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SLEEP IN YOUNG ADULTS EXPERIENCING HOMELESSNESS

OPEN SPACE, THIN BLANKETS, AND SNORES: AN EXAMINATION OF SLEEP IN YOUNG
ADULTS EXPERIENCING HOMELESSNESS

by

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A project submitted in partial fulfillment
of the requirements of the University Scholars Honors Program

Seattle Pacific University

2018

Approved _____

Date _____

Abstract

Sleep has been identified as a public health concern, especially among college students and young adults, which are defined here as adults ages 18-25 years old. Individuals who are homeless also face specific challenges to getting high quality, restful sleep. The purpose of this review is to investigate the potential health burden of impaired sleep quality in young adults experiencing homelessness. The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Ebscohost, Medline, Google Scholar, and PsychInfo databases were searched using the following terms independently and in combination: sleep, sleep quality, young adults, college students, emerging adults, sleep hygiene, homeless, subjective sleep inadequacy, impaired sleep, health, and self-rated health. Twenty-three articles from a variety of disciplines concerning sleep health in college students, young adults, and homeless adults were included. Of these 23 studies, 18 studies were conducted among college students and young adults and almost all were descriptive, aside from one experimental design to evaluate sleep and related parameters. The other 5 studies were conducted in homeless adult populations with one study being experimental and the others descriptive in design. Findings from these studies indicate that poor sleep quality and inadequate sleep quantity are problems in both college students and adults experiencing homelessness. This review also identified a gap in the literature—there has not been any sleep research conducted among young adults experiencing homelessness. But, the data that does exist among their domiciled counterparts and in older homeless adults reveals that sleep is likely a significant health issue which should be investigated and addressed in the target population. Additionally, though there is a large body of validated tools to assess sleep in college students, these assessment measures may be inappropriate in the evaluation of young adults experiencing homelessness.

SLEEP IN YOUNG ADULTS EXPERIENCING HOMELESSNESS

Open Space, Thin Blankets, and Snores: An Examination of Sleep in Young Adults
Experiencing Homelessness

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USCH 4965

June 6, 2018

Open Space, Thin Blankets, and Snore: An Examination of Sleep in Young Adults
Experiencing Homelessness

An estimated 1, 277 young adults ages 18-24 years old were homeless in King County last year according to the annual Count Us In campaign (All Home, 2017). The number of young adults who are homeless continues to rise (Zerger, Strehlow, & Gundlapalli, 2008). *Homeless* is defined as staying in a temporary shelter, in a public place, under a bridge, in a car, or in another similar place (Ensign & Bell, 2004). Many of the homeless young adults in King County were sheltered in emergency homeless shelters while others slept outside. Homeless young adults experience heightened challenges amid this crucial developmental stage in their lives. When facing illness, homeless young adults may long for a place to rest and recuperate but be unable to find such a place (Ensign & Bell, 2004). Compared to older individuals experiencing homelessness, young adults in King County report notably lower rates of substance abuse, chronic health problems, physical disability, and AIDS/HIV related illness (All Home, 2017). But, homeless youth are at higher risk for negative health outcomes than those who are housed due to factors such as lack of health insurance and the stressful environment of the street and shelters (Zerger, Strehlow, & Gundlapalli, 2008). Additionally, about 40% of youth and young adults in King County report a psychiatric or emotional condition (All Home, 2017). Health promotion efforts must target this vulnerable population which is especially at risk for physical and mental health problems. The issue of sleep quality emerges as a potential health problem affecting this population due to the significance of this health issue in their domiciled counterparts.

Sleep has been shown to have important implications for the development of chronic diseases such as diabetes, heart disease, obesity, and depression (Centers for Disease Control and Prevention [CDC], 2013). The CDC recommends that adults ages 18-60 years get 7 or more hours of sleep per night (2017). Information on how to improve sleep, the importance of sleep quality, and appropriate sleep length all constitute popular topics of interest, especially among college students. College students are undoubtedly at risk for impaired sleep given the heightened stress of higher level academics, new found independence which requires greater self-management of health needs, and unique social roles, which

may contribute to poor health behaviors. Taylor, Bramoweth, Grieser, Tatum and Roane (2013) explain that “the college environment is generally not the ideal environment to promote good sleep and good sleep habits” (p. 346), which elucidates the context of insomnia in college students.

While college-age students are at-risk for sleep issues, individuals who are homeless may be unduly affected by the sleep problems which are identified in the literature among the general population. Unstably housed individuals face considerable difficulty controlling their sleep environment, sleep hygiene, and sleep schedule, which challenges their ability to achieve the quality of sleep experienced by those who are housed. There is very little research literature regarding sleep health in homeless populations of the United States.

Purpose of the Review

The purpose of this review is to indirectly investigate sleep health in young adults experiencing homelessness. To do so, this review will first examine the current research on sleep among individuals experiencing homelessness, prioritizing the research done among those who are young adults. Second, the large body of research on sleep in young adults and college students will be reviewed to ascertain the current knowledge of sleep health among this widely researched population. College students are especially at risk for poor-quality sleep and individuals who are homeless face obvious barriers to achieving good sleep. Thus, this review hypothesizes that young adults experiencing homelessness will experience augmented sleep problems because young adulthood and homelessness both exist as risk factors for poor sleep. In addition, this review will identify the gaps in the research literature regarding sleep health in the target population and propose recommendations for future research.

Theoretical Foundation

Nettleton, Neale and Stevenson (2012) begin a report on homeless drug users and sleep with the following: “Sleep is a biological necessity and a basic human right” (p. 319). However, individuals experiencing homelessness risk being deprived of this basic human right. Promoting good sleep in homeless young adults represents a social justice initiative to empower the lives of those who may not be

allotted this basic human right. Though sleep can be considered a self-care activity, the existence of social determinants of health means that some individuals and communities face systematic barriers to improving their own health. According to Reutter & Kushner (2010), health equity means that all people have fair opportunities to achieve wellness. Though health inequities stem from systematic inequalities, they are experienced by individuals and communities on a day-to-day basis (Reutter & Kushner, 2010), such as by experiencing a sleep-deficit.

Nursing has been identified as a profession that is strongly suited for leadership in reducing health disparities (Smith, 2007). Though nurses should address the root causes of health inequities, this review aims to reveal the potential manifestations of health inequities experienced by individuals who are homeless. Considering health inequities and the social determinants of health provides an important reminder to nurses that complex structural inequalities contribute to poorer health outcomes in certain subgroups of the population. The profession of nursing has a duty to implement health promotion efforts so that individuals and communities can reach their fullest potential. Nurses have a corresponding obligation to concentrate such efforts in those who are most at-risk for health issues, especially homeless individuals who are immensely marginalized.

Through personal experience working overnight in a homeless shelter for young adults, the researcher observed the potential difficulties of sleeping in an emergency shelter environment. The open space, lack of privacy, and lack of control over the environment in the shelter created greater stress for overnight guests. Scheduled lights-on and lights-off times challenged individuals with work schedules requiring a specific sleep schedule. Some guests habitually departed in the morning to commute to a job before 5:00 AM, which limited their sleep duration since lights-off and quiet-time did not occur until 10:30 PM the previous night. Thin blankets, noises, worn sleeping mats, and lack of ventilation all contributed to a less-than ideal space for sleeping. Commotion and conflict between guests which occasionally occurred during the night-time hours constituted a stressor which might preclude guests from trusting the space to provide a comforting, safe environment. Thus, the notion of sleep had the potential to

constitute another stressor in the lives of young adults already experiencing the substantial stress of homelessness. See the appendix for additional detail and a spiritual statement underlying this review.

Methodology

Study Design

For this literature review, a search was conducted to produce the study sample using the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Ebscohost, Medline, Google Scholar, and PsychInfo. The following search terms were used independently and in combination: sleep, sleep quality, young adults, college students, emerging adults, sleep hygiene, homeless, subjective sleep inadequacy, impaired sleep, health, and self-rated health. Following this preliminary search, articles were discovered via citations embedded in the articles which were initially reviewed. To meet inclusion criteria, articles had to be published after the year 2000 and were written in or translated into English. Articles were included from both national and international research studies to expand the pool of available research. The selected articles included studies among college students and young adults regarding sleep quality, sleep habits, and sleep interventions. The initial aim of the review was devoted to examining the research literature among young adults experiencing homelessness. However, due to the limited scope of research conducted in this specific population, the inclusion criteria were expanded to include sleep studies among the wider population of domiciled young adults of varying socioeconomic statuses. Further, due to a sheer lack of research concerning sleep among young adults experiencing homelessness, the review also separately screened for articles on sleep in populations of individuals who are homeless, regardless of age.

Sample

Twenty-three articles from multiple disciplines including public health, sleep medicine, general medicine, nursing, and psychology were included in the review. The profession of nursing has consistently drawn upon multiple disciplines to inform nursing practice. The included studies were

published between 2000 and 2018 and used a variety of research designs. Nineteen articles focused on sleep in college students and young adults, while five studies discussed sleep in homeless subgroups. Most of these studies utilized descriptive, quantitative designs, though several did use qualitative measurements and two studies utilized quasi-experimental designs.

Findings

Sleep in College Students and Young Adults

The relationship between sleep and health in those entering young adulthood has been well documented in the research literature. Eighteen articles concerning sleep in college students and young adults have been included for this review. College students are known for their erratic sleep schedules, late bedtimes (Orzech, Salafsky, & Hamilton, 2011) and insufficient weekday sleep (Brown, Buboltz, & Soper, 2002). This, in addition to the fact that college students are a readily accessible population for research study, may explain the wide breadth of sleep research among this population. The major variables described throughout the research literature include sleep quality and quantity, stress, sleep hygiene, gender, cognitive functioning, and physical and mental health.

Sleep Quality and Quantity. Many investigators have utilized quantitative methods to assess sleep quality and related parameters. Most of these assessment methods typically rely on self-report. Sleep quality has been defined to include both quantitative aspects of sleep, such as sleep duration, sleep latency, and number of nighttime awakenings, as well as qualitative aspects such as restfulness (Buysse, Reynolds, Monk, Berman, & Kupfer, 1988). Quality of sleep among college students and young adults has frequently been assessed using the Pittsburgh Sleep Quality Index (PSQI), a self-rated questionnaire which has demonstrated acceptable internal homogeneity, consistency, and validity (Buysse et al., 1988).

Lund, Reider, Whiting, & Prichard (2010) conducted a quantitative study with a sample of 1,125 students at an urban Midwestern university. One quarter of these students reported getting less than 6.5 hours of sleep a night and only 29.4% reported getting 8 or more hours of total sleep per night, which is

the average amount required for young adults (Lund et al., 2010). Only 34.1% of these students scored in the “good” range on the PSQI, while 38% had a PSQI score that indicated poor-quality sleep. In another similar study (Orzech, et al., 2011) among undergraduate students in campus residence halls (n=4,513 students), students reported a mean total of 6 hours and 41 minutes of sleep per night. Buboltz, Brown, and Soper (2001) utilized the Sleep Quality Index (SQI) to measure general sleep difficulties among a sample of 191 undergraduate students attending a rural university in the South. More than 73% of these students had a SQI score that indicated experiencing occasional sleep problems.

Sleep quality has also been measured using the SLEEP-50, which has been validated in college students, and measures certain sleep disorders (Gaultney, 2010). In a sample of 1,845 students, the students reported a similar average of 6.79 hours of sleep on a typical night. A discrepancy in hours of sleep per night during the week versus the weekend has appeared to be an issue among college students (Gaultney, 2010; Tsai & Li, 2004). However, even when students slept an extra 2.49 hours on the weekend, they were unable to “catch up”, thus their sleep debt accrued (Gaultney, 2010). Across the research literature, college students appear to experience significant sleep problems and shortened sleep length.

Stress. Stress and sleep appear to be significantly correlated across multiple studies. Lund et al. (2010) reported that 35% of their sample stated school-related stress, racing thoughts, and worry about the future as reasons for trouble sleeping. Utilizing the Subjective Units of Distress Scale (SUDS), poor-quality sleepers reported higher levels of stress than those with optimal-quality sleep (Lund et al., 2010). Students identified both academic and emotional stress as interfering with their sleep (Lund et al., 2010). Perhaps the most striking finding of this study was that 68% of the students reported stress as the main factor interfering with their sleep, compared to a mere 10% citing temperature and 8% citing light or noise (Lund et al., 2010). A retrospective analysis of preexisting data among 29,750 college students at more than 57 institutions also found that increased stress level was a significant predictor of sleep problems (Valerio, Kim, & Sexton-Radek, 2016). The large sample size validates this finding.

A community-based sample of young adults in Australia demonstrated that shorter sleep duration was associated with psychological distress: half of participants who reported less than 6 hours of sleep per night also had high levels of current psychological distress (Glozier et al., 2010). Thus, the association between psychological distress and sleep may not necessarily present itself just in a university setting. A descriptive study concerning the relationship between mobile phone use, stress, and sleep disturbance in young adults in Sweden (n=4,156) found that awakening at night was associated with current stress (Thomé, Härenstam, & Hagberg, 2011). A qualitative, mixed-methods study of students at a large public university (n=4,513) found that students thought adequate sleep helped them manage their current stress (Orzech, et al., 2011). The large size of these two samples of these strengthen the evidence that perceived stress impedes the sleep of young adults. The correlation between stress and poor sleep is consistent in college students and young adults. These individuals identified stress as interfering with their sleep, which is important to consider when implementing interventions to improve sleep.

Sleep Hygiene. College students likely suffer from poor quality sleep due to poor sleep hygiene, which is defined as the modifiable behaviors which promote good sleep and subsequent daytime alertness (Peach, Gaultney, & Gray, 2016). A survey of 218 students at an urban southeastern university assessed mental health, sleep quality, and sleep hygiene using the Sleep Hygiene Practice Scale (SHPS) (Peach, et al., 2016). The aim was to test the direct and indirect effects of sleep hygiene on mental health (Peach, et al., 2016). The SHPS covers four domains including arousal-related behaviors, sleep scheduling and timing, eating/drinking behaviors, and sleep environment (Yang, Lin, Hsu, & Cheng, 2010). Findings from this study demonstrated the importance of sleep hygiene as it was shown to not only have effects on sleep quality, but also subjective well-being and depression (Peach, et al., 2016).

The Sleep Hygiene Awareness and Practice Scale (SHAPS) is another psychometric instrument which has been used to assess sleep hygiene habits in college students. In a comparatively small study, Brown et al. (2002) utilized the SHAPS and the PSQI to examine the relationship between SHAPS scores and sleep quality in a sample of 124 undergraduate psychology students. A regression analysis of the

collected subjective data demonstrated that sleep-hygiene practices were a significant predictor of sleep quality. However, there was only a weak association between good sleep-hygiene knowledge and good sleep-hygiene practices, which indicated that knowledge of good habits does not necessarily influence sleep quality (Brown, et al., 2002).

In a sample of 1,845 students at a large state university in southeastern United States, Gaultney (2010) examined sleep disorders and their associations with grade point average (GPA). The SLEEP-50 was used and produced to score sleep hygiene behaviors. The rate of poor sleep hygiene practices including keeping the bedroom too light, too noisy, nighttime alcohol consumption, smoking, use of other sleep-interrupting substances, and feeling sad or no pleasure was consistent at around 3%-6% (Gaultney, 2010). Individuals who self-identified as “morning people” reported higher GPAs than those who preferred evenings, which may be indicative of a modifiable sleep variable (Gaultney, 2010). Students who reported more consistent sleep schedules had significantly higher grades, though this correlation was slight (Gaultney, 2010). Still, this may indicate that students with better sleep hygiene habits are more successful academically. Valerio et al. (2016) reported that frequent use of alcohol and cigarettes was predictive of sleep problems. Though the aforementioned study did not measure alcohol use as a sleep hygiene habit, alcohol use still represents a modifiable behavior which seems to significantly impact sleep quality.

Murdock and Adams (2017) conducted a descriptive study to investigate the association between frequency and compulsivity of cellphone use with sleep-related functioning. The PSQI was used to assess sleep problems and another questionnaire assessed cellphone usage and compulsivity. Nighttime notifications and compulsive cellphone usage were significantly associated with global sleep problems and daytime sleepiness. Thus, sleep interventions should target timing and compulsivity of cellphone use instead of reducing overall use (Murdock & Adams, 2017).

Robbins and Niederdeppe (2015) utilized a sample of 361 college students to examine specific beliefs and attitudes which are associated with intentions and healthy sleep behavior. This study (Robbins

& Niederdeppe, 2015) revealed that perceived control was the most important predictor of healthy sleep behavior. Additionally, the participants' perceptions of the disadvantages of getting healthy sleep was strongly related to behavioral intention. In other words, the participants were more likely to behave in ways which matched their beliefs about the disadvantages of sleep. If students believed that longer sleep duration might impede them from engaging in other activities, then they were likely to sleep less.

Gender. Most all the studies included in this review, which used gender as a variable, reported that women tend to experience more sleep problems than men. In Valerio et al.'s large study (2016), which analyzed existing data from the Fall 2009 American College Health Association's National College Health Assessment-II survey, 68.5% of the students with sleep problems were female. Other studies have found that females are at greater risk for having at least one sleep disorder (Gaultney, 2010). Similarly, undergraduate women in the South reported more difficulty than men with falling asleep, having a disturbed night's sleep, and waking during the night (Buboltz, et al., 2001). A descriptive study in Sweden also reported that 34% of women experienced sleep disturbances versus 23% in men (Thomé, et al., 2011). Glozier et al.'s (2010) study in Australia demonstrated that shorter sleep duration was associated with high psychological distress, which was also associated with female gender.

All the studies which report poorer sleep quality in females than males utilized subjective questionnaires to assess sleep, whereas Kuula et al. (2017) utilized objective measure by actigraphy. Results of this study demonstrated that women had longer sleep duration, earlier sleep mid-point, and less irregularity in sleep than men (Kuula et al., 2017). This study was conducted among Finnish people with an average age of 25.3 years. Because the sample was from Finland and the participants were slightly older than the target population of the literature review, these findings may or may not be generalizable.

Race. A descriptive, longitudinal study in a Midwestern university examined changes in sleep problems among African American and European American students attending a large, predominantly white university (Fuller-Rowell, Curtis, El-Sheikh, & Duke, 2017). African American students had more sleep problems than European Americans related to sleep duration as well as efficiency. Also, African

American students experienced perceived discrimination which negatively impacted their sleep and caused it to diverge from the white majority students (Fuller-Rowell et al., 2017).

Cognitive Functioning. GPA is often utilized to measure the impact of sleep health on cognitive performance among college students. Orzech et al. (2011) utilized qualitative interviews in a multimethod study which revealed a strong link between sleep and GPA. However, in the same study (Orzech et al., 2011), an increase in sleep quality resulted in only a modest increase in GPA. While this study relied solely on self-report, Gaultney (2010) obtained the actual GPAs of student participants from the registrar and found a stronger association between GPA and sleep. Students who indicated sleeping poorly had a GPA of 2.35 in comparison to those who indicated better sleep having an average GPA of 2.82 (Gaultney, 2010).

Kuula et al. (2017) investigated the association between sleep and self-reported and performance-based executive function (EF) in a sample of 512 young adults. Using actigraphy to objectively measure sleep duration, it was found that naturally occurring short sleep duration and later circadian rhythm associate with poorer executive function (Kuula et al., 2017). Executive functions are the cognitive controls for certain behaviors such as attention, planning, goal-setting, inhibitory abilities, and cognitive flexibility (Kuula et al., 2017). Thus, Kuula et al. (2017) report that short sleep results in more errors and inattentive responses. Also, a later circadian rhythm was associated with poorer self-control, which may negatively affect actions in daily life (Kuula et al., 2017).

Health and Wellness. The ramifications of poor sleep quality on mental and physical health has been documented through investigations of multiple aspects of health. Valerio et al. (2016) analyzed pre-existing data on 29,750 college students from the American College Health Association (ACHA) to investigate the relationship between sleep and specific behaviors. This large-scale study revealed that self-reported sleep problems were associated with worse general health and greater use of alcohol and cigarettes (Valerio et al., 2016). Shorter sleep duration among young adults in Australia was associated with recent deliberate self-harm, reported use of marijuana, other drugs and drinking alcohol, indicating

an association with overall negative health behaviors (Glozier et al., 2010). A study concerning loneliness and sleep quality in the United Kingdom found that lonelier individuals experienced worse overall sleep quality; this association was independent of the contribution of depression (Matthews et al., 2017).

Though poor sleep quality has typically been associated with worse mental health, Haeffel (2017) found evidence to support the theory that longer sleep duration can increase the risk of depressive symptoms in cognitively vulnerable undergraduate students. In this experimental study, participants in a group with sleep restriction reported significantly fewer depressive symptoms, which may support the idea that if an individual is prone to negative thought patterns, then sleep will strengthen these thoughts and patterns (Haeffel, 2017). However, worse sleep quality has typically been associated with greater depressive symptoms (Peach, et al., 2016) and lower subjective well-being (Orzech et al., 2011). For example, in a small study (n=74) at a midwestern college, Woodard, Jechura, & Elias (2017) sought to investigate the relationship between sleep and satisfaction with overall college experience. Individuals with better sleep hygiene had higher satisfaction with college. Additionally, mood was shown to mediate this relationship which implies that greater sleep disturbance leads to a more negative mood in students which leads to less satisfaction with the college experience (Woodard, et al., 2017).

In their study of 17,465 university students ages 17 to 30 years, Steptoe, Peacey, and Wardle (2006) discovered that short sleep duration was associated with poorer self-rated health. There was no significant association observed between self-rated health and long sleep duration (Steptoe et al., 2006). Though causality could not be confirmed in this cross-sectional data set, Steptoe, et al. (2006) suggest that since the participants were relatively healthy young adults, short sleep duration likely contributed to poor self-rated health.

The link between long-term physical health and sleep is less present in the literature, which is typically comprised of relatively short-term research studies. In a longitudinal study, sleep duration was shown to be a strong and significant predictor of obesity in adults at ages 27, 29, and 34 years, but not at age 40 years (Hasler et al., 2004). Therefore, sleep duration seems to have a larger impact on younger

adults than those who are older. The overall impact of poor sleep on the mental health of young adults would likely extend to those in this same age group who are experiencing homelessness. Additionally, homeless young adults would likely experience greater long-term physical health concerns due to poor sleep because they are at greater risk for health issues.

Recommendations. Researchers seem to agree that diagnosing and treating sleep disorders could lead to improved academic performance and better quality of life for college students (Gaultney, 2010). Educating students on appropriate sleep behaviors and examining campus environments for their contributions to sleep difficulties may help promote healthy sleep in this population (Buboltz, et al., 2001). Though findings have suggested that having good sleep-hygiene knowledge is not enough to translate into good quality sleep, sleep-hygiene education programs have been recommended (Buboltz, et al., 2001). The recommendation to examine and improve college campuses in order to promote good sleep would likely be appropriate in the context of homeless youth—indeed, sleeping spaces for this population require evaluation. It is unclear whether or not sleep-hygiene education programs would or would not be helpful in young adults experiencing homelessness, so this is a potential topic of investigation as well.

Limitations. Nearly all of these studies are limited by self-report bias, though the study by Kuula et al. (2017) did utilize actigraphy to objectively measure sleep quality and duration. Actigraphy and subjective sleep measurements have been shown to correlate when comparing measurement of sleep timing and duration, but not for sleep latency or number of night awakenings (Lockley, Skene, & Arendt, 1998). Given that sleep is typically measured via self-report, data regarding sleep quality, sleep duration, and sleep problems may be inaccurate. College students may experience poor recall or may inaccurately report their sleep. Some of the studies utilized research participants who were already enrolled in a psychology course or chose to participate in a sleep-related survey, which may have influenced the results if students had a prior vested interest in psychology or sleep-related topics. It is also possible that students may have misreported because of a desire to please the researcher. Despite these limitations, the

consistency of the data regarding how well college students think they are sleeping seems to have valuable implications for their perceived rest and wellbeing. If a study was to be conducted among young adults who are homeless, similar limitations may exist, but the degree to which self-report bias might be a concern is unclear because there is no existing research.

Sleep in Homeless Populations

Five studies examining sleep in individuals experiencing homelessness were included for this review. Four out of the five studies were descriptive studies, which utilized questionnaires and relied on self-report for all sleep data. Barger, Weinrich, Bormann, Bouvier, and Hardin (2015) utilized a quasi-experimental design which included implementation of a nursing intervention to improve symptoms of insomnia in women experiencing homelessness. The additional included studies reported poorer sleep quality, shorter sleep duration, and greater instances of unintentionally falling asleep during the day among homeless adults of at least 18-years of age (Léger, Beck, & Richard, 2017; Chang, Fisher, Reitzel, Kendzor, & Nguyen, 2015; Reitzel et al., 2017).

Sleep Quantity. Rates of inadequate sleep appear to be consistently higher among homeless populations. More people among a sample of homeless adults in a shelter in Texas reported less than 6 hours of sleep compared to a nationally representative sample (Chang et al., 2015). Nearly half of the participants in this study did not obtain the recommended 7-9 hours of sleep per night, versus only 35.2% among all adults in the US (CDC, 2017). In a large sample of homeless individuals in France, homeless persons also reported significantly shorter total sleep time than the general population (Léger, Beck, & Richard, 2017). Researchers for this study do not thoroughly explain their methodology, but the large sample size (n=3,453) strengthens the validity of this finding. Respondents in this study (Léger et al., 2017) reported living on the street, in short-term shelters, long-term shelters, in social services paid hotels, and in other facilities. In the general population, 3% of people report getting less than 4 hours of total sleep over 24-hours versus 8% in the homeless population. Also, homeless women were twice as likely as men to report that they slept less than 4 hours (Léger et al., 2017).

However, in another study (Davis & Shuler, 2000) among only homeless women, participants reported an average of 7.7 hours of sleep, which is within the CDC's recommended sleep length. In this study, 24% of the sample (n=50) reported sleeping between 9-16 hours in a 24-hour period, indicating that many participants slept longer than the recommended length. The range in number of hours slept in 24 hours was much wider for homeless women compared to non-homeless adults. This may be the result of their physiological and psychological responses to their environment (Davis & Shuler, 2000). The authors state that the reliability and validity of the questionnaire used to assess sleep length had not been established. Also, it is unclear if the questionnaire had been previously used. An explanation for the longer length of sleep reported in this sample could be that all subjects were from a women's clinic in Los Angeles where all the participants were either homeless *or* enrolled in a drug rehab program. Only 75% of the participants considered themselves homeless in this sample, though the study aimed to investigate sleep patterns in homeless women (Davis & Shuler, 2000), which means that the study may not have appropriately assessed its intended population.

A convenience sample of adults was drawn from various agencies in the Oklahoma City area including participants currently receiving services at homeless shelters to examine the association between sleep problems and stress (Reitzel et al., 2017). This sample (n=525) reported an average of 6.6 hours of sleep in a 24-hour period (Reitzel et al., 2017). Short sleepers are more likely to report heart attack, coronary heart disease, stroke, and other chronic health conditions (CDC, 2013). According to Reitzel et al. (2017), subjective measures of sleep quality may be more strongly linked to problems with affective functioning relative to actual sleep duration. Across the included studies, the average sleep duration varied in the included samples of individuals experiencing homelessness. However, all results differed from comparable sleep-values in the general population or the CDC's recommendations for sleep.

Inadequate Sleep and Stress. A strong link has been found between psychological distress and self-reported sleep duration (Cunningham, Wheaton, & Giles, 2015). The study among agencies in the

Oklahoma City area found that distress intolerance was related to sleep quality, though it was not related to sleep duration (Reitzel et al., 2017). Hormones including catecholamines and cortisol, as well as the reproductive hormones and cytokines all are involved in stress response and have been linked to sleep (Davis & Shuler, 2000). Individuals who are homeless may be particularly vulnerable to distress intolerance (Reitzel et al., 2017). Reitzel et al. (2017) define distress tolerance as an individual's capacity to withstand affective, cognitive, and/or physical states of distress. Distress intolerance has been linked to poor sleep quality and thus may be the link between sleep problems and poor mental and physical health among homeless individuals (Reitzel et al., 2017). Using the Distress Tolerance Scale (DTS) and the Urban Life Stress Scale (ULSS), the results indicated a significant effect of days of inadequate sleep, average hours of sleep, and days with unintentional sleep on urban stress (Reitzel et al., 2017). This association means that inability to tolerate distress partially accounts for the associations between inadequate sleep, unintentionally falling asleep, urban stress and more days of poor mental and physical health.

This connection between urban stress and poor sleep especially appears in homeless women who are particularly at risk for poor sleep due to psychosocial, lifestyle, and environmental factors that increase their stress (Davis & Shuler, 2000). In a study among homeless women, sleep was reported to be a way to cope with stress (Davis & Shuler, 2000). Factors associated with restless sleep in this sample (n=50) include feeling anxious, hearing voices, loneliness, worry about safety, and worry about needing money. Women who coped with stress by sleeping also reported depression-associated symptoms (Davis & Shuler, 2000) which may confirm a correlation between depression-symptoms and sleeping.

Sleep and Self-Rated Health. Perceived health has been measured using the Behavioral Risk Factor Surveillance System (BRFSS) among homeless adults as well as in those who are housed (Chang et al., 2015; Reitzel et al., 2017). In a large sample of US adults, those with shorter or longer sleep duration were more likely to report fair or poor self-rated health (Shankar, Charumathi, & Kalidindi, 2011). Reitzel et al. (2017) report that 65% of their research sample (n=525) reported lifetime major

mental health diagnoses and an average of 13 days of inadequate rest or sleep over a period of 30 days. Thus, days of inadequate sleep, average hours of sleep, and days with unintentional sleep all have significant total effects on days of poor mental health (Reitzel et al., 2017). Distress intolerance appears to play a role in the association between days of inadequate rest and self-reported days of poor mental health (Reitzel et al., 2017).

Chang et al. (2015) found that fewer hours of sleep and more days of inadequate rest was associated with higher odds of poor or fair self-rated health. Given that these studies utilized self-report questionnaires to assess sleep duration and health, the bias of self-report may impact the validity of the data. Additionally, since all the studies are descriptive, one cannot determine causation. Regardless, the association between sleep duration and self-rated health merits greater attention on improving sleep among those who are homeless.

Daytime Sleepiness/Fatigue. Though multiple studies have demonstrated inadequate sleep duration among individuals who are homeless, these populations do not demonstrate an extreme deficit in length of sleep in a 24-hour period. More significant than length of sleep may be the quality of sleep achieved by unhoused people sleeping in a homeless shelter or sleeping “rough” outdoors. Compared to 15% in a nationally representative sample of French people, 33% of homeless persons complained of daytime fatigue (Léger et al., 2017). Though a study on sleep in homeless women revealed that the women were, on average, sleeping enough in a 24-hour period, none of the subjects reported only sleeping during the night, which may indicate that women get poor *quality* sleep during the night and “catch up” during the day as they are able (Davis & Shuler, 2009). Thus, poor quality sleep impacts quality of life of these individuals who could be spending their daytime hours more productively if they were adequately rested. Reitzel et al. (2017) found that homeless individuals experienced an average of 4.7 days of unintentionally falling asleep during the day, which exceeds the rate among domiciled adults. This is another indication that individuals who are homeless suffer from excessive daytime fatigue,

though this may not necessarily be apparent when simply looking at their sleep duration in a 24-hour period.

Mantra repetition: A possible intervention. Barger, Weinrich, Bormann, Bouvier, & Hardin (2015) conducted a quasi-experimental pilot study to investigate the efficacy of a one-week mantra repetition program to decrease insomnia among homeless women. Twenty-nine women, recruited from safe car parks and a transitional group home, were taught how to engage in a meditation program wherein they repeated a relaxing word or phrase throughout the day and then immediately before sleeping (Barger et al., 2015). Insomnia was shown to be a significant problem among the sample and there was a statistically significant improvement in insomnia after implementing the mantra repetition program (Barger et al., 2015). Through their nursing lens, Barger et al. (2015) produced a creative, successful, intervention to improve sleep in a relatively simple way and thus exemplify successful nursing care for health promotion among this population. This study also demonstrated successful recruitment and 1-week retainment of a group of women who are homeless and showed that mantra repetition is an ideal intervention in this target population. Though this study (Barger et al., 2015) utilized a small sample size, the instrument to measure insomnia had good sensitivity and specificity and the mantra presentation was given by a single trained researcher, both of which strengthen the validity of the findings.

Proposed Recommendations. Improving sleep has been identified as a relevant goal within the population of homeless adults (Chang et al., 2015). After identifying that adults who are homeless get less sleep than the general population, Chang et al. (2015) recommended interventions to improve sleep such as encouraging health care practitioners to screen individuals at risk for poor sleep, recommending sleep hygiene interventions, and improving shelter facilities to enhance sleep. Additionally, Barger et al. (2015) demonstrated the potential for specific interventions, namely mantra repetition, to help with sleep in women who are homeless, as discussed above. This study (Barger et al., 2015) provided good support to implement specific interventions in this subgroup which is at-risk for poor sleep.

Discussion

Both college students and homeless adults have demonstrated sleep problems that need to be addressed, though sleep issues have been more thoroughly documented among college students. The included research studies report that students tend to experience short sleep duration, which is defined as less than 7 hours of sleep per 24-hour period (CDC, 2017). Adults experiencing homelessness also experience short sleep duration at considerably higher rates than the general population, though some studies have shown that sleep quality has a more important role in effecting wellness and mental health. Shorter sleepers tend to report poorer self-rated health in both college students and in homeless adults. This review confirms that college students as well as young adults experiencing homelessness should be the focus of efforts to improve sleep.

Stress has been found to contribute to sleep disturbances among homeless individuals and college students, which manifests in college students reporting academic stress as a frequent sleep disruptor. The tremendous stress experienced by individuals who are homeless makes them especially vulnerable to poor sleep even while disregarding the environment which may not be conducive to good sleep. Homeless women have been identified as a subgroup with specific stressors which make them vulnerable to altered sleep-wake patterns (Davis & Shuler, 2009). The stress of living in an urban setting may contribute to equal or greater stress in homeless individuals than in college students. The research in homeless adults does not fully explain reasons for poor sleep, but the fact that college students report stress as the most important factor in disrupting their sleep suggests that psychosocial factors have a very important impact on sleep. Indeed, the environment of an emergency homeless shelter or “on the streets” would likely create more apparent sleep disturbances than a university dormitory. Where college students typically have agency over their sleep environment, homeless individuals face uncertainty in this regard. Potential problems experienced by homeless individuals include the uncertainty of finding a place to sleep, difficulties associated with physical comfort during sleep, and anxieties related to physical and emotional safety while sleeping (Davis & Shuler, 2009). The link between short sleep and psychological distress is

present in both homeless individuals and college students, but the direction of this relationship is unclear. The developmental stage of young adulthood combined with the experience of homelessness likely exacerbates stress in this subgroup, which in turn results in greater sleep problems. However, this relationship may also be reversed such that sleep problems may increase stress. Additionally, young women experiencing homelessness may be at greater risk for sleep problems than men since they have been shown to be more vulnerable to stress and women tend to report more sleep problems.

Assessing sleep hygiene among young adults who are homeless would be valuable but doing so necessitates a specific instrument for this target population. The SHPS covers arousal-related behaviors, sleep scheduling and timing, eating/drinking behaviors, and sleep environment, but these variables may or may not be appropriate for young adults staying in a shelter who might engage in other sleep-promoting behaviors as they are able to. Homeless individuals may not have control over the timing of their meals or sleep schedule, but perhaps they perform other sleep-promoting activities such as avoiding stressful conversations or smartphone usage before bed. Though it has been shown that sleep hygiene effects sleep quality and subsequently effects subjective well-being and depression in college students, this has not been measured in adults (young or old) experiencing homelessness. Perhaps more important than sleep hygiene behaviors would be the safety and conduciveness of the space for promoting sleep. Barger et al. (2015) demonstrated that women experiencing homelessness were receptive to an intervention to improve a sleep hygiene-related behavior in their mantra repetition program. However, the sleep hygiene knowledge of college students appears to not always translate into sleep hygiene habits, though good sleep hygiene results in better sleep. Students at a university appear to be aware of how to get good sleep but may prioritize things like academics and social life. This contrasts the potential experience of individuals who are homeless who may prioritize their health by changing their behaviors because their situations are more critical than those who are housed. The sleep hygiene habits of young adults who are homeless have not been studied, but these individuals would likely experience great benefit from interventions to improve their sleep hygiene.

Reitzel et al. (2017) showed that sleep duration was unrelated to distress intolerance whereas inadequate sleep did have an association. This may provide rationale to focus on measuring sleep quality and wakefulness during the day rather than sleep duration among individuals who are homeless. Inadequate sleep due to sleep disturbances and/or an unsuitable sleeping environment may contribute to poorer wellbeing in individuals who are homeless. However, this has not been confirmed by the research literature and merits further investigation. Insomnia may be considered an inevitable problem among homeless individuals but can also contribute to mental disorders such as anxiety, posttraumatic stress disorder (PTSD), and suicide (Barger et al., 2015). Individuals who are homeless should be screened for sleep problems. Because perceived discrimination was shown to contribute to poor sleep in college students, the stigmatization of young adults who are experiencing homelessness may also affect their sleep health. Zerger et al. (2008) states that “homeless young adults remain invisible; we need to make them visible, not by enhancing the picture of their risky and unpleasant behaviors and traumatic experiences but by acknowledging and fixing the gaps in their safety nets” (p. 835). It is clear that much remains unknown about the sleep problems experienced by young adults experiencing homelessness. Yet, the inevitability of their difficulties with various aspects of health including sleep merits further investigation into their specific health promotion needs.

Given that college students experience considerable sleep problems, the same is likely true in homeless individuals of this same age group and developmental stage. Just as poor sleep has been shown to negatively impact the cognitive and academic performance of college students, poor sleep may negatively affect the success of young adults who are homeless. The latter group face considerable challenges and require unconditional support as they navigate the complexity of social services and attempt to move on from homelessness. Poor sleep has been shown to create a more negative outlook on college life and likewise may hinder the potential of young adults who are homeless. Above all, young adults who are homeless are not privileged with the same housing and support which college students experience. The risk for poor sleep is augmented and requires interventions to promote the highest

possible health in young adults who are homeless so that they may have the best chance to engage in behaviors which will contribute to their success in life.

Conclusion

Given the potential burden of poor sleep health among homeless young adults, nurses, other healthcare providers, and social service providers have a responsibility to identify the greatest needs and possibilities for health promotion efforts. Several recommendations can be made as a result of the tremendous gap in the research literature regarding young adults experiencing homelessness. In addition to improving spaces for sleeping in homeless shelters, further research should be conducted to evaluate the sleep quality, potential barriers to sleep, and sleep hygiene habits of homeless young adults. Focus groups should be conducted to identify specific ways for shelters to improve sleep and components which hinder good quality sleep (Chang et al., 2015) especially among homeless young adults where there is no existing research. At the time of this review, no quantitative data was identified that addressed sleep health in young adults experiencing homelessness. Though much research has been conducted among domiciled college students, these research methods would likely be ineffective among the target population and the dramatically different needs of these populations make it difficult to compare the two. Hurley (as cited in Ensign & Bell, 2004) encourages qualitative research to understand the sociocultural context of health-seeking behaviors, which would be especially useful in studying sleep among homeless young adults.

Through their study on homeless youth in Seattle, Ensign and Bell (2004) provide a possible study design to investigate the actual sleep habits and perceptions of young adults experiencing homelessness. The setting for the study (Ensign & Bell, 2004) included a homeless youth clinic and two popular street locations in Seattle for homeless youth, improving recruitment of participants. Ensign and Bell (2004) utilized a descriptive design with a focused ethnographic qualitative method to ascertain the lived experience of the street youth, which may be an effective initial strategy for investigating sleep and its most important related parameters. Interviews and focus groups, important first steps of research,

would be effective at eliciting the key concerns of the young adults and their perceived barriers to getting good sleep. Following this investigative research, appropriate instruments to gather quantitative data among the target population could be constructed to address their unique concerns.

In addition to more research among the target population, there may be specific interventions to consider for implementation. Promoting sleep hygiene in college students and in homeless adults has shown to be effective in improving sleep habits. Thus, extrapolation of this data suggest that sleep education programs may assist homeless young adults in achieving higher quality sleep. Shelter environments also have a responsibility to provide safe, comfortable spaces which are conducive to sleep for individuals experiencing homelessness (Gilderbloom, Squires, & Wuerstle, 2015). Chang et al. (2015) aptly suggest offering safe sleeping accommodations which minimize vulnerability to victimization and facilitate restful sleep. This, along with interventions to promote stress reduction and good sleep hygiene habits, are of utmost importance to promote the highest level of health among the population of young adults experiencing homelessness who are at great risk for poor health while at a pivotal time in their lives.

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Appendix

Spiritual Statement

A night spent in an emergency homeless shelter involves the following: a large open space, worn mats, light streaking through cracks and doorways, thin blankets, odd smells and a cacophony of snores, coughs and the occasional mutter. In my experience working in such a place, I have grown in my understanding of the experience of sleeping in a shelter, yet never will fully grasp the trial of living homeless. In this job, I supervised shelter functions, supported guests through check-ins and worked with other staff and volunteers to address problems. During the night, I slept around 4-6 hours between lights-out at 10:30 PM and lights-on at 7:00 AM, working shifts in between. I had firsthand experience with some of the difficulties that come along with sleeping in this environment. There are obvious limitations to a shelter guests' ability to get good sleep in this space.

Many health promoting efforts seek to improve sleep quality and ensure adequate hours of sleep in college students. Most college students have a good opportunity to improve their sleep through attention to sleep hygiene and control of their environment. I was drawn to this project for two reasons: individuals in a homeless shelter have far less agency to improve their sleep using some of the behaviors that are suggested in the literature. Second, nothing appears in the research literature concerning sleep quality in this target population of young adults experiencing homelessness.

I recall evenings and nights that brought stressful situations in the shelter milieu. These made getting to sleep in a timely manner much more difficult. Sleeping on a mat near others got easier, but sleeping on a worn, uncomfortable mat never quite did. Some days after work, I got straight to studying or went to class. Other days, I had the opportunity to go back to my home and sneak in a few more hours of rest in a bed that brought relief and comfort. Both these still left me feeling sleep-deprived for the rest of the day and contributed to greater stress realizing I might not be able to make up my sleep later in the week. The next night after working at the shelter, I looked forward to falling asleep in my own bed—what a blessing it was to do so.

As a Christian and an aspiring nurse, I recognize the importance of rest in the human experience. God did not call us to live our lives devoid of adequate rest. Sleep is a key part of our human processes. I believe that all people should have the opportunity to sleep comfortably and safely, no matter if they are housed or not. I believe that resources for people experiencing homelessness should provide adequate environments for sleeping because it is a necessity like eating or hygiene. I also believe that research on health problems such as sleep should be conducted equitably in all people including marginalized groups such as homeless young adults.

Acknowledgments

I would like to express my gratitude to Dr. Julie Pusztai, who has encouraged and supported me throughout the process of this project. Thank you for continuing to have faith in my endeavors—this has made all the difference. Thank you to my second reader, Debbie Nussbaum, whose passion for addressing the issue of homelessness inspired my continued interest in this topic as well.

I would also like to thank Dr. Dale Canavan for his guidance in the author's original application to the University's Internal Review Board. His patience in this process benefitted my thought process in the project though it was decided not to conduct original research at this time.

Carrie Fry, librarian, was key to the successful inclusion of relevant articles for this literature review. Her diligence and expertise ensured that this review thoroughly included key research articles which were relevant and available.

My gratitude goes out to the guests and staff of ROOTS Young Adult Shelter in the University District of Seattle, Washington. My time working at ROOTS inspired me to research this topic and consider the deficit of resources and research among subgroups of individuals experiencing homelessness.

Finally, I have received undue support from my friends and families and I thank them for their love and encouragement.