, advisor, other research personnel, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms.
2. Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3. Report any unanticipated and/or adverse events to the IRB Office promptly.
4. Notify the IRB office when your research project is complete or when you are no longer affiliated with Oklahoma State University.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact the IRB Office at 405-744-3377 or irb@okstate.edu.

Sincerely,
Oklahoma State University IRB
CONSENT FORM

The Effects of Top Rope Climbing on Self-Esteem and Self-Efficacy in College Students

**Background Information**
You are invited to be in a research study of how participation in an indoor top rope climbing program may impact various psychosocial outcomes. We ask that you read this form and ask any questions you may have before agreeing to be in the study. Your participation in this research is voluntary. There is no penalty for refusal to participate, and you are free to withdraw your consent and participation in this project at any time. You can skip any questions that make you uncomfortable and can stop the survey at any time. Your decision whether or not to participate in this study will not affect your grades in classes that require research participation through SONA Systems.

This study is being conducted by: Myranda Billington, Leisure Studies Department, under the direction of Faculty Advisor Dr. Tim Passmore, CTRS/L, Recreational Therapy & Leisure Studies Program.

**Procedures**
If you agree to be in this study, we would ask you to do the following things:

Study participants will engage in a four week, once weekly top rope climbing course instructed by an Outdoor Adventure certified climbing wall instructor employed by Oklahoma State University. The first session of the top rope climbing program last approximately two hours and will focus on learning and practicing the basics of climbing and belaying. This will include familiarizing yourself with the climbing wall, learning about the gear and tools used in top rope climbing, and practicing tying common knots used in climbing. You will also learn how to wear and secure a harness, set up a belay device, and practice your belaying skills. After the first session, you will be required to pass a belaying certification test before continuing with the rest of the study. The following three sessions will last approximately one hour each and will consist of free climbing where you will have the opportunity to practice the skills you have learned. Additionally, all participants who agree to participate in the study will be asked to complete the Rosenberg Self-Esteem Scale (RSES) and the General Self-Efficacy Scale (GSE) assessments one time before and one time immediately after the conclusion of the climbing program.

Participation in the study involves the following time commitment: The climbing program utilized in this study consists of four once-weekly, in-person study sessions. The first session will take approximately two hours to complete. The remaining sessions will last one hour each, requiring a total of five hours of time commitment.

Risks and Benefits of being in the Study
The study involves the following foreseeable risks:
Potential risks to participating in this study include minor scrapes and bruising, moderate muscle discomfort and soreness, stress, and anxiety as a result of participating in top rope climbing. To assist with the offset of these risks, Outdoor Adventure staff are certified in adult and pediatric CPR/AED/First aid and can provide ice packs, band aids, and other basic first aid materials to treat minor injuries that occur while climbing.
There is a potential risk of breach of confidentiality, which is minimized by keeping confidential information in a protected and locked computer and office and destroying confidential information as soon as possible/at completion of the study.

**The benefits to participation are:**
Individuals who participate in the study will have free access to the indoor climbing wall in the Colvin recreation center for the Fall 2023 semester, may learn new skills related to top rope climbing, and potentially improve their self-esteem and/or self-efficacy through engaging in the climbing program. We cannot guarantee or promise that you will receive all of the benefits listed above by participating in this study.

**What Steps Are Being Taken to Reduce Risk of Coronavirus Infection?**
The following steps are being taken to address the risk of coronavirus infection:

**Screening:** Researchers and participants who show potential symptoms of COVID-19 (fever, cough, shortness of breath, etc.) will NOT participate in this study at this time.

**Physical distancing:** Whenever possible, we will maintain at least 6 feet of distance between persons while conducting the study.

**Mask/Covering:** Researchers may choose to wear a mask and may offer a mask to participants but cannot require them per OSU policy.

**Handwashing:** Researchers and participants will wash hands before/during climbing or use a hand sanitizer containing at least 60% alcohol.

**Disinfecting materials:** When feasible, researchers will clean and disinfect surfaces between participants, using an EPA-registered disinfectant or a bleach solution (5 tablespoons of regular bleach per gallon of water) for hard materials and by laundering soft materials. Disinfected materials will be handled using gloves, paper towel, plastic wrap or storage bags to reduce the chance of re-contamination of materials.

**Compensation**
You will receive a total of 6 extra credit points through SONA Systems as compensation for your full participation in the completion of this study.

**Confidentiality**
The information you give in the study will be stored anonymously. This means that your name will not be collected or linked to the data in any way. Only the researchers will know that you have participated in the study. The researchers will not be able to remove your data from the dataset once your participation is complete.

We will collect your information through online surveys. This survey data will be stored on a locked computer in a restricted-access office. When the study is completed and the data have been analyzed, the code list linking names to study numbers will be destroyed. This is expected to occur no later than May 1st 2025.

The research team works to ensure confidentiality to the degree permitted by technology. It is possible, although unlikely, that unauthorized individuals could gain access to your responses because you are responding online. However, your participation in this online survey involves risks similar to a person’s everyday use of the internet. If you have concerns, you should consult the survey provider privacy policy at [https://www.qualtrics.com/privacy-statement/](https://www.qualtrics.com/privacy-statement/)

**Contacts and Questions**
The Institutional Review Board (IRB) for the protection of human research participants at Oklahoma State University has reviewed and approved this study. If you have questions about the research study itself, please contact the Principal Investigator at mybilli@okstate.edu. If you have questions about your rights as a research volunteer or would simply like to speak with someone other than the research team about concerns regarding this study, please contact the IRB at (405) 744-3377 or irb@okstate.edu. All reports or correspondence will be kept confidential.

**Statement of Consent**
I have read the above information. I have had the opportunity to ask questions and have my questions answered. I consent to participate in the study.

If you agree to participate in this research, please click “I Agree to continue” and complete the attached surveys.
VITA

Myranda Billington

Candidate for the Degree of

Master of Science

Thesis:  THE EFFECT OF TOP ROPE CLIMBING ON SELF-ESTEEM AND SELF-EFFICACY IN COLLEGE STUDENTS

Major Field:  Leisure Studies

Biographical:

Education:

Completed the requirements for the Master of Science in Leisure Studies at Oklahoma State University, Stillwater, Oklahoma in May, 2024.

Completed the requirements for the Bachelor of Arts in Psychology at Truman State University, Kirksville, Missouri in 2020.

Experience:

Graduate Research and Teaching Assistant
Oklahoma State University: August 2020–May 2024