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ASSOCIATIONS OF TRAUMA, NIGHTMARES, AND QUALITY OF LIFE IN URBAN AFRICAN AMERICAN ADOLESCENTS

by

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DISSERTATION

Submitted to the Graduate School

of Wayne State University,

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MAJOR: NURSING

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Advisor   Date

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DEDICATION

Many people have walked with me on this journey. First and foremost, I dedicate this work to my ever-encouraging life partner who has gone the extra mile on this journey, and without whom I would have stopped half way. Thank you for your listening ear, and your patient, kind, and wise heart.   I dedicate this to my children, all five of them. They have supported me, waited for me to be off the computer, and given me thousands of reasons take life less seriously.   I dedicate this work to my mom, who first encouraged me to be a nurse and supported me every step of the way. I miss her every day and wish she could celebrate this accomplishment with me. Lastly, I dedicate this work to the teens who suffer from nightmares; may you find freedom from them, and rest.

ACKNOWLEDGEMENTS

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CHAPTER 1 Introduction

Exposure of youth to trauma and victimization is pervasive in America (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). Youth, once thought of as a time in life where one is protected from trauma, is too often the time when exposure to violence and trauma first occurs. Urban adolescents, particularly African Americans, and those of lower socioeconomic status(SES) status are especially at high risk for exposure to trauma (Hammack, Richards, Luo, Edlynn, & Roy, 2004; Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). An alarming number of urban African American children and adolescents have reported at least one exposure to trauma/violence before they reach adulthood (Buka, Stichick, Birdthistle, & Earls, 2001; Stein, Jaycox, Katoaka, Rhodes, & Vestal, 2003).

Exposure to trauma is not necessarily a one-time occurrence, and youth who are exposed to a single trauma are at far greater risk of experiencing multiple exposures of trauma and violence (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). Multiple exposures to trauma over ones' life, a frequent occurrence in urban and low SES settings, are defined as cumulative trauma (CT). CT has greater negative consequences on health and mental health than single trauma exposures (Kira, Lewandowski, Templin, Ramaswamy, Ozkan, & Mohanesh, 2008).

Nightmares are a distressing consequence of trauma exposure, and more than 60% of trauma-exposed teens have frequent nightmares (Mertin & Mohr, 2002). These trauma-related nightmares often cause more distress than occasional, ordinary nightmares and affect many aspects of life (Davis, 2009; Noll, Trickett, Susman, & Putnam, 2005; Terr, 1983). Nightmare distress is the extent to which nightmares negatively affect a person during waking hours (Belicki, 1992). Adolescents who report a higher frequency of nightmares also report higher levels of nightmare distress, and both nightmare frequency and nightmare distress are associated

with depression (Roberts & Lennings, 2006). Findings from adult studies indicate that nightmare distress is more predictive of poor well-being than is nightmare frequency (Belicki, 1992; Blagrove, Farmer, & Williams, 2004; Miró & Martínez, 2005; Schredl, Landgraf, & Zeiler, 2003). While most studies explore only nightmare frequency, the assessment of both nightmare frequency and nightmare distress is important to understand the ways in which nightmares negatively influence health and well-being.

One reported effect of nightmares is poor sleep quality. Studies have found a relation between nightmares (i.e. nightmare frequency and nightmare distress) and poor sleep quality in adolescents (Choquet, Darves-Bornoz, Ledoux, Manfredi, & Hassler, 1997; Manni, Ratti, Marchioni, Castelnovo, Murelli, Sartori, et al., 1997). Poor sleep quality, in turn, contributes to poor daytime coping with daily stress, and may increase fatigue, confusion, and anxiety (Harvey, Jones, & Schmidt, 2003; Joo, Shin, Kim, Yi, Ahn, Park, et al., 2005). Adolescents who report poor sleep quality also identify that they are more tense, moody, and irritable after a night of disturbed sleep (Kirmil-Gray, Eagleston, Gibson, & Thoresen, 1984), and thus not functioning at optimal levels.

Nightmares are also associated with the severity of posttraumatic stress disorder (PTSD) symptoms in adults. Adults who experience trauma-related nightmares report more severe symptoms of PTSD than adults with PTSD who do not have nightmares (Davis, Byrd, Rhudy & Wright, 2007; Esposito, Benitez, Barza, & Mellman, 1999; Mellman, David, Bustamante, Torres, & Finns, 2001). The association between nightmares and PTSD symptoms in urban adolescents has not been studied, and gaps of knowledge exist.

Gaps in knowledge indicate that more research is needed to examine the influence of nightmares in the post-trauma response of adolescents. Given the known association in adults

between 1) nightmares, 2) poor sleep quality, and 3) increase in PTSD symptoms, and the association between 1) poor sleep quality, 2) increased PTSD symptoms, and 3) quality of life, it is possible that nightmares lead to poorer quality of life in trauma-exposed adolescents. As such, nightmares may negatively impact quality of life through the influence that nightmares have on sleep quality and PTSD symptoms.

Statement of Problem

Urban African American adolescents are too often exposed to trauma. Nightmares are a distressing consequence of trauma exposure, yet knowledge about nightmares in trauma-exposed teens is limited. Research is needed to understand the impact of nightmare frequency and nightmare distress on quality of life in trauma-exposed urban African American adolescents. The purpose of this study was to examine the associations of trauma, nightmare frequency, nightmare distress, sleep quality, PTSD symptoms, and quality of life in urban, trauma-exposed African American adolescents.

The study was guided by the theoretical framework of the Roy Adaptation Model (RAM; Roy & Andrews, 1991), which will be discussed in detail in the Chapter One. Consistent with the RAM, the study examined associations of contextual stimuli (trauma exposure), focal stimuli (nightmare frequency and nightmare distress), physiologic and self-concept adaptive modes (sleep quality and PTSD symptoms, respectively), and output/adaptation level (quality of life).

Research Questions and Hypotheses

In order to examine the associations of nightmares (nightmare frequency and nightmare distress), sleep quality, PTSD symptoms, and quality of life in urban, trauma-exposed African American adolescents the following research questions and hypotheses were examined:

Research Question #1: What are the relations between trauma exposure (contextual stimuli), nightmare frequency (focal stimuli), and nightmare distress (focal stimuli) in urban, African American adolescents age 14 to 17?

H1a: There will be a significant positive relation between trauma exposure and nightmare frequency.

H1b: There will be a significant positive relation between trauma exposure and nightmare distress.

H1c: Nightmare frequency and greater nightmare distress will be significantly positively associated.

Research Question # 2: What are the relations between nightmare frequency, nightmare distress (focal stimuli), sleep quality, and PTSD symptoms (adaptive modes) in urban, trauma-exposed African American adolescents, age 14 to 17?

H2a: Higher nightmare frequency will be significantly associated poorer sleep quality.

H2b: Higher nightmare frequency will be significantly associated with greater PTSD symptoms.

H2c: Higher nightmare distress will be significantly associated with poorer sleep quality.

H2d: Higher nightmare distress will be significantly associated with greater PTSD symptoms.

Research Question #3: What are the relations between nightmare frequency, nightmare distress (focal stimuli), and quality of life (adaptation level) in urban, trauma-exposed African American adolescents, age 14 to17?

H3a: Higher nightmare frequency will be significantly associated with lower quality of life.

H3b: Higher nightmare distress will be significantly associated with lower quality of life.

Research Question #4: What are the relations between sleep quality, PTSD symptoms (adaptive modes), and quality of life(adaptation level) in urban, trauma-exposed African American adolescents, age 14 to 17?

H4a: Poorer sleep quality and greater PTSD symptoms will be significantly positively associated.

H4b: Poorer sleep quality will be significantly associated with lower quality of life.

H4c: Greater PTSD symptoms will be significantly associated with lower quality of life.

Research Question #5: What are the relations between trauma exposure (contextual stimuli), sleep quality (physiologic adaptive mode), and PTSD symptoms (self-concept adaptive mode)in urban, trauma-exposed African American adolescents, age 14 to 17?

H5a: There will be a significant inverse relation between trauma exposure and sleep quality.

H5b: There will be a significant positive relation between trauma exposure and PTSD symptoms.

Research Question # 6: Do sleep quality and PTSD symptoms (physiologic and self-esteem adaptive modes, respectively) mediate the relations between nightmare frequency, nightmare distress (focal stimuli), and quality of life (adaptation level) in urban, trauma-exposed African American adolescents, age 14 to 17?

H6a: Sleep quality will mediate the relation between nightmare frequency and quality of life.

H6b: Sleep quality will mediate the relation between nightmare distress and quality of life.

H6c: PTSD symptoms will mediate the relation between nightmare frequency and quality of life.

H6d: PTSD symptoms will mediate the relation between nightmare distress and quality of life.

Moderator and Control Variables

Due to the minimal research on the effect of nightmares in trauma-exposed adolescents knowledge is limited about whether factors such as age, gender, depression, or income influence the associations between nightmares and quality of life. In this research study, gender, age, depression, household income, and number of welfare programs the teen's family receives, were examined as covariates to understand their influence on the relations between the study's independent and dependent variables.

Gender was examined in the study for multiple reasons: 1) girls report greater nightmare frequency than boys (Abdel-Khalek, 2006; Nielsen, Stenstrom, & Levin, 2006); 2) girls report more PTSD symptoms than boys (Giaconia, Reinherz, Silverman, Pakiz, Frost, & Cohen, 1995); and 3) adolescent girls report more symptoms of depression after community violence exposure than adolescent boys (Fowler, Tompsett, Braciszewski, Jacques-Tiura, & Baltes, 2009). In addition to gender, age, household income, and welfare are all standard covariates included in studies pertaining to adolescent's quality of life, and thus were included in this study. Depression was examined in the study because extant research shows increased depressive symptoms in both adults and adolescents who report nightmares, poor sleep quality, and PTSD symptoms (Cukrowicz, Otamendi, Pinto, Bernert, Krakow, & Joiner, 2006; Kirmil-Gray, Eagleston, Gibson, & Thoresen, 1984; Liu, 2004; Noll, Tricket, Susman, & Putnam, 2005). In summary, literature has identified differences in nightmare frequency, sleep quality, and PTSD

symptoms with respect to gender, depression. Also, age, household income, and welfare are standard covariates in quality of life studies. Therefore, these variables were examined in this research.

Significance

Nightmares in urban, trauma-exposed adolescents can greatly contribute to numerous problems and diminish quality of life in teens. Nurses and other health care providers regularly provide care for trauma-exposed teens, and it is imperative that these providers are aware of how common and distressing nightmares can be. Little is known about the effect nightmares have on sleep quality and PTSD symptoms in urban, trauma-exposed African American teens, and how sleep quality and PTSD symptoms may negatively influence quality of life. Findings from this study expand current knowledge about nightmares and improve understanding about the impact nightmares have on quality of life. Further, the study promotes the importance of assessing nightmares in teens who indicate they are overly tired during the daytime, or exhibit other symptoms of PTSD. Knowledge gained from this study further informs the assessment and treatment of nightmares in order to improve quality of life for trauma-exposed teens.

Very few interventions currently exist to reduce nightmare frequency, and none have been specifically developed for nightmares in trauma-exposed adolescents. One reason for this gap may be the lack of understanding of how nightmares lead to diminished quality of life in teens. The proposed study will lay the ground work for interventions that target nightmares in auma-exposed adolescents. Interventions that decrease frequency and distressing effects from nightmares may improve overall quality of life for teens.

Findings from this research will inform future research studies about nightmares for several reasons. First, the study examined nightmare frequency as a different construct from

nightmare distress, thereby improving clarity of nightmare measurement. Second, the study sample included an understudied group (i.e., trauma-exposed, urban, African American adolescents) to improve understanding of nightmares in this population. Finally, previous research methods have relied on descriptive and correlational designs, which do not allow for interpreting variable directionality and influence. The study findings, within an overall model, explained the influence of mediating factors (sleep quality and PTSD symptoms) on the relation between nightmares and adolescent quality of life. Path analysis used in the study extends previous research methods by explaining both the direct and indirect effects of nightmares. In summary, this research examined an understudied population, and used a strong methodological design, with sophisticated statistical techniques, to advance empirical knowledge of nightmares and quality of life in trauma-exposed adolescents.

Definition of Terms

The following terms are operationally defined for use in this study.

Nightmares have been defined in a variety of ways by clinicians and researchers. Some researchers have adopted the American Psychiatric Association's (DSM-IV-TR, 2000, p. 634) definition of nightmares as "extremely frightening dreams" that cause awakenings from sleep with detailed recall (e.g., Abdel-Khalek, 2006; Levin, 1998; Mindell & Barrett, 2002). This nightmare definition has been broadened by some investigators to include unpleasant emotions such as fear, panic, grief, and disgust that are associated with an unpleasant dream (e.g. Belicki, Chambers, & Ogilvie, 1997; Cellucci & Lawrence, 1978; Miró & Martínez, 2005; Zadra & Donderi, 1993). However, less than 25% of adults who suffer from chronic, trauma-nightmares are awoken by them (Kellner, Neidhardt, Krakow, & Pathak, 1992), a finding which has led researchers to include dreams that do not awaken the sleeper, but are vividly recalled when the

individual awakens (e.g. Belicki, 1999; Miró & Martínez, 2005; Nguyen, Madrid, Marquez, & Hicks, 2002). Nightmares have been variably defined as a "dream that frightens the dreamer…contains visual imagery, and portrays a story or action" (Wood & Bootzin, 1990); as "very disturbing dreams, involving any unpleasant emotions, which are usually vividly recalled" (Belicki, 1992); or as "any dream that was unpleasant or disturbing, and that was usually vividly recalled" (Miró & Martínez, 2005). For the purpose of this research, nightmares were defined as "very disturbing and unpleasant dreams that are vividly recalled and sometimes wake you up". This definition has been widely used in the examination of both nightmare frequency and nightmare distress (eg. Belicki, 1992; Miró & Martínez, 2005).

Nightmare frequency was defined as the number of nightmares an individual reports during a time period specified by the researcher. Nightmare frequency is often measured retrospectively by asking the participant to recall the number of nightmares in a specific period of time (Mindell, Owens, & Carskadon, 1999). Measurement of nightmare frequency in the current study was collected through retrospective report of nightmares in the prior week and prior month.

Nightmare distress includes the emotional disturbance of the dreamer during the waking hours that is attributed to having had a nightmare (Martínez, Miró, Arriaza, 2005). The distress resulting from a nightmare is usually measured through asking the participant to report the distress felt during the day after having a nightmare (Belicki, 1992). Nightmare distress was defined in this study as the subjective assessment of the amount of daytime distress that the participant attributes to nightmares.

Trauma is a direct personal experience of an event or multiple events that involve "actual or threatened death or serious injury, or other threat to one's integrity; or witnessing an event that

involves death, injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm or threat of death or injury experienced by a family member or other close associate" (DSM-IV, 1994, p. 467). Cumulative trauma is exposure to multiple traumatic events and situations of different intensity and duration that occur repeatedly and over one's lifetime (Kira, Lewandowski, Templin, Ramaswamy, Ozkan, & Mohanesh, 2008). The list of traumas for children also includes "developmentally inappropriate sexual experiences without threatened or actual violence or injury" (American Psychiatric Association, 2000, p. 467). The DSM-IV also specifies that the person's immediate response to the trauma event includes intense fear, helplessness, or horror.

PTSD symptoms are the degree, or number, of post-trauma symptoms identified by an individual in response to a traumatic event. The specific diagnostic criteria for Posttraumatic Stress Disorder established by the DSM IV-TR (2000) includes: "1) intrusive recollection (the traumatic event is persistently re-experienced); 2) avoidant/numbing (persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness); and 3) hyper-arousal (persistent symptoms of increasing arousal)." Youth may report post-trauma symptoms yet may not reach the threshold for diagnosis of PTSD. This study defined PTSD severity as the number of post-trauma symptoms reported.

Adolescence has been defined as the period in life that begins with puberty and extends for approximately 8 to 10 years, until the person is psychologically and physically mature and ready to assume adult responsibilities (Havighurst, 1952). Adolescence is a time of immense physical, cognitive, and psychosocial development, in which the individual is practicing new roles, developing their identity and individuality, and moving into young adulthood (Erikson, 1968; Neinstein, Juliani, & Shapiro, 1996). This study included teens who are 14 to 17 years old

for several reasons: 1) teens in this age group report higher rates of trauma exposure than younger adolescents (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009); 2) this age group is older than the age nightmare prevalence peaks (Alfano, Ginsburg, Kingery, 2007; Nielsen, Stenstrom, & Levin, 2006; Salzarulo & Chevalier, 1983); 3) it includes ages typically found in high school; and 4) limiting the age range reduces the impact of maturation differences.

Sleep Quality refers to quantitative (i.e., sleep duration, sleep latency, number of arousals) and subjective aspects (i.e., depth, restfulness) of sleep (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989). Frequent waking from nightmares and time spent awake during the sleep period because of nightmares contributes to poor sleep quality (Kales, 1980). In this research, sleep quality was identified via self-report of sleep duration, number of arousals, and subjective assessment of how rested the participant feels when they wake up.

Quality of Life (QOL) is a multidimensional concept that includes physical, mental, and social well-being, not merely the absence of disease or infirmity (WHO, 2004). In this research, quality of life is considered a subjective measurement of well-being, physical functioning, emotional functioning, social functioning, and school functioning.

Conceptual Framework

Roy Adaptation Model

The theoretical framework of the Roy Adaptation Model (RAM) provided theoretical background for the study of quality of life in trauma-exposed adolescents with nightmares. The RAM offers a global perspective for understanding humans as biopsychosocial beings who are required to adapt to environmental stimuli (Roy & Andrews, 1991). This section provides a brief overview of the central concepts of the RAM, describes in greater detail the constructs of the RAM, as well as specific ways the RAM was used to guide the study.

Overview of the Roy Adaptation Model

Consistent with the general systems theory of von Bertalanffy (1974) and the theory of adaptation as written by Harry Helson (1964), Roy's "system" is the individual person or group of people who function as a unit (Roy, 1984). Humans are conceptualized as holistic adaptive systems constantly interacting with stimuli from the environment. Stimuli can come from the external environment, such as the world around the person, or from the internal environment, such as somatic experiences, thoughts, or emotions. The process of adaptation is initiated when stimuli provoke a response in the system. Input is registered by the individual, followed by the activation of coping processes. Responses to stimuli are observable behaviors that take place in four interrelated adaptive modes; physiological, self concept, role function, and interdependence. Output, or adaptation, is both a state and process that results from the person's coping processes and behavioral responses to stimuli. Effective adaptation promotes survival, growth, integrity, and reflects an individual's quality of life. Overarching concepts of the RAM are depicted in Figure 1, which also demonstrates a feedback loop within the system.
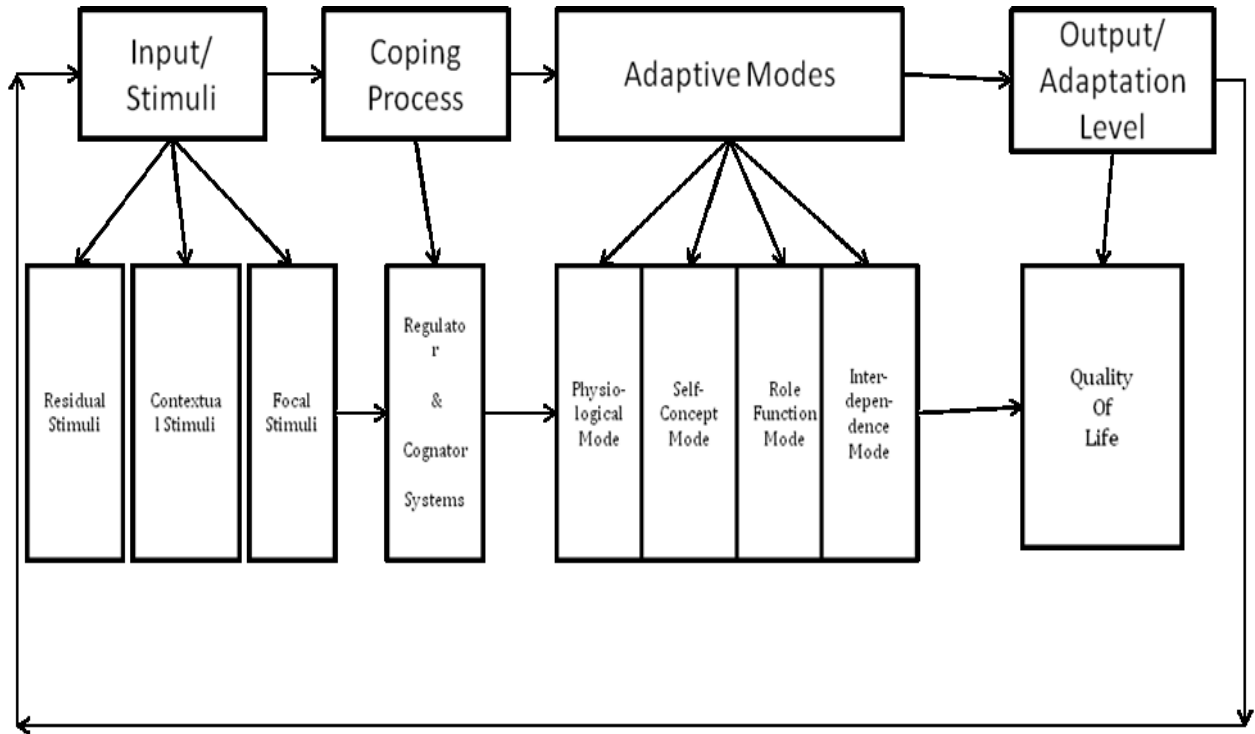
Figure 1. The Roy Adaptation Model. (Roy and Andrews (1991).

The RAM is a useful theoretical framework to guide examination of nightmares in trauma-exposed adolescents. The RAM has been applied widely within health care and has provided the foundation for numerous empirical studies, including adolescent samples (eg. LeBlanc & Morin, 2004; Limandri, 1986; Yeh, 2003) and populations exposed to trauma (Roy, 1984; Woods & Isenberg, 2001).

Roy Adaptation Model as a Guide for Study

This section explains in more detail the theoretical precepts of the RAM, including stimuli, coping processes, adaptive modes, and adaptation level. The RAM was used to direct the research questions and hypotheses of the study. Figure 2 depicts the conceptual-theoretical model derived from the RAM that guided the current study on nightmares in urban, trauma-exposed African American adolescents.
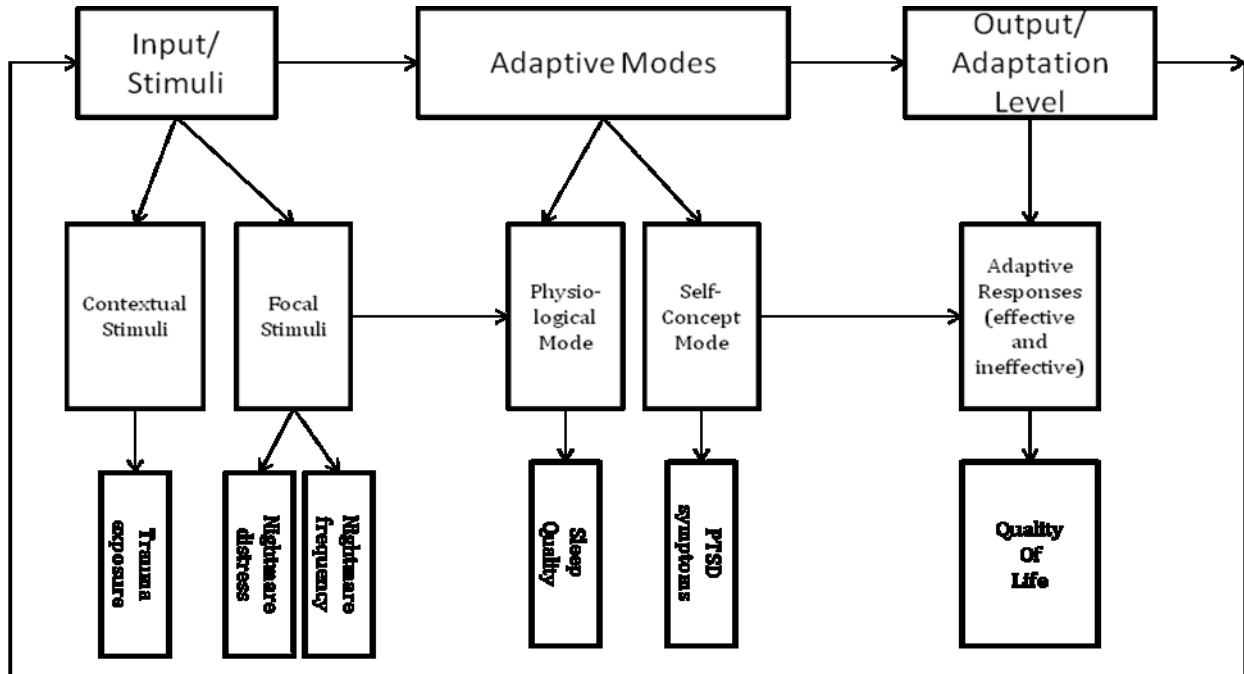
Figure 2. Conceptual-Theoretical Model derived from Roy's Adaptation Model.

Input/Stimuli

The RAM classifies environmental stimuli into three input categories: focal, contextual, and residual (Roy, 1984). All three stimuli occur simultaneously in the individual's internal or external environment. The following is a description of each of the three input categories included in the RAM, and their application to the proposed study.

Focal stimuli.

Focal stimuli are internal or external stimuli that become the focus of one's attention (Roy & Andrews, 1991). Focal stimuli, such as nightmares, influence behavior as well as have a significant influence on the person's adaptation, or quality of life. Nightmares become the focus of attention when the individual awakens from the dream with fear or other distressing emotions, and is unable to return to sleep. Also, nightmares experienced by a trauma-exposed teen may become the focus of attention because they may heighten his/her memories and feelings

associated with past trauma. Lastly, the nightmare itself may be traumatic, which could cause it to become the focus of attention.

Contextual stimuli.

Contextual stimuli are internal or external environmental factors that influence how the person perceives the focal stimuli, and contribute to how the individual responds to the stimuli (Roy & Andrews, 1991). Contextual stimuli are not in the forefront of one's thoughts, yet people are aware of them and are able to identify them as influencing the meaning of the focal stimulus. While the list of contextual stimuli is inexhaustible, Roy argues this category includes culture, family, gender, developmental stage, belief systems, ethnicity, and socioeconomic status (Roy & Andrews, 1991). Exposure to trauma, age, gender and socioeconomic status are considered contextual stimuli in this study. Although past trauma exposures may not be forefront in the individual's thoughts, they may continue to influence nightmare frequency and nightmare distress. Contextual stimuli may become focal stimuli by an individual facing certain situations (Roy & Andrews, 1999). For example, an individual who is a current victim of abuse, or other traumatic situation, might identify trauma exposure as a focal stimulus.

Residual stimuli.

Residual stimuli are all the other influences in a person's life that influence the person's response to life's stressors. Roy argues that the individual is unaware of how they are being influenced by residual stimuli, and they have an unknown effect (Roy & Andrews, 1991). Pertinent examples of residual stimuli that may influence nightmares include stress, effects from diet, sleep, and exercise, feeling safe in the home or community, resiliency, sense of personal power, noise level in the home, activity in the household that may affect sleep, early trauma exposure that is not recalled by the individual, and a myriad of other factors. Residual stimuli

can become contextual, depending on the situation and individual (Roy & Andrews, 1999). For example, if the nightmare evokes feelings of being powerless, the teen may become more aware of situations where they sense they are powerless. The influence of residual stimuli is important in adaptation, and quality of life, but is beyond the scope of this research.

Contextual and residual stimuli contribute to how a person is able to cope with stressful focal stimuli. For example, the effects of family support, past exposure to trauma, culture, gender, age and development are all contextual and residual stimuli that contribute to how a teen may cope with stressful stimuli.

Coping Processes

The coping processes are a combination of automatic, innate coping processes and acquired or learned coping processes (Roy & Andrews, 1991). People adapt positively or negatively to stimuli depending on their adaptive or ineffective coping processes (Roy & Andrews, 1999). Adaptive coping may help reduce distressing responses to focal stimuli, such as nightmares, and promote adaptation and higher quality of life. Conversely, ineffective coping may contribute to poor adaptation and lower quality of life. The effect of coping processes on nightmares and quality of life is beyond the scope of the proposed study, but should be included in future studies. Roy argues that it is not possible to directly observe coping processes, however, the effects of coping are observed through behavioral responses within four adaptation modes; physiological, self-concept, role function, and interdependence modes (Roy & Andrews, 1999).

Adaptive Modes

Roy's four adaptive modes; physiological, self-concept, role function, and interdependence, are the observable and behavioral responses to stimuli (Roy & Andrews, 1999).

Aspects of the physiological mode (sleep) and the self-concept mode (PTSD symptoms) are especially relevant in exploring how nightmares may negatively impact adaptation and will be discussed in depth in this section. Behavioral responses in the remaining two modes, role function and interdependence, may be observed in youth with nightmares but will not be included in the proposed study because their overall impact is likely less than that of sleep quality and PTSD symptoms.

Physiological mode.

The physiological mode focuses on the physiologic responses to stimuli, and physical functioning (Roy & Andrews, 1991). The physiological mode deals with the needs of the person for physiologic integrity and is related to "the way the person responds as a physical being to stimuli from the environment" (Roy & Andrews, 1991, p. 15). Adequate rest and sleep are required for one to adapt effectively to stressors. Sleep deprivation causes alterations in biochemical processes and brain function resulting in physical fatigue, poor neuromuscular coordination, irritability, inability to concentrate, disorientation, and confusion (Roy, 1984). Behavioral responses within the physiologic mode specifically sleep and degree of sleep quality, reflect physiological adaptation and thus quality of life.

A relevant dimension of the physiological mode, i.e., sleep, will be examined in relation to nightmares in the proposed study, and will be measured by sleep quality. Sleep quality is an important indicator of adolescent health and well-being. Poor sleep quality contributes to poor daytime coping with daily stress, and may increase fatigue, confusion and anxiety (Harvey, Jones, & Schmidt, 2003; Tynjälä, Kannas, Levälahti, & Välimaa, 1999). Nightmares interfere with sleep quality in adolescents through awakening from the nightmare, and feeling that sleep is generally non-restorative (Manni, Ratti, Marchioni, Castelnovo, Murelli, Sartori, Galimberti, &

Tartara, 1997). In addition, adolescents with more frequent nightmares also report greater daytime sleepiness (Joo, Shin, Kim, Yi, Ahn, Park, Kim, & Lee, 2005).

In short, poor sleep quality resulting from nightmares may reduce one's adaptation, and diminish quality of life. This research examined sleep quality as an indicator of the physiologic mode that mediates the relation between the focal stimuli (nightmare frequency and nightmare distress) and adaptation (quality of life).

Self-concept mode.

Self-concept is comprised of the overall belief and feelings that a person holds about the self at a given time, focusing specifically on psychological and emotional health, and spiritual aspects of the person (Roy, 1984). The self-concept mode is concerned with the need for psychological integrity and need to know one's identity (Roy & Andrews, 1991). Psychological integrity is threatened when an individual experiences trauma.

Exposure to trauma challenges assumptions persons have about themselves and their environment such as the belief in personal invulnerability, the perception that the world is meaningful and makes sense, and the view of self in a positive light (Janoff-Bulman & Frieze, 1983). Further, Janoff-Bulman and Frieze posit that trauma evokes feelings of vulnerability and helplessness, along with and negative self-image and self perception of being week and needy. Exposure to trauma can have both short term and long term psychological consequences, such as PTSD.

An aspect of psychological health within the RAM self-concept mode relevant to the study is severity of PTSD symptoms, which will be examined in relation to nightmares. Many adolescents who have been exposed to trauma report psychological health problems, and more specifically, PTSD (Fletcher, 1996). The relation between nightmares and severity of PTSD

symptoms has not been tested in adolescents, but adults who have nightmares also report higher PTSD symptom severity (Davis, Byrd, Rhudy, & Wright, 2007; Schreuder, Kleijn, & Rooijmans, 2000).

Relevant to this study, trauma-exposed adolescents who have nightmares may have higher PTSD symptoms, which, in turn, may reduce their adaptation, and diminish their quality of life. The study examined severity of PTSD symptoms as an indicator of the self-concept mode that mediates the relation between the focal stimuli (nightmare frequency and nightmare distress) and adaptation (quality of life).

Role function and interdependence modes.

The remaining two adaptive modes are role function and interdependence. The role function mode is concerned with how the individual performs on the basis of his or her position in society (Roy & Andrews, 1991). For adolescents, how they function at school or work is an indicator of adaptation, or quality of life. The interdependence mode is concerned with development and maintenance of satisfying affectionate relationships and support (Roy & Andrews). For adolescents, behaviors that foster quality relationships with parents, friends, peers, and helpful adults can be indicators of adaptation and quality of life. Both role function and interdependence are important in exploring quality of life in teens, and should be included in future research on nightmares in trauma-exposed adolescents.

In summary, the RAM's adaptive modes are observable behaviors that occur in response to input stimuli. Adolescents who have nightmares (the focal stimuli) may also experience poor sleep quality, and more severe PTSD symptoms, and each may play a key role in mediating the relation between nightmares and health outcomes. The adaptive modes activate adaptive responses, either effective or ineffective, which are identified as "output" (Roy, 1984).

Output

Output, also known as adaptation, is the person's response to input (stimuli), coping processes, and behavioral responses found in the adaptive modes (Roy, 1984). Adaptation is defined as both a state and a process, and is on a continuum of effective or ineffective (Roy, 1990). As a state, adaptation refers to the health and well-being (quality of life) of the person at a given time within a specific situation and environment. As a process, adaptation is the ongoing movement toward or away from health and well-being (quality of life) throughout the person's life.

Quality of life is a multidimensional construct that includes adaptation in the physiological, self-concept, role function, and interdependence modes and is represented in the current study as physical functioning, emotional functioning, school functioning, social functioning, and overall sense of well-being. Quality of life (adaptation) may be impaired by the effect that nightmares (focal stimuli) have on sleep quality (physiological adaptive mode) and PTSD symptoms (self-concept adaptive mode). The current study examined the extent to which nightmares negatively impact quality of life in trauma exposed adolescents, and the effects of sleep quality and PTSD symptoms within this association.

Summary

The RAM theoretical framework provides a valuable context to examine and understand nightmares in trauma-exposed adolescents. The focal input stimuli for the study are nightmare frequency and nightmare distress. The contextual stimulus that was examined was trauma exposure. Aspects of the adaptive modes that were examined were the physiological mode as measured by sleep quality, and self-concept mode as measured by PTSD symptoms. Output, or adaptation, was measured by assessing quality of life.

Six research questions concerning the association of nightmares on quality of life in urban, trauma-exposed African American adolescents, age 14 to 17 were generated employing the theoretical framework of the RAM. First, what are the relations between trauma exposure (contextual stimuli), nightmare frequency (focal stimuli) and nightmare distress (focal stimuli)? Second, what are the relations between nightmare frequency and nightmare distress (focal stimuli), and sleep quality and PTSD symptoms (adaptive modes)? Third, what are the relations between nightmare frequency, nightmare distress (focal stimuli), and quality of life (adaptation level)? Forth, what are the relations between sleep quality, PTSD symptoms (adaptive modes), and quality of life (adaptation level)? Fifth, what are the relations between trauma exposure (contextual stimuli), sleep quality (physiologic mode), and PTSD symptoms (self-concept mode)? Sixth, Do sleep quality and PTSD symptoms (adaptive modes) mediate the relations between nightmare frequency, nightmare distress (focal stimuli), and quality of life (adaptation level)?

The study was needed to learn more about the associations between nightmares, sleep quality, PTSD symptoms, and quality of life in trauma exposed adolescents. According to Roy, the goal of nursing practice is to promote well-being and health as the nurse intervenes by helping the person increase their adaptive responses (Roy & Andrews, 1991). Findings from the study will expand current knowledge, will have a significant impact on understanding nightmares in trauma-exposed adolescents, and will lay the foundation for possible interventions for nightmares in this population. Lastly, the RAM can be a useful theoretical guide for examining coping processes, role function, and interdependence adaptive modes in future studies about nightmares in trauma-exposed adolescents.

CHAPTER 2 LITERATURE REVIEW

Introduction

This review will provide a comprehensive and historical overview of theory and empirical research related to the study of nightmares in trauma-exposed adolescents, and will include sections on trauma exposure, nightmare frequency, nightmare distress, sleep quality, PTSD, and quality of life. Because extant literature related to nightmares in trauma-exposed adolescents is limited, this review will include studies of nightmares in adult populations in order to gain insight into what is currently known about nightmares. Gaps in knowledge about nightmares in trauma-exposed adolescents will be identified.

The body of this literature review is made up of four sections. The first section covers the literature related to the first major variable in the study: trauma exposure. This section will discuss and critique literature pertaining to both the prevalence of trauma and the effects of cumulative trauma exposure in adolescents. Within the theoretical perspective of the Roy Adaptation Model (RAM) trauma exposure is considered a contextual stimulus that influences nightmare frequency and nightmare distress.

The second section consists of an extensive review of the nightmare literature, specifically, nightmare frequency and nightmare distress. In addition, literature pertaining to associations between nightmares and trauma exposure will be discussed. The first and second sections, from a theoretic perspective of the RAM, therefore, will cover the research that has examined the focal stimuli of nightmare frequency and nightmare distress, and the contextual correlate of trauma exposure in adolescents.

The third section of the literature review will discuss sleep quality and PTSD symptoms. From the theoretical perspective of the RAM, sleep quality is a factor within the physiological

adaptive mode, and PTSD symptoms, a psychological dimension within the self-concept mode. Literature dealing with the relations between nightmares, sleep quality, and PTSD symptoms will be discussed and critiqued.

In the fourth section of the literature review, research pertaining to quality of life will be discussed, as well as the relation between nightmares and quality of life. The final section of this chapter provides an overall summary of the gaps in knowledge about nightmares that will be addressed in the proposed study.

<div align="center">*Trauma*</div>

The proposed study conceptualizes trauma, from a theoretical viewpoint, as contextual stimuli. According to the theoretical perspective of the RAM, contextual stimuli are internal or external environmental factors that influence how the person perceives and responds to the focal stimulus (Roy & Andrews, 1991). As such, trauma exposure influences on how teens view the world, themselves, and has an impact on the development of nightmares. This review will first define trauma exposure, cumulative trauma, and the subjective response to trauma. Next, research that has examined trauma in youth, especially youth at high risk for trauma, will be discussed. Gaps of knowledge that will be addressed by the proposed study will be identified.

Definition of Trauma

Trauma is a sudden, unpredictable, life-threatening event that is out of the ordinary life experience, and may result from natural or accidental disasters (earthquake, fire), large-scale catastrophes (war), medical trauma (stroke), personal catastrophes (rape, assault, witnessing violence) (Keane, Marshall, & Taft, 2006). The American Psychiatric Association describes trauma as direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's integrity; or witnessing an event that involves death,

injury, or a threat to the physical integrity of another person; or learning about unexpected or violent death, serious harm or threat of death or injury experienced by a family member or other close associate (DSM-IV TR, 2000). Further, exposure to trauma can occur through various means, including direct victimization, witnessing or hearing violent acts, and media violence (Buka, Stichick, Birdthistle, & Earls, 2001). The DSM-IV-TR specifies that for children, trauma also includes "developmentally inappropriate sexual experiences without threatened or actual violence or injury" (DSM-IV-TR, 2000, p. 424). The DSM-IV-TR description of childhood trauma is considered by some to be inadequate because the trauma criteria are limited to aspects of physical traumas and exclude other non-physical ways children are exposed to trauma, such as verbal and emotional abuse (Munson, 1995).

Trauma can also be defined by the subsequent subjective response one has to it. For example, in her overview of childhood traumas, Terr (1991) defines childhood trauma as "the mental result of one sudden, external blow or a series of blows, rendering the young person temporarily helpless and breaking past ordinary coping and defensive operations." Similarly, Saakvitne and colleagues (2000) described the subjective impact of trauma as "…a traumatic event or situation creates psychological trauma when it overwhelms the individual's perceived ability to cope, and leaves that person fearing death, annihilation, mutilation, or psychosis. The individual feels emotionally, cognitively, and physically overwhelmed" (p. 94).

Cumulative Trauma Exposure

Most research about trauma exposure in adolescents has examined the association between adverse outcomes from specific trauma exposures such as physical abuse (e.g. Kolko, 1992), sexual abuse (e.g., Berliner & Elliott, 2002), domestic violence (e.g., Chemtob & Carlson, 2004), or community violence (e.g., Lambert, Ialongo, Boyd, & Cooley, 2005). However,

trauma is not necessarily confined to a one-time occurrence, and trauma exposure can take place in the home, at school, and in the community. Multiple exposures to trauma over one's life is referred to as cumulative trauma Measuring cumulative trauma exposure is important to begin to understand the multiple effects that trauma has on more than one area of functioning, and on a child's growth and development (Gustafsson, Nilsson, & Svedin, 2009)Kira, Lewandowski, Templin, Ramaswamy, Ozkan, & Mohanesh, 2008). Kira and colleagues developed a taxonomy of stress and trauma that differentiates between one-time trauma exposure and repeated, or chronic, exposures. To test their taxonomy, the researchers used a sample of 501 Iraqi refugees, with an age range of 12-79. The researchers used the 22-item Cumulative Trauma (CT) measure that assessed trauma experiences such as torture, war, rape, sexual and physical abuse, car accidents, abandonment by parents, exposure to racism, and natural disasters. Participants were asked to rate the frequency of each kind of trauma that had happened over their life time on a scale of 0 (indicating that the trauma did not happen) to 4 (indicating that the trauma happened on four or more occasions). Using multiple regression analysis, Kira and associates found that the cumulative trauma dose significantly predicted poor health and PTSD, and that the effects were stronger with cumulative trauma as opposed to a one-time trauma exposure. Results were not provided by age group and only 9.4% of the sample were adolescents between 12 and 19 years, so it is unknown if these findings would be repeated in samples that only included adolescents. Also, the study used a sample of Iraqi refugees from one metropolitan area in the United States, and thus, may not be generalizable to other trauma-exposed adolescents.

Multiple trauma exposure was also studied by Finkelhor and colleagues (2005) in a large national survey of 2,030 children age 10 to 17 and caregivers of children age 2 to 9. The researchers used the Juvenile Victimization Questionnaire (JVQ: Hamby & Finkelhor, 2001) to

assess trauma exposures over the prior year. The JVQ assesses 34 forms of offenses against youth that cover five general areas of concern: conventional crime, child maltreatment, peer and sibling victimization, sexual assault, and witnessing and indirect victimization. They found that 71% of the overall sample had at least one direct or indirect victimization over the course of the prior year and the average number of separate, different victimization incidents was three. Teens were more frequent victims of offenses such as rape, bias attacks, sexual harassment, and serious assaults that cause injury than were school-age children. Finkelhor and colleagues found that only 29% of the children and teens had no direct or indirect victimization in the year prior to the study, and concluded that exposure to various forms of violence, maltreatment, and crime has become commonplace.

Polytraumatization, or multiple trauma exposure, was also studied by Gustaffson and colleagues (2009) in a sample of 400 adolescents and 270 school age children in Sweden. The researchers used the Life Incidence of Traumatic Events to collect information about various trauma events the teen has experienced. Almost 90% (89.5%) of the adolescents in the sample reported at least one traumatic event. Adolescents who were 12 to 15 years of age reported a mean of 2.7 (S.D. = 1.8) different traumas, and older adolescents, ages 16 to 20, reported a mean of 4.0 9 S.D. = 2.3) trauma events. The study also found that multiple exposures to trauma (polytraumatization) predicted more psychological problems after controlling for age and gender. Studies about multiple exposures to trauma in teens are emerging finding that the accumulation of different traumas has a cumulative effect on teens' mental health and functioning.

Trauma Prevalence in Adolescents

Each year, millions of children and adolescents are exposed, as victims or witnesses, to violence in their communities, schools, and homes (Finkelhor, Turner, Ormrod, Hamby, &

Kracke, 2009; Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003). Kilpatrick, and colleagues (2002) reported that in their sample of adolescents, ages 12 to 17 (N = 4,008), 17.4% reported physical assault, 8.1% reported sexual assault or rape, 9.4% reported being victim to physical abuse. Alarmingly, more than half of their sample reported experiencing some form of violent victimization and 39.4% reported witnessing violence (Kilpatrick, Saunders, & Smith, 2002). African American high school-age youth who live in urban, low socioeconomic status (SES) neighborhoods are frequently exposed to trauma and violence (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). Lastly, older teens report higher frequency of violent exposure than younger teens.

African American adolescents

A difference in exposure to violence based on racial background was found by Schwab-Stone and colleagues (1995) who found that more African American and Hispanic youth had seen someone stabbed or shot than did Caucasian youth. In their study of 2,248 sixth, eighth, and tenth graders from an urban public school system, 80% of adolescents had seen someone assaulted in the past year, 30 to 40% had seen a shooting or stabbing, and close to 25% had witnessed a murder.

The Center for Disease Control (CDC) published 1999 to 2002 findings from the National Vital Statistics System, which collects death certificate data from the United States (Center for Disease Control, 2008). Most common causes of deaths from unintentional injuries were homicide, motor vehicle accidents, and unintentional fires or burns,   African American youth, age 10 to 19 had significantly higher rates of deaths from unintentional injuries such, and the gap between African American and Caucasian youth became wider each year through adolescence.

A study examining racial disparities in dating violence among teens, age 14 to 17 from a racially diverse sample (N = 707) in California was conducted by Malik, and colleagues (1997). Dating violence included pushing, hitting, and verbal threats, and boys and girls reported being both the perpetrator and victim of dating violence. Findings showed that African American teens reported more dating violence than Asian American, Hispanic, and European American teens.

Urban adolescents.

Urban adolescents are higher risk of exposure to trauma and violence than their suburban counterparts (Stein, Jaycox, Kataoka, Rhodes & Vestal, 2003). Stein and colleagues conducted a review of 43 research reports published between 1991 and 2002 focused on child and adolescent community violence. Most studies reviewed by Stein and colleagues were cross sectional studies that assessed life-time exposure to violence in samples of predominantly urban and minority youth. Stein concluded that urban adolescents, especially those who are poor and of minority races, are at higher risk of exposure to trauma than their suburban counterparts. Prevalence estimates in the studies reviewed by Stein and colleagues showed that 50% to 96% of urban youth are exposed to some form of violence related trauma in their neighborhoods (Stein, Jaycox, Kataoka, Rhodes, & Vestal, 2003).

Another study of community violence found high rates of trauma exposure reported by Buckner, and colleagues (2004) who examined effects of exposure to violence in a sample of 95 children, age 8 to 17 years. The youth came from extremely poor, predominantly single-parent households who were recently or currently homeless. Exposure to violence was measured using self-report based on two measures of lifetime exposure to trauma and violence. The researchers used the instrument *Things I Have Seen and Heard* (Richters & Martínez, 1990) which is a self-

report instrument consisting of 15 items that ask about witnessing or experiencing various violent acts and the frequency of these experiences. Types of violence included in the measure are seeing violence to others, experiencing violence to self, and experiencing violence in the home. In addition, the researchers used the Life Events Questionnaire (LEQ; Masten, Newman, & Andenas, 1994) that asked about events such as parents separating or being divorced, family's financial situation becoming worse, family having been evicted from the home, and having a family member develop severe emotional problems. Findings showed that 83% of those who were 12 years and older reported experiencing some form of exposure to community violence. No significant differences in rates of violence exposure were found based on race-ethnic status: 62% of non-Latino White youth, 70% of African American youth, and 59% of Latino youth had reported some form of violence. Almost half (48%) of the 95 participants were Latino youth, and there may not have been adequate power to show racial differences due to low numbers in other racial groups. Importantly, multiple exposures to trauma and violence were found in that 37% reported two or more exposures to traumatic or violent events, and 23% reported three or more exposures.

Youth who attend schools in urban, poor neighborhoods are often exposed to violence. Singer and colleagues (1995) compared school violence based on geographical location of the school. The researchers surveyed 3,724 students, grades 9 through 12, in six public high schools, including four large city schools, one suburban school, and one school in a small city. Students attending the large city schools lived in neighborhoods with predominantly lower socioeconomic status, compared to upper-middle class students attending the suburban school. Exposure to school violence was categorized into witnessing violence or direct victimization, and each category measured threats, beatings, or slapping/hitting/punching and participants were asked to

indicate frequency on a Likert scale ranging from "never" to "almost every day". Students in urban locations reported higher rates of witnessing other students being hit/slapped and beaten up at school than students in non-urban schools. Singer concluded that the larger schools located in lower SES, high crime neighborhoods significantly predicted rates of violence exposure.

Exposure of urban youth to trauma is not confined to community violence. Finkelhor and colleagues (2005) assessed multiple types of trauma in their national survey focused on the relation between poverty and violence. Youth living in urban communities in households with annual incomes less than $20,000 reported higher rates witnessing or indirect victimization, such as witnessing domestic violence, physical abuse by a sibling, being near or a riot or other civil disturbance where shooting and bombing was happening, murder of someone close to them, or home robbery, was also more prevalent in this lower income group. In addition poorer urban youth reported higher prevalence of five specific types of victimization (assault with a weapon, attempted assault, multiple peer assault, completed or attempted rape, and emotional abuse) than those in families with higher income. Poor, financially unstable households may contribute to higher reports of trauma and violent exposures amongst urban African American teens.

Poverty was associated with higher amounts of trauma exposure in the prospective cohort study, the National Longitudinal Study of Adolescent Health, (N= 15,197) in 2001 and 2002 reported by Hussey, Chang, and Kotch (2006). The study was a nationally representative sample (77% response rate) of adolescents who participated in in-home interviews. The study found that household income of less than $15,000 per year was associated with traumatic experiences. Of responses to maltreatment, the study found that having been left home alone as a child, indicating possible supervision neglect, was most prevalent (reported by 41.5% of respondents), followed by physical assault (28.4%), physical neglect (11.8%), and contact sexual abuse (4.5%).

Hussey and colleagues sample was not specifically urban teens, but the findings contributed to recognizing the influence of poverty in trauma exposure.

Older adolescents.

High school-age teens are at higher risk of exposure to multiple and serious forms of trauma than younger children. Finkelhor and associates (2009) conducted a large national survey (The NatSCEV) which assessed past-year and lifetime exposure to violence in sample of 4,549 children and adolescents. The primary purpose of the study was to examine the incidence and prevalence of children's exposure to various violent experiences across a wide developmental spectrum to understand the full extent of violence in the daily lives of children (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). The researchers conducted telephone interviews of caregivers of children age 9 and younger and youth age 10 to 17 assess child maltreatment, peer and sibling victimization, sexual victimization, witnessing and indirect victimization, school violence and threats, conventional crime, and internet violence and victimization. Findings from the study showed that older adolescents were more likely than younger children to experience more serious forms of violence (including assaults with injury, gang assaults, sexual victimizations, and physical and emotional abuse, and to witness violence in the community). Also, of those who reported a direct victimization, 64.5% also reported multiple exposures, and 86.6% of youth who reported being exposed to violence during their lifetimes also reported being exposed to violence within the past year. The researchers concluded that youth who are exposed to one type of violence are at greater risk of experiencing other types of violence throughout their teen years. The two studies by Finkelhor and colleagues (2005, 2009) are important in their efforts to quantify and categorize multiple types of traumatic exposures over a

child's lifetime, however further knowledge is needed about how repeated exposure and multiple types of trauma affects youth.

Summary of Trauma in Adolescents

Literature about prevalence of trauma in youth indicates that many adolescents, particularly teens who live in poor, urban communities are exposed to high rates of trauma. African American high school-age youth who live in urban, low socioeconomic status (SES) neighborhoods are frequently exposed to trauma and violence (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). Students attending schools located in high crime neighborhoods are at higher risk of exposure to violence (Singer, Anglin, Song, & Lunghofer, 1995). Young people living in dangerous communities often have constant fear for their own safety as well as the safety of those around them (Buckner, Beardslee, & Baussuk, 2004). Most studies reviewed focused on exposure to physical violence, such as assault and rape, but these are examples of extreme cases of trauma exposure that teens face on a day-to-day basis. Research about prevalence of multiple trauma exposure is emerging and studies conducted by Finkelhor and associates (2009), and Gustafsson and associates (2009) provide important understanding about the co-occurrence of various types of trauma exposure. More large scale surveys are needed to confirm findings from Finnkelhor and associates that youth exposed to one type of violence are at far greater risk of experiencing other types of violence. Lastly, a gap of knowledge exists regarding the effects of cumulative trauma exposure in teens. The study conducted by Kira and associates (2008) is the only study to examine how cumulative trauma predicts poor health outcomes, but the findings may not be generalizable because it only included Iraqi refugees. All studies to date exploring cumulative trauma in teens have been cross-sectional, and research using predictive longitudinal designs is needed There is a great need for further research about

the effects of cumulative trauma in adolescents. Therefore, the current study chose a sample of youth who are at high risk for trauma exposure (urban, African American teens who are age 14 to 17) and examined multiple exposures to various types of trauma, and explored the effects of trauma such as nightmares, PTSD, sleep quality, and overall quality of life.

Nightmares

The following section will review literature examining nightmares in adolescents. First, an historical overview and definition of nightmares and other parasomnias will be provided. Second, the literature that has examined nightmare prevalence, nightmare frequency, and nightmare distress will be reviewed and critiqued. Literature related to trauma-related nightmares will be examined and gaps in knowledge about nightmares in trauma-exposed adolescents identified.

Nightmares have been a topic of interest among theologians, philosophers, and scientists throughout history and across cultures (Barrett, 1996). References to nightmares as a precursor to madness are found in ancient folklore and literature (Mack, 1970). Kellerman (1987) provided an historical perspective of nightmares from the writings of Sigmund Freud who established the theory of dreams as "wish fulfillment" whereby the dreamer fulfills wishes of the unconscious mind, such as acts of aggression and sexuality. However, Freud acknowledged that childhood sexual traumas could show up as frightening, anxiety-provoking fear enactments in nightmares (Kellerman, 1987) and considered repetitive post-traumatic nightmares an exception to his wish fulfillment theory of dreaming (Hartman, 1998).

Definition of Nightmares

Hartmann (1984) defined a nightmare as a long, frightening dream that awakens the sleeper. The American Psychiatric Association defines a nightmare similarly as an extremely

"frightening dream that usually involves threats to survival, security, or self-esteem" (DSM-IV-TR, 2000, p. 580). Further, a nightmare awakens the dreamer, who rapidly becomes oriented and alert. Thus, their two criteria for dreams to be classified as nightmares are, 1) an extremely frightening dream, and 2) direct awakening from that dream. The DSM-IV-TR adds that the dream experience, or the sleep disruption resulting from awakening, causes clinically significant distress or impairment in social, occupational, or other important areas of functioning. Diagnostic criteria for nightmares established by The American Sleep Disorders Association (ASDA) include: 1) sudden awakening from sleep with intense fear or anxiety, but also anger, sadness, disgust, and other dysphoric emotions; 2) full alertness on awaking with immediate recall of frightening dream content, and 3) a delayed return to sleep after the awakening from the dream (ASDA, International Classification of Sleep Disorders, 2nd edition, (ICSD), 2005). The APA and ASDA definitions have a few differences; 1) the ASDA includes negative emotions other than fear, 2) the ASDA includes the person has a delayed return to sleep, and 3) the APA includes subjective distress or impairment resulting from the nightmare.

Nightmares were typically thought to occur only during REM sleep and during the middle to last half of the night (Maurer & Schaefer, 1998). However, in a recent review of post-trauma dreaming and nightmares, Phelps and colleagues (2008) concluded that dreams and nightmares can occur across all stages of sleep, and have been observed in both REM and non-REM sleep.

Researchers studying nightmares have used varied definitions of nightmares, and often do not require the waking criteria of the DSM-IV-TR. For example, research conducted by Roberts and Lennings (2006) with 148 adolescents defined nightmares as any frightening and lengthy dream sequence with depicted physical or other threat. Similarly, Kravitz, (1993) and associates

defined a nightmare as any dream event that was distressing to the child in their study of 82 children and adolescents (mean age=11.8) who had sustained burn injuries. In a study of 19 adjudicated youth, 13-18 years old living in a court ordered facility, Krakow and colleagues (2001) defined nightmares as bad or disturbing dreams that *may* awaken the individual from sleep. This definition includes any disturbing emotions not limited to fear, and the DSM-IV waking criterion was not required. Disparate definitions of nightmares likely contribute to differences in what is counted as a nightmare, and may contribute to different conclusions found in nightmare research.

Parasomnias: Nightmares and Night Terrors. The American Psychiatric Association categorizes nightmares as parasomnias, which are sleep disorders characterized by abnormal behavioral or physiological events occurring in association with sleep, specific sleep stages, or sleep-wake transitions (DSM-IV-TR, 2000). Other parasomnias are Sleep Terror Disorder, Sleepwalking Disorder, and Parasomnia Not Otherwise Specified. Nightmares can be confused with sleep terrors due to the distress exhibited by the dreamer resulting from each type of dream, and because the onset of both are at age 3 or 4, yet they are characteristically different with regard to the time of night they occur and through observing the child's behavior.

While nightmares are considered a disorder of sleep or dreaming, sleep terrors (also referred to as night terrors) are considered a disorder of arousal. According to review articles on sleep disorders, sleep terrors are extremely frightening dreams characterized by pallor, sweating, pupil dilation, piloerection, and tachycardia, and violent thrashing (Howard & Wong, 2001; Mindell, Owens, & Carskadon, 1999; Schuen & Millard, 2000). Sleep terrors cause a partial arousal from sleep and the child is difficult to awaken, but once awake is confused, and has no recall of the dream (Sadeh, 2005). When awoken from a nightmare, the child is usually alert, not

confused, and able to vividly remember details of the dream (Mindell, Owens, & Carskadon, 1999; Schredl, Fricke-Oekerman, Mitschke, Wiater, & Lehmkuhl, 2008). Also, following a nightmare the child is usually distraught and has difficulty returning to sleep on his or her own, whereas the child with sleep terrors is able to immediately return to sleep with no distress (Sadeh, 2005).

In summary, there is general agreement that nightmares are frightening or disturbing, and once awake, the dreamer is alert and has vivid recall of the dream content. Yet, lack of consistency remains about the waking criteria of nightmares, which has lead to disparate reports about nightmare prevalence and frequency. Also, many studies about adolescent nightmare do not include any definition of nightmares, leaving it up the individual participant or reader to project their own understanding of what to consider a nightmare. The current study provided participants the most commonly used definition of nightmares: "a dream that may or may not waken the individual, is very disturbing, and is vividly recalled when the individual awakens".

Nightmare Prevalence

Occasional nightmares are considered to be part of normal child development and their presence does not indicate psychic disequilibrium or pathology (Mack, 1965; Mindell, 1993). Nightmares are fairly common in childhood, and occur in 10% to 50% of children between 3 and 6 years of age (Mindell, Owens, & Carskadon, 1999). In a sample (N = 60) of children, from ages 5 through11 (mean age = 7.20, SD = 1.64), Mindell and Owens (2003) found that 75% of children reported having at least one nightmare in their lifetime, 38.5% indicated they had experienced one nightmare per year, 28.2% experienced one nightmare per month, 25.6% experienced one or two nightmares in a week, and 7.8% experienced three or more nightmares per week.

Nightmare prevalence peaks around age 7 to 10 (Muris, Merckelbach, Gadet, & Moulaert, 2000; Salzarulo & Chevalier, 1983). In a study of 309 children and adolescents aged 5-18, Simonds and Parraga (1982) compared nightmare frequency in younger children (age 5-8) and adolescents (age 15-18) and found that at least one nightmare in the previous 6 months was reported in 30.9% of the younger children and in only 8.9% of adolescents. Nightmares in childhood and adolescence normally decrease in prevalence and frequency with age (Alfano, Ginsburg, Kingery, 2007; Nielsen, Stenstrom, & Levin, 2006; Salzarulo & Chevalier, 1983).

Studies about the prevalence and frequency of nightmares in adolescent populations have produced inconsistent results. Two epidemiological studies examining sleep complaints were conducted by Ohayon and colleagues (2000, 2001). Both studies conducted telephone interviews using the Sleep-EVAL interview system to collect information about sleep/wake schedules, sleep habits and sleep disorders. Nightmares were assessed based on DSM-IV criteria for nightmare disorder. The Sleep-EVAL interview used in both studies was developed for a broad range of the general population and not specifically for research with adolescents. According to the author of the studies, the interview is written in a simple manner and the researchers verified understanding of the questions posed. The first study of 1,125 adolescents age 15 to 18 years in four European countries (France, Germany, Great Britain, and Italy) showed that 4.2% of the sample reported having nightmares at least monthly. In the second study with 724 adolescents, age 15 to 18, Ohayon and Roberts (2001) found 3% of the sample reported nightmares at least monthly. Random sampling, large sample size, and inclusion of a narrow age range (15-18) and one developmental stage strengthened Oyahon and colleagues studies by minimizing alternative explanations based on age differences. Thus, the findings cannot be generalized to other age groups. Nightmares were defined using DSM-IV criteria, which require that the nightmare

awakens the individual and this may have contributed to the small number of reported nightmares. In addition, the sample included youth from European countries, which limits generalizability of the findings to urban adolescents in the United States.

Considerably more nightmares were found in a sample of 99 female high school students (mean age=16.7, SD=1.8) who live in São Paulo City, Brazil (Andrade & Menna-Barreto, 2002). The researchers used a 47-item sleep inventory survey that included one question about nightmares, and found that 4% of the sample reported having nightmares more than once a week and approximately 13% reported having nightmares once or more per month. Participants were asked to estimate the number of nightmares they had on a 4-point Likert scale ranging from less than once a year to more than once a week, which may be too large of a range to accurately estimate frequency. Generalizability of findings is limited by the small sample size from one school in one city in Brazil, and including only females without a comparison sample of males. Also, findings cannot be generalized to teens in the United States.

Several studies conducted in the United States have found higher prevalence of nightmares in individuals with mental health problems. A study conducted by Simonds and Parraga (1984) explored nightmares as one of the sleep behaviors and disorders in 150 children and adolescents (aged 4-18) evaluated at psychiatric clinics with 309 participants from the general population (control group). The authors found that 40% of the clinic population reported nightmares, which was significantly greater than the general population in which 16.5% reported nightmares. In addition, significant correlations were found between nightmare prevalence and anxiety and depression. Of those participants with anxiety and depression, 71.4% also reported having nightmares. Prevalence was not reported by age sub-groupings, and the age range used in the study was large. While both the clinic group and control group were between the ages of 4-

18, the age distribution in the clinic group was skewed toward a younger age (36% were younger than 9 years old) than was found in the control group (30% were younger than 9 years old). Since younger children typically have more nightmares, findings do not clearly indicate if higher nightmare prevalence is associated with the mental health co-morbidities found in the clinic population or because the clinic group was younger than the control group.

Another study that included a sample (N=128) of children and adolescents, age 6 to 17, with mental health problems was conducted by Alfano and colleagues (2007) who found that 44% of boys and 62.7% of girls had at least one nightmare in the prior six months. All participants in the study met criteria for an anxiety disorder (i.e., Social Anxiety Disorder, Separation Anxiety Disorder, or Generalized Anxiety Disorder). Nightmares were assessed using five questions on the Child Behavior Checklist-Parent Version (CBCL; Achenbach, 1991) which was completed by the parent. This study did not use a standardized measurement specific for nightmares, and nightmares were examined as either present or not present over the past 6 months. Also, data about nightmare presence were collected from parents, who may not know about nightmares, especially in older children and teens. Lastly, the sample included a wide age range, with 67% of the sample being 11 years or younger, which, as in the previous study, may have skewed the results.

In summary, occasional nightmares in children and adolescents are common, are generally considered benign, and are associated with normal physical and psychosocial development (Anstead, 2000; Mindell, Owens, & Carskadon, 1999). Most research indicates that nightmare frequency decreases by adolescence. Studies indicate that higher nightmare frequency may be seen in individuals with mental health problems than in the general population. Discrepancies about nightmare prevalence and frequency may result from varying

nightmare definitions, research methodologies, and different time frames in which participants were asked to recall frequency of nightmare occurrences. These inconsistencies leave gaps of understanding about nightmare frequency in adolescents.

Nightmare Frequency and Gender Differences

Most research indicates that women and girls have more nightmares than men and boys (Levin & Nielsen, 2007). Several studies, reviewed in this section, have reported that gender differences exist in terms of frequency of nightmares in adolescents.

Mahendran and colleagues (2006) reported gender differences in their sample of 490 Singapore youth, ages 2-19. The researchers used a questionnaire posed to parents as part of a routine assessment at a clinic providing psychiatric assessment and treatment for a wide range of emotional and behavioral conditions in children and adolescents. Parents were asked to recall sleep behaviors occurring over the previous 6 months and rate them on a 3-point scale of 'never occurred', 'previously only', and 'still ongoing'. Those with current sleep problems were further asked to estimate their frequency as 'frequent' (more than 2 times a month) or 'infrequent' (less than two times per month). Chi-square tests showed more girls than boys reported nightmares (X^2 =12.01, p<005). A limitation of the study was that parental report of nightmares was used, which may not be as reliable as asking the youths themselves. Also, findings were reported for the entire sample which included a very large age range limiting the reliability of findings because parents may be more aware of nightmares that their younger children have, but less aware of nightmares in older teens. The study failed to report the reliability or validity of the scales used to measure frequency of sleep problems. These limitations could have affected internal and external validity of the research design and findings.

Nielsen and fellow researchers (2006) examined gender and age differences of nightmare frequency using a large Internet questionnaire conducted after the terror attack on September 11, 2001. Respondents (N= 23,900) were asked to complete an online survey that included age, gender, primary language spoken, and estimates about the number of dreams and nightmares recalled in a typical month. The researchers found that overall females reported significantly more nightmares than males. The sample was separated into subgroups by age (10-19, 20-29, 30-39, 40-49, 50-59, and 60-99). The subgroup of youth age 10-19 was further separated into year by year age groupings. A year-by-year assessment of the 10-19 age subgroup indicated that gender differences first appeared as a trend (p = .060) at age 14 and became significant after age 14 (p < .01) with females reporting more frequency of nightmares than males. The study was an internet survey which the authors note had not been validated against other paper and pencil tests. Also, internet survey methods may reduce social desirability bias, and promote more reliable responses. However, there was no way to ensure that respondents were truthful about their age and gender in an internet survey, which poses a threat to validity.

Two epidemiological studies conducted with Kuwaiti youth added to the growing literature about gender differences seen in nightmares. In the first of these two studies, Abdel-Khalek (2001) examined sleep disorders and nightmares of 2,574 children and adolescents ages 11 to18 using self-report questionnaires that included a statement "I have nightmares that wake me up scared" during the past month. Participants were instructed to indicate nightmares on a 5-point intensity scale (0= "no", 1= "a little", 2= "moderate", 3= "much", and 4= "very much". The researcher found gender differences, in that 9.5% of boys and 15.7% of girls reported they had nightmares "much" and "very much" on a 5-point Likert scale. The author of the study

noted that a limitation of his study was that the prevalence rate of nightmares was computed for the entire sample without separating the sample into age or gender subgroups.

To address the limitation from his first study, Abdel-Khalek (2006) replicated the first study with a sample of 6,727 Kuwaiti youth, ages 10-18. To examine age and gender differences in the prevalence of nightmares, youth were given the same instructions as in the first study, to answer the question "I have nightmares that wake me up scared". Younger males (age 11, 12, and 13) had steadily increasing prevalence rates. Older males, from the age of 14 to 18, had steadily decreasing prevalence. At 13, 17.6% reported having nightmares in the prior month, while at age 18 the number dropped to 6.1%. Conversely, the prevalence of nightmares increased for females; 9.5% at age 11, and 17.9% at age 18. Significant differences were found between males and females with regard to nightmare mean scores in the ages of 15-18. Nightmares decreased in males after age 13, while they progressively increased with age in females.

Abdel-Khalek (2006) noted that gender differences in nightmare prevalence may be due to psychosocial stressors faced by Kuwaiti females during adolescence, such as menarche, media reports of rape, murder, and kidnapping, parental and societal restrictions placed on females. The Likert scale used in both studies provided a subjective response about nightmares without providing parameters about how many nightmares are included in the "much" or "very much" categories. The authors of the study noted that the scale was based on intensity, yet findings were reported as nightmare frequency. The concept of nightmare frequency is different than the concept of nightmare intensity (Belicki, 1992). Construct validity of the instrument used in the two studies is limited because it is unclear if findings are reflective of frequency or intensity of

nightmares. The study participants for both of Abdel-Khalek's studies were Kuwaiti, which reduces generalizability of findings to youth from other countries.

In summary, research suggests that gender differences exist in adolescents (Abdel-Khalek, 2006), and may emerge at age 14 (Nielson, Stenstrom, & Levin, 2006). While gender differences were reported by other studies, methodological limitations make findings inconclusive. For example, limitations of the studies conducted by Mahendran and associates (2006) and Alfano and associates (2007) are that they both included a wide range of ages of participants and reported findings for the entire sample. It cannot be concluded at what age a gender disparity emerges, or if gender disparity is found in every age and developmental stage. There were also methodological limitations that could affect the validity of findings in the studies by Mahendran and Alfano and their research associates in that parents, and not the youth themselves, were asked about nightmare frequency. Parents may be unaware of nightmares in their older children, and parental reports are not the most accurate way to determine nightmare frequency (Schredl, Fricke-Oerkermann, Mitschke, Wiater, & Lehmkuhl, 2009). Lastly, none of the studies in this review were conducted using urban minority samples or adolescents with trauma exposure. Thus this is a gap in knowledge that the current study sought to fill.

Nightmare Frequency and Trauma Exposure

Studies about nightmares in adolescents are emerging and indicate that adolescents exposed to trauma have higher prevalence of nightmares than those not exposed to trauma. Trauma-related nightmares are often literal in depicting the trauma event; they are "anxiety-provoking", and "entirely unpleasurable" (Terr, 1987, p.239). While nightmares are a common immediate reaction to traumatic experiences, some researchers posit they may diminish in frequency and intensity as time passes (Mindell, Owens & Carskadon, 1999; D'Cruz, O'Neill, &

Vaughn, 2001). However, several empirical studies have found relationships between traumatic exposure and repetitive, persistent post-traumatic nightmares.

Using a qualitative approach to understanding persistent nightmares as a long term response to trauma, Terr (1983) conducted a follow-up study of children and adolescents who had been kidnapped from their Chowchilla, California school bus in July 1976. The children were held at gunpoint for 11 hours in two blackened vans and then buried alive for 16 hours in a truck-trailer. Four years after the incident, Terr interviewed the victims and one boy who had been let off the bus immediately before it was seized in order to better understand the residual effects of the trauma. At the time of the interview, the children's ages ranged from 9 to 18. Terr reported that repetitive nightmares were an ongoing problem, and though they were less frequent four years after the kidnapping, the intensity of single nightmares remained high. Terror dreams with no morning remembrance of the dream content were reported by 13 of the victims. Modified playback dreams were reported by 7 youth, and 12 youth reported nightmares that were unlike the trauma. Dreams in which the child allowed themselves to die were reported by 14 of the victims and were described as horrifying to the dreamer. Terr reported that some death dreams were visualized at leisure during the daytime. While nightmares reported by the children and adolescents became less frequent over time, they remained very intense and were visualized during waking hours. Terr's study, using qualitative methods, provided an important window into the subjective experience of nightmares, yet it did not give empirical data about nightmare frequency or nightmare distress.

Another study that examined long-term effects of trauma was conducted by Kravitz, and colleagues, (1993) who studied nightmares and other long-term effects of burn injuries in 82 children and adolescents admitted to two pediatric burn units for reconstructive, orthopedic, or

rehabilitative procedures. The goal of the study was to describe the incidence and nature of sleep disorders that are experienced by pediatric patients with burns at one year or more after the acute injury. The sample included patients who were admitted to hospital during a 9 month time frame. The burn injury happened when the child was between the ages of 30 months and 20 years (mean = 4.2) and the study was conducted as a follow up between 1 to 12 years after the injury. The authors of this study compiled data collected by RN assessments and observations, medical records, and child and parent interviews about the incident and experiences of sleep disorders. Nightmares were defined as any dream event that was distressing to the child. Nightmares were found in 37% of the sample. The study found no relationship between the incidence of nightmares and the length of time post-burn, age in which the child was burned, which may indicate that nightmares may be an enduring problem many years after the traumatic exposure. Nightmare content was largely repetitive of the initial burn trauma and of painful treatments in the hospital. The small sample included only burn patients and no comparison group, which may threaten the external validity of the findings and limit generalizability to those who have not experienced the same type of trauma. Also while the study included a wide age range, and assessments were conducted from 1 to 12 years after the injury, it did not control for extraneous variables or alternate explanations based on age, developmental changes, or life events since the time of the injury.

Trauma from sexual abuse can cause long-term effects, including sleep disturbances and nightmares. Noll and colleagues (2006) conducted a longitudinal study that included girls who had been victims of child sexual abuse. The initial data collection point included a sample 84 of sexually abused and 82 comparison females between the ages of 6 and 16. The groups did not differ with respect to age, minority status, or socioeconomic status. Follow-up data collected

approximately 10 years after the disclosure of abuse were provided from 78 girls from the abused group and 69 girls from the control group. At follow up, the participants ranged in age from 16 to 28 years old. The Brief Symptom Inventory (Derogatis & Spencer, 1982) and the Youth Self Report (Achenbach, 1991) were used to ascertain whether or not participants reported nightmares over the prior 2 years. Other measures for depression, revictimization, PTSD, and characteristics of the abuse were completed. Nightmares were included in the broad category of sleep disturbances. Analysis of variance was conducted, finding that the abused sample had significantly more sleep disturbances. A hierarchical regression model was tested finding that sexual abuse was a unique predictor of sleep disturbance independent of depression and PTSD symptoms. Researchers also found that sleep disturbances were a long-term consequence of childhood sexual abuse. A limitation pertinent to the current study is that since roughly half of the sample was over age 18, generalization about nightmares to adolescents younger than 18 is limited. Also, specific data about nightmares were not collected, and findings could be reflective of other sleep disturbances.

In another study of the effects of sexual assault, Choquet and colleagues (1997) examined associations between rape, nightmares, sleep quality, health, and behavior problems. The random sample (N=8,140) included French adolescents, grades 8 to 12, from 186 public schools. Participants responded to multiple choice questions about sociodemographic characteristics, school, prescription and illicit drug use, delinquent and violent behavior, attempted suicide, exposure to violence, rape, health complaints, lifestyle, and opinions about health education. Nightmares during the past 12 months were assessed using a scale of never, rarely, fairly often, and very often as part of a series of questions on sleep disorders. The researchers found that 61 students reported they had been raped. For statistical analysis, the rape group was computer

matched to two non-victims by sex, age, school district, and school grade to serve as a control group. The sample used for analysis (n=183) included 61 rape victims, and 122 control group students, with a mean age of 16.2 (SD= 2.02). More than twice as many rape victims (36%) reported nightmares fairly often or often as did the control group (13%). The researchers did not report correlations of nightmares and other variables, and other negative life events or traumas were not examined. The researchers did not report reliability or validity of the instruments used in the study. The findings from this sample cannot be generalized to other youth living in other countries, because only French students were included.

Adolescents who witness violence, such as domestic abuse, are also at risk of having persistent nightmares Mertin and Mohr (2002) studied post-trauma symptoms in a sample of 56 Australian youth, age 8-16 who had been exposed to domestic abuse and found that 61% reported experiencing recurrent and distressing dreams related to the abuse. The mothers had been separated from their abuser for an average of 20 months, but even after being separated, 82% (n=37) of the mothers reported being abused or harassed by their spouse/partner, and 15 reported the harassment was still continuing at the time of interview. As for the youth, 43% (n=24) still had contact with their father, usually by order of the family court. The children and their mothers were not living with the abuser, and all had resided in a temporary shelter before moving into their own home or apartment. PTSD symptoms were assessed using a structured interview format conducted at the shelter or community health center. The youth in Mertin and Mohr's study had been out of the domestic violence situation for an average of 20 months, indicating that while the immediate crisis situation of domestic violence and moving to a shelter environment had passed, nightmares and other trauma symptoms persisted. A limitation of the study is that direct exposure to trauma through abuse, and indirect exposure to trauma through

witnessing domestic abuse was not assessed from the youth's perspective. Instead, the researchers used the mother's report of abuse to their children. In doing so, actual abuse exposure may be underestimated. Pertinent to the current study on nightmares in trauma exposed adolescents, the study by Mertin and Mohr found that 61% of youth in their sample reported disturbing dreams. The small sample of Australian youth limits generalizability of findings to other youth in similar situations from other countries.

Being arrested and incarcerated is considered a traumatic experience, and many youth may have been exposed to trauma prior to incarceration. Using mixed qualitative and quantitative methods to understand nightmares, Halliday (2004) reported on two studies about nightmares in incarcerated males, ages 13-18. The youth in both studies resided in a short-term treatment facility that provided specialized drug and alcohol treatment to juveniles during their last 6 months of incarceration. Nightmares were defined as bad dreams that woke the youth up. In the first study, one question about the presence or absence of dreams or nightmares within the prior month was included as part of the routine screening. If the youth could recall dreams, probing questions were asked to provide details about the dream content and emotional responses to the dream. The first study (N=100) found that 12% reported nightmares in the previous month. Similarly, the second study (N=100) found that 13% of participants reported nightmares in the previous month. While the studies did not report trauma exposure, incarcerated youth may experience higher trauma-exposure and may have higher prevalence of nightmares than the general population. Halliday assessed the presence or absence of nightmares during a routine screening, and did not assess frequency of nightmares.

In summary, studies examining nightmares in youth with trauma exposure indicate that nightmares are common in trauma-exposed adolescents, and are an enduring problem long after

the initial trauma exposure (Kravitz, McCoy, Tompins, et. al., 1993; Mertin & Mohr, 2002; Noll, Trickett, Susman, & Putnam, 2005; Terr, 1983). The prevalence of nightmares ranged from 12% in Halliday's sample to 61% in Mertin and Mohr's sample. With the exception of Choquet and associates (1997), the studies used purposive sampling technique with small sample sizes to explore nightmares. Research designs varied and included qualitative methods, cross-sectional, and longitudinal study designs.

Summary of Nightmares in Adolescents

In summary, most studies indicate that nightmares are more common in childhood, and become less common during adolescence. With regard to gender differences, girls report nightmares more frequently than do boys, and the gender differences emerge about age 14 (Abdel-Khalek, 2006; Nielsen, Stenstrom, & Levin, 2006). Adolescents with trauma exposure or psychiatric illnesses are found to have higher nightmare prevalence and frequency than adolescents in general population (Mertin & Mohr, 2002). Most studies about nightmares in adolescents have been conducted in the past 10 years, indicating the study of nightmares in adolescents is relatively new. Existing studies are fraught with inconsistencies regarding definition of nightmares, and strategies to measure nightmares. To date, no consistent definition of nightmares has been operationalized. Some researchers follow the APA definition and only include dreams that cause awakening, while other researchers include all bad dreams regardless of whether the dream causes waking, and others leave it up the participant to determine what dreams are nightmares. One reason for inconsistent nightmare frequency results in extant studies is how restrictive or broadly nightmares are defined. From their research about factors affecting nightmares in children, Schredl and colleagues (2008) recommended that nightmares are interchangeable with 'bad dream' and 'disturbing dream', and the waking criteria should not be

required. While this continues to be a debate among researchers, the current study followed Schredl and colleagues recommendation and not require direct awakening from the nightmare.

Another reason for inconsistent nightmare frequency reported in studies may be due to how nightmares are measured. The concept of nightmare frequency has not been operationally defined (i.e., once a month/once a week, never/sometimes/often, yes/no). Some researchers dichotomized nightmare presence by asking if nightmares were either present or absent. Dichotomous level of measurement cannot be used to determine means or deviation within the sample (Burns & Grove, 1997). A limitation of dichotomous measures for nightmares is that there is likely to be substantial within group differences in those who endorse nightmares. A youth who has nightmares once a year is qualitatively and quantitatively different than someone who has nightmares every night, yet both are included in the group who report having nightmares. Some researchers rated nightmare frequency as never, sometimes or often. Vast individual differences in judgment may exist among participants who are asked to categorize their nightmares as seldom, sometimes, or frequent. In his review of dream recall reliability in adult research, Schredl (2002) noted that questionnaire items with absolute response categories such as "just about every day, or "every two days" had good test-retest reliability ($r = .906$ after 4 weeks, and $r = .830$ after 10 weeks), while questionnaires with relative response categories such as 'never, rarely, on occasion, often" yielded considerably lower test retest reliability ($r = .590$ after 2 month). Therefore, the current study measured nightmare frequency by number of nightmares the participant recalls during the past week and past month.

Most studies about nightmares in children and adolescents included a wide range of ages. Since nightmares are more common in younger children than adolescents, findings from studies that include both school-age children and adolescents in nightmare frequency findings could

result in spuriously high nightmare frequency. The current study limited the sample to adolescents of high school age to ensure that findings about nightmare frequency will adequately reflect that population. Lastly, nightmare frequency in trauma-exposed adolescents has not been adequately studied and gaps of knowledge exist. To address these gaps, this study examined predictive effects of trauma in nightmare prevalence.

Nightmare Distress

Most research about nightmares in adolescents has focused on nightmare prevalence and nightmare frequency. From these frequency data, conclusions are made about how big of a problem that nightmares pose. Schredl and colleagues (2003) assert that not only the frequency of nightmares, but also the degree of distress associated with a nightmare should be taken into account when examining problems associated with nightmares. Nightmare distress refers to the level of distress that is associated with nightmares, and includes reactions and concerns of the dreamer relative to their nightmares. Research on nightmare distress in adult samples is scant, and this is even truer in adolescent samples. Only two studies were found that examined nightmare distress in adolescents (Roberts & Lennings, 2006; Roberts, Lennings, & Heard, 2009).

The first study was reported by Roberts and Lennings (2006) who examined the relation between nightmares, psychopathology, and personality in a sample of 148 Australian students, ages 12 to 18. Participants were recruited from private schools in the area and through the researcher's personal contacts. Participants who were approached personally were provided an envelope to return the surveys by mail. Nightmare frequency was measured by the Nightmare Incident Scale (NIS) which asks for an estimate of nightmares experienced in the preceding week and average per week over the preceding year. Nightmare distress was measured by the

Nightmare Distress Questionnaire (Belicki, 1992), a 15-item scale that measures the degree of daytime distress the person attributes to their nightmare. Other variables of interest in the study were personality and psychopathology, as assessed in four areas: hopelessness, anxiety and depression, self-esteem, and one question about self harm in which participants were asked the extent they would agree with a statement that they had thought about ending their own life. Roberts and Lennings found that nightmares, especially nightmare distress, were correlated to neuroticism and anxiety. Hierarchical multiple regressions were computed for nightmare frequency and nightmare distress as the dependent variables and personality dimensions and psychopathology variables as predictor variables. Nightmare distress and nightmare frequency were not predicted by psychopathology variables or personality variables. Internal validity of findings may be compromised due to selection bias because 44 participants came from within the researcher's circle of friends and acquaintances. Also, the small sample size limits generalizability of findings.

The research team conducted a second study with a larger sample size (N=624) to examine nightmare distress, nightmare frequency, anxiety, and stressful life events in adolescents ages 12 to 19 (Roberts, Lennings, & Heard, 2009). The sample was recruited from 15 public and private schools in the area and through the researcher's personal contacts. Similar to the research group's earlier study, the authors used the NES to assess nightmare sleeping distress, the NDQ to measure nightmare waking distress, and NIM to measure nightmare frequency. Anxiety and negative life events were also measured. To measure negative life events, the researcher used the Life Events Scale, an instrument designed to assess the estimate and frequency of negative life events and how bothered the participant was in the prior 12 months by those events. All measures were given in a paper and pencil, questionnaire format and either turned in to school

personnel or mailed to the researcher. Positive correlations were found between nightmare frequency and nightmare distress. Nightmare frequency and nightmare distress were included in hierarchical multiple regression with forced entry, to test whether anxiety and life events predicted the nightmare variables. Findings showed anxiety was predicted most strongly by nightmare distress, and nightmare frequency became not significant in predicting anxiety once nightmare distress was added in to the regression equation model. The researchers did not report findings from analysis of associations between life events distress and nightmares. The study used only Australian youth and generalizability to youth from other countries is limited. The authors note a threat to validity in the study is that life-stress was assessed over a 12-month period, but anxiety was measured over 7 days. The same methodological concerns about recruitment (i.e. possible selection bias) exist in this study as in Roberts & Lennings' first study.

In summary, the only studies exploring nightmare distress in adolescents have been conducted by the same research team. The dearth of studies of nightmare distress in adolescents has left large gaps in understanding the degree to which nightmare distress affects mental health and physical health outcomes. Gaps exist also in understanding how life stress affects nightmare distress. Questions about the association between trauma, violence and nightmare distress in adolescents remain unanswered. Studies using adult samples have provided insight into nightmare distress, and while it cannot be assumed that findings in adult samples will hold true for adolescents; these studies can provide initial understanding and context in which adolescent research can be developed.

In a landmark study, Wood and Bootzin (1990) measured nightmare frequency and nightmare distress using both recall of dreams and prospective dream logs. The researchers recruited 220 participants from an undergraduate psychology class, who were asked to

retrospectively estimate the frequency of nightmares over the past month and prior year, as well as complete a 2-week dream log. Nightmare distress was assessed through asking one question about how severe a problem they have with nightmares. Nightmares were defined as a dream that; 1) frightens the dreamer while one is asleep, 2) contains visual imagery, and 3) portrays a story or action. The researchers found that nightmare distress was correlated with nightmare frequency as measured by 12 month retrospective reports, but the relationship was only moderate when nightmare distress was measured by dream logs. Findings of the study indicate no significant association between anxiety and nightmare frequency, as measured by both retrospective recall and with dream logs. Also, no relation was found between anxiety and nightmare distress. The authors proposed that anxious individuals with nightmares may not actually have more nightmares, but may be more likely to remember them. Wood and Bootzin also concluded that nightmare frequency and nightmare distress were two distinct phenomenon, and that both should be examined to understand nightmares. Findings of the study were correlational, therefore no conclusions can be made regarding causality or predictive characteristics of study variables. Also, the researchers measured nightmare distress by asking participants one question, to rate how severe a problem they have with nightmares. The construct of nightmare distress may not be adequately measured using the one question asked by the researchers, and no reliability or validity data were reported, thereby posing a threat to internal validity of the study.

Belicki (1992) examined the relation between nightmare frequency, nightmare distress, and psychopathology in a group of 85 university students aged 18-38. Nightmares were operationally defined as very disturbing dreams, involving any unpleasant emotion, which are usually vividly recalled, and participants were asked to estimate the number of nightmares they

had in the prior year. Nightmare distress was assessed using the author's Nightmare Distress Questionnaire, which includes 15 items asking about daytime distress related to nightmares. The study also measured personality variables and psychological adjustment (measured by the Symptom Check List-90 (Derogatis, 1977), the Fear Survey Schedule-II (Corcoran & Fischer, 1987), and the Beck Depression Inventory. Nightmare distress and nightmare frequency were slightly correlated (r=.26, p<.05). Multiple regression analysis showed psychopathology, and not nightmare frequency, predicted nightmare distress. The small sample size limits generalizability. While the researcher noted that the NDQ questionnaire was deemed reliable in previous studies, no reliability tests were was reported. Nightmare frequency was based on an estimate of the number of nightmares over the prior year. Since people may forget and either overestimate or underestimate the number of nightmares they had over such a long time period, distant recall of nightmare frequency may threaten reliability of findings.

Nightmare distress in undergraduate students (N=116) was also examined by Levin and Fireman (2002) using a prospective nightmare protocol. The participants were first screened for presence of nightmares, and those reporting they had nightmares were asked to indicate how often they had had a nightmare within the past year using a scale from "not at all", "once or twice a year", "3-10 a year", "once a month", "once a week", and "more than once a week". Only participants who indicated they had "3-10 a year" or more were included in the study. The definition of a nightmare was 'a scary dream that awakens the dreamer from sleep'. Other variables measured were depression (measured by the BDI), state and trait anxiety (measured by the State and Trait Anxiety Inventory; STAI), dissociation, schizotypy, and general psychopathology (measured by the SCL-90R). Participants were asked to keep a dream log for 21 days, and record when they had a nightmare. Those who had nightmares were asked to rate

the intensity, vividness, and waking distress attributed to each nightmare on a Likert scale. The researchers classified nightmare frequency as high (three or more), moderate (one or two), or low (zero). The study found that nightmare prevalence and nightmare distress were not significantly correlated ($r=.21$, ns). A three-way MANCOVA with nightmare presence as the independent variable, no nightmare presence as the covariate, and the psychopathology measures as the dependent variable showed that the high nightmare group reported significantly higher levels of psychological disturbance than the low and medium nightmare groups, indicating that having nightmares on a weekly, or more, basis was associated with increased psychological symptoms. Also, nightmare distress accounted for more unique variance than nightmare prevalence in predicting anxiety and depression. The sample included undergraduate students, which may not be representative of the general population.

Summary of Nightmare Distress

Nightmare distress has become a more common variable in studies with adults. Most studies use Belicki's questionnaire on nightmare distress. Findings from studies show greater nightmare distress is more consistently associated with greater psychological problems than is nightmare frequency. Wood and Bootzin, and Levine and Fireman used a combination of retrospective recall and prospective dream logs, and reported disparate conclusions about the correlation between nightmare frequency and nightmare distress. The discrepancy may be because Wood and Bootzin used one only question to ascertain nightmare distress, while Levin and Fireman used a more comprehensive nightmare distress assessment. Also, Levin and Fireman collected dream log data for one week more than Wood and Bootzin, thereby providing more nightmare frequency data for analysis. Dream logs have advantages and disadvantages. An advantage of using dream logs is that they don't rely on recall, provide a window into

everyday life, and the give a 'real time' measurement of behaviors or experiences (Quittner, 2000). A disadvantage of dream logs is participant burden because dream diary protocols requires daily adherence over a specified time. Participant burden of daily adherence to the dream log protocol may be why self-report questionnaire protocols are used more often than dream log protocols in adolescent studies.

Because there is a limited amount of research about nightmare distress in adolescents, it is necessary to include findings from research of the topic in adults and extrapolate findings to adolescents. Yet, further study is needed to know whether results from adult samples will hold true among adolescents, particularly trauma-exposed adolescents. The current study assessed nightmare distress using Belicki's NDQ, which is the most frequently used measure for nightmare distress.

Nightmares and Sleep Quality

The third section of the literature review will discuss pertinent literature about sleep quality in adolescence. From the current study's theoretical perspective of the RAM, sleep quality is a factor within the physiological adaptive mode. Sleep quality is subjective assessment of overall sleep and is affected by the contextual stimulus (trauma exposure) and focal stimulus (nightmares). In addition, sleep quality may partially mediate the relation between nightmares and outcome variables, and this study examined the existence and strength of this mediation.

Sleep quality is an important indicator of adolescent health and well-being (Tynjälä, Kannas, Levälahti, & Välimaa, 1999). Poor sleep quality related to sleep deprivation contributes to poor daytime coping with daily stress, and may increase fatigue, confusion and anxiety (Harvey, Jones, & Schmidt, 2003). Adolescents who report poor sleep also report they are more

tense, moody, and irritable after a night with disturbed sleep (Kirmil-Gray, Eagleston, Gibson, & Thoresen, 1984).

The literature examining sleep quality in adolescents has focused on sleep quality, health, and quality of life, however little is known about the relation between nightmares and sleep quality in adolescents. Two studies using adolescent samples that included nightmares and sleep quality were found and are included in this review.

Manni and colleagues (1997) assessed nightmares and self-reported sleep quality in a randomized, cross-sectional study of 17-year-old Italian students (N=869). Participants in this study completed a 130-item sleep questionnaire to report problems of sleep over the previous twelve months on a four level scale ('never', 'sometimes', 'often', 'always'). The researchers dichotomized the choices by coding 'never' and 'sometimes' as 0, and 'often and 'always' as 1. The group reporting no sleep problems was labeled as the 'restorative sleep group' (n=727) and those reporting sleep problems were labeled the 'non-restorative sleep group' (n=142) for comparison. Nightmares were reported by 48.9% of the non-restorative sleep group as compared with 14.6% of the restorative sleep group. Using logistic regression analysis, nightmares attained the highest odds ratio on their model of dependent variables predicting non-restorative sleep (OR=62.1, 95% CI= 58.0 - 64.4). The researchers used a questionnaire they had written for the study, which had been previously piloted and successfully demonstrated reliability. Another strength of the study was the sample was randomized which increases generalizability of findings to other youth in Italy. However generalizability of findings to youth in the United States may be limited.

Another study examining nightmares and their association to other sleep problems, excessive daytime sleepiness, and school performance was conducted by Joo and colleagues

(2005) with 3,871 high school students, ages 15 to 18, in South Korea. The researchers used a self-report questionnaire that included questions about bedtime, wake-up time, sleep duration, sleep latency, sleep-related problems such as nightmares, snoring, sleep apnea, insomnia, and teeth grinding. Daytime sleepiness was measured by the Epworth Sleepiness Scale, an 8-item scale that has been validated and used in adolescent samples. Questions about sleep-related problems were asked in multiple choice format, including 'never', '1-2 days/week', '3-4 days/week', '5-6 days/week', or 'always (every night)'. Findings showed that students with nightmares 4 days per week or more had a 61% greater excessive daytime sleepiness as compared to those without nightmares. The researchers did not report specific questions they asked to assess for nightmares, and did not report reliability or validity data on the questions asked about sleep-related problems, therefore construct validity of the measure is unknown. Also, findings cannot be generalized to youth in other countries because the sample consisted on teens in the southern part Korea.

In summary, only two studies were found that explored associations between nightmares and sleep quality. Findings from the studies indicate that adolescents with nightmares also report poor sleep quality. Both studies were conducted with large, randomized samples of adolescents using self-report measures and cross-sectional correlational designs in countries outside the United States. In addition, neither study included trauma-exposed samples. Therefore, review of studies examining the associations of trauma exposure, nightmares, and sleep quality from adult literature is warranted.

Research with adult samples indicates that poor sleep quality is correlated with nightmares. The first correlational study was conducted by Köthe and Pietrowsky (2001) who investigated sleep quality effects of nightmares in correlation with personality and mood effects

in a sample of 41 adults, all of whom were self-identified as having "occasional nightmares". Mood, personality traits, estimate of nightmare frequency during the prior month and year, and life events inventories were assessed. Participants were then asked to keep a 4-week sleep quality and dreaming record. After having a nightmare, participants were instructed to complete a mood and anxiety questionnaire and the Nightmare Behavior Questionnaire, developed by the authors, designed to explore the behavioral effects caused by a nightmare on emotion, cognition, coping strategies, and physical complaints. Results showed that sleep quality was negatively affected by nightmares and 49% of participants awoke from the nightmare, 48.9% had difficulty returning to sleep, and 56.6% felt restless and uncomfortable after a nightmare. Nightmare frequency and personality variables were not significantly related. After a nightmare, 68% felt tired or very tired in the morning, were more anxious, had lower well-being, felt distressed, and preoccupied by their nightmares. Participants also reported physical complaints, feeling afraid, discouraged, nervous, restless and upset the day after having a nightmare. The study design included baseline assessment and daily logs which offered new understanding about problems participants attribute to nightmares. The sample size was small and was recruited from a university in Germany limiting generalizability of findings. Statistical analysis included T-tests and correlations, so causality of nightmare effects cannot be concluded.

In another study, Ohayon and colleagues (1997) studied the sleep habits and sleep disorders among a representative sample of 5,622 participants between 15 and 96 years of age from France. The researchers used a telephone interview that asked about nightmares, psychopathological traits, sociodemographics, sleep-wake schedule, daytime functioning, psychiatric and medical history, medications, and drug use. Of the sample, 1,049 participants reported insomnia and were included in further analysis about nightmares, and 18.3% reported

nightmares. Insomniacs with nightmares reported more daytime problems with functioning, cognitive ability, and daytime mood than did participants with insomnia but no nightmares. The nightmare group had more problems with impaired attention, memory, concentration, and overall daytime functioning than the non-nightmare group. Nightmares were not operationally defined in this study.

In a prospective study that used dream diaries, conducted by Schredl (2003) examined mediators of the relation between nightmares and sleep quality. Schredl studied the relationship between nightmares and sleep quality in a sample of 444 adults who were mostly psychology students. The study also examined nightmare frequency in relation to personality measures such as neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness. Using dream diaries over a two-week period and retrospective dream recall questionnaires, Schredl found that 52.2% experienced nightmares once a month or more often, 12.1% of participants reported that nightmares occur at least once a week. Frequency of nightmares was correlated to the intensity of negative emotions measured by the dream diary. Also, nightmare frequency was correlated with the number of negative events and global stress reported by participants. Sleep quality was measured using an 11-item sleep quality scale and a 6-item insomnia scale, both of which were significantly correlated to nightmare frequency. Schredl found that the relationship between nightmare frequency and poor sleep quality was partially mediated by self-reported neuroticism and current stress, and concluded that nightmares are an independent factor contributing to insomnia complaints, an indicator of poor sleep quality. Nightmares were not explicitly defined as a dream that awakens the dreamer, which may explain the high prevalence of nightmares found in this study. The study sample included mainly

psychology students from a university in Germany which may not represent the general population in other countries.

Sleep disruption from nightmares due to the amount of time that participants spent awake after experiencing a nightmare was found by Kales and colleagues (1980). Kales and associates evaluated characteristics of adults with trauma-related nightmares in 30 adult patients who reported at least 12 nightmares per year. Participants reported their nightmares typically woke them up and they had difficulty returning to sleep because of fear of attack, fear of falling, fear of death, and feeling of choking or suffocating.   Nightmare sufferers reported they did not resume sleep for an average of 23.2 minutes after being awoken from a nightmare. Kale's study is unique in operationalizing sleep disturbance by asking nightmare sufferers to estimate the number of minutes it took them to return to sleep; however the small sample size limits generalizability of findings.

Research about associations of nightmares and sleep quality in trauma-exposed adult samples is limited. Davis and colleagues (2007) studied 94 adults with both trauma exposure and at least one nightmare per week in the prior 3 months. The researchers used the Trauma Related Nightmare Survey (TRNS; Davis, Wright, & Borntrager, 2001) to assess characteristics of chronic nightmares, such as frequency, severity of nightmares, as well as cognitions, emotions, and behaviors related to nightmares. The PSQI (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989) was used to measure sleep quality. Participants in the study reported a mean nightmare frequency of 4.01 (SD=3.78) per week. Regression analysis showed that nightmare frequency was a unique predictor of poor global sleep quality even after controlling for PTSD symptoms. The sample included patients who were in treatment for nightmares, which may represent a group with more severe nightmares, thus limiting generalizability to other trauma-exposed

populations. Also potentially limiting generalizability of findings is that the sample was primarily Caucasian women recruited from one geographical location.

Another study that included trauma-exposed adults was conducted by Woodward and colleagues (2000) who studied sleep and nightmares in 63 Viet Nam combat veterans with PTSD using polysomnography and subjective report of sleep and nightmares. They found that trauma-related nightmares, more than non-trauma nightmares, were associated with more wake-after-sleep time as well as overall sleep problems. Few researchers have employed polysomnography in a sleep laboratory to measure sleep quality and trauma-related nightmares because this type of artificial environment of sleep likely inhibits nightmares. In a review of nightmare research in adult populations, Wittman, Schredl, and Kramer (2007) noted that while traditional sleep studies are often performed in the sleep laboratory, most nightmare researchers agree the sleep laboratory is not the most desirable setting to study nightmares. Wittman and colleagues further concluded the sleep laboratory is likely to influence dream content and dreams become less intense and emotional in the laboratory than dreams at home.

Poor sleep quality can be caused by physiological problems as well as nightmares. For example, breathing-related sleep disorder is a sleep disruption that can impair sleep quality due to frequent arousals from sleep as the individual attempts to breathe normally. The most common cause of breathing-related sleep problems is sleep apnea, characterized by loud snores or brief gasps that alternate with episodes of silence (DSM-IV, 1994). Breathing-related sleep disorders are most frequently found in overweight males (DSM-IV, 1994). Literature in both adult and pediatric samples indicate that breathing-related sleep problems predict health distress, reduced energy, poor social and emotional functioning and poorer cognitive functioning (Moore P, Bardwell WA, Ancoli-Israel S, et al, 2001; Owens, Opipari, Nobile, & Spirito, 1998).

Summary of Nightmares and Sleep Quality

Two descriptive studies were found in adolescent literature; both found a significant association between nightmares and poor sleep quality in adolescents, and that poor sleep quality is associated with daytime problems such as mood, daytime functioning, and ability to cope with daily stressors. Furthermore, studies by Schredl (2003) and Davis and associates (2007) indicated that nightmares uniquely contributed to poor sleep even after other variables were accounted for. With regard to trauma-exposed populations, Davis and colleagues (2007) found that nightmare frequency was a unique predictor of poor global sleep quality, even after controlling for PTSD symptoms. No similar studies have been conducted in trauma-exposed adolescents. Research has not been done that explores whether sleep quality mediates the relation between nightmares and other quality of life in studies with either adults or adolescents.

Lack of research has left gaps of knowledge about nightmares and sleep quality, as well as the extent that sleep quality mediates the associations between nightmares and quality of life in trauma-exposed adolescents. The current study was needed to understand the effects of nightmares on sleep quality, and the potential influence of sleep apnea in the associations of trauma exposure, nightmares, sleep quality and quality of life.

Nightmares and PTSD Symptoms

As an introduction to PTSD symptoms, a brief overview of PTSD will be provided, followed by a review of studies that have examined the association between nightmares and PTSD symptoms. Posttraumatic Stress Disorder (PTSD) is often found in people who have experienced a sudden, unpredictable, life-threatening event involving exposure to death, personal injury, or injury or death of loved ones (Dyregrov & Yule, 2006). The specific diagnostic criteria for PTSD established by the APA (DSM IV-TR (2000) includes 1) re-experiencing the

event through trauma reenactment and repetitive play in which themes or aspects of the trauma are expressed; 2) avoidant and numbed response; 3) increased arousal such as hypervigilance, decreased concentration; 4) exaggerated startle response; and 5) disturbed sleep (e.g., nightmares). Finally, the DSM-IV-TR (2000) qualifies that the length of the disturbance must be more than one month, and there must be clinically significant impairment caused by the disturbance in a main area of functioning. While overall diagnostic criteria are the same for children as for adults, the DSM-IV-TR includes behavior in children that is disorganized and/or agitated. Other behaviors indicative of PTSD in children include repetitive play and recreating events from the trauma (Terr, 1991). Behavioral regressions, such as bed-wetting, refusal to sleep alone at night, and difficulty separating from parents during the day have also been noted as characteristic of post-trauma response in children (Perrin, Smith, & Yule, 2000; Saigh, Yasik, Sack, & Koplewicz, 1999).

Research has revealed a wide range for PTSD prevalence following trauma, varying from 10% to 100% (Pynoos, Steinberg, & Wraith, 1995). A meta-analysis of nearly 2700 youth with varied trauma histories showed that 36% met criteria for PTSD, and the rates of PTSD in children did not vary significantly across developmental age spans (Fletcher, 1996). Giaconia, and colleagues (1995) conducted a longitudinal study examining the long term effects of trauma and PTSD in 384 older adolescents (mean age = 17.9). They found that 14.5% of their sample who reported trauma exposure developed PTSD by age 18. Participants with PTSD also were found to demonstrate widespread problems with many areas of health and functioning, such as academic problems, interpersonal problems, and emotional problems.

Nightmares are considered the "hallmark" symptom of PTSD that can become repetitive and chronic (Ross, Ball, Sullivan, & Caroff, 1989). However, no studies examining trauma and

PTSD in adolescents included analysis about associations between nightmares and PTSD symptoms. It is necessary, therefore, to review findings from adult studies to better understand associations between trauma, nightmares, and PTSD severity.

Findings from several studies examining nightmares in combat veterans show nightmares that are exact replays of the trauma (replicative nightmares), or those that are very similar (trauma-similar) to the trauma are associated with severity of PTSD symptoms. For example, Esposito and colleagues (1999) studied dreams of 18 combat veterans, and found a relationship between trauma-similar dreams and severity of re-experiencing symptoms of PTSD. The small sample size and inclusion of only combat veterans of Esposito's study limited generalizability of findings to other adults with exposure to trauma.

In a larger sample (N= 223), Schreuder and associates (2000) included civilian victims of war (n=167) and combat veterans of World War II (n=56) to examine the relation between trauma, PTSD, and nightmares. The study was conducted at a psychiatric center for treatment of victims of World War II between the years of 1940 and 1954, and most patients were being treated for anxiety or mood disorders. The researchers differentiated post-traumatic nightmares from post-traumatic anxiety dreams; nightmares were defined as frightening dreams from which the sleeping person instantly wakes up, and anxiety dreams were frightening dreams remembered only after waking up at the end of the night. For purposes of analysis, three groups of participants were compared, those with post-trauma nightmares (n=102), those with only post-trauma anxiety dreams (n=24), and those with neither post-trauma nightmares nor post-trauma anxiety dreams (n=97). Using MANOVA to compare PTSD symptoms reported by the three groups of participants, the researchers found that those with post-trauma nightmares had more severe PTSD symptoms and reported more psychological problems. Also, those with post-

trauma nightmares reported worse psychological and physical functioning and increased sleep problems compared to those without nightmares. The study sample included only patients who were seeking psychiatric treatment for problems they attributed to traumatic war experiences many years earlier, and may have more severe trauma-related symptomology and other mental health problems, including anxiety and depression not examined or controlled for in the analysis. Therefore, other contributing factors may have influenced the findings. Whether findings in the study would be replicated in a community-based sample of trauma-exposed adolescents is unknown.

A study of non-war related trauma dreams conducted by Mellman and associates (2001), that assessed dreams of 60 adults six weeks after being hospitalized for a life-threatening event such as motor vehicle accident, industrial accident, and interpersonal assault. Participants were asked to record all dreams in a morning diary for 2 to 3 mornings during the initial evaluation. Also, participants recorded the similarity of the content of the dream to the traumatic incident and the degree to which the dream was disturbing (on a 5-point Likert scale). Among the 60 participants who recorded their dreams, 18 remembered a dream, and a total of 21 dreams were described. Of the dreams recorded, 10 were categorized as trauma dreams; four dreams were similar to the actual event, and 6 dreams were described as exact replications of the event. Dreams that were not distressing or dissimilar to the trauma were not considered trauma dreams. At the 6-week follow up, PTSD symptoms were significantly more severe in the group reporting trauma dreams compared to those who did not report dreams. The authors noted a limitation of the study was that dreams were recorded for only 2 to 3 days, and only a few dreams were reported. The overall low number of dreams and even lower number of trauma-dreams is a limitation of this study because not enough data were collected to make reliable conclusions

about the significance of such a small number of dreams. In addition, alternative explanations for nightmares could be suggested, which limit validity of findings from the study. The researchers did not note whether nightmare questions on the PTSD measure were removed from the analysis of PTSD severity. Since nightmares are a re-experiencing symptom included in the PTSD assessment, nightmares should be removed from the measurement to be sure PTSD symptoms are not spuriously elevated. Researchers also included a baseline PTSD evaluation and recording of dreams while the patients were still in the hospital. Some of the patients were still receiving narcotics and other psychoactive drugs that may have influenced their responses. Lastly, the researchers used an instrument to measure PTSD during the acute post-trauma phase. It is possible that positive PTSD symptom findings may be reflective of PTSD from prior traumas, and not as a result of the accident that brought them into the hospital. No conclusions that nightmares predict the development of PTSD can be reliably made from this study.

Davis and colleagues (2007) studied 94 adults with both trauma exposure and at least one nightmare per week in the prior 3 months. The researchers used the Trauma Related Nightmare Survey (TRNS; Davis, Wright, & Borntrager, 2001) to assess characteristics of chronic nightmares, such as frequency, severity of nightmares, as well as thoughts, emotions, and behaviors related to nightmares. Sleep Quality was measured using the Pittsburgh Sleep Quality Index (PSQI; Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). The sample in this study reported a mean frequency of 4.01 (SD=3.78) nightmares per week, 3.24 nights per week with nightmares (SD=1.96) and 1.81 nights per week with more than one nightmare (SD=2.09). Nightmare severity was rated on a scale of 0 ('not disturbing at all') to 4 ('extremely disturbing') and findings showed the average nightmare severity was 3.0 (SD = 0.78). A significant relation was found between trauma-similar nightmares and greater overall PTSD symptom frequency and

severity, and the relation was stronger than the association between PTSD symptom severity and dissimilar nightmares. Since the sample included those seeking treatment for nightmares, their nightmares may be more severe thereby limiting generalizability to other adults in the general population.

In summary, studies in this review indicate that adults who suffer from trauma-related nightmares have more severe symptoms of PTSD than trauma survivors who do not have nightmares. Davis and associates (2007) studied mostly Caucasian women, but the same conclusions were drawn from Schreuder and associates' (2000) sample, which were mostly men. Both studies included only adults who were in treatment for psychiatric problems or nightmares, and have mental health problems, so generalizability to other trauma-exposed populations is limited. It cannot be assumed that findings reported in studies with adults would be the same in adolescents. No similar studies have been found in adolescent populations, leaving gaps in understanding the associations between nightmares and PTSD symptom severity in that age range. Further, the effects of PTSD in the associations between nightmares and quality of life in adolescents had not been researched prior to the current study.

Nightmares and Quality of Life

This section of the literature review will discuss literature regarding nightmares and the current study's outcome variable: quality of life. High quality of life is an indicator of effective adaptive responses to stimuli (Roy & Andrews, 1991). The World Health Organization (WHO) defines quality of life is a multidimensional concept that includes physical, mental, and social well-being, and not merely the absence of disease or infirmity (WHO, 2004). Most studies in this section did not assess for all dimensions of quality of life as defined by the WHO, but are included in this review because synthesis of literature indicates nightmares are associated with

lower health and functioning. In addition, no studies with adolescent samples have been done examining the associations between nightmares and quality of life; therefore this section will review literature using adult samples.

Two studies discussed in the previous section in this review examined the associations between well-being and nightmares in adults. Köthe and Pietrowsky (2001) found that people with nightmares had lower well-being, reported more anxiousness, physical complaints, and distress, and were more preoccupied by their nightmares than those with no nightmares. Likewise, Ohayon and colleagues (1997) found nightmares were associated with daytime problems, such as cognitive ability, daytime mood, impaired attention, memory, concentration, and overall daytime functioning.

In an early report about health problems and sleep disorders in the general population (N= 1,006), Bixler and colleagues (1979) found that individuals with current nightmares reported significantly more persistent or recurring health problems, more hospitalizations during the previous year, and they needed more help with emotional problems during the previous year, specifically for tension, problems with alcohol, depression, and loneliness. The study used the Los Angeles Metropolitan Area Survey of 1973, that included 100 questions, and several questions about sleep included whether or not the participant had a current or past problem with nightmares, and if so, how long had the problem lasted. The survey also included questions about persistent or recurring health problems, number and duration of hospitalizations during the past year, and general assessment of their need for help with various difficulties in life. Results indicated 11.2% prevalence of nightmares. Validity and reliability for the assessment measure was not reported, which may limit reliability of results. This study was an early descriptive

study that helped lay foundation of research about correlations about nightmares and quality of life indicators.

Two studies examined mental health dimension of quality of life and nightmares. Blagrove and colleagues (2004) assessed 147 college students and staff, ages 17 to 83 (mean age = 23.76 years, SD = 11.39) finding that nightmares predicted low well-being. Well-being was assessed by self-report measures of anxiety, depression, neuroticism, and acute stress. Anxiety and depression were assessed using the Profile of Mood States (POMS-BI; Lorr & McNAir, 1980). Neuroticism was measured by the Eysenck Personality Questionnaire-RS (EPQ-RS; Eysenck & Eysenck, 1991). Acute stress was measured by the General Health Questionnaire (GHQ; Goldberg & Williams, 1988), a global measure of acute psychological distress and inability to carry out normal, healthy functions. Low well-being was defined as difficulty dealing with stress, psychosocial problems, and inability to carry out normal daily functions in healthy way. Nightmare distress was measured by the Nightmare Distress Questionnaire (Belicki, 1992). Nightmares were defined in the study as very disturbing dreams in which the unpleasant visual imagery and /or emotions wake up the person. Participants first were asked to retrospectively recall the frequency of nightmares and complete the measures of well-being and nightmare distress. Participants completed the dream log for 2 weeks. Of the 147 in the entire sample, 104 reported having nightmares and 43 reported they did not have nightmares. Findings of the study showed that individuals who report nightmares, either on the retrospective questionnaire or the dream logs, also report lower well-being scores, and well-being became worse with higher frequency of nightmares. Using multiple regression analysis, the researchers concluded that nightmare distress moderated the relations between nightmare frequency and low well-being. The sample included a wide age range of both college students and staff, which

may have influenced findings. Age did not significantly correlate with nightmare frequency, but it had significant negative correlations with neuroticism, depression, and stress (three of the four measures for well-being). The researchers' concept of well-being did not include a physical component, which would have made the well-being construct more comprehensive.

Another study about nightmares and mental health dimensions of quality of life, by Zadra and Donderi (2000), examined the association between well-being and nightmares in 89 college students (mean age= 20.5, SD not reported). Well-being was examined through assessing neuroticism, anxiety, depression, personal adjustment, life events, and overall psychological symptoms. Using multiple hierarchical regressions to determine the separate and unique contributions of nightmares as compared to bad dreams in relation to well-being, the researchers found that the measures of well-being accounted for a significant portion of the variance in nightmare frequency beyond that accounted for by the bad dream variable. The sample size was small, predominately young college students, and mostly women, which may limit the generalizability of findings. Aspects of well-being measured in this study were limited to psychological factors, and no physical health or functioning factors of well-being were included.

Physical measures and stress-related health symptoms in 289 college students who reported having nightmares were examined by Madrid and colleagues (1999). The researchers used the Stress-Related Problems Scale (Hicks & Hyler, 1998), a 48-item scale with seven symptom subscales: allergy symptoms, anxiety, circulatory problems, gastrointestinal problems, headache, respiratory problems, and pain. Nightmare distress was measured using the NDQ (Belicki, 1992). Findings showed that those with higher self-reported nightmare distress scored significantly lower on all measures of health symptoms. The study used only correlational statistical analysis so no causation can be concluded from the findings.

In another study reporting that nightmares are associated with quality of life indicators was conducted by Agargun and associates (2003), who examined the association between nightmares and aspects of quality of life such as occupational, social, and family domains. The sample included 292 undergraduate students at a university in Turkey with no history of previous psychiatric diagnoses. Dream anxiety distress was measured through the Van Dream Anxiety Scale (VDAS), developed by the study author, and included questions concerning nightmare frequency, difficulty of returning to sleep after a nightmare, and fear of sleeping because of anticipated nightmare, trouble sleeping, dream recall frequency, daytime sleepiness, daytime anxiety, occupational distress, familial distress, social distress psychological problems and memory/concentration problems. The study also examined childhood trauma events, and these data were collected through structured interview and self-report questionnaires. A strong positive association was found between trauma dreams and childhood traumatic events. Importantly, Agargun and associates found that subjects with trauma nightmares had higher levels of overall distress. The study's significance was limited by the use of correlation analysis, so no conclusions about nightmares causing or predicting poor well-being could be generated.

Summary of Quality of Life

The World Health Organization (2004) defines quality of life as a multidimensional concept that includes complete physical, mental, and social well-being and not merely the absence of disease or infirmity. All the studies reviewed indicate that nightmares are associated with various components of quality of life. Most studies included in this review considered well-being primarily in the psycho-social arena, and these studies did not include a physical health measurement in their assessment of well-being. A physical health measure was used by Bixler and colleagues (1979) who used an instrument that measured physical and emotional health, but

this measure was not developed to measure quality of life. Most studies in this review were conducted in the past 10 years, indicating that research about the associations between quality of life and nightmares has only recently been examined. No study used a validated measure for quality of life (as understood by the WHO), indicating there are still gaps related to understanding and measuring the concept of quality of life in nightmare literature. No adolescent studies were found that examined the association between nightmares and quality of life. There may be similarities between adolescents and samples of college students regarding nightmares and quality of life, but the differences in life experiences and stressors are likely to influence nightmares and perceptions of quality of life. Lastly, while Agargun and colleagues (2003) assessed childhood trauma exposure in their adult sample, no research to date has included a sample of trauma-exposed adolescents. Gaps exist in understanding the associations between nightmares and quality of life in trauma-exposed adolescents. The current study expanded current knowledge through assessing all WHO dimensions of quality of life.

Summary

Exposure to trauma and violence is a widespread problem in adolescents. Research using large community samples indicates that older teens living in urban areas are more often exposed to many types of traumas than school-age children (Finkelhor, Ormrod, Turner, &Hamby, 2007; Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009). Exposure to multiple traumas over time, or cumulative trauma, has been shown to predict poor health and PTSD (Kira, Lewandowski, Templin, Ramaswamy, Ozkan, & Mohanesh, 2008). Adolescents living in low-income, dangerous, and urban communities are at greatest risk for trauma exposure (Singer, Anglin, Song, & Lunghofer, 1995).

Nightmare prevalence in adolescent samples has been studied in several types of settings and using various sampling methods. Most research indicates nightmare frequency decreases by adolescence (Alfano, Ginsburg, & Kingery, 2007; Nielsen, Stenstrom, & Levin, 2006). Monthly nightmares in the general population were found in as little as 3% of the sample by Ohayon (2001), but as high as 61% in trauma-exposed adolescents (Mertin & Mohr, 2002). Gender differences emerge about age 13 or14, in that more girls than boys experience nightmares (Abdel-Khalek, 2006; Nielsen, Stenstrom, & Levin, 2006). Mertin and Mohr (2002), Kravitz (1993), Noll (2005), and Terr (1983) found nightmares are not only a short-term response to trauma, but can become an enduring problem long after initial trauma exposure. Methodological differences, and inconsistent definition of nightmares in studies have contributed to inconclusive findings about the prevalence and frequency of nightmares. Studies among children and adolescents included a wide range of ages. Nightmare distress refers to the level of distress associated with nightmares. Most studies use the Nightmare Distress Questionnaire (Belicki, 1992) to measure the construct. Findings from most studies indicate the degree of nightmare distress is associated with psychological problems such as anxiety, depression, and suicidality (Belicki, 1992; Levin & Fireman, 2002; Wood & Bootzin, 1990). Most studies examining nightmare distress were conducted with college students, and gaps exist in understanding the effect of nightmare distress in adolescents. Nightmare distress has not been studied in trauma exposed adolescents.

Very few studies examined associations of nightmares, PTSD symptoms, and sleep quality. Correlations between nightmares and poor sleep quality in adolescents have been found from descriptive studies (Joo, Shin, Kim, Yi, Ahn, et. al., 2005; Manni, Ratti, Marchioni, Castelnovo, Murelli, et. al., 1997). Yet, prior studies have not explored whether sleep quality

mediates the relation between nightmares and other daytime problems in studies with either adults or adolescents. Empirical examination about the associations between nightmares and PTSD symptoms has found trauma nightmares to be associated with more severe PTSD symtpomology in adults (Davis, Byrd, Rhudy, & Wright, 2007; Schreuder, Kleijn, & Rooijmans, 2000). However, no studies examining the associations between nightmares and PTSD symptoms have been conducted in adolescents.

Lastly, research is emerging in adults finding that nightmares are associated with lower quality of life (Blagrove, Farmer, & Williams, 2004; Zadra & Donderi, 2000). Research about nightmares and quality of life in adolescent samples has not been strenuously conducted.

The associations between nightmare frequency, nightmare distress and quality of life have not been examined in trauma-exposed adolescents, leaving wide gaps in understanding. It is not known if sleep quality and PTSD symptoms mediate the relation between nightmares and quality of life in trauma-exposed adolescents. The current study expanded understanding about the relations between trauma, nightmares, sleep quality, PTSD symptoms, and quality of life in trauma-exposed adolescents. Further, the current study was needed to understand the meditational role of sleep quality and PTSD symptoms in the relation between nightmare frequency, nightmare distress, and quality of life in trauma-exposed adolescents.

CHAPTER 3 METHODS

This chapter addresses the methodological procedures implemented in the study, and includes sections pertaining to research design, variables, sample, instrumentation, data collection procedures, and data analysis. The overall purpose of the study was to examine the relations between trauma exposure, nightmare frequency, nightmare distress, sleep quality, PTSD symptoms, and quality of life in urban, trauma-exposed African American adolescents.

Design

The study utilized a predictive, cross-sectional research design to examine the relations between the predictor variables (trauma exposure, nightmare frequency, nightmare distress) and the outcome variable (quality of life), and the extent to which the intervening variables of sleep quality and PTSD symptoms mediate the relations between nightmare frequency, nightmare distress, and quality of life in study participants. The study also measured potential effects of gender, depression, and sleep apnea in the relations between the predictor, outcome, and mediating variables. The design of the study also enabled data to be collected from multiple sources, the adolescent and their parent or guardian.

Setting

Participants in the study were patients at the Adolescent Clinic at Children's Hospital of Michigan, part of the Detroit Medical Center, located in Detroit, Michigan. The Adolescent Clinic provides primary care for adolescents, predominantly African American youth living in lower socioeconomic, urban neighborhoods in Detroit. With a staff of nurses, nurse practitioner, physicians, social workers, and psychologists, the clinic offers comprehensive primary health care to adolescents age 12 through 21. Patients are seen for numerous health related concerns

including: routine physical examinations and immunizations; pelvic examinations and pap smears; evaluation and management of sexual-related issues such as pregnancy, birth control, and sexually transmitted diseases; evaluation and management of growth and puberty concerns; substance abuse problems; weight control problems, including eating disorders and nutritional problems; chronic illnesses such as asthma, diabetes, and seizures; emotional and psychosocial concerns including abuse, mood and behavioral problems, and family conflicts; and evaluation and treatment of learning problems and school difficulties, and stress management with complementary and alternative medicine treatments.

Sample

A convenience sample of 151 male and female African American adolescents and their parent, or guardian, participated in the study. Inclusion criteria for the sample was African American male or female, clinic patients, ages 14 through 17, with an available parent or legal guardian who is present at the clinic. Exclusion criteria were inability to read or speak English, and having no parent or guardian present in the clinic. A total of 186 were eligible and 164 (88%) agreed to participate in the study. Reasons for refusal included "not enough time", and "not interested in research". Data from thirteen participants were discarded; nine because of incomplete data and two participants were withdrawn from the study before completing because they were unable to reliably complete the questionnaires. An additional two participants had been diagnosed with sleep apnea, or a sleep disorder in which the parent reported the teen had long pauses in breathing while asleep. Joo and associates (2005) found that students with habitual snoring and sleep apnea had significantly poorer sleep quality compared with students who did not snore or have sleep apnea. Because sleep apnea could potentially confound findings about sleep quality, data from two teens with sleep apnea or pauses in breathing were discarded.

Inclusion in the study was limited to adolescents age 14 through 17 for several reasons: 1) as cited previously, there is a higher rate of trauma exposure experienced in this age group as compared to younger adolescents (Finkelhor, Turner, Ormrod, Hamby, & Kracke, 2009), 2) this age group is older than when nightmare prevalence peaks (Alfano, Ginsburg, & Kingery, 2007, Nielsen, Stenstrom, & Levin, 2006; Salzarulo & Chevalier, 1983), and 3) it includes ages typically found in high school. By limiting the sample to African American youth ages 14 through 17, the impact of maturation, age, and cultural background on the dependent variable was reduced. The sample included only African American youth because the clinic patient population is 90% African American.

Power Analysis

Structural Equation Modeling (SEM) was performed to examine possible direct and indirect relationships of the independent variables and mediating variables on quality of life. Nunnally and Bernsten (1994) recommend 30 participants per independent variable in the path model to increase the likelihood that findings can be replicated and reduce error. Therefore, based on this recommendation, 150 participants were required for the current study to test the effects of five latent variables: trauma exposure, nightmares, PTSD symptoms, sleep quality, and quality of life. Including 150 participants in the study provided adequate power to perform all statistical analyses, including SEM and regression analyses, required to test the study hypotheses.

Multiple regression correlation was used to investigate relationships and predictability between adolescent's reported trauma exposure, nightmare frequency, nightmare distress, PTSD symptoms, sleep quality, and quality of life while controlling for gender, depression, and sleep apnea. Power, the likelihood of rejecting the null hypotheses, was set at 80% and a moderate

effect size (0.12) was used to determine the necessary sample size. The significance level, or alpha, is the probability of rejecting a true null hypothesis and was set at 0.05. Based on the parameters set forth by Cohen (1988) for social science studies, a sample size of 92 was needed. The sample size of 150, therefore, was deemed more than adequate to complete all analyses.

Data Collection Instruments

The predictors (trauma exposure, nightmare frequency, nightmare distress), mediator variables (sleep quality, PTSD symptoms), and outcome (quality of life) were assessed via self-report. As research has demonstrated that parents often underestimate the severity of post-trauma problems, and the frequency and distress associated with nightmares experienced by their children (Dyregrov & Yule, 2006; Schredl, Fricke-Oerkermann, Mitschke, Wiater, & Lehmkuhl, 2008), data were obtained via teen-self-report. Demographic information and quality of life were obtained from parents or caregivers using paper and pencil questionnaire.

Trauma Exposure

Trauma exposure was assessed using self-report instruments.

Cumulative Trauma Measure (CT; Kira, Lewandowski, Templin, Ramaswamy, Ozkan, & Mohanesh, 2008). The CT is a 57-item assessment for trauma that measures 22 kinds of traumatic experiences including torture, war, rape, sexual and physical abuse, community violence, car accidents, parental abandonment, exposure to racism, and natural disasters. Development of the instrument was based on the theoretical understanding that different types of traumas and cumulative traumas have different effects on individuals. Participants are asked to rate the frequency of each kind of trauma that has happened over his or her life time. An example of questions asked is, "My parents went through a divorce and/or separation." If this has happened, the participant is asked to indicate the number of times this has happened (never,

once, twice, three times, etc.). Next, if this has happened the participant is asked to rate how it has affected him/her on a Likert scale ranging from 1 (extremely positive) to 7 (extremely negative).

Psychometric properties of the CT were reported by the authors of the scale in a sample of 501 Iraqi refugees from Wayne County, Michigan. The sample ages ranged from 12 to 79 years, but only 9.4% of the sample was aged 12-19. Adequate internal consistency of the measure was found for the adolescent group (alpha = .778). Criterion and predictive validity of the measure were found using multiple regression, path analysis, and logistic regression resulting in significant association between the CT and measures for PTSD and poor health. The CT scale was also used in a study by Kira and associates (2005) of African American and Iraqi children and was found to have adequate internal consistency as a measure of reliability with an alpha coefficient of 0.78.

Survey of Exposure to Community Violence (SECV; Richters & Saltzman, 1990). The SECV measures frequency of exposure to or being a victim of various types of violence in the home, school, or neighborhood. The SECV is a 55-item measure about direct victimization from violence, witnessing violence, and hearing about violence from others on a scale from "never" to "almost every day." Examples of questions in the SECV are "How many times have you *yourself* been in a serious accident where you thought that someone would get hurt very badly or die?" and "How many times have you seen someone else have a serious accident where you thought that the person would get hurt very badly or die?"

Psychometric analysis, reported by Feigelman, Howard, Li and Cross (2000), showed good internal consistency of the measure in their sample of 349 primarily African American youth. Other psychometric analysis has not been published. Established norms are based on

children (N=54) in a low income, moderately violent neighborhood in Washington D.C. (Richters & Saltzman, 1990).

Children's Report of Exposure to Violence (CREV; Cooley, Turner, & Beidel, 1995) measures frequency of teen report to exposure to community violence as a victim, as a direct witness, through reports from others, and through the media. Subscales for the measure include Direct Exposure (real acts that the youth has witnessed or heard about) and Media Exposure (exposure to violence through the media).

The current study included the 12-item subscale of Direct Community Violence which includes questions about being chased, threatened, robbed, beaten up, shot, and stabbed. The questions ask if the exposure ever happened (yes/no), how many times in the last year has it happened and how many times before starting middle school did the exposure happen on a scale of never, one time, a few times, many times, every day. The author of the instrument reported excellent internal reliability and moderate test-retest reliability (Cooley, Turner, & Beidel, 1995).

Nightmare Frequency

Nightmare frequency was measured using teen-self report via paper and pencil questionnaire.

Trauma Related Nightmare Survey (Child Version): (TRNS; Davis, Wright, & Borntrager, 2001). Nightmare frequency was assessed using a modified version of the TRNS, which is a brief self-report measure that assesses frequency, severity, and duration of nightmares, as well as thoughts and emotions related to nightmares. Nightmare frequency is measured by asking participants to recall the number of nightmares they had during the past week and in the previous month. The TRNS (CV) is written at a 4th grade reading level, and has been used with youth age 9 through 17 (Langston, 2007).

Psychometric properties for the adult version of TRNS were assessed in a sample of 49 adults for whom the measure was developed (Davis, Byrd, Rhudy, & Wright, 2007). Adequate test-retest reliability was found for the past week hours of sleep per night ($r=.72$), feeling rested upon waking ($r=.65$), and frequency of nightmares ($r=.64$). Davis, and colleagues (2007) also reported convergent validity with daily records of nightmares and sleep activity for nights with nightmares ($r=.82$), and number of nightmares ($r=.81$), respectively. No psychometric properties are available for the TRNS-CV. Therefore, nightmare frequency was also measured in the current study by specific items pertaining to nightmares using the validated Pittsburg Sleep Quality Inventory (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989), and the Clinician Administered PTSD Scale (Blake, Weathers, Nagy, Kaloupek, Gusman, Charney, & Keane, 1995). The current study conducted correlation analysis finding significant correlations ($p \le .01$) among the among nightmare assessments used, indicating convergent validity of the nightmare measures in the study.

Nightmare Distress

Nightmare distress was assessed using a teen self-report administered by paper and pencil questionnaire.

Nightmare Distress Questionnaire (NDQ; Belicki, 1992). The NDQ is a 13-item instrument that asks participants to rate the degree of distress they experience in relation to their nightmares on a 5-point rating scale. Items 1 through 11 of the NDQ assess nightmare distress and questions 12 and 13 ask about the participant's interest in therapy for nightmares. The current study included only questions pertaining to nightmare distress in analyses. Across four studies in undergraduate samples, Belicki (1992) reported reliability estimates ranging from .83 to .88 for the NDQ. While extensive psychometric data is not available for use in adolescent

populations, this tool was used by Roberts and Lennings (2006) in a sample of 148 Australian adolescents (12-19 years). Adequate internal consistency was reported by Roberts and Lennings (α=86). The current study tested reliability of NDQ items 1 through 12with this sample finding good internal consistency (Cronbach's alpha = 0.918).

PTSD Symptoms

PTSD symptoms were measured using two teen self-report instruments.

UCLA PTSD-RI, Part III. PTSD Symptoms were assessed using the UCLA PTSD-Reaction Index Part III (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick; 1998), which asks about specific post-trauma stress symptoms experienced in the previous month using a five-point Likert-scale (0 = none of the time to 4 = most of the time). Part III assesses for severity of PTSD symptoms as described in the DSM-IV such as intrusion (intrusive images or memories of the trauma coupled with thoughts and feelings re-experiencing the event), avoidance; and increased arousal (hypervigilance, decreased concentration, and exaggerated startle response). A total score of 38 detects PTSD. This score has a sensitivity of 0.93 and specificity of 0.87. An example of questions asked in this measure is "I feel jumpy or startle easily, like when I hear a loud noise or when something surprises me."

Psychometric properties have been examined and reported by Steinberg and colleagues (2004), who reported Cronbach's alpha = 0.88, and test-retest reliability coefficient of 0.84. Good convergent validity was reported as 0.70 with the DSM-IV diagnostic criteria for PTSD and 0.82 with the Clinician Administered PTSD Scale-Child and Adolescent Version (CAPS-CA) (Newman, Weathers, Nader, Kaloupek, Pynoos, Blake, et al., 2004). The UCLA PTSD-RI also includes Part I and Part II, which were not included in this study. The authors of the measure note that the purpose of Part I is to help the teen recall details of the traumatic event and sets the

stage for subsequent questions. Part II assesses whether the traumatic event meets DSM IV diagnostic criteria of trauma. Part I and Part II of the measure were not included in this study because they are duplicative of other assessments used in this study.

Clinician Administered PTSD Scale-2 (CAPS-2; Blake, Weathers, Nagy, Kaloupek, Gusman, Charney, & Keane, 1995). The CAPS-2 assesses frequency of 17 symptoms based on the DSM-IV and provides diagnostic measurement for the diagnosis of PTSD as well as scores for re-experiencing, avoidance and numbing, hyperarousal, and total PTSD. Developed after the CAPS-1, which allows for diagnosis of PTSD, the CAPS-2 was designed to monitor changes in symptom status over a 1week time frame, rather than a one-month time period. The measure can be administered via paper and pencil questionnaire, and provides a brief assessment of PTSD symptom severity, with higher numbers indicating more severe PTSD symptoms. The CAPS-2 includes 18 questions about PTSD symptoms using a 5-point Likert scale to indicate the frequency symptoms in the past week from 0 (not at all), to 5 (more than once a day). An example statement is "how often have you had the feeling of…trying to avoid reminders of painful past events." Adequate interrater reliability (0.76 - 0.99) was measured in a sample of 30 adults (inpatient and outpatient) in treatment for PTSD (Weathers, Keane, & Davidson, 2001). The CAPS-2 score provided a total score indicating the number PTSD symptoms in the past week.

Sleep Quality

Sleep quality was measured in the proposed study by teen self-report and parental report.

The Pittsburg Sleep Quality Index (PSQI; Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). The PSQI is a standardized, self-report questionnaire that was used to measure sleep quality. It consists of 19 items, rated on a 5-point scale, measuring the following seven aspects of

measuring sleep quality: subjective sleep quality, sleep latency, sleep durability, sleep efficiency, sleep disturbances, use of medications and day time dysfunction. The components can be added to yield a total PSQI score; higher scores reflect poorer sleep. An example question in the PSQI is "during the past month, how often have you had trouble sleeping because you wake up in the middle of the night or early morning." The teen is asked to indicate frequency on a scale from "not during the past month" to "three or more times a week."

Buysee and colleagues (1989) reported internal consistency in a sample of 52 healthy adults (control group), 62 adults with sleep disorders, and 34 depressed adults. The authors found the PSQI internal reliability acceptable with a Cronbach's alpha of 0.83 and test-retest reliability coefficient of 0.85 for the global score. For the individual component scores, test-retest reliability of .65 to .84 over an average of 28.2 days (range of 1 to 265 days) was reported by the author. A total PSQI score of 5 yields a diagnostic sensitivity of 89.6% and specificity of 86.5% (kappa = .74, $p<.001$) for poor sleep quality (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). Internal consistency of the PedsQL in the current study sample resulted in the following Cronbach's alpha of subscales: Physical α.= 731, Emotional α = .842, Social α.=.769, and School α =.775.

The PSQI has been widely used by both researchers and clinicians to monitor changes in sleep quality and sleep disorder identification in a variety of populations (Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). Although developed for adults, the PSQI has been used in adolescent studies. For example, Krakow and associates (2001) used the PSQI to evaluate nightmare treatment effectiveness in 19 trauma-exposed adolescent females (age 13-18). In another study Megdal and Schernhammer (2007) used the PSQI to study correlates of poor sleepers in 131 students (grades 9 through 12).

The PSQI includes five items to obtain collateral information from the participant's roommate or bed partner. This section will be completed by the teen's parent. Questions in this section include observations of loud snoring, sleep apnea, restless leg, and episodes of disorientation or confusion.

Quality of Life

Quality of life was measured by teen self-report and parental report. Both instruments were administered via paper and pencil questionnaires.

Peds Quality of Life Inventory-Generic Core Scales (PedsQL 4.0; Varni, Seid, & Rode, 1999). The Peds QL assesses the following domains: 1) physical functioning, 2) emotional functioning, 3) social functioning, and 4) school functioning. The PedsQL consists of 23 items rated on a 5-point Likert scale for participants to report the extent to which each item has been a problem over the past month (0=never a problem, 1= almost never a problem, 2= sometimes a problem; 3 = often a problem; 4= almost always a problem). Total quality of life score is obtained by sum of scores and subscale scores.

Psychometric analysis was conducted on a community sample of 2,437 children and adolescents, ages 8-18. Results found good internal consistency reliability for adolescents age 13-18 (α = 0.72 to 0.89) (Varni, Burwinkle, & Seid, 2006). The authors of the instrument conducted a multi-group confirmatory factor analysis of the measure with different socioeconomic groups in a sample of 453 students age 5-18 finding that youth across SES groups interpreted items on the Peds QL in a similar manner (Limbers, Newman, & Varni, 2008). Also, the authors conducted confirmatory factor analysis of the measure with different race and ethnicity groups in a sample of 5,490 youth from White Non-Hispanic, Hispanic, Asian/Pacific

Islander, and Black Non-Hispanic ethnic backgrounds and found no difference in how youth interpreted items on the Peds QL (Limbers, Newman, & Varni, 2008).

Demographic Information

Demographic Questionnaire. The following demographic data were obtained from the adolescent participant: gender, age, grade, school performance (i.e. recent grades, GPA, and whether or not the teen has repeated a grade, been expelled or suspended from school). Parental report included the teen's health history, household income, insurance, and welfare, if any, the family receives. This information was collected in order to accurately describe characteristics about the sample and to control for covariates in data analysis.

Moderator and Control Variables

Gender, age, household income, welfare, depression, and breathing-related sleep problems are variables that may influence nightmares, sleep quality, and PTSD symptoms and data were collected on these covariates. Gender and age, potential moderators, were recorded on the demographic form. Parental report of household income and welfare were recorded on the parent, or guardian, portion of the demographic form.

The covariate variable depression was assessed using the BASC-2 SRP scale for depression (BASC-2 SRP; Reynolds & Kamphaus, 2004). The scale consists of 16 items asking about feelings of depression, including queries about feeling sad and unhappy. The teen rated their moods and feelings on a scale from "almost always" to "never." The depression subscale is one of the clinical subscales of the BASC-2 SRP. Examples of questions in the BASC-2 SRP depression subscale include True/False questions including "Nothing goes my way." and "Nobody ever listens to me." Examples of items that include rating scales with four choices (from 'never' to 'always') are "I feel sad." and "Nothing about me is right." The publisher's

manual suggest that T-scores from 60 through 69 on clinical scales indicate being at risk for psychological and behavioral problems. The BASC-2 SRP depression subscale has demonstrated adequate reliability for general normed samples of adolescent males (α = .85) and females (α =.85) (Reynolds & Kamphaus, 2004).

Feasibility Study

A feasibility study was conducted in August, 2009, in order to a) check readability and understandability of the instruments in adolescents similar to those that would be included in the current study, b) determine the amount of time needed for data collection, and c) assess feasibility of conducting the study at the Adolescent Clinic. The sample in the feasibility study, 10 adolescents and their parents, were the same age and had similar backgrounds to the sample recruited for this study. As a result of feedback from participants in the feasibility study, one change was made to the measures: Question 7 on the TRNS-Child Version "Did your nightmares begin after something scary happened (such as someone hurting you, a car accident, a fire, or any other traumatic experience)?" was misunderstood by some teens who reported their scary dream as something scary that happened to them. The question was changed to read "Did your nightmares begin after something scary happened **in real life** (such as someone hurting you, a car accident, a fire, or any other traumatic experience)?" In addition, it was determined that the UCLA PTSD-RI Part 1 not be included to measure exposure to trauma because the instrument duplicates questions asked on other instruments that will be used to assess trauma exposure.

<center>*Data Collection Procedures*</center>

Sample Recruitment

The principal investigator met with the Medical Director of the Adolescent Clinic to discuss the purpose and procedures of the proposed study, and obtained written permission to

conduct the study at the clinic. Formal institutional agreement was obtained from Detroit Medical Center and Children's Hospital of Michigan. Approval for the study was obtained from Wayne State University Human Investigation Committee (HIC) before the study commenced.

Recruitment of the sample took place at the Adolescent Clinic. A sign was posted in the clinic lobby advertising the study. Upon check-in, the researcher informed parents and patients of the study and asked if they would be interested in learning more about the study. Parental consent forms and teen assent forms, including thorough information explaining the study and research requirements were explained by the P. I. and signed by the participant and parent or caregiver. The consent forms provided examples of questions that were included in the instruments and information about confidentiality. In order to ensure confidentiality, participants were assigned a code number by the investigator which was used for identification on all questionnaires. Participants were told the study was voluntary and would take approximately 110 minutes for the teen and 20 minutes for the parent, or caregiver, to complete. Adolescents and parents, or guardians, who chose not to participate were not penalized in any way for non-participation.

After completing the consent/assent process, the parent, or guardian, were provided the demographic questionnaire and the BASC-PRS to complete. The researcher restated to the adolescent that the purpose of the study was to learn more about how trauma experiences and nightmares affect different areas of teens' lives. The researcher explained the definition of nightmares in this study is "a very disturbing and unpleasant dream that you vividly recall and sometimes wakes you up." The researcher remained with the adolescent to answer questions, provide clarification, and hand the instruments to the participant. The first instrument the teen completed was the teen demographic form. To test reading and comprehension, the researcher

read the instructions with the teen and told the teen she would like to do the first question together. If the teen is able to comprehend and follow instructions on the instrument, he/she will complete the rest of the demographic form alone. Next, the teen was given the PSQI, which helped him or her think about their sleep patterns and sleep quality. The remaining instruments were given one at a time, and instructions of how to complete each questionnaire were read to the teen. Teens who demonstrated difficulty reading or comprehending the questions, had the questions read aloud, and answers given by the teen were recorded. The researcher provided affirmation and encouragement as the teen completed questionnaires.

Adolescents completed questionnaires in a quiet area in the clinic waiting room, and in the clinic exam room while waiting for their doctor or nurse practitioner. Upon completion of the research instruments, adolescent participants were given $20 as compensation for their time. Parents, or guardians, were given $10 as compensation for their time.   Additionally, teens were given incentives such as bottled water and other snacks during the data collection period. The researcher collected all instruments from the teen and parent, or caregiver.

Seven referrals were made to clinic Social Work staff because teens expressed distressing emotions during data collection, or because the teen was currently a victim of abuse. Of the seven referrals to Social Work staff, two participants withdrew from the study before finishing data collection.   In each instance, social work staff met the teen and parent and offered immediate intervention, as is standard protocol for the clinic.   In addition, parent and teen participants were provided information about community and clinic providers they could contact if they experienced any distressing feelings after participating in the study. No untoward effects were reported or observed that required more than social work referral.

The researcher collected data every day that the clinic was open and alternated between morning hours and afternoon hours so all appointment times were equally represented. The data collection period was July, 2010 to January, 2011 and ended when data were collected from 164 participants. On average, data were collected from approximately 3 or 4 participants each day.

Data Management

Consent forms were kept locked in a file in the researchers home office. Using only code numbers for identification, the collected data were double entered into SPSS Data Entry Station to assure accuracy of data entry. Data were then analyzed by PASW (SPSS Windows), version 18. Path analysis was conducted using LISREL, version 8.80. Prior to data analysis, distribution of variables was examined for accuracy of data entry and to check missing data. Descriptive statistics, multiple regression, and path analyses were used to test hypotheses.

<div align="center">

Data Analysis

</div>

Descriptive Statistics

Descriptive statistics including frequency distributions, measures of central tendency (mean, median, and mode), and dispersion were conducted on all variables of interest to understand, organize, and summarize the data. The categorical variable gender was coded with 1 for boys and 2 for girls. The remaining variables in the study are ordinal, with frequency distributions to provide counts, means, and percentages. Distribution of data was analyzed for symmetry, skewness, modality, kurtosis and outliers.

Cronbach's alpha procedures were conducted on the NDQ. Correlation matrices were constructed of nightmare frequency data collected from the TRNS, CAPS, and PSQI using Pearson's Product-Moment correlations. Reported nightmares in the past week and past month were calculated to create the nightmare frequency variable. Correlation of the CAPS-2 and

UCLA-PTSD Scale were performed using Pearson Product-Moment correlations. T-tests were performed to assess for gender differences in variables studied. Two questions on the CAPS-2 (frequency of nightmares and frequency of violent dreams) were removed from the CAPS-2 total score for analyses to avoid measurement error that would be created by measuring nightmares twice. Multiple regression analyses were conducted to test the strength and direction of hypothesized associations of variables of interest. SEM was performed to test the causal model of trauma, nightmare frequency, nightmare distress, PTSD, sleep quality, and quality of life.

Data Analysis-Hypotheses

Research Question #1: What are the relations between trauma exposure, nightmare frequency, and nightmare distress in urban, trauma-exposed African American adolescents, age 14 to 17?

H1a: There will be a significant positive relation between trauma exposure and nightmare frequency.

H1b: There will be a significant positive relation between trauma exposure and nightmare distress.

H1c: Nightmare frequency and nightmare distress will be significantly positively associated.

Figure 3 depicts the measurement model for the latent variables trauma exposure, nightmare frequency and nightmare distress, as well as the hypothesized associations that were measured to test hypotheses in Research Question 1. Linear regression analyses were used to examine the strength and direction of relations between trauma exposure, nightmare frequency, nightmare distress while controlling for gender and age.
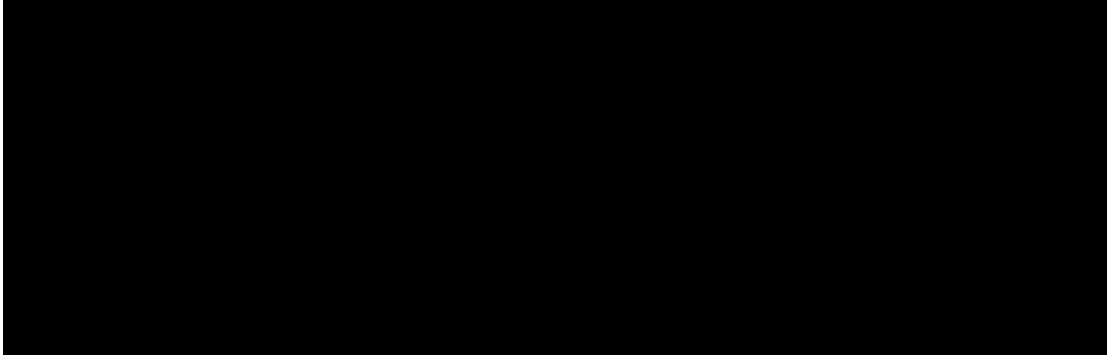
Figure 3. Hypothesized association between trauma exposure, nightmare frequency, and nightmare distress.

Research Question # 2: What are the relations between nightmare frequency, nightmare distress, sleep quality, and PTSD symptoms in urban, trauma-exposed African American adolescents, age 14 to 17?

H2a: Higher nightmare frequency will be significantly associated poorer sleep quality.

H2b: Higher nightmare frequency will be significantly associated with greater PTSD symptoms.

H2c: Higher nightmare distress will be significantly associated with poorer sleep quality.

H2d: Higher nightmare distress will be significantly associated with greater PTSD symptoms.

Figure 4 depicts the measurement model for the latent variables nightmare frequency, nightmare distress, sleep quality, and PTSD symptoms as well as the hypothesized relations included in research question 2. Regression analysis were used to test the direction and strength of the associations between variables, and how much variance in the outcome variable can be

accounted for by the predictor variables. To test H2a and H2c, multiple linear regression analysis was used to examine the relations between nightmare frequency, nightmare distress, and sleep quality while controlling for gender, age, and breathing-related sleep problems. Nightmare frequency and nightmare were entered as independent variables, and sleep quality was entered as the dependent variable. To test H2b and H2d, multiple linear regression analysis was used to examine the relations between nightmare frequency, nightmare distress, and PTSD symptoms while controlling for gender, age, and depression.. Nightmare frequency and nightmare distress was entered as independent variables and PTSD symptoms as the dependent variable.
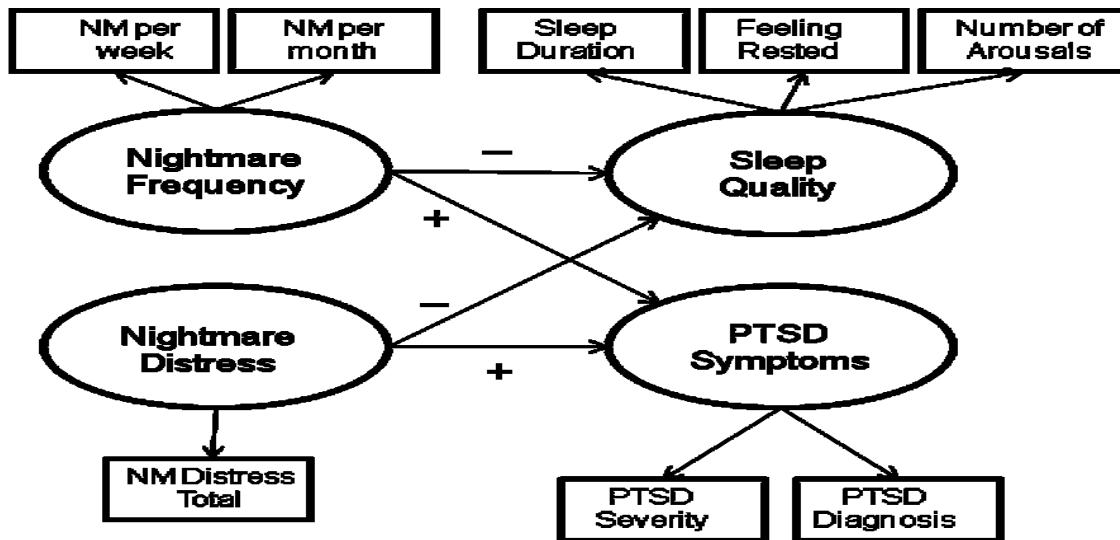
Figure 4. Hypothesized associations between nightmare frequency, nightmare distress, sleep quality, and PTSD symptoms.

PTSD symptoms were measured using the CAPS-2 total score, which includes specific measures of nightmare frequency. To avoid including these items on both the outcome and predictors, the items were removed from the CAPS-2 total score prior to examining the relation between PTSD symptoms and nightmare frequency. Items removed from the CAPS-2 total score include "How often in the past two weeks have you had: 1) bad dreams or nightmares, and 2) violent dreams?" Likewise, one question on the PSQI about how often in the past month the

participant has had bad dreams was removed prior to examining the relation between nightmare frequency and sleep quality. This was done to ensure that the magnitude of relations between nightmare frequency, sleep quality, and PTSD symptoms was elevated by shared variance.

Research Question #3: What are the relations between nightmare frequency, nightmare distress, and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?

H3a: Higher nightmare frequency will be significantly associated with lower quality of life.

H3b: Higher nightmare distress will be significantly associated with lower quality of life.

Figure 5 depicts the measurement model for the latent variables nightmare frequency, nightmare distress, and quality of life as well as the hypothesized associations included in research question 3. Each hypotheses tested in research question 3 was examined using linear regression analysis which showed how much variance in quality of life is explained by nightmare frequency and nightmare distress while controlling for gender and age. Nightmare frequency and nightmare distress were entered as independent variables, and quality of life was entered as the dependent variable.
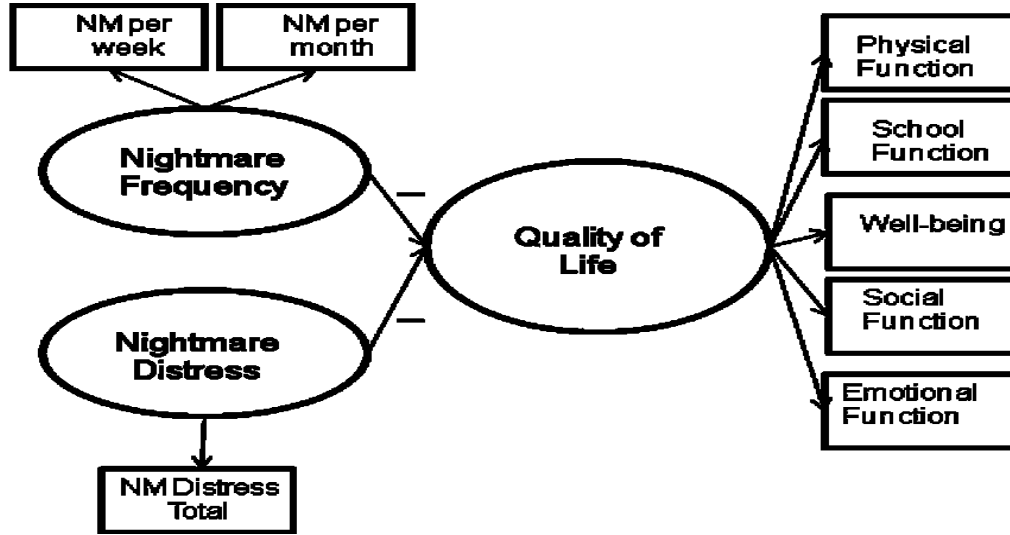
Figure 5. Hypothesized association between nightmare frequency, nightmare distress, and quality of life.

Research Question #4: What are the relations between sleep quality, PTSD symptoms, and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?

H4a: There will be a significant inverse relation between sleep quality and PTSD symptoms.

H4b: Sleep quality will be significantly positively associated with quality of life.

H4c: Greater PTSD symptoms will be significantly associated with lower quality of life.

Figure 6 depicts the measurement model for the latent variables sleep quality, PTSD symptoms, and quality of life as well as the hypothesized associations included in research question 4. Each hypotheses tested in research question 4 was examined using multiple linear regression analysis to show how much variance in quality of life can be explained by sleep quality and PTSD symptoms while controlling for gender, age, depression, and breathing-related sleep problems. Sleep quality and PTSD symptoms were entered as independent variables, and quality of life was entered as the dependent variable.
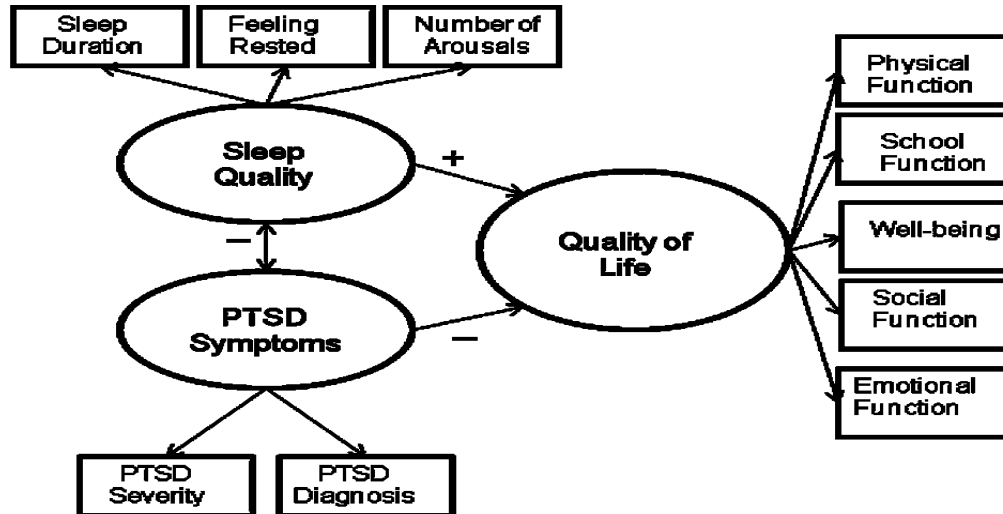
Figure 6. Hypothesized association between PTSD symptoms, sleep quality and quality of life.

Research Question # 5: What are the relations between trauma exposure, sleep quality, and PTSD symptoms in urban, trauma-exposed African American adolescents, age 14 to 17?

H5a: There will be a significant inverse relation between trauma exposure and sleep quality.

H5b: There will be a significant positive relation between trauma exposure and PTSD symptoms.

Figure 7 depicts the measurement models for the latent variables trauma exposure, sleep quality, and PTSD symptoms and the hypothesized associations from research question 5. Linear regression analysis was used to examine the direction and strength of the relations between trauma exposure, sleep quality, and PTSD symptoms while controlling for gender, depression, and breathing-related sleep problems.
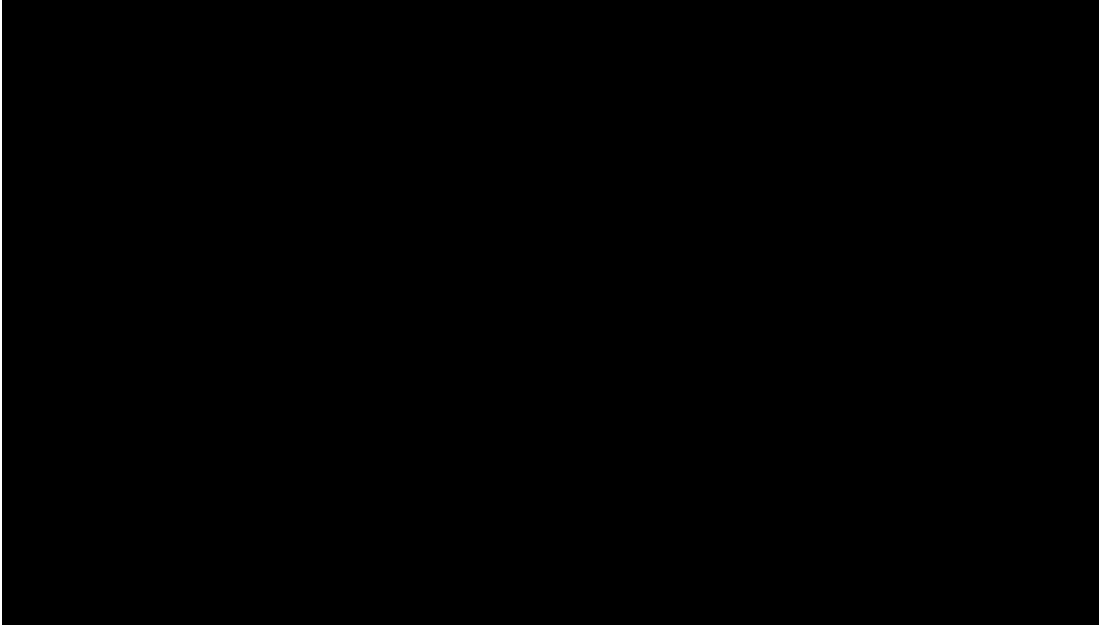
Figure 7. Hypothesized association between trauma exposure, sleep quality, and PTSD symptoms.

Research Question # 6: Do sleep quality and PTSD symptoms mediate the relations between nightmare frequency, nightmare distress, and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?

> H6a: Sleep quality will mediate the relation between nightmare frequency and quality of life.
>
> H6b: Sleep quality will mediate the relation between nightmare distress and quality of life.
>
> H6c: PTSD symptoms will mediate the relation between nightmare frequency and quality of life.
>
> H6d: PTSD symptoms will mediate the relation between nightmare distress and quality of life.

The sixth research question was examined through regression path modeling to determine whether trauma, nightmare frequency, nightmare distress, PTSD symptoms, and sleep quality are related, directly as well as indirectly to quality of life. First, multivariate analysis of variance was used to examine the mulitidimensional effect of independent variables on the mediating variables and on the outcome measure.

The path model depicting the exogenous, intervening, and endogenous variables is shown in figure 8. Specifically, analysis of the path model tested the 1) direct effect of trauma exposure on nightmare frequency and nightmare distress, sleep quality, and PTSD symptoms, 2) the indirect effect of nightmare frequency and nightmare distress on quality of life, and 3) the mediating influences of sleep quality and PTSD symptoms on the relation between nightmare frequency, nightmare distress, and quality of life.
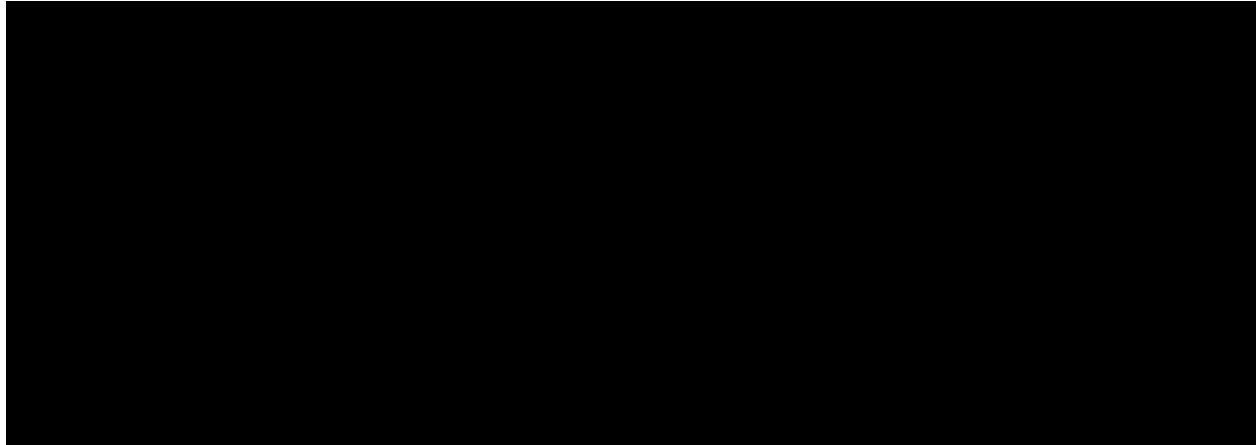
Figure 8. Hypothesized path model. Influence of sleep quality and PTSD symptoms on the relation between nightmare frequency, nightmare distress, and quality of life.

Path analysis is appropriate to test the model because it allowed testing the theorized path by model by explaining the direct and indirect effects that one variable has on another (Kline, 2005). The computer software program LISREL was used to test the fit of the latent variables trauma exposure, nightmare frequency, nightmare distress, sleep quality, PTSD symptoms, and

quality of life. Goodness of fit index (GFI) and comparative fit index (CFI) of .95 and a GFI

greater than .90 was set to indicate adequate fit.

Chapter 4 RESULTS

This chapter reports the results of the statistical analysis of the study. The initial section includes descriptive statistics of the sample and of the variables studied. Descriptive statistics will also be provided for the covariates identified in the study: age, gender, depression, household income, welfare, and depression. In the next section, results from the multivariate and path analyses conducted to test the study hypotheses will be reported and explained. Lastly, a summary of study findings will be provided.

Data Management

Prior to analyses, checks were performed for missing and out-of-range data, for deviations from normality, and potential violations of statistical assumptions. Participants with missing data were removed. Missing data were identified in the PSQI; two participants did not report 'time to bed' and in those cases "hours of sleep" was used to estimate sleep efficiency. Eighteen participants reported their total "hours of sleep" was greater than number of hours in bed. In those 18 cases, "sleep efficiency" was estimated by number of hours in bed and number of minutes it took to fall asleep.

Histogram graphs and box-plots were used to examine data for outliers. Data in six variables contained outliers: depression, nightmare frequency, CAPS-2, cumulative trauma, SECV witnessed-major, and Peds QL total score. Data were brought to acceptable normality using a log-transformation procedure for nightmare frequency. A windsoring procedure was used with depression, CAPS-2, cumulative trauma, SECV Witnessed-major, and PedsQL total score to bring data to acceptable normality.

In order to fully capture the range of PTSD symptoms teens may experience, both the CAPS-2 and the UCLA PTSD Scale total count were used for multivariate analyses. Pearson's

Product-Moment correlations showed high correlation between CAPS-2 and UCLA PTSD Scale (r=0.78, $p \leq$ .001). Two variables (frequency of nightmares and frequency of violent dreams in the past week) were removed from the CAPS-2 score for multivariate analysis to avoid measurement error by counting nightmares twice, as both a symptom of PTSD, and as its own variable.

Descriptive Analysis

Descriptive analysis of the sample, such as age, gender, school performance, and household income will be presented to provide a snapshot of teens who participated in the study. Next, descriptive statistics of the variables studied: frequency and types of trauma exposure, nightmare frequency, nightmare distress, sleep quality, PTSD, and quality of life will be presented. As complete data were obtained, all analyses included the entire sample (n = 151). For significant t-tests, the "t" value and degrees of freedom (*df*) reported in the findings are Equal Variances Not Assumed from SPSS results.

Sample Characteristics

Age and gender.

The convenience sample for this research consisted of 151 African American adolescents, ages 14 to 17. Sample characteristics were obtained through demographic forms completed by teens and their parents (or guardians). The average age of teens in the study was 16 years old (*M* = 16.11, SD = 1.15). Teen age was equally represented across the age range of teens in the sample (21.2% were 14 years; 24.5% were 15 years; 29.1% were 16 years, and 22.2% were 17 years old). Girls in this sample were slightly older than boys, (boy *M* = 15.87, SD = 0.96; girl *M* = 16.20, SD = 1.20, t = -1.71, (*149*), p = .125). More girls (n=111) participated than boys

(n=40). The high number of girls compared to boys in the study is reflective of the Adolescent Clinic patient population.

School performance.

Over two-thirds (69%; n=104) of teens had been suspended from school, and 6% (n=9) had been expelled at some point in their education. The most commonly reported reasons for receiving a suspension at school were fighting (n=47), skipping school or being truant (n=15), and negative actions toward teachers which included insubordination, arguing, talking back, or yelling at a teacher (n=14). No significant gender differences were found in the frequency of school suspensions or expulsions. Thirty-five participants (23.2%) had repeated a grade; an additional four teens had repeated more than one grade. First grade was repeated the most frequently (34 times). Five participants repeated the 2nd grade, 1 repeated the 3rd grade, and 1 repeated the 7th grade. In all 39 grades were repeated.

Mean grade point average (GPA) in the sample was 2.82 (SD = .792). No significant gender differences were reported (girl M = 2.88, SD = 0.826; boy M = 2.66, SD = 0.684; t (83)= -1.12, p = 0.266). Interestingly, only 56% (n = 85) of participants knew their GPA, so it is not known if GPA findings are generalizable to the remainder of the sample.

Household income.

The mean annual income reported was between $10,000 and $19,000 (Table 1). Although the study did not obtain the number of members living in the household information, over two thirds of the sample reported household incomes below the poverty line, based on 2010 U. S. poverty guidelines for as family of four (aspe.hhs.gov, 2010). Most families (72.8%) receive at least one welfare program, such as Social Security, Social Security Supplemental Income, Food Stamps, or Family Independence Program.

Table1
Household Income for the Previous Year (n=147).

Income Last Year	n	%
No Income	6	4.0
$0 - $9,999	44	29.1
$10,000 - $19,999	39	25.8
$20,000 - $29,999	26	17.2
$30,000 - $39,999	10	6.6
$40,000 - $49,999	6	4.0
$50,000 - $59,999	2	1.3
$60,000 - $69,999	5	3.3
$70,000 - $79,999	5	3.3
More than $80,000	4	2.6

Note. Household income was not reported by 4 parents/guardians.

Study Variables

Trauma exposure.

This section explains the findings about frequency and types of trauma exposure through community violence exposures and cumulative trauma exposures. Frequency of exposure to each trauma type will be described for the whole sample. In addition, age and gender differences in trauma exposures will be identified.

Community violence exposure was assessed by the Survey of Exposure to Community Violence (SECV; Richters & Saltzman, 1990) and the Children's Report of Community Violence (CREV; Cooley, Turner, & Beidel, 1995). From the SECV two subscales of violence exposure were identified: 1) witnessing-major, which includes seeing someone else being violently victimized (e.g., shot, stabbed, or raped), and 2) witnessing-minor, which includes seeing less serious situations of community violence where the teen did not see themselves as directly threatened (e.g., seeing someone asked to be involved with selling or using drugs, seeing someone being picked up or arrested, or seeing someone be slapped by a family member).

Seventy-six teens (50.3%) reported at least seven different occurrences of seeing major types of community violence (SECV witnessing-major). Among these events, the most common occurrences were seeing someone seriously wounded (n = 55, 36.4%), seeing someone shot (n = 27, 17.9%) and seeing someone attacked (n = 22, 14.6%).

Teens reported an average of 16 different occurrences of seeing minor types of community violence (SECV witnessing-minor). Among these events, seeing someone picked up or arrested (n = 125, 83.95%), hearing gunfire near home (n = 117, 77.5%), and seeing a person slapped by a non-family member (n = 105, 70.5%) were the most frequently reported. Eleven teens reported hearing gunfire outside the home almost every day, and an additional 13 teens hear gunfire outside their home at least once a week.

Victimization exposure was identified from the CREV data. These data included the number of times the teen had personally experienced community violence (e.g., being beaten up, chased, robbed, or shot). Over half of the teens in the study reported exposure to community violence through direct victimization on at least four different occurrences (n = 87, 57.6%). Of teens who reported direct victimization, 40 teens reported they have been chased, 32 teens reported being beaten up, 13 have been robbed, and 5 have been shot.

Cumulative Trauma Exposure was assessed using the Cumulative Trauma Measure (CT; Kira, Lewandowski, Templin, Ramaswarmy, Ozkan, & Mohanesh, 2008). The CT measures exposure to a broad range of traumatic events (e.g., parental abandonment, physical abuse, sexual abuse, car accidents, exposure to racism, torture, and war). The five most frequently reported traumatic events reported on the CT measure were: 1) "my girlfriend or boyfriend cheated on me" (n=70, 46.4%), 2) "I have witnessed people dealing drugs" (n=63, 41.7%), 3) "my family moved frequently" (n=50, 33.1%), 4) "I experienced sudden unexpected death of a

brother, sister, close relative, or dear friend due to illness or injury" (n = 45, 29.8%), and 5) "I

was abandoned by my father, but not my mother" (n=44, 29.3%).

Table 2
Trauma Exposure Frequency.

Trauma Type	Males			Females			t
	M	SD	Range	M	SD	Range	
Victimization	5.08	1.62	3 – 11	4.64	1.15	3 – 10	1.83
Witnessing-major	8.80	3.72	4 – 33	8.91	3.43	7 – 24	-0.17
Witnessing-minor	28.78	12.91	7 – 73	27.07	12.90	10 – 64	0.72
Cumulative Trauma	4.43	4.02	0 – 22	3.99	3.76	0 - 16	0.62

T-tests identified no significant gender differences in mean frequency of trauma

exposures (Table 2), although, a trend was seen in boys reporting more direct victimization from

community violence than girls (t(149) = 1.83, p =.07). In addition, teen age did not significantly

correlate with trauma exposure (CREV r = .00, p = 92; SECV Witnessing-major r = .01, p = .92;

SECV Witnessing-minor r = .06, p = .50, and CTS r = .03, p = .69).

Further examination of gender differences in trauma exposure revealed that girls and

boys reported being exposed to different types of trauma occurrences. Table 3 shows the trauma

Table 3
Gender Differences in Community Violence (CV) and Cumulative Trauma (CT) Exposure.

	Males = 40		Females = 111		
	n	%	n	%	t
(CV) Been robbed	7	17.5%	6	5.5%	1.97*
(CV) Been beaten up	15	37.5%	17	15.3%	2.25*
(CV) seen others using/selling drugs	33	82.5%	73	65.7%	2.16*
(CV) Sexually assaulted	1	2.5%	32	20.7%	-4.13**
(CT) Death of parent	0	0	11	10%	3.48**
(CT) Unwanted sex	0	0	11	10%	3.48**
(CT) Been cheated on	13	43.5%	57	51.3%	2.12*
(CT) Been arrested	9	22.5%	5	4.5%	2.58**

* p ≤ .05. **p ≤ .001.

types that are significantly different between genders. Boys reported higher numbers of

community violence victimization (e.g., being robbed and being beaten up), and seeing others

using or selling drugs. Boys have also been arrested more than girls. Girls reported higher trauma through being sexually assaulted, or having sexual experiences that they did not want.

Nightmare frequency.

In order to maximize the accuracy of measuring current frequency of nightmares in the sample, nightmare frequency was assessed from items from three independent measures, the Trauma Related Nightmare Survey (TRNS; Davis, Wright, & Borntrager, 2001), the Clinician Administered PTSD Scale-2 (CAPS-2; Blake, et. al., 1995), and the Pittsburg Sleep Quality Index (PSQI; Buysee, Reynolds, Monk, Berman, & Kupfer, 1989). The TRNS assesses the number of nightmares in the past week, and during the past month. The CAPS-2 includes one item that assesses the number of nightmares in the past week. The PSQI includes one item that estimates how often teens have trouble sleeping because they had nightmares in the past month. Correlational analysis between the TRNS, CAPS, and PSQI showed a strong relation among all nightmare assessments (Table 4). Given the magnitude of the relation between all three measures, the nightmare frequency measure (nightmares per week in the past month) was constructed, and all follow-up analysis used a single nightmare frequency measure. Correlational analysis between the three nightmare assessments and the constructed nightmare variable showed strong relations (Table 4).

Table 4
Correlation of Nightmare (NM) Frequency Reports and Constructed NM Variable.

	1	2	3	4
1. TRNS	--	.684*	.587*	.780*
2. CAPS		--	.697*	.922*
3. PSQI			--	.818*
4. NM per week				--

*$p \leq .001$.

Just over half of participants (n = 78, 51.8%) reported at least one nightmare in the past month. Of the 78 teens with nightmares, 22 (14.6%) reported having two or more nightmares per week, and 14 (9.2%) reported experiencing nightmares almost nightly (≥ 5/week). Teen age did not correlate with nightmare frequency ($r = .03$, $p = .72$), but girls reported that they experienced significantly more nightmares than boys ($t (139.9) = -4.74$, $p \leq .001$). As seen in table 5, 13.5% of girls have nightmares at least 4 nights per week.

Table 5
Gender Differences in Nightmare Frequency.

	Males (n = 40)		Females (n = 111)	
Number of Nightmares	n	%	n	%
No nightmares	25	62.5	48	43.2
≥ 1 time/month	6	15.0	16	14.4
1 time/week	9	22.5	25	22.5
2- 3 times/week	0	0.0	7	6.4
4 -5 times/week	0	0.0	10	9.0
6 - 7 times/ week	0	0.0	5	4.5

Nightmare distress.

Nightmare distress was assessed using the Nightmare Distress Questionnaire (NDQ; Belicki, 1992). The NDQ assesses nightmare distress on a scale of 0 – 4 (0 = never feel distressed, 1 = rarely feel distress, 2 = sometimes feel distress, 3 = often feel distress, and 4 = always feel distressed). Mean report of nightmare distress in the sample was low ($M = 0.68$, SD = 0.76). However higher nightmare distress was reported by participants with frequent nightmares (≥ 1 nightmare /month; $M = 0.93$, SD = 0.14)) than those with few nightmares (≤ 1 nightmare/month: $M = 0.29$, SD = 0.49; $t (139.2) = -4.14$, $p = .006$). Similar to nightmare frequency teen age did not correlate with nightmare distress ($r = .02$, $p = 78$), but girls reported higher levels of nightmare distress than boys ($t (97.6) = -2.97$, $p = .004$).

Posttraumatic stress disorder.

PTSD symptoms were assessed using the UCLA PTSD-RI Scale (Pynoos, Rodriguez, Steinberg, Stuber, & Frederick, 1998) and the Clinician Administered PTSD Scale-2 (CAPS-2, Blake et al., 1995). The CAPS-2 assesses frequency of PTSD symptoms in the *past week* (0 = not at all, to 5 = more than once a day). Score totals indicate severity of PTSD symptoms: 0 to 19 = asymptomatic, 20 to 39 = mild, 40 to 59 = moderate, and 60 to 79 = severe PTSD symptoms. The UCLA PTSD-RI scale assesses symptoms over the *past month* (0 = none of the time, to 4 = most of the time), with a score of 38 detecting a PTSD diagnosis.

Frequency analysis showed 22 participants (15%) scored above 38 on the UCLA-PTSD-RI scale, indicating current PTSD diagnosis. Similar amounts of PTSD symptoms were found on the CAPS-2 assessment: 18 (11.9%) participants scored between 20 and 39, indicative of moderate PTSD symptomatology, and 11 (6.6%) teens scored between 40 and 76 (severe symptomatology). No correlation was found between teen age and PTSD (UCLA PTSD-RI I = .00, I = .96; CAPS-2 I= .03, I = .68). Girls reported higher amounts of PTSD symptoms than boys (Table 6).

Table 6
Gender Differences in Mean PTSD scores.

PTSD Measure	Males (n = 40)			Females (n = 111)			
	M	SD	Range	*M*	SD	Range	t
UCLA PTSD-RI	14.60	15.98	0 - 59	20.31	16.67	0 - 67	-1.88*
CAPS-2	9.60	11.55	0 - 47	12.94	15.52	0 - 76	-1.24

p = .06

Sleep quality.

Sleep quality was assessed with the Pittsburg Sleep Quality Index (PSQI; Buysee, Reynolds, Monk, Berman, & Kupfer, 1989) seven subscales (sleep latency, sleep durability, sleep efficiency, sleep disturbance, use of medication, daytime dysfunction, subjective sleep

quality) and total sleep quality score. The sleep disturbance subscale is comprised of 9 scaled items, each rated on a 1 – 3 scale (0 = not during the past month, 1 = less than once a week, 2 = once or twice a week, 3 = three or more times a week). The most often reported sleep disturbance, "waking up in the middle of the night or early morning once or twice a week" was reported by about a third of the teens (n = 39, 32.5%), and three or more times by a quarter of the sample (n = 37, 24.5%).

Higher scores on the PSQI indicate more sleep problems. A PSQI total score of five (5) or more indicates poor sleep quality. About a third of the sample (n = 58, 38.4%) reported PSQI total scores above 5, the instrument's threshold for "poor" sleep quality. Teen age and sleep quality was not correlated ($r = .10$, $p = .21$). Significantly more girls (40.5%) than boys (32.5%) reported poor sleep quality with PSQI scores above 5 ($t = -0.909$, $p = .046$). However, mean scores of sleep quality did not significantly differ by gender (girl $M = 5.36$, SD = 3.76; boy $M = 4.75$, SD = 3.26; $t = -.91$ (149), $p = .36$.

Quality of life.

The Peds Quality of Life Inventory (PedsQL; Varni, Seid, & Rode, 1999) was used to obtain the teens' perception of their quality of life. This measure provides a total life quality score from assessing four subscales; physical, emotional, social, and school. The PedsQL is scored using a 5-point Likert scale of 0 to 4 for each item (0 = never, 1 = almost never, 2 = sometimes, 3 = often, 4 = almost always); higher scores indicate lower quality of life. About one third of the sample (n = 49, 32%) reported school related problems sometimes, often, or almost always. Almost one fourth of teens reported having emotional problems at least sometimes (N = 33, 22%). The subscales in which teen reported the fewest problems were Physical and Social, yet 7% reported problems with physical health and social functioning at least some of the time.

No correlation was found between teen age and PedsQL ($r = .05$, $p = .58$). Girls had higher

mean scores on PedsQL Physical subscale ($t = -6.38$ (128.58), $p \leq .001$), and the Emotional

subscale (t = -2.99 (82.17), p = .007), indicating lower quality of life in each of these domains

(Table 7).

Table 7
Gender Differences in Quality of Life (QOL) Scores on PedsQL.

PedsQL	Males (n = 40)		Females (n = 111)		
	M	SD	M	SD	t
Physical	.16	.27	.58	.52	-6.38**
Emotional	.52	.75	.95	.90	-2.99*
Social	.40	.71	.46	.59	-0.57
School	1.10	.78	1.20	.81	-1.14

$* p \leq .01$, $** p \leq .001$.

Identification of Covariates

Potential covariates were identified *a priori* and tested via correlation analysis. Age,

gender, household income, and welfare were included in the multivariate analyses. In addition,

depression has been associated with poor sleep quality and PTSD symptomology Kirmil-Gray,

Eagleston, Gibson, & Thoresen, 1984). Thus, depression was included in analyses examining the

relation between sleep quality and PTSD symptoms. Depression was assessed via parental report

and teen report. Per parental report only 7.3% (n = 11) of teens had depression. Teen report of

depression was obtained from the depression subscale of the Behavior Assessment Scales for

Children (BASC-2; Reynolds & Kamphaus, 2004). According to the developers of the BASC-2,

T-scores between 60 and 69 indicate risk for depression. Fourteen percent (n = 21) of the sample

reported depression symptoms in the range indicating they are at risk for depression. No

significant gender differences in reports of depression were identified (girl *M*: 5.12, SD = 5.33,

boy *M*: 3.55, SD = 3.91; *t(149)* = -1.70, *p* = .09).

Statistical Analyses of Hypotheses

Hypotheses 1a through 5b were tested using correlational and regression analyses. Step-wise regressions were performed by entering independent variables were in step one; covariates were simultaneously added in step two of the regression. Kleinbaum, and colleagues (2008) state variables that are considered of equal importance may be added simultaneously. Hypotheses 6a through 6d were tested using Structural Equation Modeling (SEM).

Hypothesis 1a. (SUPPORTED). There will be a significant positive relation between trauma exposure and nightmare frequency. A significant positive relation was identified between nightmare frequency and the four study trauma variables: 1) cumulative trauma ($r = .396, p \le .001$), 2) victimization ($r = .146, p = .073$), 3) witnessed-major ($r = .212, p = .009$), and 4) witnessed-minor ($r = .205, p = .011$). Regression analysis revealed that cumulative trauma ($\beta = .45, p \le .001$), and gender ($\beta = .26, p = .001$) predicted higher nightmare frequency scores. All variables included in the model make a significant contribution to predicting nightmare frequency (adj. $R^2 = .20, F = 5.71, p \ge .001$). Table 8 displays the zero-order correlations between the nightmare frequency and the predictor variables, and the standardized regression coefficients (β) and significance (p) for nightmare frequency. Although each community violence measures predicted nightmare frequency when entered into the regression model as the sole violence predictor, when entered all in one step the multicollinearity was evident among the trauma variables and they no longer significantly predicted nightmare frequency. Correlational and regression analysis supported the hypothesis that there is a significant positive relation between trauma exposure and nightmare frequency, and that trauma exposure explains a significant amount of the variance in nightmare frequency, independent of age, household income and welfare status.

Table 8
Regression of Nightmare Frequency by Trauma.

Final Model			
Predictor Variables	*r*	β	*p*
Cumulative Trauma Count	.40***	.45***	.00
CREV Victimization	.15†	-.11	.24
SECV Witnessed Major	.21**	-.03	.79
SECV Witnessed Minor	.23**	.09	.38
Age	.05	-.00	.97
Gender	.25**	.26***	.00
Income	.01	.06	.46
Welfare	.03	.06	.49

†*p*≤.10. *p*≤.05. **p≤ .01. ***p≤ .001.

Hypothesis 1b (SUPPORTED). There will be a significant positive relation between trauma exposure and nightmare distress. A significant positive relation was found between nightmare distress and study trauma measures: 1) cumulative trauma ($r = .36$, $p \leq .001$), 2) victimization ($r = .30$, $p \leq .001$), 3) witnessed-major ($r = .15$, $p = .069$), and 4) witnessed-minor ($r = .25$, $p = .002$). Regression analysis (see table 9) found that cumulative trauma (β = .28, $p = .01$), and gender (β = .20, $p = \leq .001$) predicted greater nightmare distress. Trauma variables and covariates accounted for a significant amount of the variance in nightmare distress (adj. $R^2 = .19$, $F = 5.52$, $p \leq .001$). Correlation and regression analysis supported Hypothesis 1b, finding significant positive relations between trauma exposure and nightmare distress.

Table 9
Regression of Nightmare Distress by Trauma.

Final Model			
Predictor Variables	*r*	β	*p*
Cumulative Trauma Count	.36**	.28	.01
CREV Victimization	.30**	.17	.07
SECV Witnessed Major	.15†	-.16	.10
SECV Witnessed Minor	.25*	.14	.15
Age	.02	-.03	.71
Gender	.20*	.26	.00
Income	-.01	-.09	.33
Welfare	.13	-.14	.09

†*p*≤.10. *p*≤.05. **p≤ .01. ***p≤ .001.

Hypothesis 1c (SUPPORTED) Nightmare frequency and greater nightmare distress will be significantly positively associated. Pearson's Product-Moment Correlation (2-tailed) identified a strong relation between nightmare frequency and nightmare distress (0.640, $p \leq$ .001), thereby supporting the hypothesis. Teens with more frequent nightmares also experience greater nightmare distress.

Hypotheses 2a (SUPPORTED). Higher nightmare frequency will be significantly associated poorer sleep quality. A significant relation was identified between nightmare frequency and sleep quality ($r = .45$, $p \leq .001$). Depression was included as a covariate in the regression equation because, as earlier identified, depression may contribute to the variance of sleep quality. Regression analysis, shown in table 10, identified that sleep quality scores were predicted by nightmare frequency ($\beta = .33$, $t = 4.18$, $p \leq .001$), and depression ($\beta = .32$, $t = 4.15$, $p \leq .001$). All variables in the overall model explained 27% of the variance in sleep quality (adj. $R^2 = .267$, $F = 10.11$, $p \geq .001$). Correlation and regression analyses supported the hypothesis that nightmare frequency is significantly associated with poorer sleep quality. Teens in the sample with higher nightmare frequency and depression have the poorest sleep quality.

Table 10
Regression of Sleep Quality by Nightmare Frequency .

Final Model			
Predictor Variables	r	β	p
Nightmare Frequency	.39**	.33**	.00
Age	.10	.10	.17
Gender	.19*	-.06	.40
Income	.30	.09	.26
Welfare	-.04	.06	.50
Depression	.29**	.32**	.00

*$p \leq .05$, ** $p \leq .001$.

Hypothesis 2b (SUPPORTED). Higher nightmare frequency will be significantly associated with greater PTSD symptoms. A significant relation was identified between nightmare

frequency and the PTSD measures (UCLA PTSD-RI Scale: $r = .46$, $p \leq .001$; CAPS-2: $r = .51$, $p \leq .001$). In addition, there is a significant relation between the covariate, depression, and the PTSD measures (UCLA PTSD-RI Scale: $r = .70$, $p \leq .001$; CAPS-2: $r = .59$, $p \leq .001$). Stepwise regression analyses were performed on each of the PTSD measures (see Table 11).

Table 11
Regression of PTSD by Nightmare Frequency.

Final Models			
Predictor Variables	*r*	β	*p*
UCLA PTSD-RI Scale			
Nightmare Frequency	.47**	.22**	.00
Age	.00	.02	.70
Gender	.15†	.01	.86
Income	-.13	-.14*	.04
Welfare	-.04	-.06	.37
Depression	.70**	.61**	.00
CAPS-2			
Nightmare Frequency	.40**	.34	.00
Age	.05	.06	.35
Gender	.05	-.07	.27
Income	-.10	-.08	.28
Welfare	.03	.02	.81
Depression	.60**	.46**	.00

† $p \leq .10$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

In the first regression, PTSD (via the UCLA PTSD-RI Scale) was entered as the dependent variable. Nightmare frequency explained 21% (adj. $R^2 = .21$, $F = 40.51$, $p \leq .001$) of the variance in PTSD scores. All variables in the model accounted for 53% of the variance in PTSD (adj. $R^2 = .53$, $F = 29.26$, $p \leq .001$). Nightmare frequency (β = .22, $p \leq .001$), depression (β = .32, $p \leq .001$), and household income (β = -.14, $p = .04$) significantly predicted higher PTSD scores. In the second regression, PTSD (via the CAPS-2) was entered as the dependent variable and nightmare frequency explained 23% of the variance of PTSD (CAPS-2) symptoms (adj. $R^2 = .26$, $F = 52.41$, $p \leq .001$). After entering covariates into the model, nightmare frequency (β = .34, $p \leq .001$) and depression (β = .46, $p \leq .001$) predicted higher PTSD scores. Nightmare frequency

and the covariates accounted for 43% of the variance in PTSD (adj. R^2 = .429, F = 19.80, $p \leq$ .001).

Findings from these regressions indicate that low-income, trauma-exposed teens with nightmares and depression are at high risk of developing PTSD symptoms.

Hypothesis 2c (SUPPORTED). Higher nightmare distress will be significantly associated with poorer sleep quality. A significant relation was identified between nightmare distress and sleep quality (r = .39, $p \leq$ .001), and between depression and sleep quality (r = .43, $p \leq$ .001). Regression analysis showed nightmare distress (β = .25, p = .001) and depression (β = .33, $p \leq$ .001) significantly predicted poor sleep quality (Table 12). In the final model, 22% of the variance in sleep quality scores was explained (adj. R^2 = .22, F = 8.20, $p \leq$ .001). Correlation and regression analyses support the hypothesis. Greater amounts of nightmare distress and depression symptoms contribute to poorer sleep quality.

Table 12
Regression of Sleep Quality by Nightmare Distress.

Final Model

Predictor Variables	r	β	p
Nightmare Distress	.33**	.25**	.00
Age	.19*	.10	.16
Gender	.10	-.03	.66
Income	.30	.13	.14
Welfare	-.04	.12	.16
Depression	.29**	.33**	.00

* $p \leq$ .05, **$p \leq$ .001.

Hypothesis 2d (SUPPORTED). Higher nightmare distress will be significantly associated with greater PTSD symptoms. A significant relation was identified between nightmare distress and the PTSD measures (UCLA PTSD-RI Scale: r = .517, $p \leq$ .001; CAPS-2: r = .475, $p \leq$ .001) and between depression and the PTSD measures (UCLA PTSD-RI Scale: r = .704, $p \leq$ .001; CAPS-2: r = .590, $p \leq$ .001). Two regressions were performed with PTSD as the dependent

variable. In the first regression, PTSD symptomology (via the UCLA PTSD-RI Scale) was significantly predicted by nightmare distress (β = .21, $p \leq$ .001) and depression (β = .59, $p \leq$ .001). In the second regression, PTSD (via CAPS-2) was also predicted by nightmare distress (β = .25, $p \leq$ .001) and depression (β = .48, $p \leq$ .001). In the final model, 52% of the variance in PTSD (UCLA-PTSD Scores) was explained (adj. R^2 = .52, F = 28.51, $p \leq$ .001). Findings from regression analyses identifying that PTSD, as measured by both CAPS-2 by the UCLA PTSD-RI Scale, predicted nightmare distress (see table 13) thereby supporting Hypothesis 2d. Teens with greater nightmare distress and depression are a risk for higher PTSD symptoms.

Table 13
Regression PTSD by Nightmare Frequency.

Final Models			
Predictor Variables	*r*	β	*p*
UCLA PTSD-RI			
Nightmare Distress	.52*	.21**	.00
Age	.00	.03	.66
Gender	.15†	.02	.69
Income	-.13	-.11†	.10
Welfare	-.04	-.01	.85
Depression	.70*	.59**	.00
CAPS-2			
Nightmare Distress	.47*	.25**	.00
Age	.05	.07	.31
Gender	.05	-.04	.54
Income	-.10	-.04	.59
Welfare	.03	.08	.28
Depression	.60*	.48**	.00

†$p \leq$.10. *$p \leq$ .01. **$p \leq$ .001.

Hypothesis 3a (SUPPORTED). Higher nightmare frequency will be significantly associated with lower quality of life. A significant relation was found between nightmare frequency and quality of life (r = .42, $p \leq$ .001). Five regression analyses were performed with

Table 14
Regression Analysis of Quality of life QOL by Nightmare Frequency.

Final Models			
Predictor Variables	*r*	β	*p*
QOL-Overall			
Nightmare Frequency	.42**	.38**	.00
Age	.05	.02	.83
Gender	.25*	.15*	.05
Income	.01	-.12	.16
Welfare	.03	-.12	.16
QOL-Physical			
Nightmare Frequency	.34**	.27**	.00
Age	.11	.06	.41
Gender	.37**	.30**	.00
Income	-.05	-.08	.35
Welfare	.00	-.05	.58
QOL-Emotional			
Nightmare Frequency	.56**	.54**	.00
Age	.02	-.01	.84
Gender	.22	.09	.22
Income	-.00	-.07	.35
Welfare	-.07	-.13†	.10
QOL-School			
Nightmare Frequency	.14†	.13	.14
Age	.06	.05	.55
Gender	.09	.06	.52
Income	-.03	-.06	.52
Welfare	-.02	-.05	.59
QOL-Social			
Nightmare Frequency	.19*	.21*	.02
Age	-.06	-.06	.45
Gender	.05	.00	.99
Income	-.11†	-.18†	.06
Welfare	-.02	-.15	.11

†$p \leq .10$. *$p \leq .05$. **$p \leq .001$.

quality of life subscales (overall, physical, emotional, school, and social) as dependent variables, and nightmare frequency as the predictor variable (see Table 14). Quality of life overall scores were predicted by nightmare frequency (β = .38, $p \leq .001$) and gender (β = .38, $p \leq .001$). Likewise, physical quality of life scores were significantly predicted by nightmare frequency (β = .34, $p \leq .001$) and gender (β = .37, $p \leq .001$). Nightmare frequency uniquely predicted poorer quality of life in the emotional scale (β = .54, $p \leq .001$) and social scale (β = .21, $p \leq .05$).

Nightmare frequency and covariates explained 17 % of the variance in overall quality of life (adj.

$R^2 = .17, F = 31.19, p \leq .001$).

Table 15
Regression Analysis of Quality of life QOL by Nightmare Distress.

Final Models			
Predictor Variables	*r*	β	*p*
QOL-Overall			
Nightmare Distress	.59***	.46	.00
Age	.05	.02	.75
Gender	.25**	.15	.04
Income	.01	-.06	.44
Welfare	.03	-.02	.82
QOL-Physical			
Nightmare Distress	.39***	.34	.00
Age	.11	.07	.37
Gender	.37***	.29	.00
Income	-.05	-.04	.65
Welfare	.00	.03	.76
QOL-Emotional			
Nightmare Distress	.59***	.56	.00
Age	.02	-.00	.95
Gender	.22**	.11	.12
Income	-.00	.00	1.00
Welfare	-.07	-.01	.95
QOL-School			
Nightmare Distress	.18*	.17	.04
Age	.06	.05	.53
Gender	.09	.05	.55
Income	-.03	-.04	.67
Welfare	-.02	-.01	.88
QOL-Social			
Nightmare Distress	.34***	.33	.00
Age	-.06	-.06	.46
Gender	.05	-.02	.84
Income	-.11	-.14	.12
Welfare	-.02	-.08	.37

† $p \leq .10$. * $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Hypothesis 3b (SUPPORTED). Higher nightmare distress will be significantly associated

with lower quality of life (QOL). A significant relation was identified between nightmare distress

and overall quality of life ($r = .59, p \leq .001$). Five regression analyses were performed using the

overall with quality of life and each of the four subscales as dependent variables, and nightmare

distress as the predictor variable (see table 15). Nightmare distress (β = .46, $p \leq$.001), gender (β = .15, $p \leq$.05) significantly predicted overall quality of life scores. Also, nightmare distress (β = .34, $p \leq$.001), gender (β = .29, $p \leq$.001) significantly predicted quality of life scores in the physical scale. Nightmare distress uniquely predicted lower quality of life scores in three domains: School (β = .17, p = .042), Social (β = .33, $p \leq$.001), and Emotional (β = .56, $p \leq$.001). The highest magnitude of effect from nightmare distress was identified in the emotional scale of quality of life (β = .56, t = 8.63, $p \leq$.001). In the final model, nightmare distress and covariates explained 24% of the variance in overall quality of life (adj. R^2 = .24, F = 48.88, $p \leq$ .001). Correlational and regression analyses support Hypothesis 3b that higher nightmare distress is associated with lower quality of life.

Hypothesis 4a (SUPPORTED). Poorer sleep quality and greater PTSD symptoms will be significantly positively associated. As shown in table 16, a significant relation was identified between sleep quality (PSQI) and PTSD symptoms (CAPS-2: r = .78, $p \leq$ .001; UCLA PTSD-RI Scale: r = .40, $p \leq$ .001). These findings support the hypothesis that sleep quality and PTSD symptoms are significantly associated.

Table 16
Correlation of Sleep Quality and PTSD Measures.

	1	2	3
PSQI	--	.37*	.40*
CAPS-2	--	--	.78*
UCLA PTSD Scale	--	--	--

$*p \leq .001$.

Hypothesis 4b (SUPPORTED). Poorer sleep quality will be significantly associated with lower quality of life. A significant relation was identified between sleep quality and quality of life (r = .47, $p \leq$.001). Five regression analyses were performed with QOL total score and the four subscales as dependent variables, and sleep quality as the predictor variable (see Table 17).

Sleep quality and gender significantly predicted overall quality of life scores, as well as quality of life scores in the physical and emotional scales. Sleep quality uniquely predicted quality of life in the school scale (β = .31, $p \leq$ .001) and in the social scale (β = .33, $p \leq$ .001). In the final model, sleep quality and covariates explained 26% of the variance in overall QOL (adj. R^2 = .26, F = 11.69, $p \leq$ .001). These findings indicate that teens who have poor sleep quality are likely to function poorly and have lower quality of life.

Table 17
Regression of Quality of Life QOL by Sleep Quality.

Final Models			
Predictor	r	β	p
QOL-Overall			
Sleep Quality	.47***	.47***	.00
Age	.05	-.02	.79
Gender	.25**	.21***	.00
Income	.01	-.14	.09
Welfare	.03	-.11	.17
QOL-Physical			
Sleep Quality	.32***	.29***	.00
Age	.11	.04	.59
Gender	.37**	.34**	.00
Income	-.05	-.09	.29
Welfare	.00	-.04	.63
QOL-Emotional			
Sleep Quality	.53***	.53***	.00
Age	.02	-.05	.45
Gender	.22*	.19**	.01
Income	-.00	-.09	.27
Welfare	-.07	-.12	.14
QOL-School			
Sleep Quality	.31**	.31***	.00
Age	.06	.02	.76
Gender	.09	.07	.40
Income	-.03	-.08	.40
Welfare	-.02	-.05	.56
QOL-Social			
Sleep Quality	.25**	.27***	.00
Age	-.06	-.06	.46
Gender	.05	-.02	.84
Income	-.11	-.14	.12
Welfare	-.02	-.08	.37

*$p \leq$ .05. **$p \leq$ .01. ***$p \leq$ .001.

Hypothesis 4c (SUPPORTED). Greater PTSD symptoms will be significantly associated with lower quality of life. A significant relation was identified between PTSD symptoms (via UCLA PTSD-RI Scale and CAPS-2) and overall QOL (UCLA PTSD-RI r = .72, $p \leq$ .001; CAPS-2 r = .68, $p \leq$ .001). Regression analyses were performed with QOL (overall, physical, emotional, school, and social) as the outcome variables and PTSD (UCLA PTSD-RI scale and CAPS-2) as the predictor variables (Table 18).

Table 18
Regression Quality of Life QOL by PTSD.

	UCLA PTSD-RI Scale			CAPS-2		
Final Models						
Predictor	r	β	p	r	β	p
QOL-Overall						
PTSD	.72***	.71**	.00	.68***	.66	.00
Age	.05	.02	.69	.05	-.01	.90
Gender	.25**	.14	.17	.25**	.19	.00
Income	.01	.03	.68	.01	-.03	.64
Welfare	.03	-.01	.92	.03	-.02	.24
QOL-Physical						
PTSD	.44***	.40***	.00	.42***	.40***	.00
Age	.11	.07	.35	.11	.05	.50
Gender	.37**	.30***	.00	.37**	.33***	.00
Income	-.05	.01	.94	-.05	-.03	.76
Welfare	.00	.02	.81	.00	-.02	.79
QOL- Emotional						
PTSD	.77***	.77***	.00***	.75***	.75***	.00
Age	.02	-.01	.92	.02	-.04	.47
Gender	.22*	.11*	.05*	.22*	.16*	.01
Income	-.00	.10	.12	-.00	.03	.57
Welfare	-.07	.00	.10	-.07	-.08	.60
QOL- School						
PTSD	.42***	.42***	.00	.41***	.40***	.00
Age	.06	.05	.50	.06	.03	.67
Gender	.09	.02	.77	.09	.05	.48
Income	-.03	.02	.80	-.03	-.01	.90
Welfare	-.02	.01	.91	-.02	-.03	.71
QOL- Social						
PTSD	.56***	.56***	.00	.44***	.44***	.00
Age	-.06	-.06	.40	-.06	-.08	.30
Gender	.05	-.03	.65	.05	.02	.81
Income	-.11	-.07	.41	-.11	-.12	.15
Welfare	-.02	-.07	.41	-.02	-.13	.14

* $p \leq$ .05.** $p \leq$ .01. ***$p \leq$ .001.

In the final regression models PTSD (via UCLA PTSD scale) and covariates accounted for 52% of the variance in overall QOL (adj. R^2 = .52, F = 163.96, $p \leq$ .001), and PTSD (via CAPS-2) and covariates accounted for 45% of the variance in overall QOL (adj. R^2 = .45, F = 124.97, $p \leq$ .001). Regression analysis (see table 18) shows that there PTSD (PTSD-RI Scale β = .71, $p \leq$ .001; CAPS-2 β = .66, $p \leq$ .001) significantly predicted lower overall quality of life scores. In addition, PTSD uniquely predicted lower quality of life in the school and social domains.

Hypothesis 5a (SUPPORTED). There will be a significant inverse relation between trauma exposure and sleep quality. Three of the four trauma variables were significantly correlated with sleep quality (CT r = .24, p = .003; victimization r = .23, p = .005; CV witnessed-minor r = .18, p = .03). The trauma variable CV witnessed major was not significantly correlated with sleep quality (r = .15, p = .06). When entered into the regression model, covariates and trauma variables explained a significant amount of variance in sleep quality (adj. R^2 = .05, F = 2.85, p =.026). Due to multicollinearity identified in earlier analyses, trauma variables when entered as a group did not significantly contribute to the variance in sleep quality.

Table 19
Regression Sleep Quality by Trauma Exposure.

Final Models			
Predictor Variables	r	β	p
Cumulative Trauma Count	.24**	.14	.20
Victimization	.23**	.14	.20
Witnessed-Major	.15[†]	-.03	.79
Witnessed-Minor	.18*	.08	.48
Age	.19*	.08	.35
Gender	.10	.10	.23
Income	.30	.07	.46
Welfare	-.04	.05	.60

[†]$p \leq$ .10. *$p \leq$ .05. **$p \leq$ .01.

However, trauma variables were significantly associated with sleep quality thus the hypothesis was supported (see Table 19).

Hypothesis 5b (SUPPORTED). There will be a significant positive relation between trauma exposure and PTSD symptoms. Correlational analyses identified significant relations between PTSD and cumulative trauma, CT victimization, CT witnessed-major, and CT witnessed-minor (see Table 20).

Table 20
Correlation of Trauma types and PTSD.

Trauma Measures	UCLA PTSD Scale	CAPS-2
Cumulative Trauma	.45*	.46*
CREV Victimization	.37*	.32*
SECV Witnessed-major	.34*	.35*
SECV Witnessed-minor	.43*	.42*

*$p \leq .001$.

Two regression analyses were conducted with PTSD (UCLA PTSD-RI Scale and CAPS-2) as the dependent variables and trauma types (cumulative trauma, CREV victimization, SECV witnessed-major, and SECV witnessed-minor) as predictor variables. In the final regression model, 25% of the variance in PTSD was explained via the UCLA PTSD scale (adj. $R^2 = .25$, $F = 13.22$, $p \leq .001$) and 24% of the variance in PTSD was explained via the CAPS-2 (adj. $R^2 = .24$, $F = 12.79$, $p \leq .001$). PTSD scores via the CAPS-2 were uniquely predicted by trauma (cumulative trauma = $\beta = .32$, $p = .002$; witnessed-minor = $\beta = .22$, $p = .03$). As shown in Table 21, PTSD scores on the UCLA PTSD scale were significantly predicted by cumulative trauma ($\beta = .25$, $p = .008$), gender ($\beta = .21$, $p = .004$), and household income ($\beta = -.17$, $p = .04$). Correlation and regression analyses support Hypothesis 5b that trauma exposure predicts PTSD symptoms.

TABLE 21
Regression of PTSD by Trauma.

| Final Model	*r*	β	*p*
Predictor Variables			
Cumulative Trauma Count	.45**	.25*	.01
CREV Victimization	.37**	.16[†]	.09
SECV Witnessed Major	.34**	-.03	.76
SECV Witnessed Minor	.43**	-.03	.76
Age	.00	-.03	.68
Gender	.15[†]	.21**	.00
Income	-.13	-.17*	.04
Welfare	-.04	-.10	.24

[†]*p*≤.10. **p*≤.05.***p*≤.001.

Structural Equation Model

Upon completion of multivariate analyses, a Structural Equation Model (SEM) was performed using LISREL to test Hypotheses 6a through 6d. Included in the model were variables identified as predictors of quality of life: trauma exposure, nightmare frequency, nightmare distress, sleep quality, and PTSD symptoms. In addition, covariates (household income, teen gender, teen age, and welfare) were also included. Household income and welfare were combined to represent socioeconomic status (SES) and included in the initial structural equations.

Structural Equation Modeling involves three steps: 1) specification of fixed parameters and free parameters of the model, including variables and paths, 2) estimation made by the LISREL analysis of parameters that are assessed for goodness of fit, and 3) assessing goodness of fit (Burns & Grove, 1997). Paths that were not significant at $p \leq 0.10$ (i.e., SES and age) were removed from the model. For the final SEM model, results were reported as standardized path

coefficients. The final model fit the data very well: $\chi^2 = 269.77$, df = 215, $p < .01$, RMSEA = .041, Goodness of Fit Index (GFI) = .86 (figure 9).
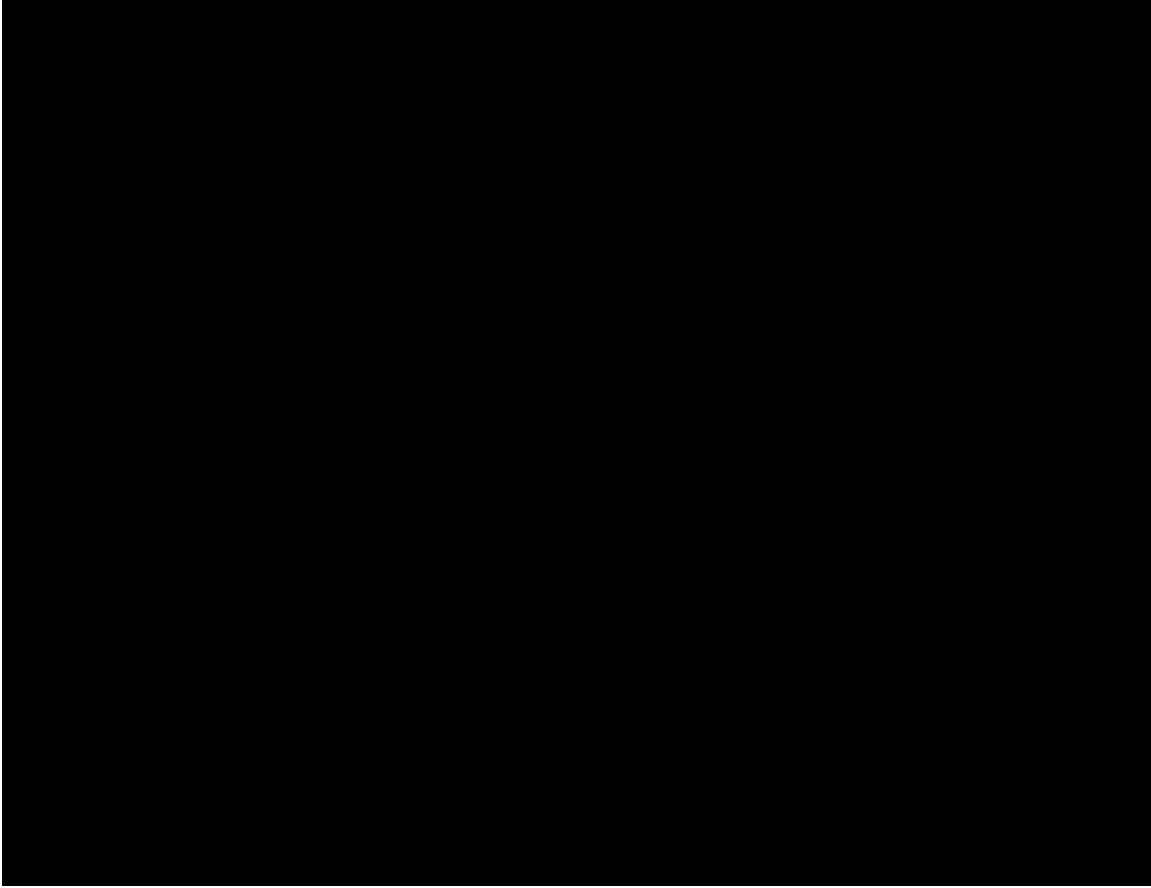
Findings from the SEM model provided evidence for hypotheses 6a, 6b, 6c, and 6d.

Hypothesis 6a (SUPPORTED). Sleep quality will mediate the relation between nightmare frequency and quality of life.   Sleep quality is uniquely predicted by nightmare frequency ($\beta = .10$, $p < .001$). Sleep quality, in turn, predicted poorer quality of life ($\beta = .07$, $p = .006$). The hypothesis that sleep quality mediates the relation between nightmare frequency and quality of life is supported.

Hypothesis 6b (NOT SUPPORTED). Sleep quality will mediate the relation between nightmare distress and quality of life. This hypothesis is not supported in the SEM model.

Nightmare distress does not predict sleep quality; therefore sleep quality does not mediate the relation between nightmare distress and quality of life.

Hypothesis 6c (NOT SUPPORTED). PTSD symptoms will mediate the relation between nightmare frequency and quality of life. This hypothesis is not supported in the SEM model. Nightmare frequency does not predict PTSD; therefore PTSD does not mediate the relation between nightmare frequency and quality of life.

Hypothesis 6d (SUPPORTED). PTSD symptoms will mediate the relation between nightmare distress and quality of life. SEM identified that nightmare distress predicted PTSD symptoms ($\beta = .08$, $p = .003$). In turn, PTSD directly influenced quality of life ($\beta = .12$, $p < .001$). The hypothesis that PTSD mediates the relation between nightmare distress and quality of life is supported.

Additional Findings

Four additional findings identified from SEM path results add to understanding nightmares and quality of life in trauma-exposed teens. 1) Nightmare frequency was predicted by trauma exposure ($\beta = .08$, $p < .001$) and gender ($\beta = .07$, $p = .001$). Girls who have high amounts of trauma exposure experience the most frequent nightmares. 2) Higher levels of nightmare frequency predicted increased nightmare distress ($\beta = .10$, $p < .001$) and poor sleep quality ($\beta = .10$, $p < .001$). Interestingly, the path between nightmare frequency and nightmare distress was unidirectional. Teens with higher frequency nightmares will have more distress from their nightmares, but not vice versa. Also, teens with frequent nightmares have the poor sleep quality. 3) Nightmare distress ($\beta = .08$, $p = .003$), poor sleep quality ($\beta = .19$, $p = .004$) and trauma ($\beta = .08$, $p < .001$) all positively predicted PTSD symptomatology. A combination of factors influence severity of PTSD symptoms: including nightmare distress, poor sleep quality, and trauma

exposure. 4) Quality of life was directly influenced by poor sleep quality ($\beta = .07$, *p* = .006), PTSD ($\beta = .12$, *p* < .001), and gender ($\beta = .05$, p = .010). Sleep quality and PTSD symtpomatology mediated the relations between predictor variables and quality of life. A surprising finding was the direct influence of gender on quality of life. Girls' perception of quality of life is lower than boys' perception of their quality of life.

Summary of findings

The study hypotheses were designed to examine the effect of trauma, nightmare frequency, and nightmare distress on quality of life, and to determine if sleep quality and PTSD mediate the relations. Study hypotheses predicted that the effect on quality of life by nightmare both frequency and nightmare distress would be mediated by sleep quality and PTSD. Several significant results were found in the study. Nightmare frequency and nightmare distress are associated with quality of life in unique pathways. Nightmare frequency influences sleep quality, while nightmare distress influences PTSD symptoms. An unexpected finding of the study is that trauma exposure predicts nightmare frequency and PTSD but not nightmare distress. Nightmare distress, however, predicts PTSD. Lastly, gender predicts nightmare frequency and quality of life, but not nightmare distress or sleep quality. These findings will be further explained in the discussion section of the study.

Chapter 5 DISCUSSION

The purpose of this study was to expand knowledge about the associations of nightmare frequency and nightmare distress, sleep quality, PTSD symptoms, and quality of life in urban, trauma-exposed African American adolescents. The theoretical framework of the Roy Adaptation Model (RAM) guided the study in conceptualizing nightmares as the focal stimuli that affect adaptation and quality of life in adolescents. Contextual stimuli, such as age, gender, household income, and trauma exposure that could influence nightmares were identified and measured in the study. This study measured observable behaviors in two of the RAM adaptive modes; physiological and self-concept modes, through assessing PTSD symptoms and sleep quality. Finally, the study examined adaptation through assessing teens' perceptions of quality of life.

The following section provides a discussion of key study findings and a comparison of the key findings with extant literature about trauma exposure and nightmares. In addition, findings about the effects of gender on the variables studied will be discussed. Study strengths and limitations will be identified and discussed. The study significance will be discussed including the impact this study can have on nursing practice, such as improved assessment for trauma and nightmares, and ways nurses can advocate for teens. Lastly, recommendations for future research will be identified.

Every teen in this community sample had been exposed to multiple traumas, over half had at least one nightmare in the prior month, and close to 20% had PTSD symptoms. Every teen had been directly exposed to trauma, whether through community violence, from relationships with peers or dating partners, or from traumatic events in the home. In addition, all teens had witnessed community violence such as seeing someone attacked, hearing gun fire

outside their homes, or being the victim of an attack. Another disturbing finding of the study was number of teens who endorsed multiple trauma exposures in their lifetime. Previous studies about teens and trauma indicate that having one exposure to trauma puts teens at a higher risk for future trauma occurrences (Finkelhor, Ormrod, Turner, Hamby, & Kracke, 2009). Multiple trauma exposure has a cumulative effect in many facets of teens' lives. Teens in the current study reported high amounts of trauma exposure in their every day lives, and given the fact this is a community sample, the trauma exposure reported in this study may be just the "tip of the iceberg".

Teens recruited for the study had come to the Adolescent Clinic at Children's Hospital of Michigan for a routine health care visit, such as annual check-ups, sports physicals, birth control, and other well-teen health care. High exposures to trauma, and high numbers of teens with nightmares and PTSD symptoms are therefore more dramatic given the sample was a community sample of "average" urban teens who, in the usual course of their day deal with highly disruptive issues that, in many cases, interfere with their optimal functioning and quality of life. Importantly, while almost one fourth of the sample reported emotional problems, the study sample was not a clinical sample of teens being treated for mental health problems. Also, since the majority of teens in the sample were receiving preventative health care, they are likely to have functioning family systems that are stable enough to schedule and keep health care appointments, as compared to those teens who do not have an adult that ensures the teen receives health care. Because of this, the sample may reflect more organized family systems that better able to protect their teens from as many traumatic exposures as those teens that do not receive primary health care.

Discussion in Relation to Specific Research Questions

1. What are the relations between trauma exposure, nightmare frequency, and nightmare distress in urban, African American Adolescents age 14 to 17?

This study found that trauma exposure, specifically cumulative trauma, predicted higher nightmare frequency; the more exposures to trauma teens have is directly related to how frequently they have nightmares. Assessment of trauma in the study was not based on one discrete trauma exposure, rather a wide variety of trauma exposures were assessed (e.g., witnessing community violence, direct victimization, and cumulative exposures), and over the teens' lifetime. Nightmares are a common reaction to trauma exposure, and when exposures to trauma are multiple and cumulative, nightmares can become more frequent and long-lasting.

Nightmare distress was assessed using the Nightmare Distress Questionnaire (Belicki, 1992) which assesses how much daytime disturbance is attributed to the nightmare. The amount of nightmare distress was overall low, but became significantly greater as nightmare frequency increased. Teens with the highest nightmare frequency had the greatest nightmare distress. It is possible that there is a kindling effect of nightmare distress, in that the distress teens experience is compounded as the frequency of nightmares increase. Teens with multiple nightmares every week may perceive greater distress because they do not have as many nights without nightmares to recover from the emotional toll from the nightmare. In the same respect, it is possible that teens that have one nightmare during the month may have a chance to recover from the distress of the nightmare before they have another nightmare. Thus, longer periods of time between nightmare occurrences may help to dissipate teens' perspective of distress associated with nightmares because the teen has a chance to put it out of mind.

2. What are the relations between nightmare frequency, nightmare distress, sleep quality, and PTSD symptoms in urban, trauma-exposed African American Adolescents, age 14 to 17?

Nightmares and sleep quality.

Most teens in the study had a nightmare in the prior month and 20% of the girls had at least two nightmares each week. Findings from the study showed that nightmare frequency, nightmare distress, and depression predicted poor sleep quality. The most common reason teens identified for poor sleep quality was waking up in the middle of the night or early morning. Previous research has also shown that nightmares contributed to poor sleep quality from waking up and not being able to return to sleep (Kales, Soldatos, Caldwell, et. al, 1980; Köthe & Pietrowsky, 2001). Teens may wake up from a nightmare feeing scared or distraught and have a difficult time returning to sleep. Also, even if teens do not wake up from the nightmare, they still may have more fitful sleep causing them to feel tired and not rested when they wake up.

Nightmares and post traumatic stress disorder symptoms.

Nightmares are one of the re-experiencing symptoms of PTSD and questions in the PTSD assessment asked about the presence of nightmares. Therefore in order to accurately measure the effects from nightmares on PTSD the nightmare questions from the PTSD assessment were removed before analysis. This study found that nightmare frequency, nightmare distress, and depression contributed to higher PTSD symptoms (after removal of the nightmare questions). This finding is similar to findings reported by Davis and colleagues (2007); more disturbing nightmares (as compared to less disturbing nightmares) were more highly associated with PTSD symptoms in trauma-exposed adults. Nightmares may remind the teen about past trauma, which could contribute to worse PTSD symptoms. Also, nightmare content that is similar to the

traumatic events could make the teen feel they are reliving the trauma, and thereby exacerbate PTSD symptoms.

3. What are the relations between nightmare frequency, nightmare distress, and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?

Quality of life is not just the absence of illness or disease, rather it is well-being in all aspects of life, including physical, emotional, social, and school functioning. The study showed that nightmares, both the frequency of nightmares and distress associated with nightmares, contributed to lower quality of life in every domain (physical, emotional, social and school). This study found that 32% of teens identified problems in school and 22% had emotional problems. One possible reason nightmares may have adverse effects on emotional well-being is that nightmares can evoke feelings of fear, anger, disgust, or sadness. The nightmare itself may be traumatic, and teens with may find it impossible to stop thinking about the nightmare, or be preoccupied by trauma experience recalled through the nightmare.

Nightmares are considered focal stimuli (within the Roy Adaptation theoretical framework) that become the focus of attention, when the teen awakens and vividly recalls the nightmares. The negative feelings that the teen wakes up with after a nightmare may persist when the teen wakes up, and may interfere with optimal functioning at school and other aspects of daily life, thus decreasing overall quality of life.

4. *What are the relations between sleep quality, PTSD symptoms and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?*

Sleep quality and quality of life

Both poor sleep quality and higher PTSD symptoms impaired quality of life in this sample. Poor sleep quality contributed to lower level of functioning in all aspects of quality of

life (physical, emotional, school functioning, and social). From a theoretical perspective, the RAM identifies sleep as a component of the physiological adaptive mode, and notes that adequate sleep is necessary for effective adaptation. Effective adaptation leads to higher quality of life. Findings from the study emphasize the importance of sleep in daily functioning and life quality. It is possible that poor sleep quality contributed to school functioning because sleepy teens may be less able to learn, problem solve, and succeed in school. Recently expectations have been raised for schools to show high academic outcomes in their students and sleep-deprived teens are greater risk of falling behind their peers who do not have problems sleeping. In addition, poor sleep can have an adverse affect on emotional functioning leaving teens less able to cope with everyday stressors. Social functioning can also become impaired because teens with inadequate sleep are more irritable and less able to get along with others (Kirmil-Gray, Eagleston, Gibson, & Thoresen, 1984). Finally, as obesity has received a great deal of national attention in recent years. Sleep deprivation has been shown to contribute to lower physical activity, exercise, and obesity (Gupta, Mueller, Chan & Meininger, 2002; Taheri, 2006).

PTSD and quality of life

Findings from this study showed PTSD and quality of life are related. This finding, in itself is not new, and a previous adolescent study reported correlational relations among PTSD and problems in school functioning, family relations, somatic complaints and mood problems (Avery, Massat, & Lundy, 2002). The current study extended Avery's correlational findings through the use of regression analysis that showed PTSD symptoms accounted for 52% of the variance in overall quality of life. The emotional aspect of quality of life was most significantly related to PTSD symptoms, which is not surprising, given PTSD symptoms are mostly emotional in nature. However, associations between PTSD symptoms and quality of life were not isolated

to emotional aspects, and findings of the study showed PTSD predicted physical problems. Teens with higher PTSD symptoms may report more physical complaints to their health care provider than teens without PTSD, and they may be higher consumers of health care. Lastly, PTSD predicted more problems with social and school functioning. PTSD symptomology includes intrusive recollections of trauma, whereby they re-live the traumatic event in their thoughts. Intrusive recollections may interfere with teens' ability to concentrate on school subjects, and impair learning. Findings from the study promote the need for early detection and treatment of PTSD symptoms in the adolescent population in order to decrease the adverse affect PTSD symptomology has on teen's quality of life.

5. *What are the relations between trauma exposure, sleep quality, and PTSD symptoms in urban, trauma-exposed African American adolescents, age 14 to 17?*

Trauma exposure and sleep quality

Findings of the study indicate that trauma (victimization, witnessing, and cumulative trauma) was correlated to sleep quality. However when regression analysis was performed to examine the degree to which trauma predicted poor sleep quality, multicollinearity effects between the trauma variables influenced the regression findings. Multicollinearity exists when two variables measure the same construct, and results in the each of the two variables cancelling out the effects of the other variable. Findings from the study, therefore, show that trauma is significantly related to sleep quality.

Trauma exposure and PTSD

Trauma exposure was significantly related to higher PTSD symptoms. This is not surprising; given PTSD is a consequence of trauma exposure. Because of this, four different types of trauma exposure were assessed. The study examined exposure to trauma events from

direct victimization and through seeing situations that are traumatic. All types of trauma statistically predicted higher PTSD symptomology. This finding emphasizes that even "just" witnessing traumatic situations can result in significant PTSD symptoms. Teens in this study witnessed an average of 28 "minor" events. Yet, perhaps seeing multiple "minor" events over time has a cumulative effect that can result in PTSD. Also, it is likely that adolescents who witness minor events of community violence are around situations and places where they are at higher risk of witnessing other types of community violence or being directly victimized.

Interesting associations between PTSD symptoms and sleep quality were identified through path analysis. Sleep quality had a direct effect on PTSD symptoms in the study, but the path was unidirectional; PTSD symptomatology did not have a direct effect on sleep quality. This finding is contrary to a supposition made by Harvey and colleagues in their review of sleep and PTSD (Harvey, Jones & Schmidt, 2003). Harvey and colleagues postulated that sleep quality may be impaired due to the PTSD-related pre-sleep thoughts and that greater PTSD may contribute to poor sleep quality from frequent awakenings during the course of the night. Harvey and colleagues reviewed studies with adult samples, whose PTSD symptomatology is likely different than the adolescent sample in this study. For example, teens may not have as much stress-related sleep problems as adults, or teens may cope with emotional problems such as PTSD by sleeping more. Findings from the current study indicate that poor sleep quality may contribute to the risk of teens developing more PTSD symptoms. Thus assessment of sleep is vitally important, along with early interventions to promote good sleep to help teens cope with stressors and possibly decrease the risk of developing severe PTSD.

Another factor associated with higher PTSD symptoms was lower household income. Several reasons may account for this finding. Teens from poorer families may not have

resources available to them to curb the negative impact of trauma. It is possible that teens from poor families go without treatment for PTSD for a myriad of reasons (e.g., lack of access to mental health care, not having a parent home to help schedule appointments, lack of trust or belief in the benefit of mental health care, or limited availability of trained mental health providers). Another possible reason lower household income predicted higher PTSD symptoms is that teens from poorer families are often exposed to higher doses of trauma, or different types of trauma that would put them at greater risk of PTSD symptoms (Finklehor, Turner, Ormrod, Hamby, & Kracke, 2009).

6. Do sleep quality and PTSD symptoms mediate the relations between nightmare frequency, nightmare distress, and quality of life in urban, trauma-exposed African American adolescents, age 14 to 17?

To test the hypotheses generated by Research Question 6, Structural Equation Modeling (SEM) was performed. This advanced statistical procedure tested the hypothetically causal paths leading from trauma exposure and nightmares to quality of life. SEM produced important findings about the how sleep quality and PTSD symptoms mediate, or have an effect on, the relation between nightmares and quality of life. Nightmare frequency and nightmare distress are two distinct phenomenon, as evidenced by the unique ways they affect quality of life.

The path model confirmed that sleep quality mediated the relation between nightmare frequency and quality of life, but not between nightmare distress and quality of life. It is interesting that it may be the quantity of nightmares, and not the distress from them, that contributes to poor sleep quality and decreases quality of life. Teens who waken frequently from nightmares, or have less restful sleep because they have frequent nightmares, may begin to show signs of poor sleep which may lead to quality of life problems. Routine assessments should

include nightmare frequency, and interventions that target nightmare frequency should be offered. Another reason for lack of influence from nightmare distress on sleep quality could be from the overall low amount of nightmare distress in the sample.

The path model also confirmed that PTSD symptoms mediated the relation between nightmare distress and quality of life, but not nightmare frequency and quality of life. Distress that is attributed to nightmares may indirectly affect quality of life from higher PTSD symptoms. Some nightmares may be more distressing than others. A qualitative difference in nightmare distress has been identified in previous research (Davis, Byrd, Rhudy, & Wright, 2007; Terr, 1983) in that some nightmares are replicative of the trauma exposure, and other nightmares are more random and not at all like the trauma. Replicative nightmares are often more distressing, and may lead to worse PTSD. While more research is needed about nightmare content and distress, it is clear from this study that higher nightmare distress reported by teens is associated with the severity of their PTSD symptoms and puts teens at risk of lower quality of life.

Findings Related to Gender

Several gender differences were found in the study. Gender differences included girls were at higher risk than boys for 1) reporting more nightmares, 2) worse PTSD symptomatology, and 3) poorer quality of life. It is well known from previous studies that, after the age of 14, girls have more nightmares than boys (Abdel-Khalek, 2006; Nielsen, Stenstrom, & Levin, 2006). The current study confirmed that finding in the adolescent sample, all of whom were over age 14. Girls in this study also reported more nightmare distress than boys. This finding is similar with Belicki, (1992) the developer of the NDQ. Lastly, girls in this study had significantly higher PTSD scores than boys. This finding is consistent with conclusions from the meta-analysis about gender differences in trauma and PTSD conducted by Tolin and Foa (2006).

Tolin and Foa found that, even after controlling for types of trauma, girls were more likely than boys to meet criteria for PTSD.

The current study found differences in the kinds of trauma reported by boys and girls. As an example, more girls than boys were sexually abused or had a parent die, whereas boys were more frequently beaten up or robbed. Both trauma exposure types may be horrifying for a teen to experience, but the girls' trauma could be considered a more personal violation than that of the boys. The current study did not examine PTSD based on trauma type, and more research is needed in the area.

Study Strengths

Strengths of the Sample

The study sample included an understudied group (i.e., trauma-exposed, urban, African American adolescents) to improve understanding of nightmares in this population. Analysis of demographic variable demonstrates the sample was highly homogeneous. Homogeneity in the sample was achieved by a conscious and determined adherence to the sample inclusion criteria of (African American boys and girls, age 14 to 17 who are patients in the clinic) and also due to demographic commonalities in the adolescents who received health care provided at this clinic. While homogeneity in the sample reduces generalizability, it helps to eliminate the effects of possible extraneous variables that could affect the outcome variable in a study (Kerlinger & Lee, 2000).

Strengths Related to Measurement Reliability and Validity

One of the strengths of the study was that, unlike many previous studies that used measures developed for and used in adult populations, this study used almost all instruments that were developed and tested for reliability and validity specifically in adolescent samples.

However, one measure used in the study that was developed for adults was the Nightmare Distress Questionnaire (NDQ; Belicki, 1992). Therefore, reliability was tested in this sample and good reliability was found.

Nightmares were examined using responses to three measures that asked nightmare frequency in the past week and in the past month. Assessing nightmares through recall over the past week and month of specific numbers expanded previous research about nightmares in teens. Many previous studies were imprecise in their assessment nightmare frequency, such as by asking teens whether or not they have ever had a nightmare, or estimating how many nightmares teens could recall over the past year, or solely through asking parents to estimate how many nightmares their teen may have had. The current study's method of assessing frequency of using multiple measures added more confidence that nightmare frequency was accurately measured. In addition, the study limited nightmare frequency to those experienced in the past week and past month, in order to match assessments used for sleep quality, PTSD, and quality of life.

Multiple measures were also used to assess PTSD symptoms. This was important because two questions were removed from the CAPS-2 scale because the questions asked about nightmares. Because the measure was altered, it was prudent to include a second measure for PTSD. Analyzing responses to both measures gave the researcher more confidence that the PTSD construct was measured accurately.

Strengths of Data Collection Methods

Strict adherence to established data collection protocols reduced the potential of researcher bias. Data were collected at various hours throughout the days the clinic was open, and all participants who met the inclusion criteria were asked to participate. The researcher used scripted instructions about how to complete questionnaires were provided to all participants

in the same manner. Adherence to the scripted instructions decreased variation in how the instructions were presented, and prevented the possibility that an important part of the instructions may have inadvertently been left out.

Nightmares were clearly defined for participants in this study. This was an important improvement in protocol compared to previous research. Many previous research studies have not defined what a nightmare is, leaving it up to the participant to decide what is, and is not, a nightmare. Lack of definition of a construct, such as nightmares, can lead to inconsistent reporting. A participant who believes that a nightmare must wake him or her up in a panic to qualify as a nightmare will report fewer nightmares than the participant who believes any mildly unpleasant dream is a nightmare.

Another study strength was that data about nightmares and other variables of interest in the study were collected by teen self-report. Self-report may provide a truer estimate of teen's perceptions compared to parental report. This is particularly important in assessing nightmare frequency because parents may be unaware of nightmares in their older children. Even though some previous research has relied on parental report for nightmare frequency, parental reports are not the most accurate way to determine nightmare frequency because they have been found to under-estimate how many nightmares the teen has (Schredl, Fricke-Oerkermann, Mitschke, Wiater, & Lehmkuhl, 2009). While there are limitations to self-report, which will be presented in the limitations section of this discussion, social science research frequently relies on self-report and it is the most common method used in nightmare research (Levin & Nielsen, 2007).

Strengths of Statistical Analysis

This study advanced previous nightmare research in teens by using more sophisticated statistical analysis than in previous studies, which relied on correlational research methods. This

study used regression analysis which helped identify associations and predict the influence of independent and dependent variables. Another step forward in understanding the influence of nightmares that this study provided was from the use of path analysis. Structural Equation Modeling explained the direct and indirect effects of nightmares on sleep quality, PTSD and quality of life. The SEM path analysis confirmed the unidirectional causal flow of the study variables, thus improving understanding about which variables have the greatest influence on quality of life.

Strengths of the Use of Nursing Theory

This study promoted utilization of the Roy Adaptation Model in nursing research. The RAM incorporates theoretical constructs and practical applications that helped lay the groundwork for understanding the multidimensional facets of teens. The study used the RAM to identify nightmares as focal stimuli that affect adaptation and quality of life in adolescents. The RAM helped the researcher identify contextual stimuli, such as age, gender, SES, and trauma exposure that could influence nightmares. The RAM has been used in studies of trauma-exposed adults, but the current study is the first to employ the RAM theoretical precepts in trauma-exposed adolescents.

Findings from the study added to the discipline of nursing by expanding current knowledge about nightmares in trauma-exposed adolescents. According to Roy, the goal of nursing practice is to promote well-being and health as the nurse intervenes by helping the person increase their adaptive responses (Roy & Andrews, 1991). This study adds to the practice of nursing because it promotes the assessment for trauma exposure and nightmares by nurses, and lays the groundwork for interventions to target nightmares in teens.

The current study examined two of the four adaptive modes identified by Roy, the physiological and self-concept modes. The RAM could also be a useful theoretical guide for future research about nightmares that would include assessments of the adaptive modes of role function and interdependence. Lastly, Roy's conceptualization of coping processes, including the regulator (innate coping) and cognator (learned coping) coping mechanisms could guide future research about nightmares in teens.

Study Limitations

Limitations of Sample

The study used a convenience sample of African American low-income urban, teens. The design of the study limited inclusion criteria of the sample in terms of ethnicity and age range in order to maximize homogeneity and thus reduce other sources of variance, but in doing so, findings from the study may not be generalizable to teens from other ethnic backgrounds, or teens that are younger or older than the sample age. In addition teens were recruited at only one location in the city of Detroit. Therefore, findings may not be generalizable to all teens, such as suburban or rural teens, or teens from other cities in the United States. A final limitation was that the sample was a convenience sample and was mostly girls. While the sample was representative of the patient population in the clinic because more girls were seen in the clinic, the findings of the study are skewed towards girls' responses, and therefore may not be representative of the general teen population.

Source of Bias

While self-report measures are frequently used in social science research and self-report is the most common method used in nightmare research (Levin & Nielsen, 2007), this type of reporting can be a source of bias. Participants may vary their responses based on what they think

are the researcher's expectations, or to make themselves look better or worse than they are. In addition, self-report questionnaires elicit information about the participant's own perceptions at a given time and place about their life experiences. For example, perceptions of sleep quality or quality of life could have been affected by how well teens slept the night before, or how well they felt on the day of the study. If they were awake the night before, or felt sick the day of the study, they might have perceived their overall sleep quality or quality of life as poor, and responded accordingly. The researcher understands the developmental view of teens who may be more apt to "live in the moment" and thus have their perceptions and responses more determined by how they feel at the moment rather than from an overall perspective, and, to reduce this source of bias, the researcher instructed participants to think about the past month while responding to questionnaires. Also, the researcher attempted to improve time perspective by including event anchors of something that happened one month ago, such as "since school started", or "since Thanksgiving'.

A challenge to accurately assessing nightmare frequency is that of recall. Teens who had a nightmare the night before may over-report their overall nightmare frequency because they recall the nightmare more clearly. Alternatively, teens whose last nightmare was several weeks earlier may forget how many nightmares they had in the past month and may under-report overall frequency. The study sought to reduce the chance of under- or over-reporting nightmares by asking about number of nightmares using several measures.   Teens were asked about nightmares in the past week, and then in the past month, using questions from three assessments. Asking about nightmare frequency in the past week is are likely more reliable than asking teens to estimate how many nightmares they have in general, or over the past year because teens are

more likely to remember numbers of recent nightmares better than nightmares from the distant past.

Limitations in Design

A limitation of the study was that it used a cross-sectional study design. A cross-sectional design can give a snapshot of the teen's current perceptions at one time, and can not provide data about how teen's perceptions may change over time. In addition, cross-sectional designs cannot show that one variable causes a change to occur in another variable. To strengthen the design, this study included a predictive design strategy and model testing that examined how trauma and nightmares influence quality of life variables.

A limitation in the study research design was that the measurement for socioeconomic status (SES) used in the study was a "proxy measure" for the construct of SES, and included only household income and welfare status. Other factors, such as education level and occupation of the primary wage earner, and number of people in the household, should be included in future research to gain a more accurate assessment of SES. Another limitation in instrumentation was that the construct of nightmare distress was measured by an instrument developed for adults, and while the instrument showed good reliability in the study sample, it may not completely capture teen's perceptions about distress associated with nightmares. Lastly, quality of life was measured by only one instrument, the PedsQL and, while the instrument has been shown to be a valid and reliable measure of quality of life in urban teens, the study may have been stronger if quality of life was assessed using multiple measures.

<div align="center">

Significance

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All teens in this community sample of teens receiving primary health care had been exposed to multiple traumatic events. In addition, over half of them reported at least one

nightmare in the past month finding that underscores trauma-exposed teens have frequent and distressing nightmares. Further, statistical analyses provided evidence that trauma and nightmares predicted poor sleep quality, more PTSD symptoms, and lower quality of life. Nurses and other health care providers who work in urban health centers are likely to see many teens, just like those in the study who have been exposed to trauma, have frequent nightmares, and are possibly not functioning at their optimal level. It is crucial, therefore, that nurses ask specific questions about trauma exposure and nightmare experiences.

Assessing for trauma and nightmares

Nurses in primary care settings, schools, or other community settings are in a prime position to ask specific questions about possible trauma exposures. The simple act of asking teens in a private and safe location, such as the clinic office, is an important first step to detection of and intervention for trauma. In addition, if teens share they have experienced a traumatic event, they should be asked about other victimizations and trauma occurrences, because, as this study emphasized, trauma exposure is usually not one isolated event. Nurses can use developmentally-appropriate screening tools, such as the assessments used in this study, which assess community violence and cumulative trauma exposure. Incorporating trauma assessments as standard practice would improve comprehensive care for teens.

Likewise, it is important that nurses and other health professionals ask teens about nightmares. Findings from this study clearly show that nightmares pose a significant risk to teens quality of life, yet nurses and other health care providers are often remiss in asking about nightmares. Owens (2006) assessed knowledge and attitudes of 626 pediatricians regarding sleep disorders in children and adolescents and noted that health care providers do not adequately assess for sleep problems due to lack time and lack of basic knowledge about sleep disorders.

Also, teens do not often come to see their health care provider with a primary complaint of nightmares, even if they have frequent nightmares. Unless the health practitioner brings up the topic of nightmares, it is often not addressed. Nurses can become more knowledgeable about nightmare in their teen patients. By simply asking patients to tell them about nightmares they may help the teen become open to interventions for treating nightmares.

Intervening when trauma or nightmares are detected

As found by the high number of trauma exposures reported by teens in the sample, not all trauma exposure can be prevented. Nurses and other health care providers must respond quickly to help reduce the negative sequela of trauma exposure. Early detection of trauma exposure, and providing a safe place where teens feel comfortable talking about their experiences is an important first step. Nurses who listen non-judgmentally are able to help the teen begin to express their feelings and may help the teen become more amenable to accepting counseling from a professional therapist. Through careful listening, nurses can identify which teens may need follow-up counseling to deal with traumatic experiences. Nurses can be resources for teens by knowing where teens can turn for help with PTSD or other emotional problems. Nurses who are knowledgeable about mental health centers or professional therapists can be instrumental in "paving the way" by making referrals and providing contact information. Developmentally-appropriate individual and group therapies for PTSD are available and helpful for teens to identify their emotions, develop coping skills, and improve their overall functioning and quality of life.

For some teens, however, PTSD symptoms seem resistant to treatment. For these teens, it is possible that frequent and distressing nightmares may be an overlooked trigger to their PTSD symptoms. Teens with treatment refractory PTSD symptoms may be reliving trauma

events that caused the PTSD in their nightmares.   Teens with frequent nightmares could benefit from therapy that specifically targets nightmares in addition to treatment for overall PTSD symptoms.   Treatment for nightmares are not as well known or used as often as PTSD treatments, yet therapy that specifically targets nightmares could improve overall treatment outcomes.   In addition, this study emphasized the profound impact nightmares had on functioning and quality of life, thus treating them is crucial to improving overall health and quality of life.

While most of the treatment research for nightmares has been carried out in adults, there are treatments that appear promising for teens with nightmares. Two examples of treatments that target nightmares are 1) Imagery Rehearsal Therapy (IRT; Krakow, Kellner, Neidhardt, Pathak, & Lambert, 1993) which is a cognitive behavioral therapy, and 2) Exposure, Relaxation, and Rescripting Therapy (ERRT; Davis, 2009) which combines exposure therapy and behavioral therapy approaches. Both IRT and ERRT promote re-scripting the nightmare through changing the content and ending of the nightmare, and have been successfully used for treatment of chronic trauma-related nightmares. In addition, IRT, while developed for adult populations, was tested in a small sample of adjudicated girls with promising success (Krakow, Sandoval, Schrader, et. al., 2001).

More work is needed in developing nightmare treatments for adolescent populations. Nurse clinicians and researchers knowledgeable in adolescent development can collaborate with other therapists, and use successful adult therapies such as IRT or ERRT as a starting point for developing and testing treatments to target nightmares in trauma-exposed teens. Treatments to target nightmares go hand in hand with cognitive behavioral interventions for PTSD currently used. Nightmare treatment could be the key to unlocking the door to refractory PTSD; reducing

nightmares teens may decrease the triggers that evoke PTSD symptoms, and improve overall mental health and functioning.

Advocacy

Nurses have a long history of being identified as patient advocates, and advocating on behalf of low-income teens is even more important because they very little political power. Therefore, in addition to assessment and interventions for trauma and nightmares on an individual level, nurses can advocate for teens by being on the frontlines of policy making and education programs designed to reduce rates of teen trauma exposure. Nurses in policy making roles can work for policies that make communities safer, such as improved gun control, better funding for crime prevention programs such as neighborhood watch programs and increased police presence, and tougher sentences on perpetrators. Nurses who work in schools are in a unique position to collaborate with other school professionals to promote programs that decrease violence, such as bullying and fighting, in their schools. Lastly, nurses who work with teens and parents in all settings can advocate for teens by providing education and support in ways to help teens stay safe.

Recommendations for Future Study

Although this study extended knowledge about nightmares in adolescents in a number of ways, there are still many unanswered questions. Thus, more studies are needed to improve understanding of nightmares in teens. For example, further exploration of nightmares in samples of teens from different SES and cultural groups, and from different geographic locations are needed. In addition, future studies that include collateral information from parents may provide more objective data about teen functioning and health. Further understanding about nightmares

could also be gained through employing other study designs such as prospective or qualitative designs.

Prospective studies using dream logs, such as the studies conducted by Wood and Bootzin (1990) and Levin and Fireman (2002) would add more descriptive knowledge about the effects of nightmares on quality of life in adolescent samples. Prospective studies could employ dream logs or diaries of how teens perceive their ability to cope and function during the day after they have had a nightmare, thus giving more information regarding their perceptions of how nightmares affect their daily functioning. Although this type of prospective study may be difficult to conduct because it would require high levels of participant commitment to complete daily diaries, this method could be very useful in helping clinicians understand that nightmares have direct and immediate effects on teen's emotions and functioning.

Other types of qualitative studies, such as focus groups, that further explore teen's subjective responses to nightmares could promote understanding of the lived experiences of nightmares. Questions that could be answered through qualitative methods are those that explore and describe teen's feelings immediately after waking up from a nightmare, what helps them to feel better, if and how their nightmares have changed as they have gotten older, and perceptions of how nightmares affect daily functioning. Content of nightmares could be further explored through qualitative research methods to help differentiate if some nightmares are more disturbing than others, thus improving understanding of nightmare distress. Teen's subjective point of view about nightmares could improve overall understanding of nightmares.

Lastly, future research is needed that include testing of nightmare interventions. For example, intervention studies are needed to test outcomes of developmentally-appropriate interventions, based on treatment models similar to IRT or EERT, what would target nightmare

in addition to usual PTSD therapy. Randomized experimental designs could compare groups of trauma-exposed teens who receive the nightmare intervention along with usual PTSD therapy with those who receive usual PTSD therapy and those who receive no therapy. Intervention research such as this would inform clinicians and researchers about the benefits of including targeted treatment for nightmares, and possibly improve outcomes in their patients with PTSD.

Conclusion

This study was the first study to examine associations between nightmares and quality of life in trauma-exposed adolescents. Finding from the study are a big step forward in advancing our knowledge of nightmares in adolescents and their relation to trauma, PTSD, sleep quality, and quality of life. Participants in this community based sample had high amounts of trauma exposures and nightmares that were directly related to worse PTSD and poor sleep quality. In addition, negative outcomes associated with nightmares were found in problems identified in physical and emotional health, relationship problems, and problems functioning in school. Understanding about the adverse outcomes of nightmares gained from this study make it clear that, in addition to vigilant assessment for nightmares, developmentally-appropriate treatments that target nightmares are needed. Nurses and health providers who work with trauma-exposed adolescents can utilize findings from this study to be the forerunners of helping reduce nightmares and improve health and quality of life for teens.

APPENDIX A

WAYNE STATE UNIVERSITY

HUMAN INVESTIGATION COMMITTEE
101 East Alexandrine Building
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://hic.wayne.edu

NOTICE OF FULL BOARD APPROVAL

To: Barbara Peterson
Family, Comm Mental Health
5557 Cass

From: Ellen Barton, Ph.D.   *S. Millis for /CB*
Chairperson, Behavioral Institutional Review Board (B3)

Date: July 16, 2010

RE: HIC #: 063910B3F

Protocol Title: Trauma, Nightmares and Quality of Life in African American Teens

Sponsor:

Protocol #: 1006008435

Expiration Date: June 16, 2011

Risk Level / Category: 45 CFR 46.404 - Research not involving greater than minimal risk

The above-referenced protocol and items listed below (if applicable) were **APPROVED** following *Full Board Review* by the Wayne State University Institutional Review Board (B3) for the period of 07/16/2010 through 06/16/2011. This approval does not replace any departmental or other approvals that may be required.

- Flyer
- Participant Information Form
- Assent Form (revised 7/8/10)
- Parental Permission/Research Informed Consent (dated 7/8/10)

* Federal regulations require that all research be reviewed at least annually. You may receive a *"Continuation Renewal Reminder"* approximately two months prior to the expiration date; however, it is the Principal Investigator's responsibility to obtain review and continued approval *before* the expiration date. Data collected during a period of lapsed approval is unapproved research and can never be reported or published as research data.

* All changes or amendments to the above-referenced protocol require review and approval by the HIC **BEFORE** implementation.

* Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the HIC Policy (http://www.hic.wayne.edu/hicpol.html).

NOTE:

1. Upon notification of an impending regulatory site visit, hold notification, and/or external audit the HIC office must be contacted immediately.
2. Forms should be downloaded from the HIC website at each use.

APPENDIX B

Parental Permission/Research Informed Consent

Title of Study:

Nightmares and Quality of Life in Teens

Principal Investigator (PI):   Barbara L. Peterson, R. N.

C/O Wayne State University College of Nursing

577 Cass Ave.

Detroit, MI 48202

(313) 577-5137

Purpose

You and your child are being asked to be in a research study focused on trauma and nightmares because your child is an African American teen between 14 and 17 years of age. This study is being conducted at the Children's Hospital of Michigan Adolescent Clinic. The estimated number of study participants to be enrolled in the study is about 165 teens and their parents or caregivers. Please read this form and ask any questions you may have before agreeing to be in the study.

In this research study, we will learn about different traumatic events and situations in young people's lives, and how these events affect their sleep, functioning in school and home, and overall quality of life. This information will be used to help me earn my PhD at Wayne State University.

Study Procedures

If you and your child agree to take part in this research study, he/she will be given several questionnaires that ask about exposure to various traumatic events, sleep, nightmares, functioning in school and home, and quality of life. As the parent/caregiver you will be asked to complete a demographic questionnaire and a questionnaire that asks about their daily functioning. Names will not be placed on any of the questionnaires. Upon completion, all forms and questionnaires will be stored in a locked filing cabinet. Informed consent and youth assent forms will be kept in a separate location. It will take about 90 minutes for your teen to complete the questionnaires while you wait here in the waiting room. It will take about 15 minutes for you to complete your portion of the questionnaires. If your teen's name is called for his/her appointment, he/she can finish after the appointment.

Benefits

As a participant in this research study, there may be no direct benefit for you or your child; however, information from this study may benefit other people with traumatic exposures and nightmares now or in the future.

Risks

There are no known risks at this time for you to participate in this study, however, by taking part in the study, your child may experience the following risks. It is possible, that your child may become anxious, sad, or angry by some of the questions that ask about trauma or nightmares. Ms. Peterson, the

researcher, is a trained psychiatric nurse practitioner with many years of experience working with adolescents experiencing stress. Therefore, if your child does become upset by any of the questions, Ms. Peterson can help you and your child discuss the situation, decide whether or not to continue in the study, and alert the clinic staff for assistance if that becomes necessary.   If you wish, your child might also seek help from a school counselor or another counselor about the feelings brought up by the survey. If your child reports thoughts of harming self or others, the researcher is legally required to talk to you, enlist assistance from the clinic staff, and help obtain emergency mental health services for your child. The following information must be released/reported to the appropriate authorities: (1) if at any time during the study there is concern that child or elder abuse has possibly occurred, or (2) you or your child disclose illegal criminal activities, illegal substance abuse or violence.

Alternatives

This study does not include a treatment or intervention. You and your child may choose not to participate in the study with no negative outcomes from that decision.

Study Costs

Participation in this study will be of no cost to you.

Compensation

For taking part in this research study, you will receive $10 for your time and any inconvenience. Your teen will receive $20 for his/her time and any inconvenience.

 Research Related Injuries

In the unlikely event that this research results in an injury, treatment will be made available including first aid, emergency treatment, and follow-up care as needed. Care for such will be billed in the ordinary manner to you or your insurance company. No reimbursement, compensation, or free medical care is offered by Wayne State University or Children's Hospital of Michigan. If you think that your child has suffered a research related injury, contact the PI right away at (313) 577-4865.

Confidentiality

All information collected about your child during the course of this study will be kept confidential to the extent permitted by law. Your child will be identified in the research records by a code name or number. Information that identifies your child personally will not be released without your written permission. However, the study sponsor, the Human Investigation Committee (HIC) at Wayne State University, or federal agencies with appropriate regulatory oversight [e.g., Food and Drug Administration (FDA), Office for Human Research Protections (OHRP), Office of Civil Rights (OCR), etc.) may review your records.

When the results of this research are published or discussed in conferences, no information will be included that would reveal your child's identity.

Voluntary Participation/Withdrawal

Taking part in this study is voluntary. You have the right to choose not to take part in the study and to allow your child to take part in this study. If you decide to participate in the study and allow your child to take part in the study you can later change your mind and withdraw from the study. You and/or your child

are free to only answer questions that you want to answer. You are free to withdraw your child from participation in this study at any time. Your decisions will not change any present or future relationship with Children's Hospital of Michigan, Wayne State University or its affiliates, or any other services you or your child are entitled to receive.

The PI may stop your child's participation in this study without your consent. If your child has any side effects that are very serious or if your child becomes ill during the course of the research study your child may have to drop out, even if you would like to continue. The PI will make the decision and let you know if it is not possible for your child to continue. The decision that is made is to protect your child's health and safety, or because it is part of the research plan that people who develop certain conditions or do not follow the instructions from the study doctor may not continue to participate.

Questions

If you have any questions about this study now or in the future, you may contact Barbara Peterson at the following phone number: (313) 577-5137. If you have questions or concerns about you or your child's rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1628 to ask questions or voice concerns or complaints.

APPENDIX C

Documentation of Adolescent Assent (Agreement) Form

(ages 13-17)

Title of Study: *Sleep: How is it Affecting Your Life?*

Principal Investigator (PI):   Barbara L. Peterson, R.N., MSN

                                          C/O Wayne State University College of Nursing

                                          5777 Cass Ave.

                                          Detroit MI 48202

                                          (313) 577-5137

Why am I here?

This is a research study. This study is being done to learn about how sleep affects the way teens function, get along with people, and what they think about their life. Also, the study is being done to learn more about how traumatic or scary events and situations might affect their sleep, such as causing nightmares.

Only people who choose to take part are included in research studies. You are being asked to take part in this study because you are a teenager, African American, and came to the clinic today. Please take time to make your decision about whether you would like to be part of this study or not. Talk to your family member here with you today and be sure to ask questions about anything you don't understand.

Why are they doing this study?

This study is being done to help people understand more about sleep and nightmares from traumatic things that have happened to teens, and how sleep affects how teens think about their lives.

What will happen to me?

If you decide to participate, you will be asked to complete several questionnaires. The following are topics that will be asked about in this study and examples of questions that will be asked:

- How you sleep: *"During the past month, how often have you had trouble sleeping because you cannot get to sleep within 30 minutes?"*
- Traumatic events that may have happened: *"I was abandoned by my mother.", "How many times have you yourself actually been chased by gangs or older kids?"*
- If you have nightmares: *"How many nights in the last week did you have a nightmare?", "Are you ever afraid to fall asleep for fear of having a nightmare?"*
- How you function at school and home: "*I have trouble concentrating or paying attention.", "My parents listen to what I say."*
- How you feel about your quality of life: *"I am good at making decisions.", "I wish I were different."*

There are no right or wrong answers to any of the questions you will be asked. You don't have to answer any questions that make you feel uncomfortable. <ins>How long will I be in the study?</ins>

It will take about 110 minutes to answer the questions while you wait to see your doctor or nurse today. If your name is called for your appointment, you can finish the questionnaires when you get done.

<u>Will the study help me?</u>

You may not benefit from being in this study; however information from this study may help other young people in the future. Information from this study will help the researcher learn more about how events in teen's lives affect their sleep and how they think about their lives. With this information it may be possible to develop methods to help teens sleep and feel better.

<u>Will anything bad happen to me?</u>

It is not expected that any harm or any bad things will happen to you from being in this study. If you become sad, anxious, or angry by some of the questions that ask about trauma experiences or nightmares, you should let Ms. Peterson know, because she is experienced in helping teens who are experiencing stress. She will try to help you out. She will also talk to the clinic staff to get you more help if it is needed. If you wish, you might also want to talk to your parent, a school counselor or another counselor about the feelings you have from the questionnaires.

If at any time during the study there is concern that: child abuse or elder abuse has possibly occurred, you have a reportable communicable disease (i.e., certain sexually transmitted diseases or HIV), or you disclose illegal criminal activities, illegal substance abuse or violence, then we would need to report these things to the appropriate authorities. Ms. Peterson, a mandated reporter, is required to tell clinic social work staff, who will follow reporting and follow up procedures. The law also says we have to tell someone if you might hurt yourself or someone else. In that case, the researcher will need to talk to your parent/guardian who is with you today, and we would develop a plan to get you help.

<u>Will I get paid to be in the study?</u>

For taking part in this research study, you will receive $20 for your time and any inconvenience.

<u>Do my parents or guardians know about this?</u>

This study information has been given to your parent/guardian with you today, and he/she said that you could be in it. You can talk this over with him/her before you decide.

<u>What about confidentiality?</u>

Your privacy is very important. Every reasonable effort will be made to keep your information confidential and your name will not be on any of the forms that you fill out. Sometimes, though, we do have to let some people look at your study records to help us understand what the teens have said or to help us improve our study procedure.

<u>What if I have any questions?</u>

You can ask us any questions you want at any time. For questions about the study please call the researcher, Barbara Peterson at (313) 577-5137. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1628.

<u>Do I have to be in the study?</u>

You don't have to be in this study if you don't want to, or you can stop being in the study at any time. Please discuss your decision with your parent and researcher. No one will be upset, angry, or treat you differently if you do not want to participate in the study.

Participation in future research studies:

It is possible that the researchers will do follow up research studies to learn more about the information gathered in this study. You can still participate in the research study today even if you don't want to be contacted in the future. Please check the correct box to the statement about contacting you for future studies.

APPENDIX D

CAPS-2 (PTSD)

Below are some statements regarding how you may have felt and acted <u>during the past week</u>. Please circle the number for each statement to indicate how often that feeling or behavior has occurred in the past week.
Use the following scale:

        0=not at all
        1=only once during the week
        2=2 or 3 times during the week
        3= 4 or 5 times during the week
        4=about once a day
        5=more than once a day

	Not At all	Once/ week	2-3 times/ week	4-5 times/ week	About once/ day	More than once/day
1. Bad dreams or nightmares.	0	1	2	3	4	5
2. Being especially alert or watchful, when there was actually no need to be on guard.	0	1	2	3	4	5
3. Feeling in a daze.	0	1	2	3	4	5
4. Flashbacks of past unpleasant events.	0	1	2	3	4	5
5. Unexpected or disturbing memories.	0	1	2	3	4	5
6. Feeling as my emotions were shut down or blunted	0	1	2	3	4	5
7. Working hard to block out certain memories.	0	1	2	3	4	5
8. Violent dreams.	0	1	2	3	4	5
9. Trying to avoid reminders of painful past events.	0	1	2	3	4	5
10. Checking to see that I was safe.	0	1	2	3	4	5
11. Jumping or being very frightened by sudden loud noises.	0	1	2	3	4	5
12. Acting or feeling as if I were re-experiencing some painful past events.	0	1	2	3	4	5
13. Distress caused by reminders of painful past events.	0	1	2	3	4	5
14. Effort to avoid reminders of painful past events.	0	1	2	3	4	5
15. Feeling in danger.	0	1	2	3	4	5
16. Feeling out of touch with my surroundings.	0	1	2	3	4	5
17. Feeling that things going on around me were strange, unfamiliar, or not quite real.	0	1	2	3	4	5
18. Feeling as if I am watching myself from outside my body.	0	1	2	3	4	5

APPENDIX E

Cumulative Trauma Scale—Teenage Version

Directions: Many people have experienced different kinds of events and situations in their lives. These next questions will ask you about some specific things that may or may not have happened to you.

First, Circle the **Y** if the event or situation has ever happened to you, or **N** if it never happened to you. *If you think that any of the event or situations is too personal and you would rather not indicate whether they have happened, you can skip that one.*

Then, if the event or situation happened to you, write how old you were when it first happened to you.

Next, if the event or situation happened to you, write how many times it happened in your life.
Then, if the event or situation happened to you, circle the number that best shows if it had a positive or negative impact on you.

You can use the following scale:

Circle Y (yes) or N (no)		Event or Situation	Age trauma first happened	# times it happened	Extremely Positive	Very Positive	Somewhat Positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
Y	N	1. My family has moved frequently.			1	2	3	4	5	6	7
Y	N	2. I was abandoned by my mother (but not by my father).			1	2	3	4	5	6	7
Y	N	3. I was abandoned by my father (but not by my mother).			1	2	3	4	5	6	7
Y	N	4. I was abandoned by both parents.			1	2	3	4	5	6	7
Y	N	5. My parents divorced.			1	2	3	4	5	6	7
Y	N	6. I was adopted.			1	2	3	4	5	6	7
Y	N	7. I was in foster care. (still am in foster care)			1	2	3	4	5	6	7
Y	N	8. I had frequent changes in caregivers.			1	2	3	4	5	6	7
Y	N	9. I witnessed one or both of my parents/major caregivers killed.			1	2	3	4	5	6	7
Y	N	10. I witnessed /experienced the killing a brother, sister, close relative, or dear friend.			1	2	3	4	5	6	7

1

APPENDIX F

Survey of Children's Exposure to Community Violence
Youth Report Version

Listed below are various kinds of violence and things related to violence that you may have experienced, seen, or heard about. For each question, circle the letter that best describes your experience *to the best of your knowledge*. DO NOT INCLUDE IN YOUR ANSWERS THINGS YOU MAY HAVE SEEN OR HEARD ABOUT ONLY ON TV, RADIO, THE NEWS, OR IN THE MOVIES. DO NOT write your name anywhere on this form. This is a confidential survey. NO ONE will know that these are your answers. CIRCLE ONLY ONE.

Being Chased

1. How many times have you *yourself* actually been chased by gangs or older kids?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

2. How many times have you *seen someone else* get chased by gangs or older kids?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

3. How many times have you *only heard about* someone being chased by gangs or older kids?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

Drug Activity

4. How many times have you *seen other people* using or selling illegal drugs?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

5. How many times have you *yourself* actually been asked to get involved in any aspect of selling or
   distributing illegal drugs?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

6. How many times have you *yourself* actually been asked to use illegal drugs?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

7. How many times have you *seen someone else* being asked to get involved in any aspect of selling or
   distributing illegal drugs?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

8. How many times have you *only heard about* someone else being asked to get involved in any aspect of
   selling or distributing illegal drugs?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

Serious Accidents

9. How many times have you *yourself* actually been in a serious accident where you thought that someone
   would get hurt very badly or die?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

10. How many times have you *seen someone else* have a serious accident where you thought that the person
   would get hurt very badly or die?

(a) never	(d) 3 or 4 times	(g) at least once a month

| (b) 1 time | (e) 5 or 6 times | (h) at least once a week |
| (c) 2 times | (f) 7 or 8 times | (I) almost every day |

11. How many times have you *only heard about* someone else having a serious accident where you thought the
   person could have been hurt very badly or died?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

<div align="center">

Forced Entry

</div>

12. How many times have you *yourself* actually been at home when someone has broken into or tried to
   force their way into your home?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

13. How many times has *your* house been broken into where you *weren't* home?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

14. How many times have you *seen someone else* trying to force their way into *somebody else's* house or
   apartment?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

15. How many times have you *only heard about* someone trying to force their way into somebody else's
   house or apartment?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

<div align="center">

Arrests

</div>

16. How many times have you *yourself* actually been picked-up, arrested, or taken away by the police?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

17. How many times have you *seen someone else* being picked-up, arrested, or taken away by the police?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

18. How many times have you *only heard about* someone else being picked-up, arrested, or taken away by the
    police?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

Threats

19. How many times have you *yourself* actually been threatened with serious physical harm by someone?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

20. How many times have you *seen someone else* being threatened with serious physical harm?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

21. How many times have you *only heard about* someone else being threatened with serious physical
    harm?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week

(c) 2 times   (f)   7 or 8 times   (I)   almost every day

Slapping, Hitting, Punching

22. How many times have you *yourself* actually been slapped, punched, or hit by someone?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f)   7 or 8 times   (I)   almost every day

23. How many times have you *seen someone else* being slapped, punched or hit by a member of your family?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f)   7 or 8 times   (I)   almost every day

24. How many times have you *only heard about* someone else being slapped, punched or hit by a member of
     your family?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f)   7 or 8 times   (I)   almost every day

25. How many times have you *seen another person* getting slapped, punched or hit by someone who was *not* a
     member of their family?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f)   7 or 8 times   (I)   almost every day

26. How many times have you *only heard about* someone else getting slapped, punched or hit by a person who
     was *not* a member of their own family?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f)   7 or 8 times   (I)   almost every day

Beatings and Muggings

27. How many times have you *yourself* actually been beaten up or mugged?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

28. How many times have you *seen someone else* getting beaten up or mugged?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

29. How many times have you *only heard about* someone else being beaten up or mugged?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

| Rape and Molestation |

30. How many times have you *yourself* actually been sexually assaulted, molested, or raped?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

31. How many times have you *seen someone else* being sexually assaulted, molested, or raped?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

32. How many times have you *only heard about* someone else being sexually assaulted, molested, or raped?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

| Carrying Guns and Knives |

33. How many times have you actually *seen someone* carrying or holding a gun or knife? (DO NOT
    INCLUDE police, military, or security officers.)

(a) never (d) 3 or 4 times (g) at least once a month
(b) 1 time (e) 5 or 6 times (h) at least once a week
(c) 2 times (f) 7 or 8 times (I) almost every day

34. How many times have you *only heard about* someone carrying a gun or knife? (DO NOT INCLUDE police, military, or security officers.)

   (a) never (d) 3 or 4 times (g) at least once a month
   (b) 1 time (e) 5 or 6 times (h) at least once a week
   (c) 2 times (f) 7 or 8 times (I) almost every day

35. How many times have you *yourself* heard the sound of gunfire *outside* when you were in or near your
   home?

   (a) never (d) 3 or 4 times (g) at least once a month
   (b) 1 time (e) 5 or 6 times (h) at least once a week
   (c) 2 times (f) 7 or 8 times (I) almost every day

36. How many times have you *yourself* heard the sound of gunfire *outside* when you were in or near the school
   building?

   (a) never (d) 3 or 4 times (g) at least once a month
   (b) 1 time (e) 5 or 6 times (h) at least once a week
   (c) 2 times (f) 7 or 8 times (I) almost every day

37. How many times have you *yourself* seen or heard a gun fired in your home?

   (a) never (d) 3 or 4 times (g) at least once a month
   (b) 1 time (e) 5 or 6 times (h) at least once a week
   (c) 2 times (f) 7 or 8 times (I) almost every day

   Serious Woundings

38. How many times have you *actually seen* a seriously wounded person after an incident of violence?

   (a) never (d) 3 or 4 times (g) at least once a month
   (b) 1 time (e) 5 or 6 times (h) at least once a week
   (c) 2 times (f) 7 or 8 times (I) almost every day

39. How many times have you *only heard about* a person seriously wounded after an incident of violence?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

| Knife Attacks |

40. How many times have you *yourself* actually been attacked or stabbed with a knife?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

41. How many times have you *seen someone else* being attacked or stabbed with a knife?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

42. How many times have you *only heard about* someone else being attacked or stabbed with a knife?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

| Gun Attacks |

43. How many times have you *yourself* actually been shot with a gun?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

44. How many times have you *seen someone else* being shot with a gun?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

45. How many times have you *only heard about* someone else getting shot with a gun?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f) 7 or 8 times   (I) almost every day

Dead Bodies

46. How many times have you *actually seen* a dead person somewhere in the community? (DO NOT
    INCLUDE wakes and funerals.)

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f) 7 or 8 times   (I) almost every day

47. How many times have you *only heard about* a dead person somewhere in the community? (DO NOT
    INCLUDE wakes and funerals.)

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f) 7 or 8 times   (I) almost every day

Suicides

48. How many times have you *actually seen* someone committing suicide?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f) 7 or 8 times   (I) almost every day

49. How many times have you *only heard about* someone committing suicide?

(a) never   (d) 3 or 4 times   (g) at least once a month
(b) 1 time   (e) 5 or 6 times   (h) at least once a week
(c) 2 times   (f) 7 or 8 times   (I) almost every day

Killings

50. How many times have you *actually seen* someone being killed by another person?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

51. How many times have you *only heard about* someone being killed by another person?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

| Other Types of Violence |

52. How many times have *you* been in any kind of situation *not already described* where you were extremely
frightened or thought that you would get hurt very badly or die?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

DESCRIBE:

_____
_____
_____
_____
_____
_____

| All Types of Violence |

53. How many times have you *yourself* actually been the victim of any type of violence such as those described
in this questionnaire?

    (a) never   (d) 3 or 4 times   (g) at least once a month
    (b) 1 time   (e) 5 or 6 times   (h) at least once a week
    (c) 2 times   (f) 7 or 8 times   (I) almost every day

54. How many times have you *seen someone else* being victimized by some form of violence such as those
described in this questionnaire?

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

55. How many times have you *only heard about* someone else being victimized by some form of violence such

as those described in this questionnaire?

BEATEN UP means being slapped, kicked, bitten, hit, or punched so that they were badly hurt.

56a. Have you ever been BEATEN UP?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

56b. *In the last year*, how many times have you been BEATEN UP?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

56c. *Before you started middle school*, how many times had you been BEATEN UP?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

CHASED or THREATENED means having somebody come after or want to seriously hurt their bodies.

57a. Have you ever been CHASED or seriously THREATENED?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

57b. *In the last year*, how many times have you been CHASED or seriously THREATENED?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

57c. *Before you started middle school*, how many times had you been CHASED or seriously THREATENED?

    0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

ROBBED or MUGGED means somebody took their things from them by force.

(a) never	(d) 3 or 4 times	(g) at least once a month
(b) 1 time	(e) 5 or 6 times	(h) at least once a week
(c) 2 times	(f) 7 or 8 times	(I) almost every day

58a. Have you ever been ROBBED or MUGGED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

58b. *In the last year*, how many times have you been ROBBED or MUGGED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

58c. *Before you started middle school*, how many times had you been ROBBED or MUGGED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

SHOT or STABBED means somebody hit them with a bullet from a gun or badly hurt them without a knife.

59a. Have you ever been SHOT or STABBED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

59b. *In the last year*, how many times have you been SHOT or STABBED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

59c. *Before you started middle school*, how many times had you been SHOT or STABBED?

     0. No, Never   1. One time   2. A few times   3. Many times   4. Every day

APPENDIX G

UCLA PTSD INDEX FOR DSM IV (Adolescent Version) ©

Here is a list of problems people sometimes have after very bad things happen. Please **THINK** about the bad thing that happened to you. Then, **READ** each problem on the list carefully. **CIRCLE ONE** of the numbers (0, 1, 2, 3 or 4) that tells how often the problem has happened to you **in the past month**. Use the **Rating Sheet** on Page 5 to help you decide how often the problem has happened in the past month.

PLEASE BE SURE TO ANSWER ALL QUESTIONS

HOW MUCH OF THE TIME DURING THE PAST MONTH	None	Little	Some	Much	Most
1_{D4} I watch out for danger or things that I am afraid of.	0	1	2	3	4
2_{B4} When something reminds me of what happened, I get very upset, afraid or sad.	0	1	2	3	4
3_{B1} I have upsetting thoughts, pictures, or sounds of what happened come into my mind when I do not want them to.	0	1	2	3	4
4_{D2} I feel grouchy, angry or mad.	0	1	2	3	4
5_{B2} I have dreams about what happened or other bad dreams.	0	1	2	3	4
6_{B3} I feel like I am back at the time when the bad thing happened, living through it again.	0	1	2	3	4
7_{C4} I feel like staying by myself and not being with my friends.	0	1	2	3	4

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HOW MUCH OF THE TIME DURING THE PAST MONTH	None	Little	Some	Much	Most
8_{C5} I feel alone inside and not close to other people.	0	1	2	3	4
9_{C1} I try not to talk about, think about, or have feelings about what happened.	0	1	2	3	4
10_{C6} I have trouble feeling happiness or love.	0	1	2	3	4
11_{C6} I have trouble feeling sadness or anger.	0	1	2	3	4
12_{D5} I feel jumpy or startle easily, like when I hear a loud noise or when something surprises me.	0	1	2	3	4
13_{D1} I have trouble going to sleep or I wake up often during the night.	0	1	2	3	4
14_{AF} I think that some part of what happened is my fault.	0	1	2	3	4
15_{C3} I have trouble remembering important parts of what happened.	0	1	2	3	4
16_{D3} I have trouble concentrating or paying attention.	0	1	2	3	4
17_{C2} I try to stay away from people, places, or things that make me remember what happened.	0	1	2	3	4
18_{B5} When something reminds me of what happened, I have strong feelings in my body, like my heart beats fast, my head aches, or my stomach aches.	0	1	2	3	4
19_{C7} I think that I will not live a long life.	0	1	2	3	4
20_{D2} I have arguments or physical fights.	0	1	2	3	4
21_{C7} I feel pessimistic or negative about my future.	0	1	2	3	4
22_{AF} I am afraid that the bad thing will happen again.	0	1	2	3	4

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APPENDIX H

Trauma-Related Nightmare Survey (Modified)

Instructions: The following questions are about any nightmares that you have had in the <u>past month.</u> Please read each question and answer the best that you can. If you need more room to write, you may use the back of the page.

1. About how many hours do you sleep each night? _____

2. About how long does it usually take you to fall asleep?

     _____Less than 15 minutes

     _____15 minutes to 1 hour

     _____1 hour to 2 hours

     _____More than 2 hours

3. How scared are you usually about going to sleep?

___Not at all   ___A little bit   ___A medium amount   ___A large amount   ___A huge amount

4. How rested do you usually feel when you wake up?

___Not at all   ___A little bit   ___A medium amount   ___A large amount   ___A huge amount

5. How sad do you usually feel when you wake up?

___Not at all   ___A little bit   ___A medium amount   ___A large amount   ___A huge amount

6. How old were you when you had your first nightmare? _____ years old

7. Did your nightmares begin after something scary happened in real life (such as someone hurting you, a car accident, a fire, or any other traumatic experience)?   _____Yes   _____No

    7a. If yes, how old were you when the scary thing happened? _____ years old

    7b. what was the scary thing?

    _____

    _____

8. How many nights in the <u>last week </u>did you have a nightmare? _____

9. How many nights in the <u>last week</u> did you have **more than one** nightmare per night? _____

10. In the <u>past month</u>, have you had nightmares every week? _____yes _____no

If yes, how many each week? _____

If no, have you usually have nightmares every month? _____yes _____no

If yes, about how many each month? _____

11. How upsetting have the nightmares been?

___Not at all   ___A little bit   ___A medium amount   ___A large amount   ___A huge amount

12. How many different nightmares have you had in the past month? _____

13. If you had a scary thing happen to you in real life (such as someone hurting you, a car accident, a fire, or any other traumatic experience), are your dreams like the scary thing?

_____ my nightmare is the same or almost the same as the scary thing that happened.

_____my nightmare is sort of like the scary thing, but not exactly

_____my nightmare is not at all like the scary thing

14. How often does your nightmare wake you up?

___Never   ___Hardly ever   ___Sometimes   ___Usually   ___Always

14a. If your nightmares wake you up, how long does it usually take for you to get back to sleep?

_____less than 15 minutes

_____15 minutes to 1 hour

_____1 hour to 2 hours

_____more than 2 hours

_____usually do not go back to sleep

14b. If your nightmares wake you up, what do you do to help you get back to sleep? (for example, nothing… read…watch TV… use the computer…eat… or drink something)

_____

_____

14c. After waking up from a bad dream, do any of the following things happen to you? (check all that apply)

1) ___Heart beating fast

2) ___Feeling dizzy

3) ___Can't catch breath

4) ___Pain or soreness in chest

5) ___Feel numb or tingly

6) ___Feelings that things are not real

7) ___Feeling that you are separated from yourself

8) ___Sweating

9) ___Shaking

10) ___Feel like you are choking

11) ___Upset stomach

12) ___Afraid you might lose control

13) ___Chills or hot flashes

14) ___Feeling afraid you might die

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ABSTRACT

ASSOCIATIONS OF TRAUMA, NIGHTMARES, AND QUALITY OF LIFE IN URBAN AFRICAN AMERICAN ADOLESCENTS

by

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Purpose: Exposure to trauma in youth is pervasive particularly among urban, African American teens. Nightmares are considered a hallmark symptom of Posttraumatic Stress Disorder (PTSD) and are associated with poor sleep quality and poor quality of life in adults. Research about nightmares in adolescents is lacking, and these relations have not been previously examined. The purpose of this study was to examine the relationships among nightmare frequency, nightmare distress, PTSD severity, sleep quality, and quality of life in teens.

Theory: The Roy Adaptation Model was used to conceptualize nightmares as focal stimuli reducing adaptation in teens. Nightmares may heighten memories of past trauma (contextual stimuli), and intensify PTSD. Sleep disruption impairs responses in physical and psychological adaptive modes, and impacts teen's adaptation.

Methods: A cross-sectional, predictive design with model testing was used. The sample (N=151) included African American teens, age 14 to 17, who are patients in an Adolescent Primary Health clinic in Detroit, Michigan. Data were analyzed by

correlational, regression analyses, and Structural Equation Modeling was performed to examine direct and indirect paths of trauma exposure and nightmares, and mediating influences of sleep quality and PTSD symptoms on the relation between trauma, nightmares, and quality of life.

Findings: All teens in the study reported trauma exposure, and 52% had at least one nightmare in the prior month. Trauma, nightmare frequency, and nightmare distress predicted lower quality of life. Structural Equation Modeling confirmed that sleep quality mediated the relation between nightmare frequency and quality of life, and that PTSD symptomatology mediated the relation between nightmare distress and quality of life. Gender significantly influenced nightmare frequency and quality of life.

Conclusions: Use of sophisticated statistical analysis advanced study of nightmares. Understanding about the adverse outcomes of nightmares gained from this study make it clear that, in addition to vigilant assessment for nightmares, developmentally-appropriate treatments that target nightmares are needed. Nurses and health providers who work with trauma-exposed adolescents can utilize findings from this study to be the forerunners of helping reduce nightmares and improve health and quality of life for teens.

AUTOBIOGRAPHICAL STATEMENT

My educational background includes a Diploma in Nursing from Mounds-Midway School of Nursing, St. Paul, Minnesota, 1977; Bachelors of Science in Nursing from Minnesota State University, Moorhead, Minnesota, 1996; Masters in Nursing from the University of Minnesota, Minneapolis, Minnesota, 1998. I am Board Certified by the ANCC as a Clinical Nurse Specialist (CNS) in Psychiatric and Mental Health Nursing, with a focus in Child and Adolescent Psychiatric Nursing. As a doctoral student, I was a Graduate Research Assistant for a funded research study, and a Graduate Teaching Assistant in Nursing Theory. I have been employed at the University of Michigan in the Psychiatric Emergency Department where I conduct psychiatric assessments and offer emergency interventions with children, adolescents, and adult patients. My professional career as a CNS has included both direct care as advanced-level psychiatric nursing care to children and adolescents, and administration roles in psychiatric centers. Two professional goals are to teach nursing students, and develop and test therapeutic interventions to target nightmares in adolescents.