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Walden University

College of Allied Health

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Asmai Fathelbab

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Walden University
2023

Abstract

Non-Nightmare Recurring Dreams and Trauma

by

Asmai Fathelbab

MS, Walden University, 2019

MS, Capella University, 2009

BA, CUNY-Hunter College, 2002

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

February 2023

Abstract

This study examined the relationship between trauma and non-nightmare recurrent dreams (NNRD). Although there is extensive literature on the psychological consequences, diagnosis, and treatment of trauma, studies on the role of sleep processes have focused almost exclusively on nightmares. The potential relationship between NNRD and traumatic experiences has been overlooked by researchers. The purpose of this study was to assess if history of trauma and NNRD were correlated. More specifically, using Revonsuo's threat simulation theory as a framework, the study evaluated if gender, quality of sleep, depression, anxiety, stress, and history trauma predicted NNRD. A cross-sectional correlational survey design was employed. A sample of 239 adults were recruited, of which 192 were entered in the statistical analyses. A logistic regression analysis identified quality of sleep as the only predictor of NNRD. Bivariate correlation analyses yielded significant correlations between history of trauma and anxiety, quality of sleep, depression, and stress, in that order of magnitude. The non-significant relationship between history of trauma and NNRD present an unclear picture about the relevance of threat simulation theory as an explanatory framework. Future research may benefit from improving the operationalization of NNRD as well as assessing the role of resilience and psychological needs as potential moderators of the relationship between history of trauma and NNRD. The positive social change implications of this study are associated with the potential for beliefs and attitude change on the relationship between trauma and sleep among clinical psychologists and the public.

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Dedication

I dedicate this dissertation to my mom who passed away suddenly in 2019. She was my rock, my heart and soul. She believed that everyone had the right to a great education. She was my drive and my push to go farther than I could ever imagine. From the age of 9, I was constantly told by her that I was going to be a doctor one day, and to never let anyone stop me from achieving that goal. Although I did start this degree once before a decade ago, and had it cut short because of a memory-altering TBI concussion, she never gave up on me that I would finish. She still believed I could do it, even as I struggled with reteaching myself how to read for endless hours once again without the painful migraines. I could not have done any of this without her love and support. To my mom, thank you for believing in me while you were on Earth and from Heaven above. I will always love you, Ma.

Acknowledgments

I was happy to find such wonderful support through everything. I would like to start by thanking Dr. Carlos M. Diaz-Lazaro for not just standing up and being my chair when I needed it, but for guiding me through the dissertation process. I appreciate how patient you were with this process, how you encouraged me when I felt like my confidence in my own work was off, and how you supported me through dissertation writing during a full on pandemic. I would like to thank Dr. Craig D. Marker for stepping in as committee member when I needed it, and for your helpful, much needed input. I would like to thank Dr. Megan Gramm, the university research reviewer, for the helpful suggestions along the way.

I would like to thank my brothers, my sister-in-law, my chiropractor and friend, Dr. Stern, and the rest of my friends and family who stepped in with the emotional support that I needed, and were understanding when I had to cancel everything just to get some writing done or some much needed sleep. I thank you all for being the amazing souls that you are.

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Chapter 1: Introduction to the Study

Introduction

The goal of this study was to assess the relationship between non-nightmare recurrent dreaming (NNRD) and trauma. Traumatic experiences have been said to be processed psychologically through the unconscious (Jung, 1974). As a key component of the unconscious, dreams provide a channel for the individual to work through the emotional consequences of traumatic experiences. Traumatic events are replayed during dreams as a signal that healing is needed (Jung, 1963). Interestingly, research on the relationship between dreams and trauma has focused predominantly focused on nightmares. On the one hand, this is expected as nightmares are troublesome, frightening experiences that can affect sleep quality and general wellbeing. Individuals with a history of trauma are expected to have nightmares and be in a constant state of fear; however, by solely focusing on nightmares, researchers have inadvertently missed out on the opportunity to assess the relationship between non-threatening dreams and psychological distress. NNRD is not as emotionally charged as nightmares are, but its repetitive pattern still suggests a connection to traumatic experiences. Awareness of a dream pattern presents the dreamer with an opportunity to comprehend the key roles dreaming plays within the conscious and unconscious mind (Wyatt et al., 2011). The present study assesses the relationship of NNRD and trauma, and thus aims at contributing to understanding the contribution of sleep beyond nightmares.

Using Revonsuo's threat simulation theory (TST) helped in understanding that certain threat simulations occur within the dream state (Revonsuo, 2010). TST is not

exclusively tailored to the traumatic nightmare state; instead, it covers a broader, more generalized theory of there being a threat simulation that occurs within the dream state (Revonsuo, 2010). The TST runs certain threat simulations that may or may not accompany emotional fright response that a traumatic nightmare carries. The traumatic experiences may activate certain parts of the emotional memory in the simulation to train one for the future possibility of threats (Revonsuo, 2018). Using TST, NNRD would be identified as a rehearsal of the traumatic experience in order to consciously understand and process the trauma. By focusing on the overlooked concept, NNRD, this study may contribute by identifying lesser-known symptoms that can impact trauma diagnosis and treatment.

The present study explored the relationship between NNRD and trauma. The chapter began by briefly identifying and discussing relevant literature on recurrent dreaming and trauma. Based on the reviewed literature, a research gap is identified and described in the problem statement section. The purpose statement and research question sections identify the key research goal and hypotheses of the study. Revonsuo's threat simulation theory is briefly explained within the theoretical framework section. The final sections of the chapter address nature of the study, relevant definitions, scope, delimitations, limitations, and significance.

Background

The purpose of this study was to find the potential relationship between NNRD and trauma. These two concepts are prioritized in the review of the literature presented in this section. Other constructs of interest are included based on their relationship with

these core concepts. Recurring dreams have played an important role in psychoanalytic work because of their proposed link with the processing of traumatic experiences (Lopez, 2016; Weinstein et al., 2018). To understand these dreams, one must comprehend the events that occurred within the waking state (Jung, 1974; Yu, 2010). Repetitive or recurring dreams have been suggested to be a result of unconscious problem solving. Conscious awareness of the problem has been hypothesized to lead to a reduction or even elimination of these repetitive dreams (Jung, 1963; Yu, 2011). Traumatic experiences are processed psychologically through the unconscious (Jung, 1974). Dreaming within the unconscious state helps in trauma processing and studies have found that severe trauma over one's lifetime is positively associated with the intensity of dreaming (Weinstein et al., 2018; Yu, 2015). Dreaming helps the individual work through their emotional experience of a trauma by replaying certain scenarios as a signal that healing is needed (Jung, 1963).

The research on the relationship between dreams and trauma has focused predominantly on nightmares. Nightmares are included as one of the diagnostic criteria for posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013a). Although NNRD are not as emotionally charged as nightmares, the repetitive dreaming pattern does suggest a relationship to trauma. The awareness of a dream pattern allows the dreamer to comprehend the key roles dreaming plays. Awareness of dream pattern helps when seeking treatment and throughout the progression of trauma therapy (Crawford, 2014; Wyatt et al., 2011).

To fully understand the potential relationship between NNRD and trauma, it is important to consider the role of sleep quality in our health. Quality of sleep is usually based on subjective appraisal. It has been associated with the individual's perception of their sleep and how well rested they feel upon waking (Brand & Kirov, 2011; Buysse, 1989; Buysse, 2014). Sleep disturbances such as difficulties in falling or remaining asleep are associated with poor quality of sleep. The diagnostic criteria for PTSD include marked alterations in arousal or reactivity, as evidenced by sleep disturbances (APA, 2013a). Traumatic memories have been related to sleep disturbances and recurring nightmares (Habukawa et al., 2018; Perogamvors & Schwartz, 2012; Gehrman et al., 2015).

Researchers on sleep and dreaming usually control for individual differences in dream recall. Individual differences on dream recall assume that there is variability in the individual recollection of dreams. That is, some people are more prone to remember their dreams than others. The role of dream recall is also important in fully understanding the potential relationship between NNRD and trauma. Dream recall is the basic mechanics of remembering a dream and its emotionally charged contents, where negative dreams are recalled with the purpose to evaluate their meaning (Cohen, 1974; Schredl, 2013a; Williams & Tabari, 2018). With NNRD, there is an expectation of finding that higher levels of dream recall leads to a higher number of repetitive dreaming. By looking at dream recall, a more accurate evaluation of the relationship between trauma and NNRD could be established.

There is no current research directly assessing the relationship between NNRD and gender differences, but the reviewed research found a relationship is likely to be facilitated by dream content, dream recall, and type of trauma experienced (Gay et al., 2020; Ismail et al., 2017; Komarovskaya et al., 2011; Schredl, 2010; Zhang et al., 2020). Women recall more dreams as compared with men, but men were more likely to recall aggressive dreams (Schredl, 2010; Zhang et al., 2020). The current research also found that women had poor sleep quality because of waking up more frequently during the night (Ismail et al., 2017; Schredl, 2010). There were no gender differences in PTSD symptoms, but men were more likely to develop trauma from witnessing harm being done, whereas women developed trauma at a higher rate through experience (Gay et al., 2020; Komarovskaya et al., 2011). Gender differences are likely to inform our understanding of NNRD by its association and interaction with dream content, dream recall, trauma, and the sleep quality.

Depression, anxiety, and stress are usually considered psychological consequences of trauma and are included in the diagnostic criteria for PTSD (Abdallah & Gabr, 2014; APA, 2013a; Paquet et al., 2020; Schredl, 2013). The constant state of fear brought on by trauma causes a hinderance to emotional processing and leaves the individual at a heightened state of stress, anxiety, and depression (Gerhman et al., 2015; Paquet et al., 2020; Vanderheyden, et al., 2015). The stress and anxiety produce higher emotional content in nightmares (Paquet et al., 2020), which may lead to NNRD being overlooked.

Although dreaming helps with processing the emotions associated with traumatic experiences (Lopez, 2016; Weinstein et al., 2018; Yu, 2015), more research is done regarding recurring nightmares than on NNRD. This study focused on the relationship between NNRD and trauma. In this study, trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress were all factors that were looked at regarding their potential relationship with NNRD. History of trauma was a variable in finding a relationship between NNRD and trauma. Gender was a variable within this study to establish if gender differences are a factor in the relationship between NNRD and trauma. In looking at quality of sleep, this study determined whether better quality of sleep or poorer quality of sleep are a factor in finding a relationship between NNRD and trauma. Dream recall was looked at within this study to determine if the dreams that are being remembered are in fact NNRD and used as a variable in finding a relationship between NNRD and trauma. Depression, anxiety, and stress were variables included within PTSD diagnosis criteria and were factors used in finding a relationship between NNRD and trauma. These variables were important in establishing a relationship between NNRD and trauma. One of the many benefits to understanding NNRD is its integration into trauma treatment. By focusing on including the overlooked NNRD, this could help in creating new criteria for diagnosis of trauma and development of new treatment interventions.

Problem Statement

For a long time, recurrent dreams have been associated with traumatic experiences. Carl Jung (1963), for example, has stated that conscious traumas are replayed during dreams as a signal that healing is needed. The research on the

relationship between dreams and trauma has focused almost exclusively on nightmares. In fact, experiencing recurrent nightmares is one of the diagnostic criteria for posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013a). Surprisingly missing from the literature, though, are studies evaluating the associations between non-nightmare recurrent dreams (NNRD) and trauma. This study aimed at filling that gap by directly assessing if traumatic experiences predict NNRD.

NNRD are not as emotionally charged as nightmares are, but their repetitive pattern suggests a connection to traumatic experiences. Wyatt et al. (2011) stated that with awareness of a dream pattern, the dreamer can understand the key roles dreaming plays within the conscious and unconscious states of mind. While NNRD exists on a general basis, studies have yet to find if there is a significant connection to trauma. Clinical interventions generally focus on decreasing nightmares through medication and cognitive behavioral techniques, with very little focus on the dreams' content and patterns (Crawford, 2014). For example, there is already growing literature on the effectiveness of lucid dreaming and similar techniques, which may become relevant in the case of clinical issues stemming from trauma (Baird et al., 2019). Establishing a relationship between NNRD and trauma could direct clinical psychologists to incorporate NNRD more actively in diagnosis and intervention with trauma associated emotional problems.

Purpose

The purpose of this study was to assess if history of trauma predicts NNRD. Although rarely studied, the relationship between NNRD and trauma may be helpful in

diagnosis and interventions of trauma related mental health problems. It is hypothesized that there is a positive relationship between history of trauma and NNRD. That is, as participants report a higher amount and severity of traumatic experiences, they will report a higher number of NNRD.

Research Questions and Hypotheses

RQ1 Quantitative: Does history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress predict NNRD?

$H_{1\ (alternative)}$— History of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will correlate with NNRD. The direction of the proposed relationships are as follows: a) better quality of sleep will be associated an increase in NNRD (positive correlation), b) history of trauma will positively associate with NNRD, c) dream recall will be positively related with NNRD, d) women will have more NNRD than men, e) depression will be negatively associated with NNRD, f) anxiety will be negatively correlated with NNRD, and g) stress will negatively be associated with NNRD.

$H_{1(null)}$— History of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will not correlate with NNRD.

RQ Quantitative: Is the prevalence of NNRD, recurrent nightmares, quality of sleep, depression, anxiety, and stress the same for participants with history of trauma?

H_{2a}— The prevalence of NNRD is the same for participants with history of trauma.

$H_{2\ null}$— The prevalence of NNRD is not the same for participants with history of trauma.

H_{2b}— The prevalence of recurrent nightmares is the same for participants with history of trauma.

H_{02b}— The prevalence of recurrent nightmares is not the same for participants with history of trauma.

H_{2c}— The prevalence of quality of sleep is the same for participants with history of trauma.

H_{02c}— The prevalence of quality of sleep is not the same for participants with history of trauma.

H_{2d}— The prevalence of depression is the same for participants with history of trauma.

H_{02d}— The prevalence of depression is not the same for participants with history of trauma.

H_{2e}— The prevalence of anxiety is the same for participants with history of trauma.

H_{02e}— The prevalence of anxiety is not the same for participants with history of trauma.

H_{2f}— The prevalence of stress is the same for participants with history of trauma.

H_{02f}— The prevalence of stress is not the same for participants with history of trauma.

Theoretical Framework

Revonsuo's (2003) threat simulation theory (TST) will be used as a theoretical framework for this research study. According to Revonsuo (2003), one of the reasons that

we dream is tied to an ancient survival skill that we acquired from our ancestors. For reproductive reasons, humans created simulations within their dream state to be prepared to react and process traumatic situations (Revonsuo, 2003). The TST does not specify its exclusivity to the traumatic nightmare state, but instead a simulation that occurred within the dream state that threat that has yet to occur (Revonsuo, 2010). The TST runs certain threat situations that may or may not accompany emotional fright response that a traumatic nightmare carries with it. Revonsuo (2018) stated that the traumatic experiences may activate certain parts of the emotional memory in the simulation to train one for the future possibility of threats. TST would suggest that NNRD constitute a simple rehearsal of the traumatic experience that occurs for the individual to consciously understand and process the trauma they had suffered in order to begin the healing process.

Nature of the Study

This study was a quantitative, non-experimental correlational survey design that assessed the relationships between NNRD and the quality of sleep, dream recall, depression, anxiety, stress, and history of trauma in both men and women. The predictor variables within this study were gender, the quality of sleep, depression, anxiety, stress, and history of trauma. The criterion variable within this study was NNRD. This study assessed if trauma, gender, quality of sleep, depression, anxiety, and stress are predictors of NNRD. This study also assessed if whether the prevalence of NNRD, recurrent nightmares, gender, poorer quality of sleep, depression, anxiety, and stress was the same for participants with a history of trauma.

Definitions

Gender: Gender may be used interchangeably with sex to help distinguish between the biological and behavior of an individual (APA, 2020). Gender can be a synonym used to distinguish between male and female sexes and their constructed roles, attitudes, beliefs, and behaviors that society expects of women and men (Vogt & Johnson, 2016).

Non-Nightmare Recurrent Dreams (NNRD): NNRD can be defined as a non-threatening dream that repeats itself.

Quality of Sleep: Quality of sleep has been defined as one's satisfaction with the sleep experience that is tailored to their own physical and psychological wellbeing (Buysee, 2014).

Depression: Depression is a negative affective state, ranging from unhappiness and discontent to extreme feelings of sadness, pessimism, and despondency, that interferes with daily life (VandenBos, 2015, p. 298).

Anxiety: Anxiety is an emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune (VandenBos, 2015, p. 66).

Stress: Stress is a physiological or psychological response to internal or external stimuli that involve changes affecting nearly every system of the body, influencing how people feel and behave (VandenBos, 2015, p. 1036).

Trauma: Trauma is an emotional response to a terrible event like an accident, rape, or natural disaster (APA, 2013b). Immediately after the event, shock and denial are

typical. Longer term reactions include unpredictable emotions, flashbacks, strained relationships and even physical symptoms like headaches or nausea. While these feelings are normal, some people have difficulty moving on with their lives (APA, 2013b).

Assumptions

Several assumptions can be made about the study. An assumption that was made is that participants would answer the survey questions honestly and to the best of their ability. This was relevant as data analysis and the conclusions drawn from results depend on the quality responses from participants. A second assumption made was that survey questions were understood by participants. Another assumption was that participants were able to recall dream content and any recurring patterns within them.

Scope and Delimitations

The study focused on the relationship between trauma and NNRD. This study targeted individuals aged 18 years and older from the United States of America. Individuals younger than 18 years of age were excluded from the study. All survey questions were in the English language, and thus prospective participants not proficient in reading and comprehending English were excluded from the study. The study was limited to individuals residing in the United States. Prospective participants residing in other countries were excluded.

Limitations

This study was limited by the use of a quantitative method. Quantitative methodology allows for statistical analysis and a more numbers-based approach to data collection than an observational one (Vogt & Johnson, 2016).

Another limit to the study was the use of a correlational cross-section survey design. Correlational research focuses on how two or more variables relate to one another as opposed to a descriptive study where it only focuses on measuring and analyzing one variable at a time (Cooper, 2020). Correlational studies do not manipulate variables, cannot assess causality, and no causal inferences can be made (Breakwell et al., 2010). Only inferences on the associations of variables can be made when the hypotheses are confirmed because correlational studies cannot assess causality (Cozby & Bates, 2015). Cross-sectional designs differ from longitudinal designs by collecting data from participants in a one-time occurrence instead of at multiple points in time (Vogt & Johnson, 2016). Survey designs are used to put together a description of trends and answer questions that are descriptive to establish relationship between variable-based questions and relationship-predictive questions (Creswell & Creswell, 2018).

Other limitations of this study were the self-report measures; the participants may not answer the surveys honestly and to the best of their abilities. Self-report measures tend to have problems with social desirability (Paulhus, 1984). Participants may end up altering their responses to items to make a good impression on others and/or themselves. Another limitation of this study involved finding the appropriate instruments to assess dream and sleep related phenomenon. Despite the fact that there currently are no scales that directly measure NNRD, sleep instruments containing one item that inquire about this experience will be used instead.

Significance

The goal of this study was to assess the relationship between NNRD and trauma. Individuals with a history of trauma are commonly expected to have nightmares and be in a constant state of fear. Traumatic experiences are processed psychologically mostly through the unconscious as verbal expressions of these becomes challenging (Jung, 1974). The dreaming aspect helps the individual not just work through their trauma, but express what it is and how it is they actually feel about the traumatic experience. The significance of this study lies in assessing the relationship of a less-threatening dreaming experience, NNRD, with a serious clinical issue such as psychological trauma. While many studies have studied the link between recurrent nightmares, there is no research directly assessing the connection between NNRD and trauma. The present study's findings have clinical relevance as these could guide toward (a) new criteria for diagnosis of trauma, and (b) the development of less intrusive interventions that focus on NNRD as opposed to nightmares. By focusing on a mostly overlooked concept, NNRD, this study may help identify the relevance of less known symptoms that are likely to impact diagnosis and treatment. Social change implications of this study focus on the potential of changing beliefs and attitudes of both clinical psychologists and the public on trauma. More specifically, it could motivate less intrusive interventions based on wellbeing as opposed to pathology.

Summary

The goal of this study was to explore the relationship between NNRD and trauma. Prior research on the relationship between dreams and trauma has focused

predominantly on nightmares. NNRD is not as emotionally charged as nightmares are, but their repetitive patterns suggest a connection to traumatic experiences. The present study assessed the relationship of NNRD and trauma, and thus aims at understanding the contribution of sleep, beyond nightmares. In focusing on NNRD, this study contributed by identifying lesser-known symptoms that can effect trauma diagnosis and treatment. It also assessed the relationship of gender, the quality of sleep, depression, anxiety, stress, and trauma. The study used Revonsuo's threat simulation theory to explain the proposed relationship between relevant variables.

The study used a quantitative, correlational cross-section survey design to assess the relationship between NNRD and gender, the quality of sleep, depression, anxiety, stress, and trauma. The target sample consisted of 150 general population adults which was recruited through Walden University's research participant pool and Survey Monkey. The social change contribution of this study focused on potentially changing beliefs and attitudes of clinical psychologists and the public on trauma. More specifically, it could motivate less intrusive interventions based on wellbeing as opposed to pathology. Chapter 2 will include a detailed review of the literature search strategies, Revonsuo's TST theory, and the related studies on gender, the quality of sleep, depression, anxiety, stress, and trauma.

Chapter 2: Literature Review

Introduction

Although it has been assumed that repetitive dreams are associated with a history of traumatic experiences, research has only focused on repetitive nightmares, which is currently included in the diagnostic criteria for posttraumatic stress disorder (PTSD) (American Psychiatric Association, 2013a). To this date, there is no empirical research directly assessing the relationship between NNRD and trauma. This study aims to evaluate if such a relationship exists, and if history of trauma predicts NNRD in a positive direction. Finding whether or not there is a significant connection between history of trauma and NNRD could assist in diagnosis and intervention with individuals experiencing emotional problems associated with trauma history.

With NNRD, there is a repetitive pattern that suggests a connection to traumatic experiences, even though they are not as emotionally charged as nightmares are. Awareness of a dream pattern, Wyatt et al (2011) stated, helps the dreamer understand the key roles that dreaming has within the conscious and unconscious states of mind. Although NNRD exists, studies have yet to find the link between it and trauma, leaving clinical interventions focusing on nightmares. Crawford (2014) stated that there are techniques focusing on decreasing nightmares through medication and cognitive behavior therapies, but very little is focused on the content and patterns of the dreams themselves. There is a growing trend within the research literature that focuses on the effectiveness of lucid dreaming and similar techniques that have become relevant in clinical issues stemming from trauma (Baird et al., 2019). By establishing a relationship between

NNRD and trauma, clinical psychologists will be able to incorporate NNRD within the diagnosis and intervention in trauma associated emotional problems.

The purpose of this literature review was to outline the relationship between NNRD and the quality of sleep, dream recall, gender, trauma, depression, anxiety, and stress. A preview of the major sections within this chapter is as follows. A section is dedicated to the literature search strategies, key words, and search engines. There is a theoretical and conceptual frameworks section that discussed theory to be used for this study, which are Revonsuo's TST and Jung's dream theory. A section is also dedicated to related studies. A critical analysis of the methodological shortcomings of relevant empirical articles is included as well. Finally, the last section summarizes and presents how this study will fill at least one of the research gaps and contribute new knowledge within the discipline.

Literature Search Strategy

The search approach for this study began with the literature review components or background outline, which guided the keywords used in the search databases. The keywords searched included: *PTSD, trauma, sleep disturbances, dreams, lucid dreams, nightmares, nightmares vs non-nightmare reoccurring dreams,* and *trauma and sleep disturbances*. The EBSCOHOST and PSYC INFO databases at the Walden University Library were searched. Google and Academic Microsoft were also searched for further information. The information used for this research was obtained from peer-reviewed journal articles and books. There were over 100 sources identified containing significant information dating from the 1960s to the present. This research focused on the more

recently published works within the last 10 years. The history of this topic and some theoretical framework reflected within the older resources were also used for this research. The most relevant resources for this research present the foundation of the literature review.

Theoretical Framework: Threat Simulation Theory

The theoretical framework used for this research study is Revonsuo's threat simulation theory, or TST (2003). According to Revonsuo (2003), TST runs different types of threat scenarios within one's dream state in order to make one aware and prepared to react and process traumatic situations. A reason this occurs is tied to an ancient reproductive and survival skill that was acquired from our ancestors (Revonsuo, 2003).

Revonsuo (2010) does not specify if TST is exclusively centered on recurring nightmares, but it states that it is a threat simulation that occurs within the dream state. Because TST may or may not accompany the heightened emotional fright response that normally accompanies traumatic nightmares, it is therefore applicable to this study. Traumatic experiences may activate parts of the emotional memory in the simulation to be prepared for future threats (Revonsuo, 2018). Applying TST would reflect that the healing process includes NNRD as a rehearsal of a traumatic experience that occurs in order for one to both consciously understand and process the trauma.

Sterpenich et al. (2020) stated that TST is supported by reflecting the emotional regulation process, which emphasizes the benefits of the simulation that occurs when dreaming. In immersing oneself into a world that may look realistic, such as the dream

state, it tends to be looked at as virtual reality because of one's own personal experiences within the simulation (Hobso et al., 2014). What this reflects is the functionality of TST as one that helps with a traumatic experience by creating a world where one is given the space and time to work through the emotional process.

Also, as per TST, Perogamvros and Schwartz (2012) explained that memories from a traumatic situation can be triggered without a specific reason within the REM stage of sleep. It was not specified if they are triggered within a negative manner, thus causing nightmares, or somewhat neutral, but there seemed to be a recurrent dream pattern connected to the trauma. Although, with nightmares caused by sleep disturbances, the fear that comes with it can create not just a general avoidance, but a sleep avoidance in itself (Phelps et al., 2008). This means there may be an issue with TST occurrences within nightmares because of the lack of sleep. Even so, Altszyler et al. (2017) stated that TST can be applicable when it comes to dream word association; for example, running has a sports related connotation during the awake stage, and it means to get away from a threat when one is asleep.

Kron et al., (2015) found that as the dreaming process engages the cognitive emotional processing of traumatic events, it also helped pregnant women in whether or not they had post-partum depression. The dreams that were studied of these pregnant women showed that the more self-reflecting the dreams were, the more they were considered a preparation simulation for the birth of their child; these women did not experience post-partum depression. In contrast, those women that had more shallow dreams did end up experiencing post-partum depression (Kron et al., 2015). Mota et al.

(2020) found applying TST to dreaming during the COVID-19 pandemic reflected a sterilizing factor where one was simulating new ways to clean in order to stay safe and not get infected by the virus. Within both simulations, TST was connected to preparing for birthing a child and how not to contract the COVID-19 virus.

According to Desjardins and Zadra (2006), there is a possibility that TST could be present within recurring dreams. TST being applicable within recurring dreams, or within this study reflects how one may create a simulation within their dream state in order to process a traumatic experience. Zadra et al. (2006) noted that with the most recurrent dreams, there seemed to be at least one threatening event or scenario that was being simulated within the dream. Nightmares and non-nightmares alike were observed as the different types of dreaming where TST may be reflected within different manners (Zadra et al., 2006).

Valli and Revonsuo (2006) found that with exposure to a life-threatening event, TST triggers the threat simulation system where it creates recurring simulations. By using TST as framework for understanding the relationship between NNRD and trauma, the possibility of different ways to express and process traumatic experiences is suggested. Although NNRD may not seem to be a threatening or frightening event, they could provide a mechanism by which to understand the trauma from a non-threatening perspective in order to process the traumatic experience.

Literature Review Related to Key Variables

Non-Nightmare Recurrent Dreams

According to the APA Dictionary of Psychology (VandenBos, 2015), a dream is defined as an experience that spans from sensory, motor, and emotional and take place within a conscious state when one is asleep. Although there is no specific nor straight definition as to what a non-nightmare recurrent dream (NNRD) would be, for the purposes of this study, it will be defined as a dream that repeats but does not have a fear-based context to it like a nightmare does. There is little research done on NNRD, and it is an overlooked phenomenon within dream and trauma research.

Dream content is affected by experiences; specifically, recurring dreams tend to be more present during stressful psychological experiences as a processing mechanism for the individual (Weinstein et al., 2018). For example, Eichelman and Dorava (2021) found that there is a higher probability of traumatic dreams, particularly recurring traumatic dreams, within the prison population; yet, there were no recurring dreams assessments currently put in place. Lopez (2016) also found that recurring dreams played an important role in psychoanalytic work, noting improvement for the patient when the recurring dreams were understood by the dreamer. A similar argument is made by Yu (2011), who found that dreams become recurring when there is something that is not satisfied or solved within the waking state, and they stop once satisfied or solved.

Content within dreams reflect both universal and individual themes. Yu (2010), for example, found recurring dreams tended to be universally the same, yet tailored to each individual and their situation. This meant that there are patterns within recurring

dreams that aren't restricted by culture and seem to be a shared experience. Weinstein et al., (2018) found the function of dreaming within the unconscious state is how one psychologically processes a threatening experience that occurred within the conscious state. In a similar vein., Gauchat et al. (2021) found that dreaming impacts emotional regulation, affecting the individual within the waking state.

Interest in dreams is not new. Carl Jung, for example, wrote extensively about the role of dreams in our psychological health. According to Jung (1963) dreaming is a structure or channel that serves the purpose of communication between the conscious and unconscious mind.

> A noteworthy phenomenon is the recurrent dream. There are cases of dreams repeating themselves from the days of childhood to the advanced years of adult life. Such dreams usually compensate a defect in one's conscious attitude, or they date from a traumatic moment that has left behind some specific prejudice, or they anticipate a future even of some importance (Jung, 2011, p. 90).

According to Jung, recurring dreams are a premonition of something to occur, which can relate to resiliency and preparation to handle an upcoming trauma. Also, Jung mentions that recurring dreams could also be an element from a trauma that repeats itself on a constant loop until one is aware of it and understands what the dream is trying to say to them. Jung (1963) found that dreams bring unconscious content into consciousness when we need to understand an occurrence. Dreams have been studied for some time, and recurring nightmares tend to be the main focal point when it comes to understanding traumatic experience dreaming.

Jung (1974) found that to understand what it is we are dreaming, one must know why it occurred by understanding first what experiences happened within the conscious state that led to this unconscious one. Once the issue that has caused the recurring dreaming is acknowledged, identified, and dealt with, the recurring dreaming stopped. Jung (1963) also found that dreams are, at times, a warning from the unconscious to the conscious mind. This means there is a possibility that dreams will occur on a constant basis until the conscious mind understands what the unconscious mind is trying to relay. The focal point of this study will be directed towards NNRD and its potential relationship with traumatic experiences.

Quality of Sleep

Sleep is critical for normal functioning (Brand & Kirov, 2011). For example, among adolescents, sleep alterations, sleep disturbances or poorer quality of sleep have been associated with an increase in inappropriate behaviors, poor academic achievements, and mental health disorders (Brand & Kirov, 2011). Although there is no universally endorsed definition of quality of sleep, the literature has prioritized a few. For example, Buysse (2014) the Satisfaction Alertness Time Efficiency and Duration (SATED) evaluates quality of sleep as associated with satisfaction of sleep, alertness after sleep, time spent sleeping, efficiency of falling asleep and duration of sleep. Quality of sleep or sleep health is a multidimensional complex pattern of sleep-wakefulness that is tailored to everyone's physical and psychological wellbeing (Buysee, 2014). Although there are several assessments created, such as the Pittsburgh Sleep Quality Index, it seems that quality of sleep could be based on how one rates their own sleep (Buysse,

1989). One could get eight hours of sleep and feel exhausted upon waking, yet another could sleep four hours and wake up refreshed; quality of sleep ultimately depends upon the individual. Therefore, subjective appraisal is key to defining and measuring quality of sleep.

Another conceptualization of sleep quality has centered on the sleep cycle and particularly on the Rapid Eye Movement (REM) stage. Dreaming occurs mainly during REM stage. The relationship between REM sleep and trauma induced sleep induced disturbances has been studied. Vanderheyden et al. (2015), for example, found that REM stage sleep contributed to processing trauma and emotion, and that changes within REM stage sleep were associated with previous trauma. Gerhman et al. (2015) found that sleep disturbances within PTSD were accompanied by an increase of frequency of nightmares. Sleep disturbances such as poorer quality of sleep, hypervigilance, nightmares, and/or fear of sleep directly linked to trauma have been associated to REM stage sleep changes. REM stage sleep has been implicated in the facilitation of emotional processing (Vanderheyden et al., 2015). This means that disturbances effecting REM stage sleep, such as nightmares, are likely to hinder the processing of emotions connected to trauma.

Quality of sleep has an impact on intellectual, physical, psychological, and neuropsychological health. Saksvik et al. (2021) found that poor quality of sleep is linked to negative effects on neurocognitive performance, slower response times, and higher levels of psychological distress. Also, Dimitrova et al. (2020) had found that chronic traumatic experiences have more of an effect on cognition within dissociative identity disorder than the quality of sleep does. Cui et al. (2021) on the other hand, found that

there is a relationship between quality of sleep, specifically poorer quality of sleep, and depressive symptoms. Mirghani et al. (2015) had found that there is a strong relationship between academic performance and the quality of sleep one has. In other words, the better the sleep quality, the higher the academic performance. Sleep disturbances caused by physical pain have been found to increase PTSD symptom severity amongst men (Gibson et al., 2019). In women, on the other hand, menopausal hot flashes have been found to be positively associated with sleep disturbances (Gibson et al., 2019).

Although quality of sleep appears to be associated with sleep disturbances such as nightmares, the relationship between quality of sleep and NNRD has not been directly assessed in the literature. Although it could be hypothesized that the lower emotional intensity of NNRD, as compared with nightmares, could result in reduced quality of sleep alterations, there is no empirical evidence to substantiate that claim.

Gender

Oftentimes gender and sex are used interchangeably; however, social scientists define these terms differently. Sex has been defined as the characteristics connected to one's biology, whereas gender is associated with being socialized as male or female (Muehlenhard & Peterson, 2011). According to the American Psychological Association (APA) 7th edition publication manual (2020), gender is a societal construct and identity, whereas sex is one's biological assignment. The term gender is used interchangeably with sex to help distinguish between referring to the biological form and sexual behavior of an individual (APA, 2020). Because gender is an ever-evolving construct, it is getting harder to define it simply as male and female.

Gender differences on sleep has been studied. Unfortunately, there was no research found directly connecting NNRD and gender. Schredl (2010), however, found gender differences in sleep quality. More specifically, women were found to have poorer sleep quality as compared to men. For example, women tended to wake up more frequently during the night (Schredl, 2010). Ismail et al., (2017) also found gender differences in sleep quality, with women having poorer sleep quality, which was itself connected to the higher rate of depression, anxiety, and overthinking.

Gender differences has also been identified on dream recall. Schredl (2010), for example, found women were more likely to have better dream recall than men. Nevertheless, dream recall and gender differences have been suggested to be moderated by dream content. Zhang et al., (2020), for example, found gender differences in dream recall, with men, as compared with women, more likely to recall dreams with anger and aggressive content.

Komarovskaya et al., (2011) found that the gender differences within trauma were connected to the types of traumatic experiences. Men were found to have trauma from witnessing harm being done to someone else, whereas women experienced a higher rate of sexual trauma. Gay et al., (2020), did not find gender differences when it came to PTSD symptoms, but did find a difference at the rate of risk in developing PTSD. It was found that women were at a higher risk of developing PTSD than men, but the men that did develop PTSD showed to have similar patterns of symptoms as women did (Gay et al., 2020).

Although there has not been any research directly assessing the relationship between NNRD and gender differences, based on the reviewed studies it can be hypothesized that such relationship is likely to be moderated by dream content, dream recall, and type of trauma experienced. Gender differences is likely to inform our understanding of NNRD by its association and interaction with dream content, dream recall, trauma, and the sleep quality.

Trauma

> Trauma is an emotional response to a terrible event like an accident, rape, or natural disaster. Immediately after the event, shock and denial are typical. Longer term reactions include unpredictable emotions, flashbacks, strained relationships and even physical symptoms like headaches or nausea. While these feelings are normal, some people have difficulty moving on with their lives (APA, 2013b).

Trauma has also been linked to sleep disturbances. The emotional triggers from the traumatic experience have been associated with sleep disturbances, such as poor sleep cycle, interrupted sleep, fear of sleep, and increase in nightmare frequency (APA, 2013a). Trauma has also been associated with REM-stage sleep disturbances (Habukawa et al., 2018). Cognitive based interventions such as exercises built to calm anxiety and physically relaxing techniques such as yoga, have been found to reduce trauma-based sleep disturbances and nightmare frequency (Gehrman et al., 2015).

Paquet et al., (2020), found that with trauma, nightmares were found to have established a replication of the traumatic event that was experienced. Fischmann et al., (2021) also found that trauma was connected to frequent nightmares because of the

repetitive dreaming themes and when the individual was made aware of the trauma connections to the dreaming, a solution was usually sought out causing the dreamer to create repetitive dream situations as a healing process. Furthermore, Black et al., (2021), found that the traumatic experience of a violent death caused dreams that reenacted the traumatic experience. This was a method in which the individual who had suffered the trauma was processing the trauma.

Although not specified if it only pertained to nightmares, Perogamvros and Schwartz (2012) found that memories from traumatic experiences were triggered without warning within the REM stage of sleep causing a recurring dream pattern. Phelps et al., (2008) found PTSD sleep disturbances, such as sleep avoidance, accompanied the traumatic nightmares. For example, it was found that their participants avoid sleep for fear of having nightmares. As stated within the previous quality of sleep section, trauma processing occurs within REM stage sleep (Vanderheyden et al., 2015). With trauma related sleep disturbances such as fear of sleep, sleep avoidance, or nightmares, one could ultimately have issues with processing and healing from trauma.

Jung (1974) found that to psychologically analyze a dream, one must know everything that the dreamer had experienced leading up to the dream. This includes, but is not exclusive to, present trauma. Meaning that there could very well be elements within the dream, or dreams, that stem from a series of trauma. Furthermore, when one is aware of the link between their trauma and sleep disturbances, particularly nightmares, they are more likely to seek out treatment options for their trauma (Crawford 2014; Wyatt et al., 2011). Therefore, there is a possibility that NNRD could be present but overlooked. Its

integration in trauma treatments, based on its less emotionally threatening content, could be beneficial.

Dream Recall

Dream recall refers to the basic mechanics of remembering a dream (Cohen, 1974) and its contents (Williams & Tabari, 2018). Dream recall seems to be a general self-defining term that has been used in reference to the active retrieval of one's memories of a dream.

Eichenlaub et al., (2014), found that the frequency of dream recall was associated with the differences in spontaneous brain activity. Those with higher dream recall frequency were found to have different neurophysiological traits than those with lower dream recall frequency. The temporoparietal junction is associated with conflict resolution, episodic memory, autobiographical memory, emotion regulation, attention, and cognition (Bukowski and Lamm, 2017). An increase in temporoparietal activity has been associated with improved emotional processing, encoding of dreams and memories (Bukowski and Lamm, 2017; Eichenlaub et al., 2014; Lai et al., 2019). It was found that there was higher regional blood flow in the temporoparietal junction, during both the REM and awake states, in those that had higher dream recall than those that had lower dream recall. The increase in blood flood caused an increase in activity that led to the encoding of dreams into memory (Eichenlaub et al., 2014).

Dream recall is associated with the emotions triggered within the dream. With the emotions of the dream perceived and processed as real to the dreamer, the importance of the temporoparietal junction is because of its role in emotional processing, encoding of

dreams and memory creation. The emotions within the dream are perceived as real as they are within the awake state, the difference being the dreamer is aware that it was a dream that they were having. The emotion is processed, and the memories are created as it is categorized as a dream. It was also found that at times with dream recall, negative dreams are recalled with the purpose of evaluate their meaning (Schredl, 2013a).

One's attitude towards dreaming may impact how one recalls their dreams, and the frequency of their dream recall (Schredl & Göritz, 2017). Schredl et al., (2019) also found that dream recall frequency and attitude seem to be the same over time and rarely if ever change. Dream recall is connected to the frequency that one records their dreams, the openness to the dreaming experience, one's interest in dreaming, and putting in the effort to writing down their dreams once they wake up (Schredl & Göritz, 2020). The emotional content of dreams has also been linked to dream recall. The higher the dream frequency with negative emotional content, the higher the nightmare frequency (Mathes et al., 2019), which could lead one to assume that the higher the dream frequency without the negative emotional content, the higher the NNRD frequency.

Frequency of dream recall is connected to the individual's emotional processing. We would expect that a person who is better at recalling their dreams will also report a higher frequency of nightmares or repetitive dreams. Better dream recall may not necessarily translate into having more dreams, although that is likely the impression it would give. Dream researchers must then evaluate dream recall levels among their study participants and treat is as a potential confounding variable. In the particular case of repetitive dreams, one would expect individuals with greater levels of dream recall to also

report a higher number of repetitive dreams. By controlling for dream recall levels a more accurate evaluation of the relationship between trauma and repetitive dreams could be established.

Depression, Anxiety and Stress

Traumatic experiences can trigger a variety of psychological responses. Some of these possible responses include sleep disturbances as discussed previously in this chapter. Other psychological issues associated with trauma include depression, anxiety, and stress. Depression is defined as "a negative affective state, ranging from unhappiness and discontent to and extreme feeling of sadness, pessimism, and despondency, that interferes with daily life" (VandenBos, 2015, p. 298). Anxiety is defined as an "emotion characterized by apprehension and somatic symptoms of tension in which an individual anticipates impending danger, catastrophe, or misfortune" (VandenBos, 2015, p. 66). Stress is defined as the "physiological or psychological response to internal or external stressors that involve changes affecting nearly every system of the body, influencing how people feel and behave" (VandenBos, 2015, p. 1036).

Javadi and Shafikhani, (2019) found that insomnia, nightmares, and lower level of income were connected to depression, anxiety, and stress. By acting as the risk factors, nightmares led to depression and anxiety causing insomnia. Insomnia was connected to depression in that it was either harder to fall asleep or waking up with depression. Whereas with anxiety, it was more connected to insomnia in that the individual tended to be more tired throughout the day and had difficulty falling asleep. With stress, the lower level of income caused higher stress levels which led to depression and anxiety (Javadi &

Shafikhani, 2019). Guan et al. (2020) also found that a good social support system and an increase in physical activity helped promote better sleep quality which led to stress reduction.

Trauma generally comes with the lack in positive feelings, the difficulty to relax, losing hope within the present and the future, feeling that life no longer holds meaning, feeling constantly in fear, not being able to find joy in anything the way they used too and an overwhelming sense of dread that can make it at times hard to breathe (APA, 2013a). This overall emotionality associated with trauma are called depression, anxiety, and stress. And according to the DSM V (APA, 2013a), part of the diagnosis criteria for PTSD consists of an inability to experience positive emotions, feeling hyper vigilance, and being in a constant state negative emotion.

Depression, anxiety, and stress are all factors within trauma that could be identifiable as emotional triggers and even manifest itself within a dream. Abdallah and Gabr (2014) found that depression was associated with presence of insomnia and chronic illness. It was also found that anxiety was present with insomnia, and stress was present with chronic physical and psychological illnesses (Abdallah & Gabr, 2014). Paquet et al., (2020), found that there was higher emotional content within nightmares as compared to the non-nightmare dreaming. The higher emotional content in nightmares has been suggested as associated to the stress resulting from the trauma. It is less clear, however, how these psychological reactions, such as stress, anxiety, depression, may relate to NNRD, if at all. Further research is needed to study this possible association.

Summary and Conclusions

This chapter presented a review of the literature on trauma and its relationship to gender, quality of sleep, non-nightmare recurring dreams, dream recall, depression, anxiety, and stress. Relevant articles were identified through the psychology databases available at the Walden University's library. A review of Revonsuo's TST theory was presented as it related to the study's research question. In addition, relevant empirical articles were described and reviewed, and methodological shortcomings were identified.

Revonsuo's TST theory proposes that dreams run scenarios for one to prepare to react to and process trauma (Revonsuo, 2003). By activating the emotional memory, a preparation simulation is created that runs different types of threat scenarios. This is not exclusive to recurring nightmares. The simulation creates a world that gives time and space to work through the trauma. According to TST, an NNRD would be considered a simulation.

NNRD is not as easily detected as a nightmare is, but some may recognize recurring elements within the dream connected to the traumatic experience. Jung (1963) believed that dreams could be seen as either a warning, or as something that must be brought to light to be better understood. Dreaming brings forth the unconscious to the conscious state. Making one consciously aware helps in processing and understanding the emotions and trauma. Dreaming is connected to resiliency and preparations to help handle an upcoming trauma. An NNRD will be present until one understands what the unconscious mind is trying to show the conscious mind.

Traumatic experiences are associated with poorer quality of sleep, hyper vigilance, nightmares, and fear of sleep. Poorer quality of sleep impacts the emotional processing of a trauma. There are also elements within a dream or dreams that stem from trauma. Depression, anxiety, and stress are all symptoms within the diagnosis of trauma that could be identifiable as emotional triggers that manifests itself within a dream.

The gender differences associated trauma, dream content, and dream recall were discussed. Dream recall, or the process of remembering a dream, is important because of the trauma related emotional triggers. Dream recall is also important for evaluating for the relationship between trauma and repetitive dreaming. The presence of NNRD could indicate that the mind has created a different method of trauma processing because of resiliency.

The focal point of this chapter was directed at the current literature and to reveal the research gap pertaining to NNRD, quality of sleep, gender, trauma, dream recall and depression, anxiety, and stress. This study's goal is to fill the gap in the literature and contribute new knowledge on the relationship between NNRD and trauma, thus potentially offering a non-threatening perspective to trauma interventions. The knowledge derived from this study could be applied to trauma treatment planning by incorporating NNRD. A detailed overview of the quantitative approach that was used in this study was provided in Chapter III.

Chapter 3: Research Method

Introduction

This chapter introduced the quantitative research methodology for this study on non-nightmare recurring dreams (NNRD) and trauma. The purpose of this study was to assess if trauma, gender, quality of sleep, depression, anxiety, and stress are predictors of NNRD. The study's findings may assist in diagnosis and treatment of trauma related psychological problems. It is hypothesized that there is a positive relationship between history of trauma and NNRD. That is, participants reporting a higher amount and severity of traumatic experiences are expected also to report a higher number of NNRD.

The chapter began with a section on the research design and rationale, followed by a section stating and describing the research question and hypotheses. The study's target population is identified and sampled, and both recruitment procedure and data collection procedure are described in detail. The instruments used for measuring each of the key research variables are identified and described. Reliability and validity of these are included in that discussion. The study's threats to validity are described. Ethical procedures to ensure participants' welfare within the context of the study are detailed. Finally, the last section of the chapter summarizes the key aspects of the study's methodology.

Research Design and Rationale

This quantitative study consisted of seven independent variables (history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress), and one

dependent variable (NNRD). The study aimed at evaluating if NNRD is predicted by the independent variables. The study's research questions were as follows:

1. Does history of trauma, gender, quality of sleep, dream recall, depression, anxiety and stress predict NNRD?

2a. Does the prevalence of NNRD differ based on history of trauma?

2b. Does the prevalence of recurrent nightmares differ based on history of trauma?

2c. Does the prevalence of quality of sleep differ based on history of trauma?

2d. Does the prevalence of depression differ based on the history of trauma?

2e. Does the prevalence of anxiety differ based on the history of trauma?

2f. Does the prevalence of stress differ based on history of trauma?

To address the research question, a quantitative, correlational, cross-section survey design was used. Quantitative methodology allows for statistical analysis and a more numerical approach to data collection than an observational one (Vogt & Johnson, 2016). Quantitative studies are usually categorized as descriptive, correlational, or experimental. While descriptive studies focus on measuring and analyzing one variable at a time, correlational research focuses on how two or more variables relate to one another (Cooper, 2020). As compared with experimental research, correlational research does not involve the manipulation of variables, nor the randomized assignment to different levels of interventions (Vogt & Johnson, 2016). Since correlational studies do not manipulate variables and no causal inferences can be made, some researchers avoid using the terms

independent and dependent variables for these studies (Breakwell et al., 2010), instead labeling variables as predictors and criterion.

Within correlational studies, one of the most widely used designs is the cross-sectional survey design. It is labeled “cross-sectional” as it has data collected from participants in a one-time occurrence; this is often described by researchers as taking a “slice,” or a cross section piece of a population, at a particular time (Vogt & Johnson, 2016). Cross-sectional designs differ from longitudinal designs in that the latter collects data at multiple points in time. Cross-sectional designs oftentimes use questionnaires or surveys to gather data. Survey designs could be used to piece together a description of trends and to answer questions that are descriptive; these trends illustrate relationship between variables questions and relationship between predictive questions (Creswell & Creswell, 2018).

The selected correlational cross-sectional survey design is a good fit for responding to the research questions of this study. This design assisted in determining of the proposed predictor variables associated with the NNRD (criterion). It furthered advanced knowledge in this topic as there are not published empirical studies using this methodology to assess the relationship between trauma and NNRD. There are no expected time or resource constraints regarding this design. The sample population consisted primarily of Walden University students recruited via a research participant pool. In the next section, detailed information is provided on the selection of participants, instruments, procedure, and statistical analysis used.

Methodology

Population

The target population was adults. Individuals 18 and older of both genders were recruited for participation in the study. The Census Bureau (2021) estimates that 245 million people are 18 years of age or older in the United States.

Sampling and Sampling Procedures

Sampling refers to the method of selecting units or elements for analysis from a target population (Vogt & Johnson, 2016). Probabilistic sampling involves providing each unit of the target population the same chance of being selected for participation (Cozby & Bates, 2015). This sampling strategy is usually desirable as it offers researchers the ability to make statistical inferences to the target population and its diverse subgroups. On the downside, its implementation is very costly and requires considerable resources. For the present study, a non-probabilistic convenience sampling method was used. Non-probabilistic sampling is used when the probability of selecting a unit of analysis for the sample is either not known or is at zero for part of the population (Vogt & Johnson, 2016). The convenience sample refers to the selection of prospective participants based on availability (Vogt & Johnson, 2016).

A power analysis is a method used to find out how many participants would be needed for the study to be able to correctly reject the null hypothesis (Cooper, 2020). The G*Power 3.1.9.6 application (Faul et al., 2009) was used to calculate the sample size that would be needed for this study based on the desired statistical power. As sample size increases, so does the statistical power (Vogt & Johnson, 2016). From the family of z

tests, parameters for a Logistic regression were set within the G*Power application. The type of power analysis was set as “a priori: compute required sample size- given alpha, power and effect size” (Faul et al., 2009). Power was set at 0.80, significance alpha level at 0.05, two tailed and odds ratio set at 2. The total sample size needed was calculated at 113 participants.

Procedures for Recruitment, Participation, and Data Collection

Participants for this study were recruited via Walden University’s Research Participant Pool and Survey Monkey. The Participant Pool at Walden University connects researchers to possible participants through an online bulletin board. After approval by the university’s institutional review board, information about the research study was posted in the Participant Pool’s bulletin board (via the Center for Research Quality), where it could be accessed by the Walden University online community. To recruit a more diverse sample, I also posted the survey through Survey Monkey Audience. This paid service allowed for recruitment of a small sample of participants (100 to 250) from the United States, while balancing gender and age demographics.

The completion of research surveys was anonymous and collected online through Survey Monkey and Walden University’s research participant pool. Although the minimum sample size projected by G*Power is 113 participants, at least 150 were recruited. This higher number allows for flexibility, as there are always surveys with missing data or response sets. Prospective participants of 18 years of age or older were recruited. A non-probabilistic quota sampling was used to target a balance number of participants based on age and gender.

I contacted prospective participants via an electronic informational flyer, as posted at Survey Monkey and Walden's participant pool. Interested prospective participants were directed to the link to the informed consent documentation, which provided a description of the study, as well as the potential risks and benefits of participating in the study. The individuals needed to state their understanding of their voluntary participation, and their right to withdraw at any point if they chose to. Prospective participants consenting to participate were provided with a link to the research questionnaires. Completion of research surveys was estimated to take 20 to 30 minutes. There was no compensation, no debriefing, or follow-up procedures required for this study.

The data were collected anonymously. No personal information was collected from the participants. The survey included demographic information such as age and gender, but not specific information that could identify participants. Data were saved on a password protected computer I owned. The dissertation committee also had access to the data. The data were all entered and analyzed in SPSS 28.

Instrumentation and Operationalization of Constructs

For the purposes of this study, gender and age were measured with a demographic survey. NNRD was measured using a single dichotomous Yes or No answer to the question "Have you had a non-nightmare recurrent dream within the past 30 days?" History of trauma was measured using The Trauma History Screen (THS) (Carlson et al., 2005). Quality of Sleep was measured using the Iowa Sleep Experience Survey (ISES) (Watson, 2001). Dream Recall was measured using the Dream Recall Frequency Scales

(DRF) (Schredl, 2013). Depression, Anxiety, and Stress were measured using the Depression, Anxiety & Stress Scales (DASS21) (Lovibond & Lovibond, 1995).

Sociodemographic survey. A brief sociodemographic survey asked participants about their age, gender, and other relevant information.

The Trauma History Screen. The Trauma History Screen (THS) (Carlson et al., 2005) was used to measure the history of trauma. The THS is a 14 item self-report measure assessing experiences of traumatic events and their emotional consequences. Items are responded as Yes or No (dichotomous response). If the participant responded affirmatively to experiencing a specific type of traumatic incident, he or she is also asked about number of times of the occurrence. The THS was developed as a screening tool to be used for clinical purposes, and thus it also asks participants about whether those traumatic events have "bothered them emotionally." For the purposes of this study, since the interest is on history of experiencing traumatic events, only the first 14 items were included. "No" responses will be coded as "0" and "Yes" responses as "1" or higher as indicated by the frequency of experiencing that particular event. A full-scale score was computed by adding the number of traumatic events experienced by the participant. Therefore, higher scores on the THS would indicate greater history of trauma. Cohen's kapa is used to retest the scale's reliability. Cohen's kappa has been reported between .61 to .77 (Carlson et al., 2011). The Cronbach's alpha (internal reliability) for this study was .80.

Iowa Sleep Experience Survey. The Iowa Sleep Experience Survey (ISES) (Watson, 2001) is a self-report questionnaire containing 24 questions which are

responded with a 7-point Likert scale format. The survey aims at measuring sleep and dream related phenomena and is divided in two parts: 14 questions on General Sleep Phenomena and 10 questions on Dreaming and Daydreaming. ISES measures different types of sleep and dream frequencies with the scale response of 1 through 7 as follows: 1 (never), 2 (less than once a year), 3 (once or twice a year), 4 (several times a year), 5 (once or twice a month), 6 (several times a month), and 7 (several times a week). ISES scoring on General Sleep Experience (GSE) by using the sum of questions 1, 2, 6, 7, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24. And when using the scale for scoring for Lucid Dreaming (LD), the sum of questions 8, 9 and 10 are used for scoring.

One research used ISES to examine the relationship between sleep and general sleep experiences with alexithymia as a moderator and found an internal reliability coefficient of .69 (Cronbach's alpha) (Alfasi & Soffer-Dudek, 2018). It has also been used to examine the relationship between sleep experiences and hypnotic suggestibility, dissociation, absorption, and negative affect where absorption could be connected to dissociation and found that the reliability coefficient alpha were at .83 and .85 for GSE and .75 and .78 for LD (Fassler et al., 2006). ISES was also used to find the relationship between dissociative symptoms, sleep disturbances, traumatic events, fantasy proneness, and working memory. Watson et al. (2015) found that when testing for anomalous sleep experiences, the reliability coefficient alpha was .90. The internal reliability (Cronbach's alpha) for this study was .88.

Dream Recall Frequency Scales (DRF: Schredl, 2013). DRF is a self-report 7-point Likert scale that measures 0 through 6 as follows: 0 (never), 1 (very rarely), 2

(several times a year), 3 (about once a month), 4 (about once in 2 weeks), 5 (about once a week), and 6 (several times a week). DRF was used in finding the differences in the occurrence and quality of threatening events in dreams between non-nightmare dreamers and occasional nightmare dreamers. It was found that occasional nightmare dreamers reported significantly more dreams than non-nightmare dreamers, but there were no significant differences were found in the intensity of the negative emotions, number of threats per dream, and severity of dreams. Using DRF, Schredl & Basak, (2020) reported the scale's internal reliability at .91 (Cronbach's alpha) using the sample size of 69 and finding that the number of contentless dreams did not correlate with dream recall frequency, number of mornings with successful dream recall, and attitude towards dreams. Cronbach's alpha for the present study was .72.

Depression, Anxiety & Stress Scales 21 (DASS21: Lovibond & Lovibond, 1995). The DASS21 was used to measure using the depression, anxiety and stress. DASS21 is a the brief version of the DASS where instead of 42-questions testing for depression, anxiety and stress, it is a 21 question self-report 4-point Likert scale (0 through 3) as follows: 0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree, or a good part of time, and 3 = applied to me very much, or most of the time. The scoring template is the same as using the 42-question scale, with the difference of multiplying the sum by 2. DASS21 assesses how severe the main symptoms of depression, anxiety and stress by asking simple questions such as "I found it difficult to relax" to "I felt that life was meaningless." (Lovibond & Lovibond, 1995).

DASS has been used for several reasons and found valid and reliable. Crawford & Henry (2003) found that the DASS had a good convergent and discriminant validity and reliability by using a sample of 1,771 individuals and finding that the Cronbach's alpha was at .89 for anxiety, .94 for depression, .93 for stress, and .96 overall. DASS was compared to another scale used within hospitals when it came to anxiety with those with rheumatoid arthritis, and it was found that it was reliable and valid when it came to indicating depression and anxiety and was found to have the Cronbach's alpha was at .87 for anxiety, .94 for depression, and .91 for stress (Covic et al., 2012). This scale was also used to evaluate the differences in severity of dyspepsia, and it was found that those without emotional disturbances severity did parallel the severity with dyspepsia (Siregar et al., 2016). The Cronbach's alpha coefficients for this study were: .80 for anxiety, .90 for depression, and .86 for stress.

Data Analysis Plan

The SPSS 28 software was used to analyze data and test the study's hypotheses. The first hypothesis of the study proposes that history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will correlate with NNRD. The direction of the proposed relationships are as follows: a) better quality of sleep will be associated an increase in NNRD (positive correlation), b) history of trauma will positively associate with NNRD, c) dream recall will be positively related with NNRD, d) women will have more NNRD than men, e) depression will be negatively associated with NNRD, f) anxiety will be negatively correlated with NNRD, and g) stress will negatively be associated with NNRD. Since NNRD will be measured dichotomously (no = 0, yes = 1),

a logistic regression analysis was used to test this hypothesis. A logistic regression analysis predicts group membership based on several predictor variables. Binary logistical regression is an analysis that is used when the outcome variables within studies are either binary or dichotomous (Warner, 2013). This analysis was used to predict a relationship between one or several predictor variables. In this particular case, the goal was to identify which of the proposed variables predict NNRD.

The second hypothesis proposes that the prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress will be positively correlated with history of trauma. Bivariate correlations will be used to test this hypothesis. In addition, and previous to hypothesis testing analyses, data was screened for errors, descriptive statistics (e.g. means, standard deviations) was run, and assumptions of tests were performed. Alpha level was set to .05 as it is customary in psychological studies.

Threats to Validity

Validity pertains to the quality, truth value, or strength of the research design used for the said hypotheses and or research questions (Vogt & Johnson, 2016). A challenge or threats to the validity of this study involves finding the appropriate sites for online data collection. Another challenge would be finding the instruments to assess dream and sleep related phenomenon. An example would be is that there currently are no available scales that measure one of the key variables of the study, NNRD. Sleep instruments usually have one item, if at all, to inquire about this experience. Two main limitations of this study can be identified. The study used a quantitative, correlational, cross-section survey

design. Self-report measures tend to have problems with social desirability (Paulhus, 1984). That is, participants may alter responses to items to present a good impression to others (impression management) and/or themselves (self-deception). Furthermore, correlational studies cannot assess causality. If the hypotheses are confirmed, only inferences on the associations of variables could be made (Cozby & Bates, 2015).

Ethical Procedures

The IRB review board at Walden University has reviewed this proposal to ensure this research has met ethical standards. A letter of Informed Consent was included that follows Walden University IRB guidelines and the APA 7 guidelines that is outlined by standards and ethics which includes a detailed explanation of the procedures, a description of the risks that are reasonably to be expected, a description of the benefits expected, an inquiry regarding the procedures is offered, and instructions for the participant to feel free to withdraw at any point of the study. There was a caution disclaimer message presented to the participant informing them that if they feel any stress, the study will be discontinued. The human subjects' risk that needs to be noted will be the possibility of stress when revisiting a traumatic situation. The participants were advised that they have the right to discontinue their participation from the study if it becomes too stressful. The participants were also advised that there are psychological services available to address their concerns and all issues within this research. The participants were of the adult population over the age of 18 years old. All data was collected anonymously, with no identification notation or information and will be destroyed within 5 years as per Walden University standards. The data was stored on my

personal computer hard drive, where only myself and my committee members will have access to the anonymously collected data for this research project.

Summary

The purpose of this chapter is to outline the research method used to assess if trauma, gender, quality of sleep, depression, anxiety, and stress are predictors of NNRD. The procedure, study participants, data collection, and survey questions were discussed to explain how the study was conducted and who the participants of the study were. Walden University's Participant Pool was used for the recruitment of the participants for this research study. The participants completed the surveys on Survey Monkey. The data analysis included binary logistical regression and bivariate correlations. The data collected using online anonymous self-report surveys. The five scales used are the sociodemographic survey, THS, ISES, DRF, and the DASS21. Measures were taken to ensure no harm come to the participants. The participants' privacy was protected. The study was conducted within an ethical manner, following IRB guidelines, including the presentation of a detailed informed consent. The following chapter (4) provided the results of the analyses described in this chapter. The descriptive statistics, its tables, the effect sizes of the predictor variables were included within this chapter.

Chapter 4: Results

Introduction

The purpose of this quantitative study was to explore the relationship between NNRD and trauma. More specifically, the study evaluated if trauma, gender, quality of sleep, depression, anxiety, and stress predicted NNRD. The participants of this study were male and female adults over the age of 18.

The hypotheses were as follows:

$H_{1\ (alternative)}$— History of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will correlate with NNRD. The direction of the proposed relationships are as follows: a) better quality of sleep will be associated with an increase in NNRD (positive correlation), b) history of trauma will positively associate with NNRD, c) dream recall will be positively related with NNRD, d) women will have more NNRD than men, e) depression will be negatively associated with NNRD, f) anxiety will be negatively correlated with NNRD, and g) stress will be negatively associated with NNRD.

$H_{1(null)}$— History of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will not correlate with NNRD.

H_{2a}— The prevalence of NNRD is the same for participants with history of trauma.

$H_{2\ null}$— The prevalence of NNRD is not the same for participants with history of trauma.

H_{2b}— The prevalence of recurrent nightmares is the same for participants with history of trauma.

H_{02b}— The prevalence of recurrent nightmares is not the same for participants with history of trauma.

H_{2c}— The prevalence of quality of sleep is the same for participants with history of trauma.

H_{02c}— The prevalence of quality of sleep is not the same for participants with history of trauma.

H_{2d}— The prevalence of depression is the same for participants with history of trauma.

H_{02d}— The prevalence of depression is not the same for participants with history of trauma.

H_{2e}— The prevalence of anxiety is the same for participants with history of trauma.

H_{02e}— The prevalence of anxiety is not the same for participants with history of trauma.

H_{2f}— The prevalence of stress is the same for participants with history of trauma.

H_{02f}— The prevalence of stress is not the same for participants with history of trauma.

The predictor variables within this study were gender, quality of sleep, depression, anxiety, stress, and history of trauma. The criterion variable within this study was NNRD. This study assessed if trauma, gender, quality of sleep, depression, anxiety, and stress are predictors of NNRD. Specifically, this study assessed if whether the

prevalence of NNRD, recurrent nightmares, gender, poorer quality of sleep, depression, anxiety, and stress are the same for participants with history of trauma.

This chapter starts with a description of the data collection process, which includes the timeframe, response rates, and discrepancies, Demographic characteristics of the same as well as univariate analyses are reported as well. Results of statistical tests performed to test the study's hypotheses will be presented. This chapter also includes a binary logistical regression analysis and the bivariate correlation analyses.

Data Collection

Timeframe, Response Rates, and Discrepancies

The recruitment process began in April 2022 following Walden University's IRB approval (number 04-01-22-0973537). Prospective participants for this study were recruited through Walden University's Research Participant Pool and an advertisement posted at the researcher's Facebook website. These two sites provided a link to the consent form and research instruments located via the Survey Monkey website. Information about this research study was posted in the Participant Pool's bulletin board, which was accessible by the Walden University online community. Within two weeks of the flyer's posting, the numbers for female participants were met, but not for male participants. Another flyer was submitted to the IRB for approval that aimed only to recruit male participants. Once approved, the second flyer was used to reach the recommended sample size for males, which was met in the following two weeks.

The total number of participants that volunteered for the study was 239; however, based on missing data from participants, the final sample consisted of 192 cases.

G*Power had computed a minimum of 113 participants for data analyses. There were eight missing values for the Depression Anxiety, and Stress Survey, two for the Dream Recall Frequency Scale, two for Iowa Sleep Experiences Survey, and three for the Trauma History Screen. Little's MCAR tests failed to reject the null hypothesis for all scales. Thus, data was found to be missing at random. Missing values were statistically imputed with the Expectation-Maximization algorithm. For imputing missing values in each scale, items from that scale were used as observed values.

The data collection procedure had no discrepancies. There were two questions that were reverse scored because of their negative wording, DASS 3 and DASS 17, from (*0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree, or a good part of time, and 3 = applied to me very much, or most of the time*.) to (*0 = applied to me very much, or most of the time, 1 = applied to me to a considerable degree, or a good part of time, 2 = applied to me to some degree, or some of the time, and 3 = did not apply to me at all*).

Demographic Characteristics of the Sample

The sample consisted of 82 (42.70%) men and 110 (57.30%) women, with an average age of 40 years old (M = 40.32; SD = 11.35). Out of 192 participants, 121 (63.0%) identified as white American, 24 (12.5%) African American, 24 (12.5%) Other, 9 (4.7%) Latino/Hispanic, 6 (3.1%) Asian American, and 8 (4.2%) Mixed Ethnic background.

Representativeness of the Sample

The sample used was the general male and female adult population over the age of 18 years old. The Census Bureau (2021) estimates that 245 million people are 18 years of age or older in the United States, which is about 77.6% of the country's population. The male population is estimated at 160,818,530 million, and the female population is estimated at 165,750,778; this means there are 97 males per every 100 females. The general population median age is 38.2 years, the female population median age is 39.6 and the male population median age is 37.0. This is similar to the 40.32 mean age reported for our sample. The Census Bureau (2022) also estimates the segment of population that identifies as white are at 204, 277,273 million, African American at 41,104,200 million, Latino/Hispanic at 62,080,044 million, and Asian at 19,886,049 million. Further, those that identified as two or more races/mixed race at 33,848,943 million and those that identified as other at 27,915,715 million (Census Bureau, 2022). In comparing the sample to the population, more participants identified as white American than any other race. The population ratio of male to female is like the current study. There was no real significant discrepancy of representation between the sample within this study and the USA population statistics.

Results of the Statistical Analysis Testing the Study's Hypotheses

The results of the statistical analysis testing are included in this section. These results are presented by hypotheses.

Main Hypotheses

The main purpose of this study was to assess if history of trauma predicts NNRD. Using the binary logistical regression analysis to predict a relationship between one or several predictor variables, the first hypothesis of the study proposed that history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress will correlate with NNRD. The direction of the proposed relationships was as follows: a) better quality of sleep will be associated an increase in NNRD (positive correlation), b) history of trauma will positively associate with NNRD, c) dream recall will be positively related with NNRD, d) women will have more NNRD than men, e) depression will be negatively associated with NNRD, f) anxiety will be negatively correlated with NNRD, and g) stress will be negatively associated with NNRD.

In regard to the demographic characteristics, and prior to hypothesis testing analyses, the data was also screened for errors, descriptive statistics (e.g. means, standard deviations) were run, and assumptions of tests were performed. An independent samples t-test was conducted to compare the mean scores for NNRD, stress, anxiety, depression, trauma, quality of sleep, and dream recall. There was no significant difference in scores for the variables gender (M = 1.63, SD = .48), NNRD (M = .43, SD = .49), stress (M = 7.59, SD = 4.66), anxiety (M = 5.38, SD = 4.22), depression (M = 5.66, SD = 5.08), trauma (M = 14.41, SD = 11.22), sleep (M = 71.92, SD = 20.84), and dream recall (M = 5.94, SD = 3.16). The magnitude of the differences in the means is shown in Table 1, (mean difference = 47.80, 95% CI [68.95, 74.89]).

A chi-square test of independence was performed to examine the relationship between gender and NNRD. The relation between these variables was not significant, χ^2 (1, n = 192) = 2.95, p <.09. Not only were females the same as males in reporting NNRD, but this study will fail to reject the null hypothesis because p was not less than 0.05.

Table 1

tMean Values or Frequencies for Predictor Variables

Variable	*T*	95% CI	*p*
NNRD	12.06	[0.36, 0.50]	<.001
Stress	22.57	[6.92, 8.25]	<.001
Anxiety	17.68	[4.79, 5.99]	<.001
Depression	15.45	[4.94, 6.40]	<.001
Trauma	17.80	[12.81, 16.01]	<.001
Sleep	47.80	[68.95, 74.89]	<.001
Dream Recall	26.38	[5.50, 6.40]	<.001

Note. n = 192.

Direct logistic regression was performed to assess the impact of a set of predictor variables on the odds that respondents would report that they had NNRD. The model contained seven predictor variables were included within this study (trauma, gender, sleep, dream recall, depression, anxiety, and stress) with one criterion variable (NNRD). The full model containing all predictors was statistically significant, χ^2 (1, n = 192) = 45.317, p < .001, indicating that the model was able to distinguish between respondents who reported versus did not report NNRD. The strength of the association was relatively weak with Cox and Snell's R^2 = .210 and Nagelkerke's R^2 = .282.

As shown in Table 2, one independent variable made a unique statistically significant contribution to the model (sleep). The strongest predictor of reporting NNRD was reporting a poor quality of sleep, recording an odds ratio of 14.73. This indicated that respondents who had poor quality of sleep were over 14 times more likely to report

NNRD than those who did not have difficulty with their quality of sleep, controlling for all other factors in the model. Based on these statistical analyses, only the null hypothesis on the prediction of sleep quality was rejected. None of the other predictors had a significant contribution in the classification of participants based on their recent history of NNRD.

Table 2

Binary Logistical Regression Analysis Summary

Variable	*B*	*SE*	95% CI	Wald Statistic	*p*
Trauma	-0.01	0.02	[0.96, 1.02]	0.39	0.53
Gender	-0.01	0.36	[0.48, 2.01]	0.00	0.97
Sleep	0.05	0.01	[1.06, 1.08]	14.73	<.001
DreamRecall	0.09	0.06	[0.97, 1.23]	2.18	0.14
Depression	-0.02	0.05	[0.88, 1.09]	0.18	0.67
Anxiety	-0.03	0.07	[0.84, 1.11]	0.18	0.67
Stress	0.01	0.06	[0.90, 1.13]	0.04	0.85

Note. n = 192.

The second hypothesis proposed that the prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress will be positively correlated with history of trauma. These predictions were assessed with bivariate correlations which are presented in Table 3.

Table 3

Bivariate Correlations

	1	2	3	4	5	6	7	8
1. Trauma	-							
2. Gender	.07	-						
3. NNRD	.11	.12*	-					
4. Stress	.29**	.24**	.25**	-				
5. Anxiety	.41**	.21**	.22**	.69**	-			
6. Depression	.31**	.11	.19**	.75**	.70**	-		
7. Sleep	.39**	.27**	.44**	.60**	.64**	.54**	-	
8. DreamRecall	.06	.24**	.33**	.31**	.16*	.24**	.51**	-

*** Correlation is significant at the 0.01 level*
**Correlation is significant at the 0.05 level*

The prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress in correlation with history of trauma was investigated using a Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality and linearity. Based on Cohen's value interpretations, (small r = .10 to .29; medium r = .30 to .49; large r = .50 to 1). The small significant correlations are stress and history of trauma, r = .29, n = 192, p < .001. The medium significant correlations are, depression and history of trauma, r = .31, n = 192, p < .001, sleep and history of trauma, r = .39, n = 192, p < .001, and anxiety and history of trauma, r = .41, n = 192, p < .001. Non-significant correlations are as follows, dream recall and history of trauma, r = .06, n = 192, p < .21, gender and history of trauma, r = .07, n = 192, p < .17, NNRD and history of trauma, r = .11, n = 192, p < .07.

With the null hypotheses, one fails to reject results that have a p level of .05 or above. Meaning, if the p value is less than .05, those null hypotheses are then rejected, but if the p value is at or above .05, then those null hypotheses are not rejected. For this study, the null hypotheses that are rejected are for depression (p <.001), quality of sleep (p <.001), anxiety (p <.001), and stress (p <.001). The null hypotheses that we fail to reject will be for gender (p <.17), dream recall (p <.21) and NNRD (p <.07). This means that gender, dream recall, and NNRD were non-significant for those with a history of trauma.

Chapter Summary

Chapter 4 presented the results of the statistical analysis of the survey responses of 192 participants. The data showed a sample of adults that were different races, ages,

and genders. It was also noted that there were more female than male participants. A binary logistic regression analysis was performed to assess if history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress predicted NNRD. The results of this analysis reflected that the strongest statistically significant predictor of reporting NNRD was difficulty with quality of sleep.

The second hypothesis used bivariate correlations to test if the prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress will be positively correlated with history of trauma. The results of this analysis reflected the variables were positively correlated with history of trauma with the strongest correlation being with anxiety.

Chapter 5 will present the important findings from this study and how it may help with future work within trauma.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

This quantitative, correlational cross-sectional survey study used threat simulation theory (TST) as the main framework for understanding the relationship among NNRD, history of trauma, quality of sleep, dream recall, depression, anxiety, and stress, with particular attention paid to the relationship between NNRD and trauma. Most of the empirical literature has focused on the relationship between nightmares and trauma. Establishing a connection between NNRD (as opposed to nightmares) and trauma presented the possibility of developing less intrusive clinical interventions. The sample consisted of 192 male and female adults over the age of 18. Gender and age were measured via a demographic survey. NNRD was measured using a single dichotomous (Yes/No) response to the following question: "Have you had a non-nightmare recurrent dream within the past 30 days?" The following self-reported measures with Likert response options were used to assess relevant study variables: THS to measure history of trauma, ISES to measure quality of sleep, DRF to measure dream recall, and DASS21 to measure depression, anxiety, and stress.

The first hypothesis evaluated the prediction of NNRD. A binary logistic regression analysis revealed quality of sleep as the only predictor of NNRD. The second hypothesis assessed if the prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress were associated with trauma. Bivariate correlation analyses yielded positive associations between trauma and anxiety, quality of sleep, depression, and stress. Gender, dream recall, and NNRD were unrelated to trauma.

This chapter includes the interpretations of findings, limitations of the study, recommendations for further research, implications for social change, and the conclusion.

Interpretation of Findings

The findings will be presented here in two sections. The first section will consist of the first hypothesis regarding the prediction of NNRD by history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress. The second section will consist of the second hypothesis on the prevalence of NNRD, recurrent nightmares, quality of sleep, depression, anxiety, and stress as associated with a history of trauma.

History of Trauma, Gender, Quality of Sleep, Dream Recall, Depression, Anxiety, and Stress as Predictors of NNRD

The first hypothesis evaluated if the history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress predicted NNRD. More specifically, it was hypothesized that quality of sleep, history of trauma, and dream recall would positively predict NNRD; that depression, anxiety and stress would negatively predict NNRD; and that women would report more NNRD as compared with men. Quality of sleep was the only identified predictor of NNRD, with poor quality of sleep predicting a higher report of NNRD.

Quality of Sleep

Prior to the current study, the literature had not identified a relationship between quality of sleep and NNRD; however, associations between sleep disturbances and nightmares had been reported in such frequency that the DSM-V identifies them as symptoms of PTSD (American Psychiatric Association, 2013a). This study's finding of

an association between quality of sleep and NNRD is not surprising. NNRD can be considered as one of several experiences contributing to quality of sleep. In fact, the instrument used to measure quality of sleep in this study, the Iowa Sleep Experience Survey (ISES) (Watson, 2001), includes an item assessing NNRD. The ISES is split into two parts, one part measuring general sleep phenomena and the second part measuring dreaming and daydreaming. The survey itself is a short, self-report questionnaire with 24 questions in a 7-point Likert scale format. The ISES was used within this research to measure general sleeping experiences, such as how one falls asleep and stays asleep, and the types of dreaming that may occur, such as if they were lucid or reoccurring dreaming. In short, the conceptual similarity between NNRD and quality of sleep, as measured by the ISES, is likely to explain the association between these variables. A person with poor quality of sleep can be expected to experience numerous disturbances or distractions from sleep, among which reoccurring dreams could be included.

Trauma

The main purpose of this study was to evaluate if there was a relationship between history of trauma and NNRD. Bivariate correlations failed to identify such relationship in our study. The logistic regression analysis found as much. There could be several explanations for failing to identify a relationship between history of trauma and NNRD, beginning with methodological shortcomings. NNRD was measured by a single dichotomous item. Although 43% of the sample reported experiencing a non-recurrent dream in the last 30 days, it is possible that the dichotomous scoring resulted in underreporting its frequency. For example, a post-hoc bivariate correlational analysis

between history of trauma and the "I have recurrent dreams" item on the ISES yielded a positive association ($r = .25$, $p < .01$). It is relevant to underscore that ISES items were responded to with a 5-point Likert scale. This presents the possibility that any potential relationship between trauma and recurrent dreams is moderated by the frequency of these dreams, as well as by their intensity. Another methodological shortcoming could be the lack of temporal correspondence between how NNRD and history of trauma were measured. While the item measuring NNRD included a specific timeframe (last 30 days), the items on the trauma scale did not. The THS assesses general history of trauma, that while including frequency of events, do not evaluate the timing of these events. This means that participants responded to the presence of a traumatic event regardless of whether it was experienced in the previous 30 days, 5 years, 20 years, etc. This is relevant as we would expect a higher correlation between recent experiences of trauma and NNRD, as compared with distant traumatic events and NNRD.

Regardless of these methodological shortcomings, there is little argument regarding greater association between nightmares and trauma, as compared with NNRD and trauma. Valli and Revonsuo (2006) had found that TST will trigger the threat simulation system to create recurring simulations when one is exposed to a life-threatening event. There could very well be different ways that a person processes and expresses a traumatic experience, and NNRD could be one of those, but it's not as easily identifiable as a nightmare. Furthermore, nightmares, by their negative and vivid characteristics, are likely to be more easily stored in memory and retrieved from it.

Gender

In the present study, gender was hypothesized to be a predictor of NNRD. More specifically, it was predicted that being female, as compared with being male, would predict a higher rate of reporting non-nightmare recurrent dreams; however, the logistical regression analysis failed to confirm this prediction. Previous research had not directly assessed a direct relationship between NNRD and gender differences; however, women have been found to have a higher emotional connection and higher interest in their dreams, whereas men have been found to only respond to emotionally triggering dreams filled with anger and aggression (Schredl, 2010; Zhang et al., 2020).

Dreams are involved in emotional regulation, and their recurrence plays an important role in psychoanalytic work as a problem solving technique of the unconscious when coping with stressful psychological experiences (Gauchat et al, 2021; Jung, 1963; Lopez, 2016; Weinstein et al., 2018; Yu, 2011). This study's findings on gender and NNRD indicate that being a man or a woman does not predict more NNRD. This suggests that there are no gender differences in the unconscious processing of stressful events, or if there is a difference, it is not transferred to the recurrence of dreams. It should be noted, though, that a small positive Pearson bivariate correlation was found between NNRD and gender ($r = .12$, $p < .05$). In general, it can be stated, based on the study's results, that gender has little or no relevance to the prediction of NNRD.

It is relevant to mention that a core argument for the inclusion of gender as a predictor for NNRD was previous findings of a relationship between gender and dream recall. Overall, studies find that women, as compared with men, have higher recollection

of their dreams (Schredl, 2010). Thus, it seems reasonable to expect that if women recall more dreams than men, that they will also report more recurrent dreams. In the present study, a positive association between gender and dream recall was found ($r = .24$, $p < .01$), with women reporting recalling more dreams as compared with men. It is possible, then, that any association between gender and NNRD may be indicative of gender differences in dream recall; thus, by controlling for this variable in the logistic regression, a more accurate assessment of the relationship between NNRD and gender has been generated.

Dream Recall

This leaves us to consider the relationship between NNRD and dream recall. Dream recall refers to our ability to remember dreams. Dream recall was measured by a two-item scale. One item asked about the recollection of positively toned dreams, and the other item asked about the recollection of negatively toned dreams. One would expect that the more dreams a person recalls experiencing, the more NNRD they will recall as well. Thus, in the present study, a positive association was predicted between dream recall and NNRD. It was found that dream recall had a significant correlation with NNRD ($r = .33$, $p < .01$); however, the variable was not predictive of NNRD in the logistic regression statistical analysis.

In order to explain this finding, we need to focus primarily on the measures used to assess these constructs. As noted above, NNRD was assessed with a single item, and dream recall with two items. Single item scales, as well as short scales, have the shortcoming of providing very little full scale score variability. This negatively impacts

the possibility of finding a significant statistical difference if there was one. Furthermore, the one item on the NNRD focused on positively toned dreams, as it stressed the non-nightmare content of these. Nevertheless, the dream recall scale contains an item that precisely focused on negatively tone dreams. It would have made more sense to assess dream recall of only positively tone dreams, as these are more relevant to the purpose of the study. Schredl and Göritz (2020) did state that recording one's dreams, being open to the dreaming experience, and being interested in dreaming did encourage dream recall. Unfortunately, the recording of dreams was not assessed in the present study. Jung's dream theory (Jung, 2011) discusses symbols in a dream that the unconscious creates to get the attention of consciousness, ones that could end up playing in a loop. The adoption of measures of dreaming that could identify symbology within dreams could provide relevant information regarding a potential relationship between dream recall and NNRD.

Depression, Anxiety, and Stress

Depression, anxiety, and stress are general indicators of mental health. It can be hypothesized that mental health problems are often associated with unresolved psychic conflicts. Revonsuo (2003)'s threat simulation theory of dreaming posits that individuals generate life simulations within their dreams in reaction to threatening stimuli. Therefore, it appears reasonable that individuals may process threats to their mental health through NNRD. As appealing as that possibility may sound, logistic regression analysis did not identify depression, anxiety, and stress as predictors of NNRD. That is, NNRD do not appear to be related to mental health when controlling for gender, dream recall, or quality of sleep. Bivariate correlations, however, identified that depression ($r = .19$, $p < .01$),

anxiety ($r = .22$, $p < .01$), and stress ($r = .25$, $p < .01$) were positively associated with NNRD.

Previous studies found that depression, anxiety, and stress were associated with sleep disturbances (Abdallah & Gabr, 2014). Furthermore, dream content has been found to significantly differ between nightmares and non-nightmare dreams (Paquet et al., 2020). Emotional triggers have been hypothesized as related to insomnia, nightmares, and psychological illnesses. Previous research had focused on the relationship between emotional content and nightmares while dismissing the relevance of NNRD. This was not the case within this study. Bivariate correlation suggests there is a weak but significant relationship between stress, anxiety, depression and NNRD. These findings were not confirmed by the logistical regression analysis. Further research is needed to better establish a relationship between stress, anxiety, and depression with NNRD.

Prevalence of NNRD, Recurrent Nightmares, Quality of Sleep, Depression, Anxiety, and Stress as Associated with History of Trauma

The second hypothesis was set to find if the prevalence of NNRD, recurrent nightmares, quality of sleep, depression, anxiety, and stress is the same for participants with different amounts of trauma. Bivariate correlations were run to evaluate this hypothesis. It is relevant to note that this hypothesis focuses on history of trauma. Although this is a correlational study, and causal inferences cannot be made, it can be assumed that trauma likely antecedes a host of psychological problems such as anxiety, stress, depression, and sleep disturbances. As stated in Chapter 2, sleep disturbances are common psychological problems associated. Nightmares are of particular relevance. It

has been suggested that nightmares result from traumatic experiences as replication of these events and motivate individuals to practice sleep avoidance in order to avoid the reenactment of the trauma (Phelps et al., 2008; Habukawa et al., 2018; Paquet et al., 2020; Black et al., 2021). The overall negative emotionality that comes with trauma are commonly known as depression, anxiety, and stress, which are associated with insomnia and even chronic illnesses (APA, 2013a; Abdallah & Gabr, 2014). Of course, the main interest of the present study was to explore a possible relationship between trauma and NNRD. As mentioned previously, recurrent nightmares have been associated with trauma, and are part of the DSM criteria for Post-Traumatic Stress Disorder. However, the literature has not focused at all on NNRD. If there was a relationship between NNRD and trauma, it would open the possibility of developing less invasive treatments. Could trauma be approached clinically by working on non-threatening dreams?

This study found that trauma is not associated with NNRD ($r = .11$, $p < .07$). As discussed above, there are several methodological shortcomings which could explain the non-significant finding such as measuring NNRD with a single item. Regardless of the methodological shortcomings, it appears that the NNRD and trauma relationship must be further studied before making any claims about the potential benefits of focusing on non-threatening dreams in clinical practice with individuals with psychological problems associated with trauma. Associations were found between trauma and quality of sleep, stress, depression, and anxiety. Thus, although this is a correlational study and causal inferences cannot be made, a link was established between trauma and psychological problems.

Up to this point we have been focusing on Revonsuo's threat simulation (Revonsuo, 2003) as framework for understanding the relationship among the key variables of this study. However, it appears that this theory may not be sufficient in explaining the results of the study. The theory focuses on unconscious processes having a key role in psychological wellbeing – in the psychoanalytic tradition. One possibility is that individuals are much more resilient, or not as psychologically vulnerable, than what assumed by traditional psychoanalytic theory. This could include simply not being as negatively influenced by trauma (Bonano, 2004). People are likely to be more resourceful and adaptive in managing stressful life experiences. In addition, any possible negative consequences of trauma may not solely manifest in dreams but in other aspects of a person's psychological experience – including consciously accessed red flags which the person could more easily work through.

An interesting alternative approach to understanding the relationship between trauma and NNRD is presented by Weinstein et al., (2018). Borrowing from self-determination theory (Deci & Ryan, 2008), these authors advocate for the inclusion of the psychological needs concept in the study of recurring dreams. It is argued that the frustration at failing to satisfy core psychological needs such as competence, autonomy, and relatedness may be associated with the presentation of dreams and their content. By integrating knowledge on human resilience and unsatisfied psychological needs we may better understand a possible pathway to the relationship between trauma and NNRD. Since the psychological consequences of trauma vary greatly across individuals, it is key to identify which variables moderate the relationship between experiences of trauma and

the development of serious mental health problems. It is possible that frustration at not meeting psychological needs may moderate the relationship between trauma and recurrent dreams. That is, trauma may not be in itself what predict recurrent dreams. However, when experiences of trauma impact the satisfaction of core psychological needs, that may trigger dreaming as an unconscious strategy to address the threat. Furthermore, we need to consider human variability in their ability to overcome stressful situations. Individuals with higher degree of resilience may be more resourceful in managing traumatic events. The addition of psychological needs and resilience as moderating variables in understanding the relationship between trauma and NNRD is recommended for researchers interested in this topic.

Limitations of the Study

A few of the challenges or limitations of this study were the design and the use of self-report measures. Self-report measures are known to have issues with social desirability (Paulhus, 1984). This means that participants may alter their responses according to what they believe others want them to respond (i.e. impression management). Even when in anonymous testing conditions self-report measure may influence responses through self-deception. So, not only are respondents likely to modify their attitudes to correspond with others' expectations but also to deceive themselves about their beliefs. This is likely the case in situations in which studies assess sensitive topics.

This study used a quantitative, correlational, cross-section survey design. Correlational research focuses on the relationship of two or more variables instead of

analyzing one variable at a time but cannot be used to assess for causality (Breakwell et al., 2010; Cozby & Bates, 2015; Cooper, 2020). Vogt and Johnson, (2016) stated that with cross-sectional designs data gets collected from participants during a single point in time instead of at multiple points in time. Some key items in the present study asked about recollection of events in the last 30 days. Since many of these occurrences, such as NNRD, are infrequent, extending that time frame or even asking longitudinally, would have been desirable.

Survey designs are frequently used when putting together descriptions of trends or answering descriptive questions, and with questions of the relationship between variables or relationship predictive questions (Creswell & Creswell, 2018). There are notable benefits of this design, such as allowing for assessing relationships among multiple variables. However, the availability of valid and reliable instruments is key. Unfortunately, that was a major limitation in this study as there was not an available instrument to assess NNRD. Relying on a few items to assess one of the key variables of the study is definitely one of the major limitations of this study. Furthermore, the difference between NNRD and recurrent nightmares was not well established either. Overall, the lack of valid and reliable instruments to assess uncommon sleep disturbances was a notable limitation.

Recommendations for Further Study

As noted above, several methodological shortcomings limit the reach of the study's findings. Based on these limitations, the study's findings, and considering the literature on this topic, several recommendations for future researchers are identified. In

summary, researchers are likely to benefit from using qualitative methodology and improving the measurement of NNRD

Quantitative analyses have many strengths. However, it is relevant to consider the potential benefits of qualitative and mixed methods analyses, particularly when considering the key variables of interests, NNRD and traumatic events, are not common among the general population. With qualitative analysis, for example, one would have access to the participant's experiences by conducting face to face interviews. This would allow a more in-depth exploration of sleep and dreaming experiences. Uncommon experiences such as NNRD could be investigated in more detail.

There is a need for developing instruments focused on non-nightmare recurrent dreams. Existent sleep and dreaming instruments do a poor job of drawing a meaningful distinction between recurrent dreams and recurrent nightmares. This is further complicated by our tendency to better remember dreams with negative content or emotions. In addition, researchers are encouraged to expand the timeframe on possible NNRD from the past 30 days to the past 60 days, 90 days or even 6 months or a year. This may give a different outlook on how trauma could be associated with NNRD over time. This also may help in assessing whether NNRD emerge immediately after a traumatic event or at a later point in time.

In general, researchers interested in further exploring the relationship between NNRD and trauma should not be discouraged by the lack of significant findings in this study. There is a need for research aimed at understanding NNRD and its relationship not

only with trauma, but also with depression, anxiety, stress, and other mental health markers.

Implications

The goal of this study was to assess the relationship between NNRD and trauma. Individuals with a history of trauma are commonly expected to have nightmares and be in a constant state of fear. Traumatic experiences are processed psychologically mostly through the unconscious as verbal expression of these becomes challenging (Jung, 1974). The dreaming aspect helps the individual not just work through their trauma but express what it is and how they feel about the traumatic experience. The significance of this study lies in assessing the relationship of a less-threatening dreaming experience, NNRD, with a serious clinical issue such as psychological trauma. While previous research focused predominantly on studying the link between recurring nightmares and trauma, there was no prior research done directly assessing the connection between NNRD and trauma. The present study's findings have clinical relevance as these could guide: (a) new criteria for diagnosis of trauma, and (b) the development of less intrusive interventions which focus on NNRD as opposed to nightmares.

By focusing on a mostly overlooked concept, NNRD, this study was attempting to contribute to trauma treatment by identifying the relevance of lesser known symptoms that are likely to impact diagnosis and treatment. Social change implications of this study focused on the potential of changing beliefs and attitudes of clinical psychologists and the public on trauma. More specifically, this may motivate less intrusive interventions based on wellbeing as opposed to pathology. In understanding NNRD, we may be able to

understand why some are more resilient to trauma and also understand how one's own mind helps in trauma treatment through its own version of dream therapy.

Conclusion

The goal of this study was to assess and explore the relationship between NNRD and trauma. It was hypothesized that there was a positive relationship between history of trauma and NNRD. Although the relationship between NNRD and trauma may be helpful in diagnosis and interventions of trauma related mental health problems, prior research on the relationship had focused predominantly on nightmares.

NNRD was not as emotionally charged as nightmares are, but its repetitive patterns suggested a connection to traumatic experiences. The present study assessed the relationship of NNRD and trauma, and aimed at understanding the contribution of dreams, beyond nightmares. This study contributed by identifying a lesser-known symptom that can impact trauma diagnosis and treatment. Also assessed were the relationship with gender, the quality of sleep, depression, anxiety, stress, and trauma. The study used Revonsuo's Threat Simulation Theory to explain the relationship between relevant variables. The social change contribution of this study focused on potentially changing beliefs and attitudes of clinical psychologists and the public on trauma and creating a less intrusive interventions based on wellbeing as opposed to pathology.

NNRD was not as easily detected as a nightmare is, but its recognizable recurring elements within the dream connected it to the traumatic experience. Revonsuo's TST theory did propose that dreams run scenarios for one to prepare to react and process trauma (Revonsuo, 2003). According to TST, an NNRD would be considered a

simulation by activating the emotional memory with different types of threat scenarios that was not exclusive to recurring nightmares. The simulation created a world that gave time and space to work through the trauma.

Data analyses were based on a sample of 192 adult participants. A binary logistic regression analysis was performed to assess if history of trauma, gender, quality of sleep, dream recall, depression, anxiety, and stress predicted NNRD. The results of that analysis reflected that the strongest statistically significant predictor was quality of sleep. Bivariate correlations was used for the second hypothesis to test if the prevalence of NNRD, recurrent nightmares, poor quality of sleep, depression, anxiety, and stress will be positively correlated with history of trauma. It was found that the strongest correlation was between anxiety and history of trauma.

Findings from this study and how it could help with future trauma work may help in determining if there are different ways that one processes and expresses a traumatic experience. NNRD may very well be one of those methods of trauma expression and processing but unfortunately may not be as easily stored nor retrieved from memory as it's negatively characteristic counterpart nightmare can be. With the potential relationship between trauma and recurrent dreams, there was not a clear relationship but this could have been hindered by focusing on the previous 30 days instead of other time frames. And finally, both bivariate correlations and logistical regression analysis reflected different relationships between stress, anxiety, and depression with NNRD suggesting where further research is needed. Although no direct association between trauma and NNRD was found, several recommendations were identified which are likely to

encourage researchers to improve future attempts at establishing a relationship between these variables.

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Appendix A: Consent Form

CONSENT FORM

You are invited to take part in a research study about sleep experiences and mental health. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Asmai Fathelbab, who is a doctoral student under the supervision of Dr. Carlos M. Díaz-Lázaro at Walden University.

Background Information:
The purpose of this study is to gain a better understanding of the relationship between sleep experiences and mental health.

Procedures:
This study involves the following steps:

- The first step is learning about the study, including its potential risks. This process is called informed consent, and it involves reading this document.
- If you agree to participate in the study, you will be asked to complete several surveys which should take about 20 to 30 minutes.

Volunteers must meet these requirements:

- 18 years old or older
- Have a computer and/or smartphone with internet access

Voluntary Nature of the Study:
Participation in the study is voluntary. If you decide to join the study now, you can still change your mind later. You may stop at any time. If you feel any stress or discomfort when responding to survey items you may discontinue and withdraw from the study.

Compensation
You will not be compensated for your participation in the study**.**

Risks and Benefits of Being in the Study:
Being in this study could involve some risk of the minor discomforts that can be encountered in daily life, such as stress arising from sharing personal information. With the protections in place, this study would pose minimal risk to your wellbeing. However, it is possible that some items may trigger discomfort. If you need to address any concerns or discomfort you are encouraged to seek professional healthcare services. For example, you can call the SAMHSA's National Helpline, 1-800-662-HELP (4357).

This study offers no direct benefits to individual volunteers. The aim of this study is to benefit society by having a better understanding of sleep experiences and mental health.

Privacy:
The researcher is required to protect your privacy. This is an anonymous study, which means you will not be asked any personally identifying information. You will be asked, however, to provide general socio-demographic information as well as completing the research surveys. The researcher will not use the information you provide for any purposes outside of this research project. Data will be kept secure by a password protected computer. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:
You can ask questions of the researcher by email at asmai.fathelbab@waldenu.edu. If you want to talk privately about your rights as a participant or any negative parts of the study, you can call Walden University's Research Participant Advocate, Dr. Leilani Gjellstad 612-312-1210 or email at irb@mail.waldenu.edu. Walden University's approval number for this study is _____ and it expires on _____.

You might wish to retain this consent form for your records. You may ask the researcher or Walden University for a copy at any time using the contact info above.

Obtaining Your Consent

If you feel you understand the study and wish to volunteer, please indicate your consent by clicking on the email to access and complete the survey.

Click on the link below to access the Complete Survey

Appendix B: Sociodemographic Survey

How old are you? (write in numbers of years) _____

What is your gender? (circle your selection)

1. Male
2. Female

Ethnicity (circle)

1. White American
2. African American
3. Latino/Hispanic
4. Asian American
5. Mixed ethnic background
6. Other

Have you had a non-nightmare recurrent dream within the past 30 days? Note that a non-nightmare recurrent dream refers to a non-frightening dream which has been repeated. (circle your selection)

Yes
No

Appendix C: THS

Trauma History Screen

The events below may or may not have happened to you. Circle "YES" if that kind of thing has happened to you or circle "NO" if that kind of thing has not happened to you. **If you circle "YES" for any events:** put a number in the blank next to it to show how many times something like that happened.

Event	Circle "YES" if that kind of thing has happened to you	Circle "NO" if that kind of thing has not happened to you	Number of times something like this has happened
A. A really bad car, boat, train, or airplane accident	YES	NO	_____ times
B. A really bad accident at work or home	YES	NO	_____ times
C. A hurricane, flood, earthquake, tornado, or fire	YES	NO	_____ times
D. Hit or kicked hard enough to injure - as a child	YES	NO	_____ times
E. Hit or kicked hard enough to injure - as an adult	YES	NO	_____ times
F. Forced or made to have sexual contact - as a child	YES	NO	_____ times
G. Forced or made to have sexual contact - as an adult	YES	NO	_____ times
H. Attack with a gun, knife, or weapon	YES	NO	_____ times
I. During military service - seeing something horribleor being badly scared	YES	NO	_____ times
J. Sudden death of close family or friend	YES	NO	_____ times

K. Seeing someone die suddenly or get badly hurt or killed	YES	NO	_____ times
L. Some other sudden event that made you feel very scared, helpless, or horrified	YES	NO	_____ times
M. Sudden move or loss of home and possessions	YES	NO	_____ times
N. Suddenly abandoned by spouse, partner, parent, or family	YES	NO	_____ times

Trauma History Screen – Permission to Use Scale

The instrument author has provided a blanket permission for researchers interested in using the scale. This permission is available through the author's website at https://www.ptsd.va.gov/professional/assessment/te-measures/ths.asp

Appendix D: ISES-24

Iowa Sleep Experiences Survey

The purpose of this survey to examine the prevalence of various sleep- and dream-related phenomena in the general population. Please answer the following questions honestly and accurately. Read each statement carefully, then indicate **how frequently** you have experienced this phenomenon. Use the following scale to record your responses:

A = *never*
B = *rarely* (that is, less than once a year)
C = *infrequently* (once or twice a year)
D = *occasionally* (several times a year)
E = *frequently* (once or twice a month)
F = *very frequently* (several times a month)
G = *regularly* (several times a week)

PART I: GENERAL SLEEP PHENOMENA

_____ 1. Upon awakening during the night, I am unsure whether I actually experienced something
or only dreamed about it.

_____ 2. Lying in bed, I sense the presence of someone who actually isn't there.

_____ 3. As I lie in bed, I realize that I am unable to move.

_____ 4. My legs twitch or tremble as I lie in bed.

_____ 5. My body suddenly jerks violently as I begin to fall asleep.

_____ 6. I experience intense, dreamlike images as I begin to fall asleep.

_____ 7. I experience intense, dreamlike images as I begin to awaken.

_____ 8. I am aware that I am dreaming, even as I dream.

_____ 9. I am able to control or direct the content of my dreams.

_____ 10. I am able to wake myself out of dreams that I find unpleasant or disturbing.

_____ 11. I have spells of sudden, overpowering sleepiness during the day.

_____12. While awake, I experience a sudden weakness in my body muscles during states of strong emotion such as anger or excitement.

_____ 13. I walk in my sleep.

_____ 14. I talk in my sleep.

PART II: DREAMS AND DAYDREAMS

_____ 15. I remember my dreams.

_____ 16. I have a dream that is so vivid it influences how I feel the following day.

_____ 17. I have nightmares.

_____ 18. I have dreamed that I was falling.

_____ 19. I have dreamed that I was flying.

_____ 20. I have dreamed that I woke up (that is, waking up was <u>part</u> of the dream experience).

_____ 21. I have recurring dreams.

_____ 22. I have dreamed about something that later actually happened.

_____ 23. I have died in a dream.

_____ 24. A dream helped me to solve a current problem or concern.

Appendix E: DRF

Dream Recall Frequency Scales

Frequency of positively-toned and neutral dreams

How often do you remember positively-toned and neutral dreams?

Circle one:

0 [Never]

1 [Very rarely]

2 [Several times a year]

3 [About once a month]

4 [About once in 2 weeks]

5 [About once a week]

6 [Several times a week]

Frequency of negatively-toned dreams

How often do you remember negatively-toned dream?

Circle one:

0 [Never]

1 [Very rarely]

2 [Several times a year]

3 [About once a month]

4 [About once in 2 weeks]

5 [About once a week]

6 [Several times a week]

Dream Recall Frequency Scales – Permission to Use Scale

PsycTESTS®

Dream Recall Frequency Scales

PsycTESTS Citation:
Shredl, M. (2013). Dream Recall Frequency Scales [Database record]. Retrieved from PsycTESTS. doi: https://dx.doi.org/10.1037/t27845-000

Instrument Type:
Rating Scale

Test Format:
Items on the Dream Recall Frequency Scales are scored on 7-point scales, coded as 0 (Never), 1 (Very rarely), 2 (Several times a year), 3 (About once a month), 4 (About once in 2 weeks), 5 (About once a week), and 6 (Several times a week).

Source:
Schredl, Michael. (2013). Positive and negative attitudes towards dreaming: A representative study. Dreaming, Vol 23(3), 194-201. doi: https://dx.doi.org/10.1037/a0032477

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Appendix F: DASS21

Depression, Anxiety & Stress Scales- 21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1. I found it hard to wind down	0	1	2	3
2. I was aware of dryness of my mouth	0	1	2	3
3. I couldn't seem to experience any positive feeling at all	0	1	2	3
4. I experienced breathing difficulty (eg, excessively Rapid breathing, breathlessness, in the absence of physical exertion)	0	1	2	3
5. I found it difficult to work up the initiative to do things	0	1	2	3
6. I tended to over-react to situations	0	1	2	3
7. I experienced trembling (eg, in the hands)	0	1	2	3
8. I felt that I was using a lot of nervous energy	0	1	2	3
9. I was worried about situations in which I might panic And make a fool of myself	0	1	2	3
10. I felt that I had nothing to look forward to	0	1	2	3
11. I found myself getting agitated	0	1	2	3
12. I found it difficult to relax	0	1	2	3
13. I felt down-hearted and blue	0	1	2	3
14. I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15. I felt I was close to panic	0	1	2	3
16. I was unable to become enthusiastic about anything	0	1	2	3
17. I felt I wasn't worth much as a person	0	1	2	3
18. I felt that I was rather touchy	0	1	2	3
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20. I felt scared without any good reason	0	1	2	3
21. I felt that life was meaningless	0	1	2	3

Thank you for taking part in the research.

Depression, Anxiety & Stress Scales- 21 – Author's Permission to Use Scale

The instrument author has provided a blanket permission for researchers interested in using his/her scale. This permission is available through the author's website at

http://www2.psy.unsw.edu.au/dass//DASSFAQ.htm#_3.__How_do_I_get_permission_to_use_