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The Relationship Between Resilience and Sleep Quality

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ABSTRACT

Complaints about sleep quality are common and some epidemiological surveys indicate that 15-35% of adults complain of frequent sleep disturbances. Impaired sleep is also a central feature in a number of mental health conditions such as depression and anxiety. This study was aimed at examining the relationship between sleep quality and resilience (the ability to cope and deal with stress). The hypothesis was that the two variables would be related; as resilience increased, it was predicted that sleep quality would also increase. Individuals ($N = 167$) were given the opportunity to complete a number of brief, self-report inventories assessing sleep, resilience, and positive and negative affect for extra credit in their introduction to psychology course. Bivariate correlations displayed a significant indirect relationship between resilience and the severity of sleep disturbance. A partial correlation was also computed in order to rule out pain as a confounding variable; the results revealed that the relationship between resilience and sleep quality remained significant when controlling for pain. Higher resilience was also associated with higher positive affect and lower negative affect. The hypothesis of the study was supported by the data collected. These findings suggest that the relationship between the two constructs is an area of research that may be pursued, in order to add to the literature and determine the extent of the relationship. Future research includes pursuing a more effective, longitudinal design as well as obtaining samples from more representative samples in order to determine if resilience can be an effective tool in the management and treatment of sleep disturbances.

The Relationship Between Resilience and Sleep Quality

A Thesis

Presented to

The Faculty of the Graduate School

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Of the Requirements for the Degree

Master of Science

Clinical Psychology

By

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I would like to dedicate my thesis to a man who has had one of the most profound and influential impacts on my life, my grandfather, John Blaine McCuistion. Thank you for all that you have done.

You taught me what it means to be a man of honor and integrity. It is more than just being reliable and keeping your word; standing up for your values and remaining steadfast in the defense of the values of others is what sets a man apart from the world.

I am confident that the respect you commanded and the values you cherished will live on through those who were closest to you. And with as many as there were, the world will be in good hands.

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CHAPTER I

LITERATURE REVIEW

Sleep Quality and Well-Being

Chronic sleep disturbance is associated with impaired daytime function, daytime

sleepiness and fatigue, reduced quality of life, and increased health care utilization

(Simon & Von Korff, 1997). *The Diagnostic and Statistical Manual of Mental Disorders:*

Fifth Edition (DSM-V) states that sleep disorders are often accompanied by depression,

anxiety, and cognitive changes that must be addressed in treatment planning and

management. Furthermore, persistent sleep disturbances (both insomnia and excessive

sleepiness) are established risk factors for the subsequent development of mental illnesses

and substance use disorders. Sleep disturbances may also represent prodromal expression

of an episode of mental illness, allowing the possibility of early intervention to preempt

or to attenuate a full-blown episode (American Psychiatric Association, 2013).

Sleep quality is an important clinical construct for two main reasons. First,

complaints about sleep quality are common. Some epidemiological surveys indicate that

15-35% of adults complain of frequent sleep disturbances, such as difficulty falling

asleep or difficulty maintaining sleep (Bixler, Kales, Soldatos, Kales, & Healey, 1979;

Karacan et al., 1976; Karacan, Thornby, & Williams, 1983; Lugaresi et al., 1983;

Mellinger, Balter, & Uhlenhuth, 1985). Second, impaired sleep is a central feature in

several mental conditions and has been shown to precede both depression and anxiety

(Ford & Kamerow, 1989; Sivertsen, Krokstad, Overland, & Myketum, 2009). Insomnia

symptoms are significantly associated with a range of conditions, especially mental conditions (anxiety and depression) and chronic pain conditions such as arthritis, migraines, musculoskeletal pain, and fibromyalgia (Sivertsen et al., 2009). In addition to anxiety and depression, adults with insomnia also have significantly more mental health problems than those without insomnia, including somatization, obsessive-compulsive behaviors, interpersonal sensitivity, hostility, phobic anxiety, paranoid ideation, and psychoticism (Taylor et al., 2011). Those with self-reported sleep difficulties also report poorer overall health, greater work absenteeism and greater use of general medical services, and significant increases in functional impairment and days of disability due to illness (Kupperman et al., 1995; Üstün et al., 1996).

As part of the National Institute of Mental Health Epidemiologic Catchment Area study (Ford & Kamerow, 1989), respondents were questioned at baseline and one year later about sleep complaints and psychiatric symptoms using the Diagnostic Interview Schedule. Of this community sample, 10.2% reported insomnia at the first interview; 40% of those with insomnia had a psychiatric disorder compared with 16.4% of those with no sleep complaints. The risk of developing a first episode of major depression was significantly higher in those who had insomnia at both interviews compared to those without insomnia. The risk of developing a first episode of major depression was much less for those who had insomnia that had resolved by the second visit (Ford & Kamerow, 1989). With 1 in 10 people reporting insomnia, and even more individuals reporting significant sleep disturbances, it is important to find ways of helping them cope with what stressors they are facing in order to help alleviate the wear and tear of possible comorbid disorders. For the purpose of the current study, stress is defined as a biological

and psychological response experienced upon encountering a threat that an individual

feels they do not have the resources to deal with. A stressor is the stimulus (or threat) that

causes stress.

Resilience

Resilience, as a trait, is defined as the ability to cope with stress and face

adversity (Connor & Davidson, 2003). Resilience has been found to be an effective

predictor and moderator for pain, bipolar disorder, and suicidality (Choi et al., 2015; Min,

Lee, & Chae, 2014; Newton-John, Mason, & Hunter, 2014). Not everyone who faces

adversity suffers negative psychological outcomes; certain people appear to have the

ability to overcome and adapt to adversity in a positive way, despite the negative life

events (Fitzpatrick, 2010). Therefore, resilience may be viewed as a measure of stress

coping ability and, as such, could be an important target of treatment in anxiety,

depression, and stress reactions.

In determining whether or not an individual is resilient, it is tempting to take a

dualistic approach in considering whether resilience is present or absent. However, it is

more likely that it exists on a continuum that may be present to differing degrees across

multiple areas of life (Pietrzak & Southwick, 2011). Resilience is also subject to change

over time as a function of development and one's interaction with the environment (Kim-

Cohen & Turkewitz, 2012). As a trait that can be developed over time and one that may

interact with one's environment, it is important to maintain and be prepared to enhance

resilience in individuals in order to prevent poor adjustment in the face of trauma.

Resilience in each individual may be very dependent on many aspects of a society

(Southwick, Bonanno, Masten, Panter-Brick, & Yehuda, 2014). This also means that it

may look different in different communities due to the skills that are needed to successfully thrive in that environment (e.g., a third-world environment vs. New York City), and that some skills needed for one type of trauma/stressor may differ from the skills needed for a different type of situation (Southwick et al., 2014). Interventions to increase resilience may be administered before, during, or after a traumatic or stressful experience, though some may be more effective at one point in time than another. Ideally, these interventions would occur before a stressful event occurs in order to ensure that an individual is better prepared to deal with the adversity successfully. Outside of individual interventions, it is important to promote healthy family and community systems in order to allow individuals' systems to develop and operate effectively, thus fostering resilience (Southwick et al., 2014).

A number of characteristics that resilient people exhibit have been identified (Connor & Davidson, 2003). Resilient people are likely to view stressors as a challenge/opportunity, show commitment, and be able to recognize and control their own personal boundaries/limits (Kobasa, 1979; Ong, Bergeman, Bisconti, & Wallace, 2006). They also exhibit characteristics such as close, secure attachments with others, they engage in the support of others, they participate in personal and collective goals, they are self-efficacious, and their stress is accompanied by a strengthening effect (Ong et al., 2006; Rutter, 1985). They also have past successes, a realistic sense of control, a sense of humor, are adaptable to change, and have an action oriented approach (Rutter, 1985). People who exhibit resilience are also more tolerant to negative affect and exhibit more patience than those who do not exhibit resilience (Lyons, 1991). A more recent study has

also shown that resilient individuals are significantly more optimistic and more likely to reflect spiritual dimensions such as faith (Connor & Davidson, 2003).

Research supports resilience as a modifiable trait that can be improved with treatment, with greater improvement corresponding to higher levels of global improvement (Connor & Davidson, 2003). Research on resilience has grown along with the recent trend toward a strengths perspective in positive psychology. In a recent meta-analysis by Hu, Zhang, and Wang (2015), the relationships between resilience and other variables were studied. In their analysis of sixty studies, it was observed that (1) Trait resilience was negatively correlated to negative indicators of mental health and positively correlated to positive indicators of mental health; (2) Age directly moderated the relationship between trait resilience and negative indicators but not the positive indicators of mental health, with adults showing stronger than children and adolescents; (3) Gender moderated the relationship between trait resilience and mental health. As the percentage of male participants increased, a weaker effect size was observed; and (4) Adversity moderated the relationship between trait resilience and mental health. The effect sizes were significantly stronger for people in adversity than for those not facing hardship.

Resilience is a powerful trait that relates to many indicators of mental health. Furthering research and applying resilience in new ways to old problems could serve to strengthen the construct and highlight the importance of the increased integration of resilience training into modern psychological research and treatment.

Chronic Pain, Resilience, and Sleep Quality

Pain and Sleep Quality

Due to the lack of research on the topic of resilience and its relation to sleep quality, it is necessary to examine dimensions related to sleep, such as chronic pain, in order to determine a reasonable hypothesis. Current research supports a circular interrelationship between chronic pain and sleep disturbances (Smith & Haythornthwaite, 2004; Vitiello, Rybarczyk, Von Korff, & Stepanski, 2009). Experimental studies of healthy subjects and cross-sectional research in clinical populations suggest the possibility that the relationship between sleep disturbance and pain might be reciprocal, such that pain disturbs sleep continuity/quality and poor sleep further exacerbates pain (Smith & Haythornthwaite, 2004). This suggests that consistent management of sleep disturbance may be an important treatment objective with possible benefits beyond the improvement in sleep (Smith & Haythornthwaite, 2004). More specifically, research suggests that by improving an individual's sleep quality, one may consequently decrease the individual's perceived pain (Smith & Haythornthwaite, 2004; Vitiello et al., 2009). After treatment of insomnia symptoms, subjects report better sleep quality as well as reduced pain, again supporting the link between the two (Vitiello et al., 2009).

Pain and Resilience

The reciprocal relationship between chronic pain and sleep is important to the proposed study. Studies have examined the role of resilience in adjustment to and coping with chronic pain and could pave the way to understanding how resilience and sleep quality interact in light of the reciprocal nature of sleep and pain. Evidence suggests that resilience is related with significantly less fear avoidance, less pain-related disability, and

lower reported pain intensity; higher resilience is also positively correlated with greater

pain self-efficacy (Ong, Zautra, & Reid, 2010). Resilience is also supported as a

predictive measure of self-reported chronic pain, though it does not predict as well as

other established measures of chronic pain (Ong et al., 2010). Related research also

analyzes pain catastrophizing in relation to resilience and positive emotions (Ong et al.,

2010). Analyses indicate, that independent of level of neuroticism, negative emotions,

pain intensity, income, and age, high-resilient individuals report greater positive emotions

and exhibit lower day-to-day pain catastrophizing compared with low-resilient

individuals (Ong et al., 2010). It has also been observed that psychologically resilient

individuals rebound from daily pain catastrophizing through experiences of positive

emotion (Ong et al., 2010). With evidence supporting the relationship between sleep

quality and chronic pain, as well as the interaction between resilience and chronic pain,

resilience may be an effective characteristic to examine in cases of sleep disturbances.

Relationship Between Resilience and Sleep Quality

There has been little research assessing the relationship between sleep quality and

resilience. Experimental studies of healthy subjects and cross-sectional research in

clinical populations suggest the possibility that the relationship between sleep disturbance

and pain might be reciprocal, such that pain disturbs sleep continuity/quality and poor

sleep further exacerbates pain (Smith & Haythornthwaite, 2004). Further, the experience

of pain has been related to resilience. These associations suggest that sleep quality may

negatively affect resilience, given their mutual associations with the experience of pain.

But this is not the only reason to suggest an association between sleep quality and

resilience. As noted, sleep quality has been associated with both psychological and physical well-being, variables also related to resilience.

Current Study

The current study aimed to assess the relationship between resilience and sleep quality by administering self-report measures of resilience, sleep quality, and positive/negative affect to a sample of college undergraduates. The value of this study to research literature is that there is little to no current research regarding the variables of resilience and sleep quality. The importance of this study to the clinical community is that it will examine new relationships between constructs commonly addressed in therapy and possibly point to new ways of treating and understanding sleep disturbances. Overall, then, was predicted that sleep quality and resilience would be related, and as sleep quality increases, resilience would also increase. The goal of this study was to assess that relationship.

CHAPTER II

METHODS

Participants and Procedure

Participants consisted of students enrolled in an introduction to psychology course at Abilene Christian University. The students were offered extra credit in the course for their participation in taking a survey consisting of 5 brief measures. There were 195 survey participants. Of those 195, 28 were excluded from the study because they did not give their consent to participate or they did not complete the questionnaires. This left a total of 167 participants.

Of the sample of college students, 65.9% were female and 34.1% were male. The sample consisted of ages ranged between 17 and 30 ($M =18.95$, $SD = 1.35$) and was comprised of 64.1% freshman, 24.6% sophomore, 7.8% junior, and 3.6% senior participants. The majority of the sample was Non-Hispanic white (67.7%) with the remainder being Hispanic (12.6%), African American (12%), Asian (4.8%), and American Indian (3%).

After being solicited for the study, the participants were given a link to an online survey containing a number of questionnaires to complete. After completion of the survey, students were given extra credit for the course that they were enrolled in.

Measures

Five measures were used in the current study. Two measures were used to assess sleep quality, one measure was used to assess resilience, one measure was used to assess

pain, and one measure was used to assess positive and negative affect. The Conner-Davidson Resilience Scale, Pittsburgh Sleep Quality Index, Insomnia Symptom Questionnaire, Brief Pain Inventory, and Positive and Negative Affect Schedule are all commonly used and statistically validated measures throughout the literature.

Connor-Davidson Resilience Scale (CD-RISC)

Resilience is defined as a measure of stress coping ability and could be an important target of treatment in anxiety, depression, and stress reactions (Connor & Davidson 2003). The CD-RISC was developed in 2003 to more accurately measure the construct of resilience. The CD-RISC is comprised of 25 items on a 5-point Likert Scale from zero to 4, with zero suggesting lower resilience and four being consistent with higher resilience. Thus, higher scores on the scale represent higher resilience, while lower scores represent lower resilience.

The scale was validated using different groups: a community sample, primary care outpatients, general psychiatric outpatients, a clinical trial of anxiety disorders, and two clinical trials of PTSD. The scale was found to have sound psychometric properties in regards to reliability and validity (Connor & Davidson 2003). Cronbach's alpha for internal consistency was found to be 0.89 in a sample taken from the general population ($N = 577$). Test-retest reliability was also established ($r = 0.87$), participants were tested with a 4-week interval. The mean (*SD*) CD-RISC score at the first assessment was 52.7 (17.9) and the mean (*SD*) at the second assessment was 52.8 (19.9), showing a high level of agreement. The scale also displayed convergent validity, positively correlating with the Kobasa Hardiness Measure ($r = 0.83$) and negatively correlating with the Perceived Stress Scale ($r = -0.76$).

A factor analysis identified five factors within the measure. Factor 1 reflects the notion of personal competence, high standards, and tenacity. An example item for the first factor is "You work to attain your goals." Factor 2 corresponds to trust in one's instincts. An example item for the second factor is "You have to act on a hunch." Factor 3 relates to the positive acceptance of change, and secure relationships. An example item is "You are able to adapt to change." Factor 4 is related to control, with an example being "You are in control of your life." Factor 5 is related to spiritual influences, and an example item for the fifth factor is "Things happen for a reason" (Conner & Davidson, 2003). The entire CD-RISC can be found in Appendix A.

Pittsburgh Sleep Quality Index (PSQI)

Despite the prevalence of sleep complaints among psychiatric patients, few questionnaires have been specifically designed to measure sleep quality in those individuals. The Pittsburgh Sleep Quality Index is a self-rated questionnaire, which assesses sleep quality and disturbances over a 1-month interval (Buysse et al., 1989). Nineteen individual items generate seven component scores: subjective sleep quality (During the last month, how would you rate your sleep quality overall?), sleep latency (During the past month, how long [in minutes] has it usually taken you to fall asleep?), sleep duration (During the past month, how many hours of actual sleep did you get at night?), habitual sleep quality (During the past month, when have you usually gotten up/gone to sleep?), sleep disturbances (I wake up in the middle of the night/morning.), use of sleeping medication (During the past month, how often have you taken medicine to help you sleep?), and daytime dysfunction (During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?).

The scores for these seven components are added up into one global score. Higher scores on the PSQI represent higher severity of sleep disturbances and thus, lower sleep quality.

The measure showed good internal consistency, with a Cronbach's alpha of 0.83, meaning each of the seven components were roughly measuring the same construct. The measure also demonstrated test-retest reliability, participants were tested for the second time after an average of 28.2 days. Paired t-tests displayed that subjects who took the test on two separate occasions showed no significant difference in results between the two assessments. The scores on the first and second administration were significantly correlated ($r = 0.85$). The primary test of validity assessed the degree to which the index detected differences between groups recognized clinically as distinct. The groups included individuals with difficulty maintaining and initiating sleep, individuals with excessive somnolence, individuals with depression, and a control group of healthy sleepers. The PSQI was able to successfully distinguish between the groups and identify the good and bad sleepers, as the index intended. The entire scale can be found in Appendix B.

Insomnia Symptom Questionnaire (ISQ)

The purpose of the questionnaire is to capture the multidimensionality of insomnia and accurately identify individuals suffering from insomnia. The Insomnia Symptom Questionnaire is a 13-item self-report instrument designed to establish a clinically relevant case definition of insomnia consistent with widely used insomnia classification criteria. Example items include "Have your sleep difficulties affected your work?" and "Have your sleep difficulties made you feel irritable?" Item response theory (IRT) was used to determine the optimal cutoffs for individual questions and yield a

dichotomous outcome (insomnia or no insomnia) that most closely reflects established diagnostic criteria for insomnia. The IRT analyses of the ISQ culminated in a scoring algorithm that identified insomnia based on the following responses: (1) the presence of at least three sleep symptoms: difficulty initiating sleep, difficulty maintaining sleep, or unrefreshing sleep; (2) the symptoms occur with a minimum frequency of three times per week; (3) the duration of sleep symptoms is at least 4 weeks; and (4) at least one aspect of daily life is affected substantially (Okun et al., 2009).

The scale was validated using a sample from a population that experienced high rates of insomnia in order to ensure that there were an adequate number of true positives. Within the sample, the researchers were able to identify an insomnia prevalence of 9.8%, consistent with previous research conducted on insomnia prevalence. Face and content validity were reported to be excellent due to the selection of items in the questionnaire being derived from widely accepted and published criteria within the DSM-IV. The ISQ had an overall reliability coefficient of 0.89, indicating a high degree of internal consistency (Okun et al., 2009). The authors note that further research is required to assess test-retest reliability, to compare against clinical interviews, and to assess other measures of validity. The questionnaire does not screen out insomnia related to associated medical conditions. Therefore, if medical conditions are present that cause insomnia, the scale itself will not be able to pick up on them independent of a diagnostic interview and comprehensive medical history. The entire scale is located in Appendix C.

Brief Pain Inventory (BPI)

Pain and sleep are interrelated in many cases (Smith & Haythornthwaite, 2004) and, due to their relationship, it is important to provide a measure of subjective pain in

order to rule it out as a confounding variable within the data set. The Brief Pain Inventory was developed to provide a quick and easy means of measuring pain intensity; it provides self-report items of the subjects' highest level of pain, lowest level of pain, average level of pain, and current level of pain (Tan, Jensen, Thornby, & Shanti, 2004). Subjects are also asked to rate their pain in seven different domains (general activity, mood, walking ability, normal work, relations with other persons, sleep, and enjoyment of life) on a scale from zero to 10, with zero being no pain and 10 being the most pain imaginable. Cronbach's alpha was determined for two portions of the scale, the intensity portion (0.85) and the interference portion (0.88) (Tan et al., 2004). The scales were also found to be associated with scores on other established scales for rating pain. For the purposes of the proposed study, only the first four items of the inventory will be used to screen for the presence of pain because in order to screen for general levels of pain. The first four items include the intensity scale, which includes items reflecting the subject's highest, lowest, average, and current levels of pain. The scale used can be found in Appendix D.

Positive and Negative Affect Schedule (PANAS)

Positive and negative affect are present as factors within self-rated mood. Positive affect reflects the extent to which a person feels enthusiastic, active, and alert. High positive affect is a state of high energy, full concentration, and pleasurable engagement, whereas low positive affect is characterized by sadness and lethargy. Negative affect is a general dimension of subjective distress and unpleasurable engagement that includes a variety of aversive mood states, including anger, contempt, disgust, guilt, fear, and nervousness, with low negative affect being a state of calmness and serenity (Watson, Clark, & Tellegen, 1988).

The PANAS is a 20-item self-report scale with multiple descriptors rated on a Likert scale from 1 to 5. Sample descriptors for positive affect include excited and determined. Sample descriptors for negative affect include distressed and ashamed. The scores are calculated and placed into two factors: positive affect and negative affect. The internal consistency, calculated as Cronbach's alpha, for positive affect was between 0.86 and 0.90, and the alpha for negative affect was between 0.84 and 0.87, showing good internal consistency. Test-retest reliability was assessed and, between each rating session, no significant differences were observed. The validity of the PANAS was assessed by comparing scores from other self-report measures.

In order to establish external validity, the authors compared the PANAS scores to measures of related constructs such as state anxiety, depression, and general psychological distress. They found the PANAS to be significantly correlated to the Beck Depression Inventory (BDI), the Hopkins Symptom Checklist (HSCL), and the STAI State Anxiety Scale (A-State) (Watson et al., 1988). The authors found the scale to provide reliable, precise, and largely independent measures of positive and negative affect. The scale can be found in Appendix E.

CHAPTER III

RESULTS

Validity of the Insomnia Symptom Questionnaire

Preliminary analyses were conducted to determine the presence of insomnia, based on the ISQ. Out of the 167 final participants, 37 (22.2% of the sample) were found to have reported symptoms consistent with insomnia per the ISQ criteria, while the remaining 130 (77.8% of the sample) participants did not report the symptoms necessary for an ISQ classification of insomnia.

In order to confirm the validity of the ISQ, a *t*-test was run to establish convergent validity. This was accomplished by comparing the means of the PSQI to the groups classified with insomnia and without insomnia. To establish convergent validity, those classified as having insomnia by the ISQ were expected to have higher PSQI (sleep disturbance) scores. As shown in Table 1, there was a significant difference between the two groups. The group that was classified with insomnia had higher average scores of sleep disturbance severity on the PSQI, while the group that was classified without insomnia had lower average scores of sleep disturbance severity. The difference in means displays convergent validity between the ISQ and PSQI.

Table 1

Summary of t-Tests Between ISQ Classification and PSQI Means

	PSQI	
ISQ Classification:	Mean	*SD*
Insomnia (*N* = 37)	11.43	3.11
No Insomnia (*N* = 130)	6.42	2.45

$t(165) = 10.33, p < .01$

Correlations of Resilience, Affect, Pain, and Severity of Sleep Disturbance

In order to test the hypothesis that the presence of resilience was related to lower severity of sleep disturbance, correlational analyses were completed, examining the relationship. In support of the hypothesis, a significant, negative correlation was found between resilience and severity of sleep disturbance, so that as resilience increased, the severity of sleep disturbance decreased. Correlations of resilience, affect, and severity of sleep disturbance are shown in Table 2. Additionally, there was significant relationship found between resilience and positive and negative affect. There was a positive correlation between resilience and positive affect, and there was a negative correlation found between resilience and negative affect. Pain was also related to higher severity of sleep disturbances and higher negative affect.

Table 2

Summary of Correlations Between CD-RISC, PSQI, PANAS, and Pain

Measures:	1. CD-RISC	2. PSQI	3. Positive Affect	4. Negative Affect
1. CD-RISC				
2. PSQI	-.35*			
3. Positive Affect	.39*	-.36*		
4. Negative Affect	-.44*	.52*	-.24*	
5. Pain	-.14	.24*	-.11	.27*

* $p < .01$

Partial Correlation With Pain

Due to the relationship between pain and sleep (Smith & Haythornthwaite, 2004), it could be implied that pain is a confounding variable when examining the relationship between sleep disturbance and resilience. It was important to rule out pain as a confounding variable. Therefore, a partial correlation between resilience and sleep disturbance severity was completed, while controlling for pain. Overall, the partial correlation between resiliency ratings and sleep disturbance remained significant after controlling for pain (Partial $r = -.33$, $p < .01$). The results of the analysis further support that resilience is significantly related to sleep disturbance, regardless of self-reported pain.

Relationship Between Resilience and the Insomnia Symptom Questionnaire

Additional analyses were completed to examine the difference in means of resilience in participants classified with and without insomnia. The *t*-test showed a significant difference in the means, with the insomnia group having a lower average

resilience and the group without insomnia having a higher average resilience. The results

of the *t*-test are shown in Table 3. This data further supports the hypothesis that

individuals with higher resilience report less sleep problems.

Table 3

Summary of t-Tests Between ISQ Classification and CD-RISC Means

	CD-RISC	
ISQ Classification:	Mean	*SD*
Insomnia ($N = 37$)	66.08	11.19
No Insomnia ($N = 130$)	71.86	10.57

$t(165) = 2.90, p < .01$

CHAPTER IV

DISCUSSION

Goals and Findings

Chronic sleep disturbance is associated with a number of mental health

difficulties (Taylor et al., 2011) as well as a number of physical health and chronic pain

conditions (Kupperman et al., 1995; Sivertsen et al., 2009; Üstün et al., 1996). With 15-

35% of adults reporting complaints of sleep disturbances (Bixler et al., 1979; Karacan et

al., 1976, 1983; Lugaresi et al., 1983; Mellinger et al., 1985), it is important to identify

factors related to sleep, such as the mental and physical health variables mentioned

earlier, in order to further understand the construct of sleep. One such variable that has

not been examined thoroughly in relation to sleep quality is resilience. Resilience is

supported as a trait that is related to positive outcomes of mental health (Choi et al., 2015;

Min et al., 2014; Newton-John et al., 2014) as well as with chronic pain conditions (Ong

et al., 2006; Ong et al., 2010). The research on resilience has grown in recent years with a

focus on a strengths perspective; however, there has not been a sufficient amount of

research on the relationship between resilience and sleep. Therefore, the aim of this study

was to examine the relationship between resilience and sleep disturbance, as well as other

associated factors such as positive and negative affect.

In the current study, resilience was directly related to sleep quality, such that, as

sleep quality increased, resilience also increased. This result was consistent with the

hypothesis that resilience and sleep quality would be directly related. It was also

consistent with findings from prior studies that related resilience to positive indicators of physical and mental health (Choi et al., 2015; Min et al., 2014; Newton-John et al., 2014; Ong et al., 2006; Ong et al., 2010). This study provided evidence that higher degrees of resilience were related to better subjective sleep quality, even when pain was controlled for. Furthermore, based on the ISQ, groups labeled with insomnia had significantly lower resilience than those who were labeled to not have insomnia.

Resilient individuals display numerous characteristics. They are more likely to view stressors as opportunities to overcome (Kobasa, 1979). Additionally, they are self-efficacious, patient, engaging, and have an action-oriented approach (Lyons, 1991; Rutter, 1985).

The current study identified a direct relationship between resilience and positive affect as well as an indirect relationship between resilience and negative affect. Higher resilience was associated with higher positive affect and lower negative affect. Individuals with high positive affect and low negative affect share characteristics with those of resilient individuals such as high concentration, pleasurable engagement, and patience and calmness (Ong et al., 2006; Ong et al., 2010; Watson et al., 1988). Therefore, relationships between the resilience and positive and negative affect were reasonably expected and are consistent with prior literature.

Implications

Clinical Implications

Sleep disturbances appear to have a significant effect on the functioning of adults, most notably, reductions in their overall quality of life. Similar to previous findings that high resilience may allow individuals to cope better with chronic pain conditions

(Newton-John et al., 2014), it may also help individuals deal more effectively with factors that create sleep disturbances. Resilience-enhancing programs have been employed and reviewed in prior research and have been effective in the reduction of depression symptoms and vulnerability to depression (Brunwasser, Gillham, & Kim, 2009; Fava & Tomba, 2009). The goal of these programs is to promote the protective factors associated with resilience. Examples of protective factors related to resilience include optimism, positive emotions, the use of cognitive reappraisal, social support, having a purpose in life, relying on a moral compass, and spirituality (Feder, Nestler, & Charney, 2009; Southwick & Charney, 2012). Though continued research is necessary, these types of interventions may be indicated in a number of additional uses for the reduction of mental health and physical problems. Due to the data collected in the current study, supporting the relationship between resilience and sleep disturbances, resilience-enhancing interventions may also be beneficial for use with individuals facing insomnia and other sleep-related difficulties.

With the increasing popularity of a strengths perspective, related to positive psychology, resilience may be used as an effective assessment tool to determine individuals' capabilities and strategies of coping. The presence or lack of resilience is apparent in numerous mental and physical health constructs. Therefore, the initial assessment of resilience and related factors may indicate an array of effective interventions for depression, anxiety, chronic pain conditions, and sleep disturbance. Interventions may include the aforementioned resilience-enhancing programs as well as other evidence-based treatments, depending on what strengths the individual already exhibits.

Research Implications

  Causal models. The current study is one of the first of its kind that examines the relationship between the constructs of resilience and sleep quality. The presence of a relationship points to and indicates the potential for future research in the area. However, the current study was not able to assist in the inference of causation. There are a few directions in which causation could be inferred: resilience directly affects sleep quality, sleep quality directly affects resilience, or the two factors interact with each other.

  The first model is that resilience could directly affect sleep quality. There are many characteristics of a resilient individual, including being adaptable to change, having a realistic sense of control, and being self-efficacious (Connor & Davidson, 2003). Each of these characteristics illustrate that a resilient individual is able to show success in controlling their lives and achieving their goals. If poor sleep quality is seen as a stressor, the definition of resilience (the ability to overcome stress and adversity) further implies that an individual with high resilience should be able to overcome poor sleep. When individuals with high resilience experiences stress they are more likely to respond and adapt to the stress in positive ways (Fitzpatrick, 2010). This is related to the strengthening effect inherent in resilience. Resilience may also be a protective factor of stress, comparative to its relationship with depression and anxiety (Hu et al., 2015). Therefore, an individual with high resilience that experiences poor sleep will be more likely to seek out solutions or support in order to prevent poor sleep in the future or the individual's resilience will protect against the effects of the stressors altogether.

  In the other direction, individuals' sleep quality may influence their level of resilience. When a person experiences poor sleep, they may be affected by a number of

negative effects including loss of energy, irritability, and poor concentration (Buysse et al., 1989; Okun et al., 2009). Poor sleep also significantly increases functional impairment, preventing individuals from completing numerous tasks effectively (Kupperman et al., 1995; Üstün et al., 1996). While the characteristics of resilience include self-efficaciousness, high energy, and a goal-oriented approach in life, chronic sleep disturbances have been related to contrasting characteristics in those facing sleep problems. Thus, these symptoms may inhibit the development of resilience. Overall, this model states that poor sleep decreases the energy and mental faculties that are related to the facilitation of resilience, causing low resilience.

The two variables may also display an interaction effect in which each construct acts upon the other. Sleep disturbances may inhibit the development of resilience, which in turn may exacerbate the sleep disturbances due to the lack of skills and resources to cope with them. This type of relationship may infer that treatment of either construct could lead to global improvement in the other.

The current study did not measure daily stress in association with sleep quality and resilience. Measuring daily stress could have been beneficial in identifying causal relationships. For example, if there were findings that individuals with high stress and high resilience also maintained good sleep quality, the results may have suggested that resilience helps buffer against stress to keep individuals' sleep quality high. This example would support the model that resilience affects sleep quality. On the other hand, findings that show individuals with high resilience, low stress, and high sleep quality would not significantly support the aforementioned causal relationship. Further research would then be focused on experimental and longitudinal designs.

One such strategy to identify a causal relationship would be to, first, screen participants for sleep disturbance problems. If participants were suffering from sleep problems, they would be disqualified from the study. Remaining participants would be separated into high and low resilience groups based on predetermined cut-off scores. The group with high resilience would be identified as the control while the other group with low resilience would be the comparison group. The hypothesis would be that the group with low resilience will be more likely to develop sleep problems over time, while the group with higher resilience will be less likely to develop sleep problems. The groups would be periodically assessed to examine their sleep quality and resilience. This study would test the possibility of a causal relationship, with resilience impacting sleep quality.

Another study that could be completed is an experimental design that would examine the possibility that sleep quality impacts resilience. Two groups would be created. One with good sleep quality and one with poor sleep quality. Those with good sleep quality would be identified as the control group, while those with poor sleep quality would be the experimental group. Treatment for sleep disturbances would be applied to the experimental group and each group would have their resilience and sleep quality measured over a longer period of time. The hypothesis would be that individuals, when treated for sleep disturbances, would also see significant improvements in their resilience.

Treatment. Future research may be indicated in determining how resilience-enhancing therapies may be integrated with current therapies for improving sleep. It is important to determine how effective the construct of resilience is in the treatment of sleep disturbances, if at all. Most research surrounding the current resilience-enhancing therapies is focused on depression. Therefore, if resilience does affect sleep quality, it

would be interesting to examine how such resilience-enhancing therapies affect an individual's sleep. The effectiveness of such techniques would be examined, using three groups: resilience-enhancing therapy, an already effective treatment for treating sleep problems, and usual care, providing psychoeducation on sleep problems. This would allow researchers to determine two things. First, if the therapy is effective at all, in comparison to the usual care group. And second, if the therapy is more effective than already established interventions.

Positive indicators of sleep. The finding of a relationship between resilience, a positive mental health indicator, and sleep quality points to the possibility of other positive mental health indicators that are related to sleep. Research may continue in the direction of identifying more positive variables that impact sleep and how they, in turn, relate to resilience and associated constructs. There are also a number of stressors that may cause a variety of different problems within sleep, such as psychiatric disorders and related anxiety and stress (Buysse et al., 1989). The current study measured sleep quality as a whole and did not break sleep quality down into the many different factors: subjective sleep quality, sleep latency, sleep duration, habitual sleep quality, sleep disturbances, use of sleep medication, and daytime dysfunction. A more in-depth view of these factors may be helpful in developing a deeper understanding of specific systems within sleep that may be affected more by resilience. This can be achieved through more objective assessment or more comprehensive self-report inventories containing sets of discrete factors. The PSQI was able to be broken down into seven components (Buysse et al., 1989); however, they did not contain enough differences to be considered in the

current study. Other measures of sleep may be used in order to examine these specific factors.

Resilience as a predictor. Resilience has also been found to be a predictor of chronic pain catastrophizing, suicidal ideation, and further mental/physical health variables, though resilience did not appear to operate better or add anything new to the existing measures of chronic pain (Min et al., 2015; Newton-John et al., 2014). The current study did not attempt to establish resilience as a predictor of sleep disturbances and how it compared to established measures, though the knowledge of a relationship may point to continuing study in this area.

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Limitations and Future Research

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Limitations

The results and conclusions are tempered by a number of limitations in the design of the study. First, the correlational nature of the study did not allow for a causative relationship to be determined between sleep quality and resilience. Though the study was successful in establishing that there was a relationship present between the two constructs, it would be helpful to examine them further to determine the directionality of the relationship. Second, the study was also conducted with the use of a convenient sample, comprised of mostly Caucasian, college-aged students. The current sample limits the overall generalizability of the study. Third, the inventories and scales that were used were subjective, self-report indices, with little to no objective data involved. The scales used were all standardized, but may not be as precise as objective measures, such as polysomnography which is used to examine brain waves, oxygen levels in blood, heart rate and breathing, as well as eye and leg movements, all of which may be used to

objectively identify sleep quality and disturbances. Finally, the study could not fully assess all related systems within insomnia and sleep disturbances, pointing to the need for more objective measures of sleep and longitudinal sleep studies, which may be more accurate and exhaustive in identifying relevant factors.

Future Research

There are numerous routes for future research in the realm of resilience and sleep quality because there is not much literature available in the area. The overall direction for future research must be focused on more specific aspects that the current study did not address, in comparison to the broad nature of the overall constructs. This includes breaking down the constructs into their different factors to determine which, if any, are interacting with different factors more than others. This also includes identifying specific stressors within sleep disturbances and isolating additional positive factors related to resilience.

A more specific route related to the current study would be to address the limitations. As stated, the design was correlational and it was not possible to determine causation in either direction, only that a relationship was present. Future research would aim for a longitudinal or experimental study in order to assess changes over time to determine the directionality of the relationship. This means that identifying appropriate objective measures would be helpful. Additionally, more objective measures, such as brain waves, oxygen levels, breathing, and eye and leg movements, could be obtained from polysomnography and may be more accurate and helpful in the differentiation of factors in an individual's quality of sleep. It would be important to note that individual sleep studies are very expensive and may themselves disturb sleep. Research using a

more representative population, such as a clinical sample, would be preferred as well, in order to study individuals who presently have complaints of sleep disturbances and determine if the relationship with resilience remains constant outside of a college setting, in which the sample of college students may be actively adjusting to a new style of life.

Finally, as with every many other disorders, there are a number of different confounding variables. Therefore, it is important to find tools to assess each disorder, such as insomnia, with more discrete and accurate procedures.

Recognizing a growing focus on resilience and positive indicators on mental health, this study was aimed at expanding into areas of research that have not been reviewed as extensively. This study displays the presence of a relationship that may help for future assessment of sleep disturbances as well as new strategies for treating them. It also contributes new questions to the study of resilience and its importance as an individual characteristic.

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APPENDIX A

CONNOR-DAVIDSON RESILIENCE SCALE (CD-RISC)

1. I am able to adapt when changes occur.
2. I have at least one close and secure relationship that helps me when I get stressed.
3. When there are no clear solutions to my problems, sometimes fate or God can help
4. I can deal with whatever comes my way.
5. Past successes give me confidence in dealing with new challenges and difficulties.
6. I try to see the humorous side of things when I am faced with problems.
7. Having to cope with stress can make me stronger.
8. I tend to bounce back after illness, injury, or other hardships.
9. Good or bad, I believe that most things happen for a reason.
10. I give my best effort no matter what the outcome may be.
11. I believe I can achieve my goals, even if there are obstacles.
12. Even when things look hopeless, I don't give up.
13. During times of stress/crisis, I know where to turn for help.
14. Under pressure, I stay focused and think clearly.
15. I prefer to take the lead in solving problems rather than letting others make all the decisions.
16. I am not easily discouraged by failure.
17. I think of myself as strong person when dealing with life's challenges and difficulties.
18. I can make unpopular or difficult decisions that affect other people, if it is necessary.
19. I am able to handle unpleasant or painful feelings like sadness, fear, and anger.
20. In dealing with life's problems, sometimes you have to act on a hunch without knowing why.
21. I have a strong sense of purpose in life.
22. I feel in control of my life.
23. I like challenges.
24. I work to attain my goals no matter what roadblocks I encounter along the way.
25. I take pride in my achievements.

Items are rated on a scale:
- (0) – Not true at all
- (1) – Rarely true
- (2) – Sometimes true
- (3) – Often true
- (4) – True nearly all of the time

APPENDIX B

PITTSBURGH SLEEP QUALITY INDEX (PSQI)

Instructions: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, when have you usually gone to bed?
   USUAL BED TIME_____
2. During the past month, how long (in minutes) has it usually taken to fall asleep each night?
   NUMBER OF MINUTES_____
3. During the past month, when have you usually gotten up in the morning?
   USUAL GETTING UP TIME_____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spend in bed.)
   HOURS OF SLEEP PER NIGHT_____

   For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you…
   a. Cannot get to sleep within 30 minutes
   b. Wake up in the middle of the night or early morning
   c. Have to get up to use the bathroom
   d. Cannot breathe comfortably
   e. Cough or snore loudly
   f. Feel too cold
   g. Feel too hot
   h. Had bad dreams
   i. Have pain
   j. Other reason(s), please describe_____
      i. Items are rated on a scale:
         1. Not during the past month
         2. Less than once a week
         3. Once or twice a week
         4. Three or more times a week

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6. During the past month, how would you rate your sleep quality overall?
   a. Very good
   b. Fairly good
   c. Fairly bad
   d. Very bad
7. During the past month, how often have you taken medicine (prescribed or "over the counter") to help you sleep?
   a. Not during the past month
   b. Less than once a week
   c. Once or twice a week
   d. Three or more times a week
8. During the past month, how often had you had trouble staying awake while driving, eating meals, or engaging in social activity?
   a. Not during the past month
   b. Less than once a week
   c. Once or twice a week
   d. Three or more times a week
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
   a. Not during the past month
   b. Less than once a week
   c. Once or twice a week
   d. Three or more times a week

APPENDIX C

INSOMNIA SYMPTOM QUESTIONNAIRE (ISQ)

Instructions: If you have experienced any sleep symptoms during the past month, please circle the appropriate number to let us know how your sleep is affecting your daily life.

During the past month did you have…	Never	Do not know	Rarely less than once per week	Sometimes 1-2 times per week	Frequently 3-4 times per week	Always 5-7 times per week	How long had the symptom lasted? (# of weeks, months, or years)
1. Difficulty falling asleep?	0	1	2	3	4	5	
2. Difficulty staying asleep?	0	1	2	3	4	5	
3. Frequent awakenings from sleep?	0	1	2	3	4	5	
4. Feeling that your sleep is not sound?	0	1	2	3	4	5	
5. Feeling that your sleep is unrefreshing?	0	1	2	3	4	5	

Instructions: If you have experienced any sleep symptoms during the past month, please circle the appropriate number to let us know how your sleep is affecting your daily life.

During the past month…	Not at all	A little bit	Moderately	Quite a bit	Extremely
6. How much do your sleep problems bother you?	0	1	2	3	4
7. Have your sleep difficulties affected your work?	0	1	2	3	4
8. Have your sleep difficulties affected your social life?	0	1	2	3	4
9. Have your sleep difficulties affected other important parts of your life?	0	1	2	3	4
10. Have your sleep difficulties made you feel irritable?	0	1	2	3	4
11. Have your sleep problems caused you to have trouble concentrating?	0	1	2	3	4
12. Have your sleep difficulties made you feel fatigued?	0	1	2	3	4
13. How sleepy do you feel during the day?	0	1	2	3	4

APPENDIX D

BRIEF PAIN INVENTORY (BPI)

1. On a scale from 0 to 10, with 0 being no pain at all and 10 being the worst pain
   imaginable, how would you rate your pain right now?

0	1	2	3	4	5	6	7	8	9	10

2. On the same scale, how would you rate your usual level of pain during the last
   month?

0	1	2	3	4	5	6	7	8	9	10

3. On the same scale, how would you rate your BEST level of pain during the last
   month?

0	1	2	3	4	5	6	7	8	9	10

4. On the same scale, how would you rate your WORST level of pain during the last
   month?

0	1	2	3	4	5	6	7	8	9	10

APPENDIX E

POSITIVE AND NEGATIVE AFFECT SCHEDULE (PANAS)

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you generally feel this way, that is, how you feel on the average. Use the following scale to record your answers.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

_____Interested   _____Distressed
_____Excited   _____Upset
_____Strong   _____Guilty
_____Scared   _____Hostile
_____Enthusiastic _____Proud
_____Irritable   _____Alert
_____Ashamed   _____Inspired
_____Nervous   _____Determined
_____Attentive   _____Jittery
_____Active   _____Afraid

APPENDIX F

IRB APPROVAL

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

November 20, 2015

Mr. Tyler McCuistion
Department of Psychology
ACU Box 28011
Abilene Christian University

Dear Mr. McCuistion,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "The Relationship between Resilience and Sleep Quality" (IRB # 15-103) is exempt from review under Federal Policy for the Protection of Human Subjects (45 CFR 46.101b).

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth, Ph.D.
Director of Research and Sponsored Programs

cc: Dr. Richard Beck

Our Promise: ACU is a vibrant, innovative, Christ-centered community that engages students in authentic spiritual and intellectual growth, equipping them to make a real difference in the world.

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APPENDIX G

INFORMED CONSENT

You have been invited to participate in a study examining sleep quality and psychological resilience. The decision to participate is up to you. If you decide to participate, you will be asked to complete four short surveys and provide us with basic demographic information. We believe this will take you about 20-30 minutes to complete.

Any risks will be minimized by maintaining confidentiality. Possible risks include breach of confidentiality resulting in personal information being released. Steps will be taken to ensure that information provided will remain confidential and intact; it will only be used for data analysis/research purposes. Names and personal information will not be used in research, however, some information provided (Banner ID and email) will be used for extra credit purposes in Intro to Psychology.

As stated before, if you complete the surveys you will be subject to receiving extra credit in your Intro to Psychology course with Dr. Richard Beck. Participation in this study is voluntary. If you do not wish to participate in this research, you may complete an alternative activity to earn the extra credit. You may write a 600-word reflection on how the ACU experience has impacted your spirituality. This activity is expected to take you about the same amount of time as the surveys. You may contact Dr. Beck at beckr@acu.edu if you wish to complete the alternative activity.

If you have any other questions or concerns, please feel free to contact Tyler McCuistion at: tsm09a@acu.edu