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The Relationship Between Cognitive Distortions, Self-compassion, and Insomnia Severity

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Philadelphia College of Osteopathic Medicine
School of Professional and Applied Psychology

THE RELATIONSHIP BETWEEN COGNITIVE DISTORTIONS, SELF-COMPASSION,
AND INSOMNIA SEVERITY

By Gabriel Stanziano

Submitted in Partial Fulfillment of the Requirements of the Degree of

Doctor of Psychology

June 2019

SCHOOL OF
PROFESSIONAL AND
APPLIED PSYCHOLOGY™

DISSERTATION APPROVAL

This is to certify that the thesis presented to us by GABRIEL STANZIANO

on the 9 day of MAY, 2019, in partial fulfillment of the

requirements for the degree of Doctor of Psychology, has been examined and is

acceptable in both scholarship and literary quality.

COMMITTEE MEMBERS' SIGNATURES

Chairperson

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Abstract

The goal of this study was to examine the relationships between cognitive distortions, self-compassion, and insomnia severity. Individuals were assessed using the Inventory of Cognitive Distortions (ICD), Self-Compassion Scale (SCS), and Insomnia Severity Index (ISI). Data were analyzed using a sample of 67 participants, ranging in age from 18 to 74.

A simple linear regression analysis was conducted to test the hypothesis that cognitive distortions would be predictive of insomnia severity. The results were not significant. A multiple regression analysis was used to test the hypothesis that the specific cognitive distortions of fortunetelling, labeling, and jumping to conclusions would be predictive of insomnia. The hypothesis was not supported. Lastly, a correlation analysis was used to test the hypothesis that self-compassion would be inversely correlated with insomnia. The results revealed that the correlation coefficient between these variables was not significant. Though research has demonstrated a relationship between negative beliefs about sleep and insomnia, the results of this study indicated that although certain negative sleep beliefs align with specific distortions, cognitive distortions overall and the distortions evaluated were not predictive of insomnia. Additionally, though past research has demonstrated a significant relationship between self-compassion and sleep quality, a direct relationship between insomnia and self-compassion was not found. Based on these results, future research is necessary, with a larger, more diverse sample, to further assess these relationships.

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Introduction

Statement of the Problem

Sleep is a critical element for physical and mental health (Morin, 2010), but sleep issues are prevalent across the globe (Irish, Kline, Gunn, Buysse, & Hall, 2015). Research indicates that approximately 56% of the United States population has sleep-related issues (Léger, Poursain, Neubauer, & Uchiyama, 2008). These numbers are significantly higher than Western European (31%) and Japanese individuals (29%); (Léger et al., 2008). Most Americans, between 61% and 79%, who had sleep problems reported the inability to properly function daily because of this issue (Léger et al., 2008). Among this high percentage of individuals with sleep problems, approximately 7% meet the diagnostic criteria for chronic insomnia, which consists of having trouble falling or staying asleep for no less than 1 month (Karlson, Gallagher, Olson, & Hamilton, 2013). Of those diagnosed, less than 25% seek treatment for their sleep difficulties (Morin, 2010). Individuals who do not seek treatment from a professional commonly resort to the use of alcohol or other substances, such as nutritional supplements, to help them to fall asleep, unaware of the potential side effects (Morin, 2010).

According to research conducted by Léger et al. (2008), in the United States, more women reported trouble initiating and continuing sleep than men (56% and 44%, respectively). The age range of 34-44 years, both genders combined, reported the highest rate of sleep difficulties (20%), followed by those between 25-34 years (19%); (Léger et al., 2008). Although it is one of the most common issues physicians and health-care providers face and has a higher prevalence than any other sleep-related illness, insomnia is often overlooked and left untreated, which can lead to several negative consequences

(Harvey et al., 2014). Risk factors for insomnia include unemployment, stress, poor health, and an inconsistent exercise routine (Lédger et al., 2008). Research has also indicated a potential relationship between sleep difficulties and heart problems, as well as diminished immune function (Gellis, Park, Stotsky, & Taylor, 2014; Léger et al., 2008). In regard to mental health, insomnia is positively correlated with dangerous implications, such as an increase in depression, anxiety, and substance use disorders, especially in students (Harvey et al., 2014; Kor & Mullan, 2011; Lédger et al., 2008; Morin, 2010). Anxiety and depression also commonly co-occur with insomnia, which makes sleep difficulties more serious (Bélanger et al., 2016).

Anxiety, in the form of maladaptive beliefs about sleep, is a key contributor to the maintenance of insomnia. It has been suggested that individuals with insomnia often worry about their inability to fall asleep, while thinking about potential consequences of a lack of sleep (Espie, 2007). Because of these thoughts, anxiety is triggered and displays itself in the form of a distorted view of sleep deficiency, as well as maladaptive behaviors that further exacerbate symptoms (Espie, 2007). Though there are a number of negative beliefs about sleep that individuals with insomnia endorse, research on a relationship between cognitive distortions and insomnia is lacking in the literature.

Cognitive distortions occur when one processes information “in ways that predictably resulted in identifiable errors in thinking” (Yurica & DiTomasso, 2005, p. 118). These distorted thought processes impact the way they view themselves and influence their emotions, leading to a learned and routine way of thinking. Although the literature reveals the negative impact cognitive distortions have on the preservation of emotional disorders (Yurica & DiTomasso, 2005), there is no association between these

maladaptive thought processes and their impact on sleep disorders, such as insomnia. By focusing on the cognitive distortions that individuals with insomnia relate to their sleep struggles, interventions and treatment plans can be tailored to these thought processes, potentially leading to more effective and efficient treatment, as opposed to a generalized treatment plan for all insomnia patients. Further, by exploring cognitive distortions related to sleep, individuals with insomnia may benefit from insights on how these thoughts are negatively impacting symptoms. Further, focusing on cognitive distortions may facilitate the prevention of generalizing these beliefs to areas of life other than sleep.

Whereas the dysfunctional thought processes related to cognitive distortions lead to higher levels of anxiety and distress, self-compassion has been associated with lower anxiety levels (Homan, 2016). Though positively correlated with insomnia, depression and anxiety have been found to be negatively correlated with self-compassion (Hall, Row, Wuensch, & Godley, 2013; Krieger, Altenstein, Baetting, Doering, & Holtforth, 2013), which is defined as “being kind to oneself when challenged with personal weakness or hardship” (Krieger et al., 2013, p. 501). Whereas compassion consists of being empathic towards others in their time of suffering, self-compassion means applying these beliefs towards oneself (Gerber, Tolmacz, & Doron, 2015). While related to lower levels of psychological difficulties, including depression and anxiety, that hinder sleep, self-compassion is associated with higher levels of happiness and quality of life (Homan, 2016). Furthermore, individuals reporting high levels of self-compassion are more likely to implement health-promoting behaviors, including behaviors that promote sleep, in their daily lives (Sirois, Kitner, & Hirsch, 2015).

Interventions such as relaxation exercises and mindfulness have been proven to be

beneficial for individuals with insomnia. In addition, the literature supports mindfulness-based exercises help to promote self-compassion. This emphasizes the significance of being self-compassionate to overcome this disorder or treat associated symptoms (Irish et al., 2015; Ong et al., 2008). Interventions aimed at increasing self-compassion have also been beneficial when implemented to address other mental health difficulties (Irish et al., 2015; Martires & Zeidler, 2015; Raab, 2014), such as stress, self-criticism, and rumination (Neff, Kirkpatrick, & Rude, 2007). By increasing self-compassion, individuals can diminish negative feelings associated with their struggle by letting go of attachments to certain thought processes that may result in psychologically destructive beliefs (Martires & Zeidler, 2015). It is possible that those who are unable to overcome insomnia have less self-compassion and are therefore are ineffective in their efforts to cope with it. It is important to discover if and how self-compassion can influence the ability to cope with and overcome insomnia. This can yield a greater understanding about the factors that impact quality of sleep. Furthermore, these individuals would be able to receive effective treatment, potentially focused on enhancing their self-compassion, and recover more quickly.

Purpose of the Study

The present study examined cognitive distortions as a predictor of insomnia severity. Though the literature has revealed an association between dysfunctional beliefs about sleep and the maintenance of insomnia, a direct relationship between cognitive distortions and insomnia has yet to be established. Further, this study examined whether specific cognitive distortions are more strongly related to insomnia severity than others. Throughout the literature, there are several maladaptive beliefs about sleep that align with

certain cognitive distortions, with the most common distortions being *jumping to conclusions*, *fortunetelling*, and *labeling*. The results of this study could help to provide more efficient interventions to those with insomnia. For example; by focusing on the maladaptive thoughts created by specific distortions, the treatment process can be narrowed to focus on the patterns of thinking that are most significantly impacting sleep quality.

This study also examined the relationship between self-compassion and insomnia. Although there is a strong relationship between mindfulness, which can aid in improving sleep quality, and self-compassion (Galla, 2016; Neff, 2003), a direct relationship between self-compassion and sleep quality in the insomniac population has not been identified. The results of the study could provide information on the significance of self-compassion in the context of treatment for insomnia. The acknowledgment of this variable as an integral part of sleep quality in individuals with insomnia could be beneficial for those treating this population. If self-compassion is a predictor of sleep quality, future interventions could make it a priority to focus on this early in the intervention process to provide the most efficient care possible.

Review of the Literature

Insomnia

According to the American National Commission of Sleep Disorders Research (NCSDR), insomnia is defined as “a chronic or acute sleep disorder characterized by a complaint of difficulty initiating, and/or maintaining sleep, and/or a subjective complaint of poor sleep quality that result in daytime impairment and subjective report of impairment” (Choueiry, Salamoun, Jabbour, El Osta, Hajj, & Khabbaz, 2016, p. 2).

There are differing conceptualizations of insomnia, but for the purpose of this study, the diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.: *DSM-5*; American Psychiatric Association [APA], 2013) will be used to define insomnia disorder. The *DSM-5* diagnostic criteria for insomnia consist of experiencing dissatisfaction, regarding amount of sleep and sleep quality (APA, 2013).

Sleep dissatisfaction is comprised of complaints about struggling to fall asleep at bedtime, awakenings throughout the night or early in the morning while being incapable of falling back to sleep, and waking up feeling unrested (APA, 2013; Morin, 2010). An individual must be experiencing these sleep difficulties for 3 nights a week over a 3-month period (APA, 2013; Choueiry et al., 2016). Additionally, the disturbances in sleep must lead to clinically significant distress or deficiency in educational, behavioral, academic, social, occupational, or other aspects of functioning (APA, 2013). Moreover, the struggle to sleep should occur despite adequate chances to sleep (APA, 2013). Of note is the fact that some symptoms will be more predominant than others, depending on the individual. In one study, the most prevalent symptoms reported by individuals with insomnia were difficulty staying asleep (61.0%) and early morning awakenings (52.2%),

followed by nonrestorative sleep and difficulty falling asleep (Walsh et al., 2011). Also, approximately 47% of insomnia survey participants reported experiencing only one symptom at night, approximately 33% reported experiencing two, whereas three and four symptoms were reported in 15% and 4% of individuals, respectively (Walsh et al., 2011). Though the symptoms of insomnia are multifaceted in nature and uniquely impact individuals, the negative impacts of these symptoms are clear and robust in the insomnia literature.

Negative Impacts of Insomnia

Social.

Insomnia impacts not only sleep, but also many areas of life. The disorder can cause longstanding mental and physical fatigue, negative mood, and difficulties with memory and attention (Schutte-Rodin, Broch, Buysse, Dorsey, & Sateia, 2008). In addition, professional and social lives are adversely impacted (Choueiry et al., 2016; Morin, 2010; Schutte-Rodin et al., 2008). Those with chronic insomnia experience daytime deterioration of mood, thought processes, and performance, which may also negatively impact family, friends, and coworkers (Schutte-Rodin et al., 2008). Furthermore, daytime functioning is negatively impacted, as evidenced by an elevated likelihood of arriving late or not appearing at work, making mistakes on the job, and being involved in car accidents (Schutte-Rodin et al., 2008). The social impacts are evident, but the physical health consequences leading to and caused by insomnia are also of great concern.

Physical.

Research indicates that insomnia is positively correlated with negative health

(Silvertsen et al., 2009). Studies have revealed that sleep is greatly impacted by many different ailments, such as asthma, end-stage renal disease, and cancer (Silvertsen et al., 2009). In addition, insomnia is one of the key symptoms of numerous chronic pain diseases, specifically migraines, rheumatoid arthritis, and osteoporosis (Silvertsen et al., 2009). Insomnia is also often reported in fibromyalgia and other types of musculoskeletal disorders (Silvertsen et al., 2009). Individuals with insomnia are more likely to report conditions such as neurologic disease, hypertension, heart disease, gastrointestinal problems, urinary problems, and breathing difficulties. Moreover, insomnia patients may have diminished immune systems (Gellis et al., 2014; Léger et al., 2008). Of note, the rates of insomnia in individuals with chronic pain and mental illness can be as high as 50% to 75% (Benca, Ancoli-Israel, & Moldofsky, 2004; Taylor et al., 2007). In addition to the physical ailments mentioned, it is also possible for insomnia to occur within other sleep disorders, including sleep-related movement disorders, sleep-related breathing disorders, and circadian-rhythm sleep disorders (Schutte-Rodin et al., 2008). With these co-occurring diseases, managing insomnia can become difficult. Thus, it is important to explore the relationship between maladaptive coping and insomnia.

Negative coping.

Alcohol, prescription and over-the-counter medicines, and melatonin amount to millions of dollars spent by individuals with insomnia every year (Schutte-Rodin et al., 2008). The majority of individuals with insomnia initiate their own treatment, without consulting a professional, leading to poor sleep hygiene behaviors, such as alcohol use, caffeine consumption (Irish et al., 2015), and herbal supplements, in an attempt to reduce

symptoms (Morin, 2010). This suggests they are exploring many routes to attempt to ease their symptoms (Schutte-Rodin et al., 2008). Furthermore, it has been reported that self-medicating insomniacs are more likely to relapse on substance use and commit suicide (Schutte-Rodin et al., 2008). This treatment is implemented despite the lack of knowledge of the risks and benefits of these substances (Morin, 2010). In addition to negative coping and the social and physical influences of insomnia, mental health is also impacted by this sleep disorder.

Insomnia, Anxiety, and Depression

During the early stages of studying potential causes of insomnia, a strong correlation was discovered between the sleep disorder and major depression and anxiety, specifically in the adult population (Johnson, Roth, & Breslau, 2006). It was found that individuals with chronic insomnia were 40 times more likely to be diagnosed with major depression, and just over 6 times more likely to experience an anxiety disorder (Ford & Kamerow, 1989). Recently, it was revealed that compared to those who do not report sleep difficulties, individuals with insomnia are at even greater risk of depression than reported in the past (Benca & Peterson, 2008). Also, when insomnia is continual, there is a considerably higher chance of developing a depressive disorder (Benca & Peterson, 2008).

In newer studies, insomnia in adults has been suggested as a predictor in the development of major depressive and anxiety disorders, as well as of increased suicide risk (Jansson-Fröjmark & Lindblom, 2008; Johnson, Roth, & Breslau, 2006). The association between mental disorders and insomnia tends to vary depending, on the individual. In some patients, mental disorders and insomnia develop simultaneously,

whereas in others, the development occurs in sequence (Benca & Peterson, 2008).

Presence of insomnia.

Though there is minimal research available on the impact insomnia and anxiety have on one another, there is evidence that anxiety could be viewed as a risk factor for the development of insomnia (Jansson-Fröjmark & Lindblom, 2008). Insomnia commonly develops simultaneously or after an anxiety disorder is present, while occurring prior to or at the same time as a mood disorder (Ohayon & Roth, 2003). In the past, depression was thought to be a potential cause of insomnia, but research into the epidemiology of the sleep disorder has revealed that it could be a cause of depression (Benca & Peterson, 2008).

Insomnia symptomatology was found to occur only 18% of the time prior to the appearance of an anxiety disorder (Ohayon & Roth, 2003). The symptoms of both disorders occurred simultaneously in 39% of individuals, whereas insomnia symptoms occurred following the onset of an anxiety disorder in 44% of patients (Ohayon & Roth, 2003). Lifetime associations between anxiety disorders and insomnia are moderate to strong. This is also true for associations between major depression and insomnia (Johnson, Roth, & Breslau, 2006).

Causal relationships.

Although longitudinal research indicates that those with depression could be at increased risk for developing insomnia, depression did not correlate with the onset of insomnia, according to retrospective studies (Jansson-Fröjmark & Lindblom, 2008). In most co-occurring cases, anxiety disorders appeared before insomnia (73%), but in those with comorbid depression and insomnia, insomnia was present first in 69% (Johnson et

al., 2006). Research reveals that the relationship between insomnia and anxiety and depression may be bidirectional, meaning depressive and anxious symptomatology hinders sleep quality, and insomnia leads to depression and anxiety (Mason & Harvey, 2014; Schutte-Rodin et al., 2008).

Though a potential bidirectional relationship exists between the disorders, anxiety, in the form of social anxiety, generalized anxiety, and panic disorder, was the strongest predictor of insomnia (Jansson-Fröjmark & Lindblom, 2008). Conversely, insomnia was better able to predict depression than anxiety (Jansson-Fröjmark & Lindblom, 2008). In addition, more severe depression was also reported in insomnia patients (Mason & Harvey, 2014). Moreover, the more severe and enduring the insomnia, the higher the probability of a history of mental illness (Benca & Peterson, 2008), with anxiety and depressive disorders being the most prevalent. Although the existence of anxiety is better able to predict insomnia, insomnia appears to be a stronger predictor of depression.

To summarize, though some research reveals a possible bidirectional relationship between depression and anxiety and insomnia (Jansson-Fröjmark & Lindblom, 2008; Mason & Harvey, 2014; Schutte-Rodin et al., 2008), some of these relationships have a stronger potential causal relationship than others. Whereas anxiety is viewed as the strongest predictor of insomnia, depression is better predicted by insomnia. Though it is apparent that anxiety and depression are related to insomnia, dysfunctional thought processes about sleep also hinder sleep quality (Semler & Harvey, 2005). Because of this, it is important to discuss the impact of these thought processes, specifically perceptions of sleep quality, and their connection to insomnia.

Perceived Sleep Quality and Insomnia

Individuals with insomnia tend to underestimate the amount of time they sleep each night, while overestimating the negative effect their sleep loss has on their functioning the next day (Semler & Harvey, 2005). Because of these misperceptions, it is suggested that this thought process plays a significant role in insomnia maintenance (Semler & Harvey, 2005). This is because those with insomnia commonly believe they have not received adequate sleep upon waking up. This belief initiates several cognitive processes, including unnecessary anxiety (e.g., “I’m never going to cope today”), observing sleep-related threats (i.e., headache, sore muscles), and the implementation of safety behaviors (e.g., cancelling plans, remaining in bed to catch up on sleep); (Semler & Harvey, 2005).

Research has sought to explore the relationship between perceived sleep quality and daytime functioning in those who met the *DSM-IV* diagnostic criteria for primary insomnia (Semler & Harvey, 2005). To estimate sleep during the experimental process, an actigraph, which is a small device worn on the wrist to collect data on physical movements, was worn by the participants. Information gathered from this device was used to measure the sleep/wake cycles (Semler & Harvey, 2005). Negative and positive feedback about their sleep was also recorded in diaries.

After this information was gathered, it was revealed that the day after negative feedback (poor perceived sleep quality) was obtained, individuals reported greater sleepiness and more safety-behavior use and had greater awareness of sleep-related threat compared to days when positive feedback was reported (good perceived sleep quality); (Semler & Harvey, 2005). Further, measures of daytime functioning were reported as

worse on days when the amount of sleep attained was sufficient (6.5 hours), but negative feedback was received, as opposed to days when sufficient sleep was not attained (less than 6.5 hours), but positive feedback was reported (Semler & Harvey, 2005). The results from this study align with the idea from previous research that individual perception of poor sleep quality contributes to the impaired daytime functioning of those with insomnia (Harvey, 2002).

The relationship between perceived sleep quality and insomnia has been established in the literature (Harvey, 2002; Semler & Harvey, 2005). Those with a negative perception of their sleep quality, regardless of whether they have attained an adequate amount of sleep, have self-reports of low-quality sleep (Semler & Harvey, 2005). In addition to this, this negative perception of sleep quality results in impaired daytime functioning, even when sufficient sleep was attained (Semler & Harvey, 2005). Further, this thought process plays a significant role in the development of anxiety and a heightened awareness of sleep-related threat, as well as the implementation of safety behaviors, all of which contribute to insomnia maintenance. Research has also revealed ways anxiety and depression can be exacerbated, leading to insomnia, in the form of what is called repetitive thoughts (Takano, Iijima, & Tanno, 2012).

Repetitive thought consists of “thinking attentively, repetitively, or frequently about one’s self and one’s world” (Takano et al., 2012). This thought process is viewed as a risk factor for several physical and mental ailments (Brosschot, 2010). Most research that has been conducted on repetitive thoughts has focused on the negative impact on mental illnesses, such as anxiety and depression, as well as physical illness (Watkins, 2008). In addition to this, cognitive models of insomnia propose that these

thought processes play a significant part in insomnia onset and maintenance (Takano et al., 2012). Harvey's model of insomnia states that rumination and unnecessary worry about obtaining an adequate amount of sleep leads to autonomic arousal and distress, resulting in attentional biases, as well as misperceptions of sleep and next-day functioning. This produces a pathway for the creation and maintenance of sleep discrepancies and daytime function (Harvey, 2002).

Research on the relationship between repetitive thoughts and sleep difficulties has identified a potential association between repetitive thought and self-reported sleep difficulties (Takano et al., 2012). Further, rumination was able to predict the reduction of sleep quality (Takano et al., 2012). Additionally, rumination and worry were significantly correlated with anxiety and depression, as well as self-reported sleep quality (Takano et al., 2012), which further suggests the negative impact of anxiety and depression on sleep quality.

While negative perceptions about sleep, repetitive thought, and symptoms of anxiety and depression are related to insomnia, research has shown that specific distorted patterns of thinking about sleep hinder sleep quality. Because of this, it is important to discuss the impact of these dysfunctional beliefs and their connection to insomnia, anxiety, and depression.

Cognitive Theory and Distortions

Cognitive theory is comprised of four parts: schemata, cognitive errors, the cognitive triad, and automatic thoughts (Beck, 1967; Black & Pössel, 2015). The cognitive model focuses on errors in thinking, which lead to negative beliefs about the self, world, and the future (cognitive triad); (Lorenzo-Luaces, German, & DeRubeis,

2015). Beck stated that cognitive biases and maladaptive cognitive content are a result of triggering cognitive schemas, which usually are created in early life (Lorenzo-Luaces et al., 2016). The idea of these schemas developed when Beck was studying behavioral phenomena in those with depression. This research led to his hypothesis that a key feature of depression was when an individual initiated “certain basic cognitive patterns,” also known as schemas (Beck, 1967, p. 255).

Schemas are described as rules that outline the way an individual interprets life experiences, which includes memories related to his or her experience (Worsfold, 2009). When an individual encounters a particular environment, a schema relating to the experience is constructed. Because of this, the content of schemas reflects the values, conceptions, attitudes, and goals a person has obtained (Beck, 1967; Worsfold, 2009). For these global outlooks that have been acquired, the term *dysfunctional assumption* is commonly used to address the problematic features of these mindsets (Worsfold, 2009). Further, schemas can be inflexible at times, while consisting of maladaptive information about one’s experiences (Black & Pössel, 2015).

While studying depression, Beck also discovered that individuals display errors in thinking that become part of the outline of their schema and are unfair to themselves. For example, one error in thinking could be an inclination to overgeneralize or to make conclusions about themselves from one encounter or event (Beck, 1967; Worsfold, 2009). In addition to this, the cognitive triad develops in the form of what are called negative automatic thoughts, leading to the maintenance of this distorted thinking rooted in an individual’s schema (Worsfold, 2009). The negative thoughts are considered digressions from rational ways of thinking that expose the personal meaning of a particular situation

(Worsfold, 2009). Beck suggests that the content of one's thinking separates normal functioning from dysfunction (Worsfold, 2009).

A cognitive distortion is commonly defined as an error in one's thought process because of defective processing of information (Guglielmo, 2015), which may be in the form of a private thought or verbal self-statement (Strohmeier, Rosenfield, DiTomasso, & Ramsay, 2016). In addition to this, Beck has defined cognitive distortions by the existence of "idiosyncratic thought content indicative of distorted or unrealistic conceptualizations" (Beck, 1963, p. 324). Furthermore, behaving in a way that validates an individual's distorted thought process can result in limited proactive behavior, a decrease in chances to access different types of reinforcement, continued maladaptive behavior, and elevated emotional distress (Strohmeier et al., 2016). Because of the impact distorted thinking can have on sleep, the relationship between specific cognitive distortions and insomnia complaints was explored.

Insomnia and Cognitive Distortions

Though a direct connection between cognitive distortions and insomnia has not been reported in the literature, there are several negative beliefs about sleep that align with specific cognitive distortions. One of the most common thoughts insomnia have is that they will not be able to properly function after sleeping poorly the previous night (Roane, Dolan, Bramoweth, Rosenthal, & Taylor, 2012). Further, this belief may lead to monitoring their bodies for sleepiness or fatigue to solidify their negative thought process (Sanchez-Ortuño & Edinger, 2010). This popular belief among individuals with insomnia aligns with the cognitive distortion known as *arbitrary inference/jumping to conclusions* (Yurica & DiTomasso, 2005). With this way of thinking, individuals draw a

negative conclusion without having explicit evidence to support the consequence (Yurica & DiTomasso, 2005). Although this is one of the most common thoughts of an insomniac, there are several other thought processes that are congruent with particular cognitive distortions.

Studies have explored the types of distorted beliefs that were most significantly associated with complaints about insomnia (Carney & Edinger, 2006). Individuals with insomnia and normal sleepers were compared by their responses on the Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-30); (Carney & Edinger, 2006). The items endorsed related to beliefs about negative consequences following a poor night of sleep or not having control over sleep were more strongly endorsed by individuals with insomnia (Carney & Edinger, 2006).

The aforementioned views of sleep are related to the two core pathologic feelings of helplessness (e.g., “There is nothing I can do...”) and hopelessness (e.g., “There’s little chance of getting better”); (Carey & Edinger, 2006, p. 348). These are common beliefs among individuals with insomnia regarding a lack of control over their symptoms (Eidelman et al., 2016). These thought processes align with the cognitive distortion called *fortunetelling*. An individual with this type of distorted thinking predicts or “fortune tells” a negative result of an event in the future and strongly believes that this prediction (e.g., “There’s little chance of getting better”) is accurate.

Another cognitive distortion congruent with a dysfunctional belief about sleep is known as *labeling*. With this way of thinking, individuals perceive experiences as fitting into only one of two categories: good or bad. Further, they are unable to place themselves, their experiences, or others on a continuum (Yurica & DiTomasso, 2005).

This relates to the distorted thought process in which insomniacs believe obtaining at least 8 hours of sleep is essential to feel rejuvenated and to function the following day (Sanchez-Ortuño & Edinger, 2010). If they do not get this amount of sleep, individuals with insomnia fear and believe they will not have the energy to make it through their day. This leads to behaviors that negatively impact their sleep, such as consuming caffeine or taking naps, which the individuals believe will counteract their fatigue (Sanchez-Ortuño & Edinger, 2010).

In summary, though no direct connection has been made in the literature between cognitive distortions and insomnia, there are many beliefs that are congruent with the cognitive processes of distortions. According to the literature, there were specific maladaptive beliefs about sleep that are aligned with three specific cognitive distortions: *arbitrary inference/jumping to conclusions*, *fortunetelling*, and *labeling*. As the maladaptive beliefs are predictive of insomnia, it is suggested these cognitive distortions aligning with these beliefs will be strongly related to insomnia. Because of the impact distorted thinking can have on emotional well-being, the relationship between this negative thought process and anxiety and depression was explored, specifically in relation to sleep.

Cognitive Distortions and Anxiety/Depression

It has been suggested that if individuals with insomnia constantly perceives that they are not sleeping enough, anxiety and worry related to sleep will be exacerbated (Yang & Harvey, 2004). Examples of dysfunctional thoughts related to this anxiety are “I am losing control,” “I’m not going to cope”, and “I will lose my job” (Yang & Harvey, 2004, p. 28), which align with the cognitive distortion of *jumping to conclusions*, more

specifically *fortunetelling*, in which individuals anticipate the worst result of their thoughts (Burns, 1999). This elevation in anxiety is a key contributor to insomnia maintenance because it is not beneficial for ideal sleep onset or daytime functioning (Yang & Harvey, 2004). These negative thought processes play a significant role in the diminished ability to function during the day.

Anxiety and worry hinders efficient performance and conflicts with daily functioning, leading to the maintenance of these dysfunctional beliefs and an elevated likelihood of a negative consequence (Semler & Harvey, 2005). For example, the belief that sleeping 8 hours each night is required to successfully function may lead to elevated levels of anxiety if this amount of sleep is not obtained (Carney, Harris, Moss, & Edinger, 2010). In addition, believing it is difficult to cope with daytime insomnia symptoms may also lead to high anxiety levels when anticipating the symptoms and trying to fall asleep (Carney, Segal, Edinger, & Krystal, 2007). Further, not attaining this specific amount of sleep may cause individuals to focus more on daytime dysfunction to verify their thoughts that 8 hours of sleep is needed each night (Carney et al., 2010). These distorted beliefs can also cause sleep-disruptive compensatory behaviors to occur, such as staying in bed longer to make up for lost sleep time (Carney et al., 2007). Taken together, these thought processes significantly contribute to the maintenance of insomnia (Carney et al., 2007).

There have also been studies establishing a connection between beliefs about sleep and quality of sleep (Carney & Edinger, 2006; Carney et al., 2007). The difference between endorsed items on the DBAS between age-matched groups of individuals with insomnia and normal sleepers was explored (Carney & Edinger, 2006). More

specifically, the DBAS was administered to distinguish between the beliefs about sleep between these two groups.

The results of this study revealed that of the 30 items on the DBAS, 16 items differentiated good sleepers from those with insomnia (Carney & Edinger, 2006). Additionally, the two highly endorsed beliefs were related to hopelessness and helplessness, which are commonly endorsed in other illnesses, such as anxiety and depression (Carney & Edinger, 2006, p. 348). Further, these negative thought processes may be triggered by underlying emotional states, which may exacerbate insomnia (Carney & Edinger, 2006).

In summary, the abovementioned research revealed the positive relationship between distorted cognitions about sleep and insomnia, as well as how characteristics of anxiety and depression may significantly impact the enhancement of these thought processes. The study by Carney et al. (2007) also further confirms that individuals with insomnia frequently have reduced flexibility regarding their sleep beliefs and have negative thought processes compared healthy sleepers (Carney et al., 2007). As this study focused on distortions, insomnia, and anxiety, it is important to explore research that also includes a relationship between distorted thinking and depression.

In another study, the goal of the research was to discover if individuals with insomnia and with insomnia and co-occurring mood symptomatology had comparable unreasonable beliefs about sleep compared to healthy sleepers (Carney et al., 2007). Similar to the previously mentioned study, the DBAS was used to assess the participants' cognitions about sleep. Individuals primarily with insomnia and with comorbid mood and insomnia symptoms reported similar negative sleep beliefs (Carney et al., 2007).

Regarding symptoms of depression and maladaptive sleep beliefs, it was reported that shared variance was probable. Moreover, the scores reported from the Beck Depression Inventory (BDI) and DBAS were significantly positively associated (Carney et al., 2007). Further, individuals with depression could have negative cognitions about multiple areas of their life, potentially leading to maladaptive thought processes that impact their beliefs about sleep (Carney et al., 2007)

The relationship between emotions, specifically anxiety and depression, and dysfunctional thinking is evident. The research shows the impact these negative emotions have on the exacerbation of distorted patterns of thinking about sleep, which in turn leads to the maintenance of insomnia. Because distorted thinking about sleep does not provide an accurate measure of sleep quality, it is important to understand how perception of sleep quality can negatively impact and maintain insomnia symptoms. Although negative beliefs about sleep and anxious and depressive symptoms are related in insomnia, self-compassion also plays a significant role in anxious and depression symptomatology (Van Dam, Sheppard, Forsyth, & Earleywine, 2011). It would, therefore, be important to understand the relationships between self-compassion, anxiety, and depression, given the latter two variables have established relationships with insomnia in the literature.

Self-Compassion

Self-compassion is defined as “being kind to oneself when challenged with personal weakness or hardship” (Krieger, Altenstein, Baettig, Doerig, & Holtforth, 2013, p. 501). This construct can also be viewed as a sympathetic way of observing one’s failures and inadequacies (Homan, 2016).

Self-compassion consists of three interconnected parts: self-kindness, common humanity, and mindfulness (Galla, 2016; Homan, 2016; Neff, 2003). The first component, self-kindness, includes being kind to oneself, instead of hypercritical, as well as treating the self with sympathy, approval, forgiveness, and warmth, specifically during times of difficulty and failure (Galla, 2016; Homan, 2016). Common humanity allows the individual to understand that struggle and imperfection are something that every human being experiences at some point in their life (Homan, 2016). One who possesses this component can realize that failure is part of being human and is able to positively acknowledge it (Baer, Lykins, & Peters, 2012; Galla, 2016). The last component, mindfulness, encompasses the ability to become aware of negative thoughts and emotions, without letting these feelings overtake them, which could lead to detrimental effects (Homan, 2016).

Associated constructs.

Self-compassion is often viewed as similar and closely related to other constructs, namely self-esteem (Homan, 2016). Although they appear to be similar in nature, self-compassion and self-esteem are quite different from one another (Homan, 2016). Self-esteem is commonly defined as “favorable global evaluations of the self” (Homan, 2016, p. 112). As previously stated, self-compassion is total benevolence and acceptance of oneself, while acknowledging areas in which one is lacking competence (Gerber et al., 2015; Homan, 2016). Furthermore, research indicates self-compassion is correlated with the ability to learn from mistakes, sensible expression of feelings, and the capability to accept responsibility for failures. Self-esteem, on the other hand, is associated with defensiveness and the rejection of accountability for one’s actions (Breines & Chen,

2012; Leary, Tate, Adams, Allen, & Hancock, 2007), which is unrelated to a self-compassionate mindset. It is important to note the distinct differences between these two variables, as they can be easily confused and misused. Further, self-esteem is not the only variable commonly linked to self-compassion.

Mindfulness is another construct that is frequently viewed as similar to or the same as self-compassion (Galla, 2016; Neff, 2003). On self-report measures, these two variables are often strongly related to one another, as an elevation in one often positively correlates with the other (Galla, 2016; Neff, 2003). Despite this, they have different characteristics. Mindfulness focuses on awareness of the current moment, while responding to thoughts in a way that does not impose judgement (Bluth & Blanton, 2014). Alternatively, self-compassion emphasizes the actions implemented when facing struggles. It consists of the active component of participating in self-soothing actions (Neff & Pommier, 2013). Whereas mindfulness consists of bringing awareness to a moment with composure and stability, self-compassion is applied explicitly in times of suffering (Bluth & Blanton, 2014). Mindfulness inspires an individual to accept and feel pain, whereas self-compassion explores ways to ease the pain. Lastly, self-compassion uniquely focuses on an individual's relationship with himself and herself, whereas mindfulness concentrates on an individual's connection to feelings and thoughts in the moment (Bluth & Blanton, 2014).

In summary, though the improvement in one may lead to an increase in the other, mindfulness and self-compassion are separate entities, despite the similar benefits each may provide for an individual. A self-compassionate individual has the ability to take action and implement behaviors to overcome struggles. In addition to this, self-

compassion plays a significant role in the enhancement of physical and mental health (Homan 2016; Sirois et al., 2015).

Health promotion.

Self-compassion is beneficial for the improvement of health outcomes (Sirois et al., 2015). Though the current research is minimal, there is evidence of a correlation between self-compassion and an individual's likelihood of partaking in behaviors that improve health (Sirois et al., 2015). It is also possible that self-compassion enhances health-promoting behaviors, such as goal setting and the regulation of emotions (Sirois et al., 2015). Moreover, there is literature indicating that self-compassion plays a part in the promotion of resilience related to physical illness and stress reduction (Sirois et al., 2015).

With higher resilience and diminished stress come higher reported levels of happiness and quality of life (Homan, 2016). Greater levels of self-compassion have been correlated with emotional intelligence and positive social interaction, as well as a reduction in eating disorder behaviors and perfectionism (Krieger et al., 2013). Also, interventions aimed to increase self-compassion, such as mindfulness-based therapeutic techniques, have led to decreases in self-reported rumination, anxiety, depression, and self-criticism (Homan, 2016). Moreover, lower levels of psychological difficulties, including depression and anxiety, are related to self-compassion (Homan, 2016).

To conclude, self-compassion can lead to a multitude of mental and physical health benefits. With this mindset, individuals are more motivated to engage in behaviors that are advantageous to their quality of life. Due to the association between self-compassion and mental health (Homan, 2016; Krieger et al., 2013), psychopathology was

further explored to home in on more specific mental health variables related to this construct.

Self-Compassion and Psychopathology

Research indicates that self-compassion is a robust predictor of anxious and depressive symptoms, as well as quality of life (Van Dam et al., 2011). Self-compassion also has encouraging and dependable correlations with numerous measures of psychopathology, well-being, and affect (Van Dam et al., 2011), meaning this variable is often related to lower presence of negative emotions. Other research has demonstrated that high self-compassion levels are linked to reduced worrying and ruminations, which then predict weaker psychopathological symptoms (Krieger et al., 2013; Raes, 2010). To further this claim, high levels of self-compassion are reported to be positively correlated with high reported well-being (Zessin, Dickhäuser, & Garbade, 2015), suggesting negative thought processes (worrying, rumination) are impacted by one's ability to maintain a self-compassionate mindset.

Individuals with self-compassion are also better able to cope with negativity in an assertive way, such as problem solving and cognitive reframing, as opposed to avoidance (Allen & Leary, 2010). This suggests individuals are more resilient following a stressful event and better able to positively reframe negative circumstances than those who lack self-compassion (Leary et al., 2007; Neff et al., 2007). They can view their situation in a positive way, as opposed to dwelling on negative aspects and becoming overly critical of themselves. Because those who are self-compassionate are less critical of themselves, these individuals are more likely to recognize areas of vulnerability in their lives needing improvement (Neff et al., 2006), potentially leading to a mindset that promotes positive

change.

A notable association was discovered between conscientiousness and self-compassion, which proposes that the emotional balance provided by self-compassion could bring about more culpable conduct and positive change (Neff et al., 2006). Furthermore, individuals with high reported self-compassion levels may be more conscious of their needs (Neff et al., 2006). Research shows that these high self-compassion levels are associated with the reduced likelihood that individuals will overlook their needs in times of interpersonal struggle (Yarnell & Neff, 2013). They better understand how to overcome their difficulties and may be more likely to partake in behaviors that will improve their quality of life

To conclude, self-compassion is positively associated with the likelihood of engaging in physical and mental health promoting behaviors. That is, individuals with higher levels of self-compassion have a greater chance of acknowledging their physical and mental health needs. Within mental health, there is a prominent association in the literature between self-compassion and depression, as self-compassion impacts the development and outcome of this disorder.

Depression.

The chance of fulfilling one's needs during taxing circumstances is increased when these needs are acknowledged (Brockmeyer et al., 2015). Identifying individual needs, which is a characteristic of a self-compassionate person, may avert the formation of depressive symptoms (Brockmeyer et al., 2014). According to research conducted on depressed individuals (Shahar et al., 2012) and those in partial or full remission from depression (Kuyken et al., 2010), higher levels of self-compassion were related to

reductions in depressive symptoms. This suggests that those with depression are lacking self-compassion. Further, significantly lower self-compassion levels have been reported in those experiencing a major depressive episode (Krieger et al., 2016). The results of these studies propose that reduced self-compassion plays a significant role in the manifestation of depressive symptoms.

Symptoms of depression have been negatively related to positive facets of self-compassion, while being positively associated with negative aspects of self-compassion (Krieger et al., 2013). Depression and decreased self-compassion tend to have a stronger relationship than lack of depression and high self-compassion (Barnard & Curry, 2010). To further the claim for a significant relationship between self-compassion and depression, a correlational study was conducted on a sample of college students. Results revealed that high levels of self-compassion, over a period of 1 month, were associated with less depressive symptoms (Neff et al., 2007).

To summarize, research has revealed significant relationships between self-compassion and depression. Higher levels of self-compassion are significantly correlated with less severe depressive symptomatology, though a stronger relationship exists between low levels of self-compassion and increased depressive symptoms. In addition to depression, there is evidence of a relationship between self-compassion and anxiety. Thus, it is important to explore the strength of this proposed relationship.

Anxiety.

The literature points to a significant relationship between anxiety and self-compassion. One study sought to explore the relationship between self-compassion and psychopathology, including anxiety, in the form of a meta-analysis (MacBeth & Gumley,

2012). This research discovered significant and robust correlations between self-compassion and psychopathology, which includes symptoms of anxiety. The correlation between these variables was negative, meaning high-self compassion scores were related to lower reported psychopathology (MacBeth & Gumley, 2012).

To further the claim for a significant association between self-compassion and anxiety, research was conducted on a sample of individuals with generalized anxiety disorder (GAD), according to the *DSM-IV-TR* criteria (Hoge et al., 2013). Measures were used to assess self-compassion levels (Self-Compassion Scale), anxiety sensitivity (Anxiety Sensitivity Index), and anxiety levels (Beck Anxiety Inventory), among other measures, and results were compared between individuals with GAD and healthy controls. Those with a GAD diagnosis reported lower self-compassion levels (Hoge et al., 2013). Furthermore, self-compassion was negatively correlated with anxiety levels, worry, and sensitivity to anxiety (Hoge et al., 2013), meaning those with higher levels of self-compassion were less likely to report anxious symptoms.

This study revealed the positive impact of self-compassion on the prevention of anxious symptoms. Healthy participants who reported higher levels of self-compassion were less likely to report elevated anxiety levels, worry, and anxiety sensitivity, than individuals with GAD (Hoge et al., 2013). This research suggests that self-compassion plays a significant role in the ability to prevent and cope with anxiety. In addition to GAD, similar research has been conducted on the relationship between self-compassion and other anxiety disorders.

Research has explored the relationship between self-compassion and social anxiety disorder (SAD). Individuals with SAD are commonly self-critical and observe

the world in a way that highlights negative self-judgement (Werner et al., 2012), the opposite of how a self-compassionate individual would confront struggles. The Self-Compassion Scale was used to assess the absence or existence of self-compassion. SAD was measured using the Liebowitz Social Anxiety Scale, which assesses situational fear and avoidance, and the Social Interaction Anxiety Scale measured social interaction anxiety (Werner et al., 2012). Additional scales were also used to assess specific traits of SAD, such as fear of negative evaluation and physical symptoms.

Compared to a healthy control group, individuals with SAD reported lower overall self-compassion (Werner et al., 2012). Additionally, those with SAD scored significantly lower on the six subscales of the Self-Compassion Scale (Werner et al., 2012). These results relate to past research on self-compassion, which indicated those with higher self-compassion levels are more likely to keep adverse circumstances in perspective and are protected from anxious feelings after a stressful situation (Leary et al., 2007; Neff et al., 2007). Those with SAD may not experience the same protection provided by self-compassion.

Taken together, the results of the aforementioned studies suggest that different types of anxiety disorders are related to low levels of self-compassion. Individuals who possess the characteristic of self-compassion appear to be less likely to succumb to a negative mindset about stressful situations, thus potentially averting the development and exacerbation of anxious symptomatology. Further, as previously stated, self-compassionate individuals are more likely to acknowledge what needs to be addressed in order to overcome their struggles, leading to more effective coping.

Hypotheses

There are several variables potentially impacting the maintenance and severity of insomnia. Though research has yet to reveal a direct relationship between cognitive distortions and insomnia, there are a number of maladaptive beliefs about sleep that align with certain cognitive distortions. It is assumed that these cognitive distortions, though not solely focused on sleep, may negatively impact sleep quality, while increasing anxiety, leading to the exacerbation and maintenance of insomnia.

In addition to cognitive distortions, self-compassion may also significantly impact insomnia severity. A self-compassionate individual is more likely view the positive in negative situations, as well as engage in behaviors that promote positive well-being, which may include those to enhance sleep quality. As previously stated, research has revealed relationships between anxiety, depression, and self-compassion, with anxiety and depression also negatively impacting the onset and maintenance of insomnia. It is for this reason the relationship between insomnia and self-compassion was explored.

The purpose of the present study was to test the existence and strength of these potential relationships. It was hypothesized that insomnia severity, as measured by the Insomnia Severity Index (Morin, 2001), will be predicted by higher reported levels of cognitive distortions, measured by the Inventory of Cognitive Distortions (DiTomasso & Yurica, 2011). In addition, this study hypothesized that the cognitive distortions of *jumping to conclusions*, *fortunetelling*, and *labeling* will be related to greater insomnia severity. Moreover, it was predicted that individuals with high reported self-compassion levels, as measured by the Self-Compassion Scale (Neff, 2003), would endorse lower insomnia severity.

H₁: Cognitive distortions will be predictive of insomnia severity.

H₂: Fortunetelling, Labeling, and Jumping to Conclusions will be predictive of insomnia severity.

H₃: Higher levels of self-compassion will be associated with lower levels of insomnia severity.

Method

The aim of this research was to investigate whether cognitive distortions predict insomnia severity. In addition, the study explored whether specific cognitive distortions (fortunetelling, labeling, and jumping to conclusions) are predictive of insomnia severity. Further, this study investigated whether self-compassion is related to insomnia severity. Data were collected from adults (ages 18 and older) who expressed interest in participating in a study on quality of sleep. Participants were recruited through Facebook, Twitter, and online message boards (Psych Forums, Daily Strength).

Design

The study employed a single group, cross-sectional, correlational design, a single-group simple linear regression design, and a multiple regression design. The independent variables were levels of self-compassion, self-reported cognitive distortions, and three specific cognitive distortions. The dependent variable was insomnia severity.

Participants

Participants were recruited from social media outlets (Facebook, Twitter) and online discussion forums (Psych Forums, Daily Strength) dedicated to insomnia. Data collection took place between April 2018 and April 2019. Participants were between the ages of 18 and 74 and fluent in English. Participants met the *DSM-5* diagnostic criteria for insomnia disorder. To ensure this criterion was met, a survey was created, that asked questions to determine whether their problems were consistent with a diagnosis of insomnia. Participants were excluded if they were taking medication or supplements potentially contributing to insomnia. They were also excluded if they had a medical condition that could be contributing to their sleep difficulty.

Measures

Insomnia Severity Index.

The Insomnia Severity Index (ISI; Morin, 2001) is a 7-item self-report measure of the severity of daytime and nighttime insomnia symptoms. It is one of the few measures used to screen for insomnia and assess treatment effects. It is commonly intended to measure a patient's perception of symptomatology and calculate individual insomnia dimensions. The questionnaire evaluates the following domains: distress triggered by sleep struggles, sleep initiation difficulties, noticeability to others of sleep problems, difficulty remaining asleep, daytime functioning hindrance, difficulty waking up early, and unhappiness with sleep (Morin et al., 2011). Responses are on a 5-point Likert scale ranging from 0 (*Not at All*) to 4 (*Extremely*), with the recall period being over the past month and total scores ranging between 0 and 28. Scores are interpreted in the following way: absence of insomnia (0-7); subthreshold insomnia (8-14); moderate insomnia (15-21); and severe insomnia (22-28); (Morin, Belleville, Bélanger, & Iver, 2011). Though available in three editions (patient, clinical, significant other), the patient version was used for this study. Scores from the ISI have been positively correlated with subjective sleep estimates, as well as total scores on the Pittsburgh Sleep Quality Index (PSQI), demonstrating convergent validity with other self-report sleep assessments (Morin et al., 2011). It reveals moderate to large correlations between insomnia and symptoms of psychopathology, such as anxiety and depression, as well as negative health perception and fatigue. Internal consistency scores have been shown to be high for clinical (0.91) and nonclinical (0.90) populations, and the connection among individual assessment items and total scores fall in the range of 0.55 to 0.81 for the nonclinical population,

while falling in the 0.50 to 0.85 range in the clinical population.

Self-Compassion Scale.

The Self-Compassion Scale (SCS; Neff, 2003) is a 26-item self-report measure of self-compassion. The assessment measures self-compassion through six subscales that focus on the following conflicting factors: mindfulness versus over identification, self-kindness versus self-judgement, and common humanity versus isolation. Included are positively and negatively worded statements that encompass these factors. Items consist of statements such as “*I’m kind to myself when I’m experiencing suffering*” (self-kindness) and “*I try to see my failings as part of the human condition*” (common humanity). Each statement is prefaced with “how I typically act toward myself during difficult times” and is measured on a 5-point Likert scale, ranging from 1 (*Almost Never*) to 5 (*Almost Always*). Average scores from the subscales are totaled to calculate a total score, which reveals the global measure of self-compassion (Williams, Dagleish, Karl, & Kuyken, 2014). High scores on the mindfulness, self-kindness, and common humanity scales indicate a higher level of self-compassion. High scores on the overidentified, self-judgement, and isolation scales indicate low levels of self-compassion. This scale has been effectively utilized in community and student samples, indicating good convergent and discriminate validity. The scale has also displayed excellent test-retest reliability ($\alpha = .93$); (Neff & Pommier, 2013).

Inventory of Cognitive Distortions.

The Inventory of Cognitive Distortions (ICD; DiTomasso & Yurica, 2011) is a 69-item self-report measure consisting of statements assessing 11 types of cognitive distortions. Statements are measured using a 5-point Likert scale, ranging between 1

(*Never*) and 5 (*Always*). Total scores range from 69 to 345, with higher scores revealing a higher frequency of cognitive distortions. The assessment has demonstrated high internal consistency (Cronbach's $\alpha = .98$). In addition, internal consistency for each of the 11 subscales is in the range of .56 to .94. The measure has also yielded high concurrent validity. Scores from the ICD were significantly associated with other measures of psychopathology and dysfunctional thinking. Further, total scores on the measure were able to successfully discriminate clinical and nonclinical subject.

Procedure

The study was submitted to the Institutional Review Board (IRB) and was approved. After receiving approval, the process of data collection began. Questions from the assessments were entered in Survey Monkey. On Facebook, Twitter, and message boards, a link was provided, that lead to the online surveys. The screening process consisted of the inclusion and exclusion criteria, a statement indicating that participating in the study was voluntary, and information about the purpose of the study. The amount of time to complete the self-report assessments was also explained. Participants were advised that their information and responses were anonymous.

Demographic information was collected from the participants, including age and gender. Potential participants were asked questions via survey to assess if they meet about the DSM-5 diagnostic criteria for insomnia. Participants were asked screening questions to determine if they are currently taking medication and/or supplements that may be contributing to their insomnia. In addition to this, they were asked if they had a medical condition that may be contributing to their sleep difficulties. Those who stated "yes" to either of these questions were thanked for their time and informed of their

ineligibility for the study. Those stating no were directed to the surveys for completion.

Results

Data analysis was completed using the Statistical Package for the Social Sciences (IBM SPSS Statistics 24; SPSS Inc., 2016).

Study Demographics

The total sample consisted of 206 participants. Participants with missing data on any of the psychological variables of interests and outcome measures were excluded from the analysis in a listwise deletion method, yielding the sample size of 67. The sample consisted of 62 (92.5%) females and 5 (7.5%) males. The majority of participants were within the age range of 45 to 54 (31.1%) (see Table 1 for complete demographic information). Table 2 provides the means and standard deviations of the entire sample for the main measures of the study.

Table 1

Demographic Data

Characteristic	<i>n</i>	%
Gender		
Male	5	7.5
Female	62	92.5
Age Range		
18 to 24	4	6.0
25 to 34	14	20.9
35 to 44	8	11.9
45 to 54	21	31.3

Table 1 (continued).

55 to 64	19	28.4
65 to 74	1	1.5

Table 2

Means and Standard Deviations of Measures

Scale	<i>M</i>	<i>SD</i>
Self-Compassion Scale	2.65	.77
Inventory of Cognitive Distortions	218.45	42.46
Insomnia Severity Index	18.61	5.20

To control for Type I error, a Bonferroni correction was employed and all analyses are held at $\alpha = .016$. To test the hypothesis that insomnia severity would be predicted by higher reported cognitive distortions, a simple linear regression was used, with scores on the ICD being the independent variable and scores on the ISI being the dependent variable. The relationship between the dependent variable (insomnia severity) and the independent variable (cognitive distortions) was assessed using a correlation. It was found that cognitive distortions do not have a significant relationship with insomnia severity, $r(65) = .034$, $p > .016$. Tests of assumptions for linear regression were met. For this test, it is assumed that an association between constructs is linear, which was assessed by the inspection of a scatterplot. This test also assumes that homoscedasticity is present. To ensure the presence of homoscedasticity, a scatterplot was inspected, where a plot of residuals versus predicted values and a plot of residuals versus independent variables were observed. Inspection of a scatterplot revealed that the assumptions of linearity and homoscedasticity were met.

A simple linear regression was performed for H_1 and was found not to be statistically significant, $F(1,65) = 4.684$, $p = .034$ (see Table 3). The observed p value did not meet the Bonferroni criterion of .016. Thus, insomnia severity cannot be predicted by cognitive distortions alone, although the relationship approached significance.

Table 3

Intercorrelations for Insomnia Severity and Predictor Variables

Variable	1	2	3
Insomnia severity	.17	.13	.13
Predictor variable			
1. Fortunetelling	--	.74*	.45*
2. Labeling	--	--	.41*
3. Jumping to Conclusions	--	--	--

* $p < .000$

To test the hypothesis that the cognitive distortions of jumping to conclusions, fortunetelling, and labeling are predictive of insomnia, as measured by the ISI, a multiple regression analysis was used, with the scores on the specific distortions being the independent variables and the scores on the ISI being the dependent variable. The relationships between the dependent variable (insomnia severity) and the independent variables (fortunetelling, labeling, and jumping to conclusions) were assessed using correlations. Significant, positive relationships were found between the predictor variables of fortunetelling and labeling, fortunetelling and jumping to conclusions, and

labeling and jumping to conclusions.

The intercorrelations between the predictor variables and insomnia severity can be found in Table 4. Correlational analysis did not reveal any significant relationships between the any of the three predictor variables and insomnia severity. To ensure the presence of linearity and homoscedasticity, a scatterplot was inspected, and these assumptions were met. Further, it is assumed that multicollinearity is not present. To test this assumption, a matrix of Pearson's correlations was assessed to ensure the correlation coefficients of the independent variables are below 0.8, which they were (Table 4). In addition to this, tolerance was measured to examine the association between the independent variables. Further, the variance inflation factor of the regression was assessed to ensure a lack of multicollinearity. If this number is greater than 10, multicollinearity is likely to be present. The results indicated that all three of the independent variables were significantly correlated with one another, as shown in Table 3. Though these significant relationships exist between the independent variables, the variance inflation factors of the variables were well below 10 and the tolerance statistics were all above 0.2, as shown in Table 5. This information indicates that multicollinearity is not present within the data (Fields, 2013).

Using a multiple regression analysis, a significant model did not emerge, $F(3,63) = .766, p > .05$. The coefficients of the predictor variable and summary of this model of predictor variables is shown in Table 4 and Table 5, respectively. None of these three predictor variables approached significance and were not found to be significant predictors of insomnia severity

Table 4

Model 1 Summary of the Predictor Variables (Fortunetelling, Labeling, and Jumping to Conclusions) to the Dependent Variable (Cognitive Insomnia Severity)

Mode	R	R ²	Adjusted R ²	Std. Error of Est.	R ² Change	F Change	df1	df2	Sig. F Change
1	.188 ^a	.035	-.011	5.22677	.035	.766	3	63	.517

^a = predictors (Constant), Fortunetelling, Labeling, Jumping to Conclusions

Table 5

Coefficients of Predictor Variables (Fortunetelling, Labeling, and Jumping to Conclusions) to the Dependent Variable (Insomnia Severity)

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
	1 (constant)	14.390	2.976				4.835
Fortunetelling	.044	.102	.081	.428	.670	.426	2.350
Labeling	.107	.228	.087	.467	.642	.443	2.259
Jumping to Conclusions	.132	.344	.054	.384	.702	.786	1.272

To test the hypothesis that those with higher reported levels of self-compassion will report lower levels of insomnia severity, a correlational analysis was used. To calculate a Pearson's product-moment correlation coefficient, interval data is required and a linear relationship between the constructs is assumed (Field, 2013). To test this

assumption, a scatterplot was created and observed to ensure linearity among the variables, which there was. It is also required that the constructs be normally distributed. To test this requirement, a Shapiro-Wilk Test of Normality was conducted and was not significant, $p > .05$, which suggests the assumption was not violated. Further, one construct may be categorical, with a two-category maximum. Overall, the scores on the SCS were not significantly correlated with the scores on the ISI. The correlation coefficient between the SCS and the ISI was not statistically significant, $r(65) = -.124$, $p > .05$. The hypothesis was therefore not supported by the results, which indicated that higher reported levels of self-compassion were not significantly related to lower levels of insomnia severity.

Discussion

This is the first known study to explore a direct relationship between self-compassion and insomnia, as well as the relationship between cognitive distortions and insomnia. The purpose of the study was to examine whether cognitive distortions are predictive of insomnia severity. In addition, this study explored whether the specific cognitive distortions of fortunetelling, labeling, and jumping to conclusions were predictive of insomnia severity.

Cognitive Distortions and Insomnia Severity

The first goal of the study was to test the hypothesis that insomnia severity would be predicted by cognitive distortions, specifically that higher scores on the ICD would be associated with higher scores on the ISI. Results of the simple regression analysis did not support the hypothesis and did not indicate that cognitive distortions, as measured by the ICD, were predictive of insomnia severity, as measured by the ISI.

Though this study did not reveal cognitive distortions as a significant predictor of insomnia severity, and currently there is not a direct relationship between cognitive distortions and insomnia in the literature, past studies have revealed significant associations between negative thought processes about sleep and insomnia (Carney & Edinger, 2006; Roane et al., 2012; Sanchez-Ortuño & Edinger, 2010), with several of these dysfunctional beliefs aligning with cognitive distortions. For example, one study found that themes of hopelessness and helplessness were more commonly endorsed by insomniacs than by normal sleepers (Carney & Edinger, 2006). These feelings were associated with insomniacs believing that they did not have control of their sleep (jumping to conclusions) and thinking about the negative impact of their poor sleep

(fortunetelling). Though the current study attempted to identify this association between overall cognitive distortions and insomnia, the data from the previous study were obtained through overnight sleep studies, as well as a measure of dysfunctional beliefs about sleep (Carney & Edinger, 2006), not cognitive distortions, which are not solely focused on sleep. It is also possible that the cognitive distortions play a role as a protective factor against insomnia. For example, individuals with an all-or-nothing mindset who believe that they must obtain 8 hours of sleep to function the following day may be using this mindset to their advantage and be adhering to a strict sleeping regimen to ensure ideal sleep quality. Taken together, it appeared reasonable to hypothesize that cognitive distortions would predict insomnia severity. Nonetheless, our results revealed that cognitive distortions may not be as congruent with dysfunctional beliefs about sleep as predicted.

Specific Distortions and Insomnia Severity

The next goal of the study was to test the hypothesis that specific cognitive distortions would be predictive of insomnia severity. The multiple regression analysis did not support the hypothesis and indicated that the cognitive distortions of jumping to conclusions, fortunetelling, and labeling did not significantly predict insomnia severity. Though a direct relationship between specific distortions and insomnia severity was not found in this study or in research prior to this study, previous research found that maladaptive beliefs about sleep and insomnia are positively correlated, with certain beliefs aligning with specific cognitive distortions (Carney & Edinger, 2006). For example, research has found that an individual's fear of being unable to function the day after a poor night's sleep is related to insomnia severity and maintenance (Roane et al.,

2012), which is congruent with the cognitive distortion of jumping to conclusions, though not established in the literature. Additionally, commonly endorsed beliefs about sleep often center around potential negative consequences following a poor night of sleep or not having control over the ability to sleep, which are related to the core beliefs of hopelessness and helplessness (Carney & Edinger, 2006). Though not directly related in the literature, these thought processes align with the cognitive distortion of fortunetelling, wherein an individual predicts a negative future outcome of an event. Because of these previous findings, it appeared logical to hypothesize that these specific cognitive distortions would be strongly associated with and predictive of insomnia, although nothing significant was found in the present study. This may be because the specific cognitive distortions assessed were not as related to and predictive of insomnia as predicted; cognitive distortions were not solely based on sleep difficulties, as opposed to the previously mentioned dysfunctional beliefs about sleep.

Self-Compassion and Insomnia Severity

The third goal of the research was to test the hypothesis that there would be a significant positive relationship between self-compassion and insomnia severity. Higher scores on the Self-Compassion Scale (SCS) were predicted to be related to lower scores on the Insomnia Severity Index (ISI). Results of the correlational analysis did not support the hypothesis and suggested a lack of relationship between self-compassion, as measured by the SCS, and insomnia, as measured by the ISI.

The results of this study are inconsistent with previous research on sleep and self-compassion, which has revealed a significant correlation between self-reported sleep quality and self-compassion (Kemper, Mo, & Khayar, 2015); however, a direct

relationship specifically between insomnia and self-compassion was not explored in the research prior to this study. Additional research has indicated that those with higher reported self-compassion were more likely to frequently practice health-enhancing behaviors, including habits to promote sleep (Sirois et al., 2015), though the sample sizes of the present study and aforementioned study differed significantly. Whereas data were collected from one group of individuals in the current study, 15 independent samples were previously used (Sirois et al., 2015).

There may also be significant demographic differences between subjects in the current study and previous research. For example, previous research on self-compassion and sleep included health professionals, such as physicians, nurses, social workers, and other public health professionals (Kemper et al., 2015), whereas health professionals were not the focus of the present study, and occupations were not disclosed. In addition to the difference in demographics, the aforementioned study (Kemper et al., 2015) specifically used e-mail to recruit participants, whereas this study recruited using social media platforms (Facebook, Twitter) and online message boards (Psych Forums, Daily Strength). Furthermore, the previous study used a different assessment scale to measure sleep difficulties. The Patient-Reported Outcome Measurement Information Sleep Disturbance Short Form (PROMIS) was used (Kemper et al., 2015), whereas the current study used the ISI. These scales share similar areas of assessment (difficulty getting to and staying asleep), but have significant differences, as well. The PROMIS is more focused on the patients' perception of their sleep quality, whereas the ISI assesses how noticeable the sleep difficulties are to others and distress caused by one's struggles with sleep (Morin et al., 2011). Also, the current study explored a direct relationship between

self-compassion and insomnia, whereas the past study found a significant correlation between mindfulness and self-compassion and resilience and sleep in a population of young healthcare workers (Kemper et al., 2015). Another perspective that can be gathered from these null results is that all of the individuals in the study met the diagnostic criteria for insomnia. Because they have met this criteria, self-compassion may not be present because health-promoting behaviors are not being implemented effectively. Further, although significant results were not found, it is hoped that the information from the current study can be used for future research using these variables and a larger sample size, in order to gain knowledge about more efficient insomnia treatment focused on self-compassion enhancement.

Implications

Though a lack of significant relationships was found among the variables assessed in this study, the results of this research still have implications for those in the mental health field working with individuals with insomnia. Although the present study did not yield significant results, potentially due to the limitations discussed below, therapeutic interventions that focus on the enhancement of self-compassion should continue to be researched, including mindfulness and meditation. As previously stated, individuals possessing self-compassion have the ability to take action and implement behaviors to overcome their struggles and promote their well-being in different areas of life. Further, focusing on increasing self-compassion may expedite the treatment process by narrowing the focus to patterns of thinking that may be hindering sleep quality most significantly, as this study did find a significant correlation between self-compassion and cognitive distortions. By assessing cognitive distortions within this population, interventions aimed

at changing these mindsets may lead to short- and long-term reductions in symptomatology. The significance of these potential relationships appears to have been negatively impacted by the limitations of the study.

Limitations

There are several limitations of the study. First, the sample size was significantly smaller ($n = 67$) than anticipated and did not reach the number of participants required for adequate statistical power, potentially contributing to a lack of significance in the results of the study. Because one of the statistical analyses was a correlational analysis, the directionality of effects between the constructs is unable to be determined, meaning one variable cannot be proven to be changed by the other variable. More specifically, correlation does not mean causation. The study used self-report measures to obtain information from participants, which has several weaknesses. First, it is possible that the participants' understanding of the statements from the questionnaires may vary, and it is not possible to ensure each participant will interpret the statements in the same way. Also, individuals may interpret ratings and report scores on the scales differently. For example, research has revealed that people complete self-report surveys in different ways (Austin, Gibson, Deary, McGregor, & Dent, 1998). Some have been reported to be extreme responders, meaning ratings are given using the edges of the scales, while others prefer to respond using the middle of the scale, rarely venturing out to the scale edges (Austin et al., 1998.). Moreover, the participants in the study were volunteers and may not represent other demographic groups who did not have the time to participate in the study, such as different age groups and income levels. For example, those who are older and retired, with more time to participate in the research and less daily stressors, may

report less insomnia severity than a full-time student, who may have minimal time to participate in the research due to more daily stressors. Additionally, 44% of men report difficulty with initiating and maintaining sleep (Lédger et al., 2008). In the current study, only 7.5% of the sample obtained was men. Further, it is possible that there are extraneous variables not explored in this research that may influence the relationship between constructs. For example, anxiety and depression were not controlled for in this study. This means that the attempt to reduce the effect of these confounding variables was not made and that the data may have been influenced by these external factors. On the other hand, it is likely that attrition rates would have been even higher if additional surveys to assess anxiety and depression were added. Demographic factors, such as employment, were not assessed in this study. An individual's work schedule, specifically hours worked, may have an impact on insomnia severity. Additionally, sleeping with or without a partner can have an impact on sleeping habits. Sleeping with a partner who wakes up multiple times throughout the night or moves around while asleep can impact the individual's perception of their sleep quality.

Future Directions

Future research should continue to explore these variables in different, larger populations in order to achieve significance and uncover the nature of the relationships among the variables. The only demographics obtained in the present study were gender and age. As previously stated, conducting this research on a sample of full-time college students, with responsibilities and deadlines, may yield different results than a population of older, retired adults, with fewer stressors. In addition, other variables impacted by age and gender, such as menopause and/or premenopause, should be explored in regard to

insomnia severity. Exploring other variables, such as occupation, education, race, and ethnicity, may assist in identifying significant differences among these groups.

Additionally, future research should continue to explore a direct relationship between cognitive distortions and sleep. This possible relationship may reveal the importance of self-compassion enhancement as a therapeutic intervention option for those experiencing sleep-related cognitive distortions. Additionally, the study revealed a significant relationship between self-compassion and cognitive distortions, though not directly assessed as part of the study. It would be beneficial for future researchers to further assess this relationship in larger, more diverse samples. A self-compassionate mindset may help individuals to acknowledge this struggle with their thoughts, while simultaneously preventing these thoughts from negatively impacting their sleep quality.

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