

2018

# The Effects of Sleep Deprivation on Online University Students' Performance

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*Walden University*

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# Walden University

College of Social and Behavioral Sciences

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Maureen Cort-Blackson

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Walden University  
2018

Abstract

The Effects of Sleep Deprivation on Online University Students' Performance

by

Maureen Cort-Blackson

MA, Walden University, 2010

BS, University of Guyana, 1997

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Clinical Psychology

Walden University

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## Abstract

Sleep deprivation affects the academic performance of online university students, and students who have family responsibilities and a full-time job have a higher prevalence of sleep deprivation. This phenomenological study examined the lived experiences of online university students regarding sleep patterns, sleep deprivation, and the impact on their academic performance. The theoretical foundation for this study was based on the opponent processing model that explains the 2 fundamental processes necessary for individuals to function at their optimum ability: the sleep-wake homeostatic process and the circadian rhythm processes. The research question explored the beliefs and perceptions of 10 online university students, while the sub questions focused on how distractions, social media, family, and work-related duties affected their sleep patterns. Purposeful sampling was used to recruit the participants who were current online university students, with a full time job, a family and family responsibilities. Data were analyzed through pattern coding and structural analysis. Four themes emerged from the analysis of the data: the effects of sleep deprivation, adjustment to daily lives, factors affecting sleep deprivation, and impressions of online education. Results demonstrated that sleep deprivation causes tiredness, sluggish thinking and cranky responses. Positive social change can be achieved if the 10 participants participate in building a community of online university students who will maintain an alumni base that can foster mentoring and empowering others to decrease sleep deprivation that helps in maintaining good academic standards.

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## Chapter 1: Introduction to the Study

### **Introduction**

Sleep deprivation can be defined as engaging in less than 8 hours of sleep a night (Wesensten 2012). Inadequate sleep often results in impaired cognition, which negatively affects health and well-being (Wesensten). According to Rupp, Killgore, and Balkin (2010), satisfactory sleep is essential to fulfilling social and job-related duties. Sleep deprivation may result in reduced performance and an increased level of anxiety (Gilbert and Weaver 2010). Additionally, Wesensten described sleep deprivation as being actively involved in completing activities outside of the traditional daily schedule from sunrise to sunset. Researchers such as Pace-Schott et al. have examined the effects of one night of total sleep deprivation and found that individuals who experience one night of sleep deprivation demonstrated poorer performance on neuropsychological tests of executive function compared to people who experienced 8 or more hours of sleep. The findings of the current phenomenological study contribute to the body of literature on the effects of sleep deprivation and provide students with strategies to enhance sleep.

The results of this study are important because students who experience less than 7 hours of sleep per night on weekdays and weekends demonstrated reduced performance compared to those who made up this sleep on weekends (Ming et al.). Heuer and Klein (2003) emphasized that one night of total sleep deprivation decreases the chance of obtaining and storing accurate information. This chapter will include a synopsis of the study, the background, problem statement, purpose of the study, and the research

questions. I will also discuss the conceptual basis, nature of the study, assumptions, scope and delimitations, limitations, significance of the study, and summary.

### **Background**

Several studies have pointed out the possible challenges to optimal functioning when people experience sleep deprivation. For example, Jovanovski and Bassili (2007) conducted a study that investigated the relationship between the functions of sleep as they relate to academic performance among online university students. In this study, I addressed the gap in the literature for a number of reasons. First, no researcher had identified the effects of sleep deprivation on the academic performance of online university students, primarily because of the relative novelty of online education (Becker, Adams, Orr, & Quilter, 2008). In another study examining the relationship between inadequate sleep and poor quality of academic work, Gilbert and Weaver acknowledged that sleep loss was due to later bedtimes more generally, which corresponded with a consistent worsening of academic performance. A total of 557 male and female psychology students participated in Gilbert and Weaver's quantitative study by completing a demographic survey, the Goldberg Depression Inventory, and the Pittsburg Sleep Quality Index.

The experiences of online students as compared with in-person students can be considered a new learning proficiency. Goodfellow and Lamy (2009) explained that online university students have developed adaptive learning strategies from their past learning patterns. The researchers found that online university students may need to

adjust their learning environment to be comfortable and stay focused. Adoption of a nontraditional learning environment may be unusual at the onset and present some challenges as students navigate a path of studying by themselves (Goodfellow & Lamy). In addition, it is not clear how specific phenomena such as distractions, family, and work-related duties affects the sleep patterns of online university students. Coveney (2014) asserted that there are very few qualitative empirical studies exploring the connection between an individual's lifestyle, family responsibilities, and quality of sleep. The researcher conducted a quantitative study of 186 Canadian students that explained the importance of: (a) how sleep patterns adjust as students transition through their first year and (b) how extracurricular university life (e.g., distractions such as social media) contributes to inadequate sleep.

Examining what online university students may find useful for enhancing sleep patterns was of the utmost importance. It was also necessary to explore how online university students increase their knowledge about the links between sleep deprivation and their academic performance. Online learning offer students flexibility letting them move through their assignments at their own pace. This is a new practice and as the growing sophistication of online learning progresses in the students' homes it is important to understand how they balance work and home life and personal responsibilities with their studies. The circumstances that contribute to inadequate sleep may uncover truths about online university students' perceptions. In-person university

students are reported to experience twice the amount of sleep difficulties as compared to the overall population (Gilbert & Weaver).

Gilbert and Weaver found that adequate sleep is essential to support satisfactory awareness and performance of cognitive functions; however, dynamics such as family distractions and ambient temperature within the online student's immediate surroundings may contribute to poor sleep quality. Finally, Ming et al. asserted that individuals spend a third of their lives sleeping; as such, sleep deprivation may contribute to concerns such as daytime sleepiness and reduced mental awareness. The social change implications of the results from this study will be used by online universities to create programs that may improve sleep patterns for students. The outcomes can also be used to revise the approach of diagnosing and analyzing students' sleep patterns and provide information to reduce and prevent sleep deprivation.

### **Problem Statement**

The phenomenon of sleep deprivation among online university students is understudied. In the review of the literature, I found that no researcher had identified the effects of sleep deprivation on the academic performance of online university students. Galambos, Vargas Lascano, Howard, and Maggs (2013) argued that there is an absence of data to explain the importance of how sleep patterns adjust as students transition through the first year and how university life (e.g., stress, anxiety, distractions, and/or social media) help or hinder academic performance. Luo, Pan, Choi, Mellish, and Strobel (2011) also noted that there is no existing literature about how irregular sleeping patterns

and differences in sleeping patterns may affect online university students' performance. Several researchers have investigated the phenomenon of sleep deprivation among adolescents, high school students, and in-person university students; however, no current studies focused on this issue among online university students (Tsui & Wing 2009).

My goal with this study was to fill the gap in the literature by providing first-hand information about the specific phenomenon that describes how distractions, family, and work-related duties affect the sleep patterns of online university students. Results from this study will be beneficial for online universities because they can use them to create programs that may improve sleep patterns for students. Findings may add insight shedding light on the dynamics within the home environment and how students cope with their families, having a full time job and maintaining good academic standard.

### **Purpose of the Study**

The purpose of this phenomenological study was to describe the effects of sleep deprivation on the academic performance of online university students. To address this issue, I conducted face-to-face interviews. The sample was drawn from the participant pool of an American-based, online university population consisting of graduate and undergraduate students. The selection of participants was carried out using purposive sampling to identify participants who met the requirements to inform the research question.

Qualitative research allows for a study of participants' full experience in a natural setting (Moustakas, 1994). In qualitative research, the goal is to describe experiences in

depth and interpret the meaning of participants' experiences (Moustakas). Further, this phenomenological study was aimed at obtaining a deeper awareness of online university students' direct experiences in their natural setting. By understanding the collective effects of the stated variables, online universities may be better able to create programs that will improve sleep patterns for students. The results from this study can be used to create and build a partnership of likeminded universities that are willing to include the effects of sleep deprivation on online university students' performance in their course of studies that could reach the needs of students nationally and internationally.

### **Research Questions**

Researchers have found that irregular sleeping patterns; distractions (Couyoumdjian et al., 2010; Han, 2012; Heuer & Klein, 2003); and lack of information on proper sleep practices (Tsui & Wing) contribute to sleep deprivation among students. Schuman and Attarian (2012) reported that sleep deprivation is responsible for inappropriate temper, anxiety, daytime sleepiness, and academic deficits. Because of the notably limited research on sleep deprivation among online university students, I conducted this study to address this gap. The following research questions were designed to achieve an in-depth understanding of and ascribed meaning to the effects of sleep deprivation on the academic performance of online university students.

### **Central Research Question**

What are the effects of sleep deprivation on the academic performance of online university students?

### **Research Subquestions**

1. How do online university students define sleep deprivation and what factors do they think contribute to it?
2. How do online university students maintain good academic standards while being sleep deprived?
3. What factors in the home environment may affect the sleep patterns of online university students' performance?
4. What have online university students found useful for enhancing their sleep patterns?

### **Conceptual Framework for the Study**

Understanding the effects of sleep deprivation on the academic performance of online university students is an understudied phenomenon. In this study, I focused on the experiences of online students attending school in the confines of their homes. Sleep plays an integral part for students' well-being because it assists in the process of learning and retaining information (Anjum, Bajwa, & Saeed, 2014).

The conceptual framework for this study was supported by Sutcliffe's (2008) explanation of the opponent processing model. According to Sutcliffe, the opponent processing model dictates that there are two fundamental processes necessary for individuals to function at their optimum ability: the sleep-wake homeostatic process and the circadian rhythm processes. The homeostasis process refers to the equilibrium of the body's sleep-wake cycle (Sharma & Andrade, 2012).

The human body's internal timer generates the homeostatic sleep drive by creating pressure for sleep (Anjum et al.) This process is instinctive—the longer individuals stay awake, the greater the need for sleep arises and the higher the need for sleep becomes. On the other hand, the longer individuals have been asleep, the greater the pressure for sleep subsides and the larger the chance of awakening (Anjum et al.). Therefore, the homeostatic process can be perceived as the resting and oscillation period prior to wakefulness (Sutcliffe). The circadian rhythm process can be described as the alerting system that tells the body when it is time to sleep and time to be awake (Sutcliffe). The homeostasis process and the circadian rhythm process collaborate and support each other to promote restful sleep, which contributes to enhanced academic performance.

Sutcliffe's explanation of the opponent processing model fit well with this phenomenological study. The opponent processing model relates to the understanding that an individual's sleep pattern is related to the endogenous circadian rhythm (ECR) that directs the sleep-wake phase. The circadian rhythm is a self-sustaining, 24-hour cycle that is present in all aspects of human functioning and activities in the nervous system (Mattice, Brooks, & Lee Chiong 2012). More importantly, the ECR is the body's inner clock that provides a signal and tells the body when it is sunrise and sunset (Mattice et al.). Sutcliffe's description of the opponent processing model is comparable to Urner, Tornic, and Bloch's (2009) three conditions that shape sleep patterns, which are distractions, work and family responsibilities, and academic responsibilities. The circadian rhythm may be interrupted by students' surroundings and may contribute to

sleep obstruction and an overall experience of decreased academic performance (Luo et al.). In this study, I examined the effects of sleep deprivation on the academic performance of online university students, looking at how specific phenomena such as distractions, social media, family, and work-related duties affects the sleep patterns of online university students. I also described students' perceptions about ways they can enhance their sleep patterns and increase their knowledge about how sleep deprivation affects their academic performance.

### **Nature of the Study**

I conducted this qualitative study using the phenomenological strategy of inquiry to describe the effects of sleep deprivation on the academic performance of online university students. Phenomenological research was the method chosen because it provides information about the lived experiences and fundamentals of the phenomenon investigated (see Creswell). According to Creswell, phenomenological research is an investigative approach where the participants focus on describing their experiences about a unique phenomenon, and the researcher attempts to understand the participants' views and the meaning they ascribe to their experiences. The bracketing of a researcher's own involvement to understand the participants' experiences and to eliminate assumptions is a fundamental component of phenomenological research (see Creswell). The process entails studying a small number of participants and developing themes that can relate to the meaning of the participants' stories. I conducted individual, face-to-face in-depth

interviews with students in a private room in their home via Skype to explore their experiences with sleep deprivation.

Participants were deemed eligible for the study and selected based on the inclusion criteria. The first inclusion criterion was that students must be living in the United States. Participants for this study also had to be active online university students. The sample was drawn from the participant pool of a large, American-based, online university population consisting of graduate and undergraduate students. I selected participants for this study using purposive sampling, which entailed checking the student's information to make sure that they met the inclusion criterion before they were considered eligible to participate in the study. For phenomenological research, Patton (1990) recommended purposive sampling, which is one of the distinctive elements of qualitative research. I invited participants to relate their stories through the medium of face-to-face interviews while providing information from their life experiences. The narration of their stories started from the beginning, moved to the middle, then to the end—thus, making it significant (see Seidman,). Participants provided a detailed account of the phenomenon with thick, rich descriptions of their experiences. I then analyzed the data using Moustakas's modification of the Stevick-Colaizzi-Keen method of analysis for phenomenological data. The transcendental framework I used for analysis was based on the notion of putting aside all biases (*epoché*) to see the phenomenon plainly (see Moustakas).

## Definitions

*Circadian rhythm*: The biological activity that directs the sleep-wake cycle based on the resetting action of day and night (Sutcliffe).

*Microsleep*: The uncontrollable urge to nod off during the day with an apparent struggle to stay awake (Blaivas, Patel, Hom, Antigua, & Ashtyani, 2007).

*Performance*: Having the confidence and determination to work towards accomplishing academic responsibilities (Soria & Stebleton, 2013).

*Sleep*: The process of retiring to bed and being in a relaxed state of mind, which eventually reinvigorates brain and body functions after arousal (Sharma & Andrade

*Sleep deprivation*: The reduction of sleep time that is required to maintain attentiveness, cognitive functions, and a healthy lifestyle. Sleep deprivation can occur as a result of constant awakenings and interference within the sleep environment (Sweileh et al.).

*Sleep hygiene*: Maintaining a customary sleep-wake pattern and understanding what factors hinder or support healthy sleep habits (Sharma & Andrade).

*Sleep patterns*: Routine sleep time that is set aside by individuals to engage in sleep, thus creating a consistent sleep habit (Anjum et al.).

*Students*: A person who is actively learning, while pursuing academic studies and registered in a public or private educational institution (Jovanovski & Bassili).

*Task switching*: The act of performing two different tasks in rapid succession (Couyoumdjian et al.).

Most definitions of sleep deprivation observe a common factor that is widespread among individuals who experience it: the absence of adequate sleep. Nonetheless, researchers, such as Wesensten (2012), have argued that definitions vary according to the research topic and also according to the methodology used for the particular study. Wesensten argued that sleep deprivation refers to the act of being involved in activities in a nontraditional daily schedule that is categorized from sunrise to sunset. Subramanian and Surani (2007) argued that sleep deprivation can be difficult to define in the medical or research setting; however, Wesensten defined sleep deprivation within the framework of treatment and stated that stimulants and medication are usually used by university students to prevent sleep loss and boost cognition. Subramanian and Surani echoed Wesensten's definition of sleep deprivation and proposed that sleep deprivation depends on factors such as the quantity and quality of sleep as well as the chronicity of how individuals experience sleep. From a sleep and safety standpoint, endocrinologist McDermott (2009) defined sleep deprivation as lacking sleep for 24 hours, which is usually considered to be acute sleep deprivation.

Sweileh et al. conducted research on sleep habits and sleep problems among Palestinian students and found the functions of sleep related to the environment, linking sleep deprivation to environmental problems. They stated that sleep deprivation is considered to be poor sleep patterns resulting from constant interference within the environment, like snoring by others within hearing. Deaconson et al. agreed with Sweileh et al.'s definition, finding that sleep deprivation involves sleeping less than 4

hours during a 24-hour period. In their study on sleep deprivation, Garaulet et al. stated that sleep deprivation is having less than 8 hours of sleep per night, as defined by the National Sleep Foundation.

For the purpose of this study, it was helpful to implement a definition that included components of the definitions listed above. Borrowing from the definitions of Wesensten Sweileh et al. and Garaulet et al. I included terminologies from the medical, educational, and sports perspectives. For the purposes of this study, sleep deprivation among online university students was defined as the act of engaging in less than 8 hours of sleep within 24 hours, which is needed to fulfill educational and job-related responsibilities.

### **Assumptions**

My first assumption in this study was that participants would be cooperative and honest in their responses to interview questions. Second, I assumed that the central research question was in fact targeting and assessing the effects of sleep deprivation among online university students, which was consistent with the research subquestions. I also assumed that the participants would be able to describe the effects of sleep deprivation on their academic performance as online university students. Face-to-face interviews were designed to capture the first-hand experience of sleep deprivation for students; however, because of the small sample size, the findings may not be used to make inferences to other online university populations in other locations universally. The

results of this study only represent the perceptions of a sample of one particular online student population.

### **Scope and Delimitations**

In this study, I focused on sleep deprivation among online university students in a particular online university. Because of the nature of this phenomenological study, only students from a specific online university were candidates for the study. Nevertheless, instructors, students, and individuals in the overall online school community will benefit from the results of this study. The scope of this study was to allow participants to describe their lived experiences in their natural settings.

### **Limitations**

One of the limitations of this study was that it included a small number of participants and cannot be assumed to be representative of the larger population. Creswell (2009) suggested that a sample size for a qualitative study could be as few as five and as many as 25. The range I chose for this study was between seven and 10. According to Moustakas a small number of cases facilitates the researcher's close connection with the participants and boosts the validity of the in-depth inquiry in their naturalistic settings.

Because this was a qualitative study, this research was limited to interpretation instead of quantitative analysis. This means that readers can form their own interpretations of what this study signified. Readers can also look at the data and construct their own version of what the results mean (Bloomberg & Volpe 2012).

Another limitation was that the participants' responses were affected by my presence during the interview and data collection process. Participants were made aware of my own status as an online university student. Even though I was aware of my own bias, the participants provided responses based on their own lived experiences as online university students. Moustakas stated the importance of a researcher being aware of their own biases to understand the participants' experiences as neutrally as possible.

Moreover, the results of this study only represent participants from one particular online university. As such, the results are not generalizable. Finally, I did not take other variables, such as financial difficulties, family conflicts, and family members' ongoing medical conditions, that may have contributed to sleep deprivation and affected students' academic achievement into account in this study.

### **Significance**

This study is significant because online universities are rapidly evolving and gaining popularity. Particularly important is that online education is designed so that students can have flexible schedules and locations. Researchers, such as Reid and Baker (2008), have theorized that students who practice poor sleep patterns are more likely to engage in daytime sleepiness and daytime napping. According to Rico, Sánchez-Manzanares, Antino, and Lau (2012), students who get 8 hours of sleep per night are more likely to maintain a regular academic pattern and start their academic work at the beginning of the week, study during the day, and remain alert and focused.

Quality sleep is an important component to the overall functioning of human beings. When individuals experience irregular sleep, their circadian rhythm is more likely to be confused, and this disorganization contributes to increased sleepiness and decreased academic alertness (Onyper, Thacher, Gilbert, & Gradess, 2012). Ojikutu (2010) conducted a study that measured the factors that relate to sleep deprivation, examining the significance of prolonged wakefulness as a result of using caffeine and the possible health consequences. The variables in Ojikutu's study included marital status, participants' understanding of themselves as drug addicts, university attended, techniques used in staying awake, frequency of headaches or anxiety, distraction, and prevalence of hospital visits. The writer found that issues such as anxiety, mood changes, poor concentration, reduced impetus, impatience, and misunderstandings were all related to sleep deprivation. The researcher found that the participants who experienced one or more of the variables found it challenging to increase their academic performance. The social change implication for this study is that the results will be used by online universities to foster a community of support from past participants to solving the problem and create a large number of educated students who understand the effects of sleep deprivation on online university students' performance.

### **Summary**

Several researchers have studied the effects of sleep deprivation on professionals, including doctors and nurses (MacDonald, Hébert, Flegel, & Stanbrook; Smith, Fogg, &

Eastman). However, there is a gap in the literature regarding how specific phenomena such as distractions, social media, family, and work-related duties impact the sleep patterns of online university students and their academic performance. The majority of participants in studies conducted on sleep deprivation have been adolescents and college students, with a noticeable exclusion of online university students. In Chapter 2, I will present a review of the literature on current research related to this study.

## Chapter 2: Literature Review

### **Introduction**

The purpose of this study was to explore the effects of sleep deprivation on the academic performance of online university students. I examined specific phenomena that affect students' academic performances, such as distractions, social media, family, work-related responsibilities, and sleep patterns. Online learning is an emerging trend in modern-day education (Westerfelt, 2011). Many researchers (i.e., Asaoka, et al. Couyoumdjian et al.; Field, Diego, Pelaez, Deeds, & Delgado, 2012; Nadeem, Ali, Maqbool, & Zaida, 2012) have published literature on sleep deprivation, noting that it negatively impacts university students' academic performance. The general argument in the literature is that adequate sleep is an important component in the overall health and well-being of individuals. However, in this review of the literature, I found that no researcher had identified the effects of sleep deprivation on the academic performance of online university students specifically. In this chapter, I will provide an overview and description of the conceptual framework and a review of the relevant literature.

### **Literature Search Strategy**

In an effort to ensure that this literature review was all-encompassing, I accessed Walden University's online library databases using the Search and Find function to carry out Thoreau's search of multiple databases and Thoreau's advanced search of multiple databases. The advanced feature allowed me to explore a collection of articles from PsyArticles, Academic Search Complete, ProQuest, Med-Line, Sage Publications,

SocINDEX, PsyINFO, and all dissertations. The primary search terms I used included *sleep, deprivation, university, online degree, students, recall, information, anxiety and fatigue, task switching, nightmares, personal failures, academic performance, in-person students, and stress*. Noticeable during this literature review was the lack of research on sleep deprivation among online university students. The majority of articles were focused on adolescents, high school students, and in-person college students.

### **Conceptual Framework**

I based the conceptual framework for this study on Sutcliffe's opponent processing model. The opponent processing model allows researchers to gain a deeper understanding of the lived experiences of sleep deprivation. According to Sutcliffe, the opponent processing model dictates that there are two basic procedures responsible for individuals functioning at their optimum ability: the sleep-wake homeostatic process and the circadian rhythm process. The sleep-wake homeostatic process is what happens when individuals naturally feel the urge to sleep (Luo et al.). Pfeffer, Rauch, Korf, and von Gall (2012) stated that the circadian rhythm is a self-sustaining 24-hour cycle. This ongoing 24-hour cycle is present in all aspects of human functioning, including the nervous system that supports an individual's ability to maintain academic function. Sutcliffe's opponent processing model is based on the premise that the homeostatic process determines the interface in the circadian process by making an assessment of the time to sleep and time to be awake.

With the opponent processing model, Sutcliffe suggested that when humans function to their optimum ability, they are alert and focused. Pfeffer et al. described the ECR as the human body's internal clock that provides a signal and tells the body when to sleep and when to be awake. There are certain actions that can cause the circadian rhythm to be affected. Notably, Luo et al. stated that the circadian rhythm can be disrupted by the student's surroundings, family responsibilities, and distractions. Sleep obstruction and an overall feeling of inefficiency in academic performance are notable when the circadian rhythm is interrupted (Pfeffer et al.) In support of the logic of Luo et al., Garcia, Ramirez, Martinez, and Valdez (2012) explained that any change in the circadian rhythm affects the realization of academic tasks, including memory and cognition. Garcia et al. conducted a study of eight students aged 17 to 46 years to examine fluctuation in the executive function. All the participants in their study were healthy students who attended classes daily and were free of sleep disorders. The researchers found that fewer distractions during the night and early morning contributed to increased alertness, accurate decision-making, and acceptable problem-solving. Results from their study supported the belief that changes in the circadian rhythm affect basic functions such as attention, working memory, decision-making, and problem-solving.

In a breakthrough study, Sutcliffe stated that the opponent processing model explained that the sleep-wake action can be identified through (a) the connections between the physiological structure, (b) the conflicting struggle of the suprachiasmatic nuclei of the hypothalamus, and (c) the process of regulating the sleep-wake cycle with

the naturally-occurring rhythm. The opponent processing model describes the physiological structure of the circadian programming of humans to sleep and wake naturally (Sutcliffe,). Because the circadian timing in the body occurs instinctively, it is understandable why sleep-deprived individuals engage in napping and experience excessive tiredness during the day. Bakotic and Radosevic-Vidacek (2012) argued that sleep-deprived individuals indulge in frequent waking periods even though they have encountered deficits in their sleep patterns. In an experimental study conducted by Pace-Schott et al. (2009), the researchers found that the effects of one night of sleep deprivation can be significant. Further, the participants who were sleep-deprived for 35 to 39 hours displayed decreased performance in memory and poor decision-making in their study. Compared to students who experienced 7 to 8 hours of sleep nightly, participants in the experimental study demonstrated poorer performance on neuropsychological and academic tests of executive functions (Pace-Schott et al.).

Similarly, Bakotic and Radosevic-Vidacek supported Sutcliffe's opponent processing model, finding that when the circadian rhythm is disrupted, individuals' academic and cognitive performance declines. The researchers examined experimental and correlational studies and provided empirical data to support their findings. Bakotic and Radosevic-Vidacek accessed information from the Institute for Medical Research and Occupational Health in Zagreb, Croatia and argued that factors including frequent interruptions during sleep can affect cognitive functioning. Sutcliffe addressed the fact that adequate cognition occurs as a direct result of the association between the circadian

inner clock and the sleep homeostatic progression. Ojikutu proposed that the shift between sleepiness and staying awake is directed by intricate neurobiological factors that oscillate and create awakening, preventing sleep, creating sleep, and obstructing arousal. Mattice et al. concluded that “the homeostatic regulation of sleep is responsible for the fact that the longer one stays awake, the stronger the pressure to go to sleep becomes” (p. 28).

### **Academic Performance and Sleep Deprivation**

In a fast-paced, highly technological world, sleep deprivation is notable among university students (Tsui & Wing 2009). Satisfactory sleep is the foundation for academic functions among university students (Gilbert & Weaver, 2010). Shaikh et al. (2004) conducted a quantitative study on stress and coping strategies with 264 students completing a semistructured, self-administered questionnaire. Results from their study indicated that once individuals are labeled as students, they are subjected to the stressors of achieving success by defying the odds and challenges that are imminent. Sleep deprivation and decreased academic performance are associated with a range of behavioral, physiological, cognitive, and emotional concerns (Minkel et al.) Suen, Hon and Tam (2008) found that inadequate sleep results in symptoms of tiredness, poor concentration, and frequent sleepiness, and as such, analyzing and comprehending can become difficult.

Jovanovski and Bassili conducted a study investigating the relationship between students' academic performance when they attended face-to-face lectures compared to

attending the class online. The 1,071 participants of their study were 625 students who attended an online introductory psychology course and those who attended the same course but in a face-to-face setting (446 students). Each group completed an online questionnaire survey. The researchers found that students who attended the online classes were more likely to experience disruptions in their sleep patterns; however, students who attended the face-to-face classes maintained regularity in their sleep patterns during the night and experienced a better quality of rest. Jovanovski and Bassili determined that distractions trigger decreased memory functions, which contribute to a decline in cognitive processes and poor academic performance.

Drummond, Anderson, Straus, Vogel, and Perez (2012) conducted a study that aimed to determine the extent to which memory is affected by sleep deprivation. Forty-four participants were involved in their study to explore how one night of total sleep deprivation and four nights of partial sleep deprivation affected parts of the visual working memory. The researchers found that that one night of total sleep deprivation and four nights of partial sleep deprivation had no impact on memory; however, total sleep deprivation did affect recall of information. Moreover, the researchers revealed that sleep deprivation affects memory and cognition (Drummond et al.).

Neubauer (2009) explored the relationship between the process of declarative and procedural memory, stating that the former works to retrieve information that is legitimate and detailed, while the latter is responsible for a person's movements, lifestyles, and customs. Neubauer discussed the various stages of the memory process

that respond to adequate or inadequate sleep and explained that forgetfulness is a usual concern of individuals who experience inadequate sleep, even if it is as a result of sleep deprivation from an extremely busy schedule or from a medical condition. As such, individuals find it challenging to absorb and recall information when they are unable to achieve adequate sleep on a nightly basis.

Other researchers, like Turner, Drummond, Salamat, and Brown (2007), found that working memory is limited following sleep deprivation. Working memory is the ability to retain information in the mind for a period of time (Turner et al.). Individuals can experience a decline in cognitive functioning when sleep deprived (Neubauer). The researchers specified that one important task of short-term working memory is to conserve and initiate necessary information. An earlier study conducted by Drummond et al. highlighted the fact that inadequate sleep also contributes to weakening the performance of the filtering process. The two studies make it clear that sleep deprivation affects working memory.

According to Lehman and Conceição (2014), online education necessitates similar mental and adaptive processes in contrast to in-person education; however, the online student requires an increased cognitive effort to maintain intellectual alertness. The in-person students communicate with their instructors, who provide the human touch and appeal to the student's senses (Lehman & Conceição,). Researchers such as Reid and Baker (2008) have theorized that the challenges of attending school online are inevitable. Unlike the educational setting of the traditional physical learning environment, Hauser,

Paul, Bradley and Jeffrey (2012) stated that there is noticeably limited direct contact with professors and colleagues in the online context.

Poor sleep quality and changing patterns of sleep affect in-person university students' performance and cause them to become more anxious about their quality of work (Van Gundy, Morton, Liu, & Kline, 2006). Merikanto, Lahti, Puusniekka, and Partonen (2013) declared that sleep deprivation among in-person university students and high school students affects their sleeping patterns. In addition to having an impact on cognitive tasks, in-person students suffering from sleep deprivation experience fatigue and tiredness that may make it challenging for them to perform optimally (Merikanto et al.). Reid and Baker argued that the in-person students function in a classroom environment where the psychological and physical dynamics contribute to academic achievement.

Reid and Baker explained that the struggles experienced by online university students differ from students attending onsite universities. Hill and Epps (2010) conducted research on onsite students, finding that in the physical classroom environment, students benefit from adequate lighting, individual computers, classroom technology, temperature control, and tiered seating that positively impact their overall performance. Likewise, in-person students enjoy the socio-emotional support and affection from others, along with advice and information from their peers and instructors (Davis 2007).

The experience of studying online, as compared to taking classes in person, can be considered a new learning proficiency. Goodfellow and Lamy (2009) explained that online university students have developed adaptive strategies from their past learning patterns. The writers found that online university students may need to adjust their learning environment to be comfortable and stay focused. Adoption of a nontraditional learning environment may be unusual at the onset and present some challenges for online university students as they navigate a path of studying by themselves (Goodfellow & Lamy). In comparison to online students, in-person students evade distractions by using the library or an empty classroom where family is not present (Ellis 2013). Furthermore, in-person students also practice accountability by agreeing with peers on a planned study time away from home and family responsibilities. Some students receive support from peers and avoid panicking as assignments pile up. As online university students engage in multitasking and working towards academic accomplishment, they may fluctuate between sleeplessness and staying alert and awake (Putilov 2013). Nathan (2015) stated that in-person students can immediately engage in feedback and interaction about their work, which contributes to less anxiety and improved academic performance.

Finally, it is known that sleep deprivation and decreased academic performance is identified with a range of behavioral, physiological, cognitive, and emotional concerns (Minkel et al.). Inadequate sleep results in symptoms of tiredness, poor concentration, and frequent sleepiness. As such, analysis and comprehension can become difficult (Suen et al.). What is not known, however, is how sleep deprivation affects the academic

performance of online university students. Sutcliffe's opponent processing model provides insights into this study, in which my goal is to describe the lived experiences of sleep deprivation on the academic performance of online university students.

### **Distraction and Social Media**

One aspect of preparing for success is formulating a plan and working strategically to execute the plan. However, distractions originate in all forms, shapes, and noises within the online student's environment. Outward distractions include noise, people speaking, TV, music, and alarms, which sidetrack individuals from staying focused to complete a task. Inner distractions like hunger, tiredness, ailments, anxiety, uncertainties, or other disturbing thoughts can interfere with thinking. Inner distractions can be as effective in diverting an individual's attention as external distractions (Andersson, Hatakka, Grönlund & Wiklund 2014). External distractions may also be brought about by social media, anxiety, and family responsibilities, which may affect students' optimum performance (Becker et al.). Even though Becker et al. emphasized that family distractions may contribute to sleep deprivation, no known research has focused on how social media and other responsibilities, such as family and work-related duties, affect the sleep patterns of online university students.

Suganuma et al. studied the relationship between the use of media and inadequate sleep. Participants were individuals who used electronic media before bedtime. The purpose of the study was to determine the number of media users who experienced poor sleep. The researchers conducted surveys and found that in addition to Internet use, in-

person university students participate in various media-related activities that curtail their sleep. The results indicated that the participants still had the desire to be involved in TV and Internet activities before bedtime, even though there was a notable reduction in sleep time. In fact, Suganuma et al. found that in addition to sleep loss, Internet users encounter other difficulties like poor quality of sleep long after the first use of Internet activities. Similarly, Shochat, Flint-Bretler, and Tzischinsky (2010) pointed out that electronic media contributes to a shift in sleep patterns, triggers distractions, and makes it challenging for students to maintain a customary bedtime.

Couyoumdjian et al. found that forgetting what one was doing prior to interruption may be an everyday problem for individuals who encounter disruption in their online environment. Given the new phenomenon of social media, it becomes critical to understand how distractions and social media affect the sleep patterns of online university students since no researchers have investigated this new phenomenon. Several studies, while focused on sleep deprivation, have provided awareness about the dynamics of distractions and social media. Presently, the use of technology and how it affects sleep patterns is an issue that has gained attention in the literature. Cheung and Wong (2011) conducted a study to assess Internet use patterns and the inability to sleep soundly. The participants of their study were 719 students who participated in a school-based cross-sectional study and completed the Pittsburg Sleep Quality Index Questionnaire. Results from the study showed that Internet enthusiasts experienced longer durations of sleep,

decreased sleep efficiency, inferior quality of sleep, increased sleep disruption, and daytime tiredness.

Jugovac and Cavallero (2012) studied how 24 hours of sleep deprivation hinders attention and sleep patterns. The researchers found that there was an overall decrease in response times and a notable reduction in accuracy as a result of sleep deprivation. The participants were 30 individuals who completed the Attention Network Test after experiencing two different sleep conditions: a usual night of sleep and being awake for 24 hours. Couyoumdjian et al. explained the difficulty of achieving optimal functioning when faced with outward or even inner distractions: “Real-world decision-making can occur in unique and unfamiliar circumstances, requiring an extensive range of complex skills such as anticipating consequences, keeping track of events, being innovative and avoiding distractions and irrelevant stimuli” (p. 64).

### **Family and Work-Related Responsibilities**

Jovanovski and Bassili (2007) emphasized that university students include family and work responsibilities in their schedule. Cramming and staying up extended hours at night to complete work is customary among university students (Eun 2012). As Drummond et al. hypothesized, the only way to maximize an individual’s ability to encode and recall information is to get adequate sleep and refrain from filing information into the brain for one-time retrieval. In their quantitative study, Blaivas et al. explored common sources of sleep deprivation and found that micro-sleep may be the real explanation for sleepiness. Microsleep, according to Blaivas et al. is the uncontrollable

urge to nod off during the day with an apparent struggle to stay awake. The researchers conducted this study to establish a scale for microsleep. They determined that the proportion of naps in individuals reporting difficulties was 64%, as compared with 60% in those without concerns. In a similar study, Tirunahari, Zaidi, Sharma, Skurnick and Ashtyani (2003) had 92 participants participate in a sleep latency test to analyze their level of excessive daytime sleepiness. The aim was to investigate if the change from wakefulness to sleep and back to wakefulness negatively affects the smooth functioning of cognitive actions. The researchers determined that individuals who experienced microsleep faced increased lapses in thinking and were more likely to have memory deficits.

Freedom (2011) hypothesized that excessive daytime sleepiness occurs when an individual experiences transitory periods of three or additional seconds of intervals of sleep. The writer stated that in extreme cases, the consequences of excessive daytime sleepiness can include thoughtless behavior, like ongoing strained discussions, overeating, and yelling at others for no apparent reason (Han, 2012). Moreover, poor sleep habits and insufficient sleep encourage frequent napping during the day, which quickly affects individual's mood and obstructs daily family activities (Reid & Baker, 2008). Most university students have to attend to work and family responsibilities in addition to fulfilling their student obligations (Asaoka et al.). In a qualitative study, Orzech (2013) examined adolescents' perceptions of healthy sleep patterns while performing various roles. The sample was 51 students, and the researcher created a bio-

cultural model which emphasized the value of each role. Remarkably, the results showed that when individuals participate in several roles and activities, they often place sleep last in terms of priorities in their lives.

### **Sleep Patterns**

Sleep patterns in humans develop from an interaction between the environment and the circadian rhythm (Carskadon 2004). Adequate sleep is needed to support satisfactory awareness and optimum performance of academic tasks among university students. University students struggle to balance their sleep patterns, tend to stay up late into the early morning hours, and experience one or many forms of sleep deprivation (Gilbert & Weaver,). Several studies have focused on the effects of irregular sleeping patterns. As described above, Jugovac and Cavallero studied how 24 hours of sleep deprivation hinders attention and sleep patterns.

Several researchers (Barclay, Eley, Buysse, Maughan, & Gregory, 2012; Heuer & Klein, 2003; Pace-Schott et al., 2009) have implied that the duration of and variation in sleep are genetically determined. Barclay et al. noted that studies on genetics have linked DNA to the sleep-wake patterns of individuals. Their findings indicated that there is a mutual relationship between an individual's lifestyle and recurring life events. Heuer and Klein explained the issue from a neurobiological standpoint. They declared that the prefrontal cortex is inseparable from the basal ganglia, and as such, sleep deprivation affects not only the basal ganglia but also the prefrontal cortex. Levin, Esingberg, and Benton (1991) described the prefrontal cortex as the large area in the front of the brain

that relates information and helps to make informed decisions. The prefrontal cortex is designed to be self-preserving because it is disabled during sleep (Pace-Schott et al.).

Kang and Chen conducted semistructured interviews and completed surveys with 160 participants who were first-year undergraduate students. The purpose of the qualitative study was to examine the relationship between daytime drowsiness, unplanned bedtime schedules, and tiredness among undergraduates. Results from the study indicated that environmental concerns such as noise and daytime brightness can contribute to irregular sleep patterns. Kang and Chen also found that students with a habitually irregular bedtime experience reduced sleep quality, which disrupts the circadian rhythm, even after making adjustments to their sleep patterns. Finally, Watanabe and Munoz (2011) published an article that explained that the basal ganglion is a forebrain system responsible for activities such as cognition and motor emotion. The basal ganglion is not involved directly with the cognitive, motor, and emotional functions, but rather adjusts the functions as they occur. The study suggested that the basal ganglion is vital in regulating the sleep-wake cycle.

Takasu, Takenaka, Fujiwara and Toichi (2012) contended that university students who ignore sleep patterns exhibit shorter attention, poorer endurance, less exuberance, and decreased academic performance. Supporting this argument is Kang and Chen's (2009) study on the effects of irregular sleep time. Kang and Chen reported that whenever students resist the regulations of sleep and deviate from their normal sleep schedule, optimal functioning during the day becomes a struggle. In addition, irregular

sleeping patterns and distractions also have adverse effects on the components of the executive control processes that affect performance (Couyoumdjian et al.).

### **Summary and Conclusions**

Sleep deprivation among online university students is a pervasive phenomenon and affects students' life adversely. The literature review for this study has provided an overview of sleep deprivation from the university students' perspective. Each segment of the review emphasized the effects and consequences of sleep deprivation as researched in the literature. Jovanovski and Bassili's (2007) research determined that distractions trigger decreased memory functions, which contribute to reduced cognitive processes and poor academic performance. They also demonstrated that students attending online classes were most likely to experience disruption in their sleep patterns. The greatest argument that resulted from their study is that sleep deprivation interrupts the smooth functioning of the body's internal clock that rotates every 24 hours.

Given the gaps in the literature, the following conclusions may or may not be appropriate as related to the effects of sleep deprivation among online university students. First, several researchers (Asaoka et al., 2010; Nadeem et al., 2012; Shochat et al., 2010) explored the sleep patterns and effects of sleep deprivation among college and university students. Various writers (Field et al., 2012; Nadeem et al., 2012; Orsal, Orsal, Alparslan, & Unsal, 2012; Shochat et al., 2010) have found that inadequate sleep among university students leads to anxiety, fatigue, daytime sleepiness, poor academic performance, and increased level of stress. Second, other researchers (Orsal et al., 2012;

Subramanian & Surani, 2007; Sweileh et al., 2011) have presented different definitions of sleep deprivation. However, a shared definition of the term sleep deprivation among online university students is nonexistent. As a result, it has become difficult to quantify the term to utilize it as a guide for online university students. Third, it is apparent that there is a need for research on the effects of sleep deprivation on online university students because of the increased popularity of online education. Finally, an overview of Sutcliffe's opponent processing model was presented to gain a deeper awareness of the sleep-wake cycle.

In the review of the literature, it was found that no researcher has identified the effects of sleep deprivation on the academic performance of online university students. Additional research is needed to understand this phenomenon. The information obtained from this study will shed light on this issue and will hopefully be used as a tool to enhance the lives of online university students. In Chapter 3, I will present the research design and rationale, the role of the researcher and the methodology.

## Chapter 3: Research Method

### **Introduction**

The purpose of this phenomenological study was to describe the effects of sleep deprivation on the academic performance of online university students. Several phenomena explained how sleep deprivation influenced online university students' performance. Even though researchers have documented the significance of adequate sleep to enhance total well-being, no previous research had focused on the effects of sleep deprivation on the academic performance of online university students. My intent with this study was to investigate how the phenomena of distractions, family, and work-related duties impacted the sleep patterns of online university students. Another aim of this study was to understand what online university students find useful for enhancing their sleep patterns. Lastly, the results of this study provide useful information about how online university students can increase their knowledge about how sleep deprivation affects their academic performance.

In this chapter, I will provide the framework for the methodology and describe the phenomenological method, the research design and rationale, the role of the researcher, and participant selection logic. This chapter will also include the instrumentation, procedures for recruitment and participation, data collection, and data analysis plan. Finally, the issues of trustworthiness, transferability, dependability, conformability, and ethical procedures will be discussed.

### **Research Design and Rationale**

I used a phenomenological approach to inquiry and in-depth, face-to-face interviews to gather data for this study. Skype interviews provided me with a visual element and approximated face-to-face interviews. My goal in the interviews was to obtain perceptions about the effects of sleep deprivation on the academic performance of online university students. Phenomenology is a method that allows the researcher to obtain information about the details of the phenomenon studied (Moustakas). The tradition of phenomenological research is to describe how participants experience the phenomenon studied. According to Moustakas the phenomenological method was founded by Husserl, who viewed transcendental phenomenology as emphasizing the understanding and discovery of the meanings of participants' experiences. There are two methods that can be followed when trying to understand participants' lived experiences: (a) the descriptive method and (b) the interpretive method (Moustakas). Moustakas postulated that the descriptive phenomenological method allows the researcher to reach out to participants and interact with them, while interpretive phenomenology, on the other hand, proposes that the researcher try to understand how the participants live their daily lives.

For the purpose of this study, I used Moustakas's transcendental phenomenological method to conduct the data analysis and interpretation. This method was appropriate because it allowed for the uninterrupted explanation of the phenomena as experienced by the participants. According to Moustakas, bracketing is a term used in

phenomenology to explain the action of suspending judgment, which allows the researcher a greater amount of impartiality about the phenomenon being studied. I bracketed my own experiences as an online university student by removing my biases and preconceived assumptions in order to be more understanding of the participants' interpretations (see Moustakas). The answers to the questions asked of the participants were analyzed completely (see Creswell, 2009; Moustakas, 1994). The interview questions and probes are located in Appendix A. I designed the following research questions based on results from a detailed review of the literature.

### **Central Research Question**

What are the effects of sleep deprivation on the academic performance of online university students?

### **Research Subquestions**

1. How do online university students define sleep deprivation and what factors do they think contribute to it?
2. How do online university students maintain good academic standards while being sleep deprived?
3. What factors in the home environment may impact the sleep patterns of online university students' performance?
4. What have online university students found useful for enhancing their sleep patterns?

### **Role of the Researcher**

According to Marshall and Rossman (2011), the researcher's participation is essential for successful interaction and communication with the participants. They stated that "the researcher is the instrument" (Marshall & Rossman p. 72). Furthermore, the researcher is the avenue through which all information is collected and analyzed, so it is important that the researcher experience and understand the phenomenon. Stake (2010) addressed the significance of a researcher being aware of their own personal biases and cautioned the researcher to be objective as possible while interviewing the participants. Creswell used the term bracketing to address this process, which means a researcher reversing their knowledge and understanding to avoid influencing the participants' perception of the phenomenon.

Similarly, Moustakas emphasized the importance of a researcher being aware of their biases to understand the participants' experience as neutrally as possible. Moustakas used the term *epoché*, which means being aware of personal judgment and approaching things in normal, ordinary ways. According to Moustakas, *epoché* is necessary because it allows the researcher to set apart their perceptions and observe the phenomenon from the participants' point of view. I addressed the importance of *epoché* during the data collection phase of this study.

### **Participant Selection Logic**

Seidman (2006) suggested that "the range of people from which participants are selected should be fair to the greater population" (p. 53). Two criteria determine how

many participants are enough. The first is *sufficiency*, and this requires the researcher to consider if there are adequate participants to reflect the range of experience. The second is *saturation of information*, and this is when the interviewer begins to hear the same information reported (see Seidman, 2006). According to Seidman, sufficiency is achieved when there are enough participants who have reached all the inclusion criteria to participate in the study. To determine if the participants met the criteria, I screened them before the face-to-face interview to gather details their current status as students, whether they were enrolled in graduate or undergraduate programs, and if they had a job and family responsibilities.

### **Saturation**

Guest, Bunce, and Johnson (2006) stated that saturation is most often achieved after interviewing 12 participants who are reporting on the same phenomenon. Seidman argued that saturation is identified when a researcher begins to hear the same information over and over again and is no longer learning anything new. Saturation is also reached when interviewing additional participants does not yield any new themes (Beune, Haafkens, Agyemang, & Bindels, 2010). Suri (2011) asserted that purposive sampling raises the probability of attaining saturation. For this study, I detected saturation when I began to hear repetitive information. According to Guest et al. to raise the chances of reaching data saturation, the interview process should include fairly homogeneous participants.

Creswell wrote that a sample size for a qualitative study can be as few as five and as many as 25 participants. Echoing the opinion of Seidman, Ong, Chua, and Ng (2014) noted that studies with in-depth interviews necessitate fewer participants. Seidman further recommended that it is better to err on the side of more participants than fewer because it is quite difficult to assess the number of participants in advance. I drew the sample for this study from the participant pool of a large, American-based, online university population consisting of graduate and undergraduate students and chose 10 as the number of participants for this study. Specific demographics of the sample will be detailed in Chapter 4.

### **Sampling**

Patton (1990) reported that purposive sampling is the most logical choice for qualitative studies. Seidman stated that purposive sampling allows for choosing information-rich cases extensively; additionally, it is a powerful source for gaining insight and an in-depth understanding of a phenomenon, as opposed to studies that rely on theories and experiments. Purposive sampling allows the researcher to identify all participants in a study who meet the criteria and choose only those participants to be part of the study (Seidman). Purposive sampling is appropriate when all participants studied are individuals experiencing the same phenomenon (see Seidman, 2006). This method allows selected participants to accentuate the research questions and provide rich information and insight into the phenomenon studied.

The first inclusion criterion for this study was that students had to be living in the United States. Participants could be registered students of any age attending an American-based online university for an undergraduate or graduate degree. Students had to be documented as full-time and currently in the first quarter or beyond. Students could be male or female, studying in any discipline or program. Another inclusion criterion was that students had to have a full-time job, working 35 to 40 hours per week in addition to attending school online. Students also had to be living with their immediate family.

### **Interview Structure**

I used the interview questions developed for this study as the instrument to collect the data. Moustakas recommended that the research questions be used as the basis for developing the interview questions and I followed Moustakas' recommendations. To encourage participants to discuss their experiences fully, I asked them open-ended questions. In qualitative research, the aim is to explain the experience in depth in a way that illuminates the meaning of the participant's experiences (see Moustakas). The interview questions and probes are located in Appendix A.

Interviews were a suitable tool to gather data in this study because my aim was to allow the participants to describe their lived experiences as online university students. Interviews provided me with the opportunity to discover an understanding of the lived experiences of the participants. Phenomenological studies, according to Moustakas are embedded in questions that explore the phenomenon studied. From the participants'

responses to the questions, I created themes that provided necessary information and promoted deeper discussions into the participants' lived experiences.

### **Development of the Instrument**

I designed the interview questions to specifically elicit information from the participants' direct experience with the phenomenon (see Moustakas). To accomplish this, the questions were open-ended to encourage the participants to choose which aspects of the experience were important and to explore the depth of the meaning of the experience. Prior to use, the interview protocol was reviewed by a panel of two experts from Walden University, one content and one methodology expert. According to Castillo-Montoya (2016), qualitative researchers can increase the reliability and validity of their interviews protocols by having them revised by an expert panel. The author also suggested that having the original interview protocol assessed through a panel, assist in increasing the quality of data attained during the study. A robust interview protocol is more liable to produce rich and significant data that summarizes the experiences of the participants (Castillo-Montoya). The interview protocol for this study can be found in Appendix B.

I designed the probe questions to prompt specific aspects of sleep deprivation among online university students. According to Klenke (2008), probe questions are used to gain detailed information when the researcher is trying to get deeper into the meaning of the participant's lived experiences. Huberman and Miles (1983), discussed that probe

questions allow the interviewer to fill the gap where the participants appear to have given limited responses.

### **Procedures for Recruitment and Participation**

The sample for this study was drawn from the participant pool of a large, American-based, online university population consisting of undergraduate and graduate students. Specific demographics for the sample are detailed in Chapter 4. A follow-up plan was put into place in case enough students did not respond to the advertisements about this study. The method to recruit additional participants, if needed, was snowball sampling. According to Bloomberg and Volpe, snowball sampling is a method that leads to circulation about a study from a small group spreading to a bigger population. Therefore, students who were already contacted were asked to spread the word and refer other students to assess additional participants needed, hence the *snowball* effect.

Interviewing was the strategy used for this phenomenological study. As posited by Newington and Metcalfe (2014), interviewing is a lively procedure that encourages participants to tell their stories with a detailed background. Wright, Heathcote and Wibberley (2014) wrote that the discourse is understood as a dialogue and proposes an equal status for the interviewer and the interviewee.

A description of the study was advertised in the Participant Pool, which acts as a bulletin board. The study advertisement was made visible to all students, and only participants who met the inclusion criteria contacted me. The advertisement included specific inclusion criteria. The advertisement letter included my contact information (e-

mail and phone number) and clearly stated how interested students could contact me.

The participant recruitment letter is reproduced in Appendix C.

Once the participants read the bulletin board and decided that they met the criteria to be a participant of this study, they contacted me either via a phone call or an e-mail and I started the screening process. I responded to the prospective participant and discussed the inclusion criteria to ensure that they were qualified to participate in the study. I summarized the informed consent process and the nature of the study. I asked for their phone number, their e-mail address, and mailing address, and documented this information in a notebook or Excel spreadsheet. Next, the prospective participants were informed that they would receive an informed consent form via e-mail to review prior to the interview. After one week, I contacted the participants via phone to find out if they had received and reviewed the informed consent form and scheduled the interview. The Walden University Institutional Review Board approval number for this study -was 09-27-16-0148715.

### **Data Collection**

In the preliminary meeting with each prospective participant, I reviewed the consent form, underscoring that the interviews would be audio-taped to guarantee the reliability of data collection. After the interviews were completed, I listened to the tape recordings, compared the transcripts to the recordings, and compiled a summary of the interview, which was to the participants for member checking. The participants were made aware that they could ask any questions about the informed consent. Further, they

were notified that their signature was required before the interview to confirm their willingness to be participants.

One of the goals of research interviews is for the researcher to gain a rational understanding of an individual's views. Participants will be educated about the phenomenon, while lecturers and interested professional individuals will be more informed (Kvale & Brinkmann, 2009). The interviews lasted from 1.5 to 2 hours and asked questions listed in Appendix A. The interview questions were specifically designed to capture the participants' lived experiences. The questions were open-ended and asked about factors within the home environment that impacted the sleep patterns of online university students. Semistructured and probe questions were developed to prompt certain areas of the experiences of sleep deprivation among online university students. The interview process was captured on audio tape to ensure accurate and complete data. After listening to the tape recordings, I compared the transcripts to the recordings and compiled a summary of the interview. I also took notes during the interviews to document all non-verbal cues. At the ends of the interviews, all participants were debriefed. They were allowed to divulge any questions, opinions, uncertainties, or distress. They were reformed about their right to withdraw, about confidentiality issues, and thanked for their time. The debriefing period was used to detect the participants' experience about the interview process.

At the end of the interview, confirmation was made through member checking. Creswell wrote that "member checking adjusts the research findings by returning the

completed report or selected themes back to participants to determine whether the participants felt that they were precise” (p. 191). The follow-up procedure for the interview included sending a summary of each participant’s interview to them to allow them to verify and make any additions or changes. The participants were asked to comment on the accuracy of their responses, or to add any information that might have been omitted in the interview.

### **Data Analysis Plan**

The first step in data analysis was to transcribe the recordings of the interviews, which I did myself. Verbatim transcription of face-to-face interviews enriches the narrative and minimizes or reduces piecemeal data (Nikander, 2008). After transcribing, I compiled a summary of the interview, which was e-mailed to the participants for member checking. With the transcriptions complete, I chose the pen-and-pencil method to analyze the data and group them into themes. While this process was time-consuming, it provided some impartiality. I then used NVivo software to complete the data analysis. According to Peters and Wester (2007), computerized software programs can be imprecise for qualitative analysis because they can lose significant details. I labelled the important themes by identifying the recurring patterns in the interview. The transcripts were stored electronically in Microsoft Word to help in easy retrieval and back-up. Folders were labelled to help manage and organize the themes related to the study.

Moustakas suggested that it is important to have a plan in place to manage the size of data and consider identifying themes during the analytic process. The data were

analyzed using Moustakas's modification of the Stevick-Colaizzi-Keen method of analysis for phenomenological data. Moustakas's transcendental framework was used to analyze the data. The transcendental framework is based on the notion of putting aside all biases (epoché) to see the phenomenon plainly and letting the exact sense of the phenomena evolve within their own uniqueness (see Moustakas). The steps for the analysis process were as follows:

1. Researcher's epoché
2. Listing and preliminary grouping
3. Reduction and elimination
4. Clustering and thematizing
5. The final identification of the invariant constituents and themes by application

The data collection phase began with my epoché, a Greek word that means to abstain or refrain from. Epoché involves disregarding individual's opinions, expectations, prejudices, and biases to gather empirical information, allowing for an objective understanding, and a transformation and acceptance of preconceived assumptions about the phenomenon studied (Moustakas, 1994). In the process of writing my epoché, I acknowledged my own biases without prejudice, and surrendered them to observe the participants' experiences from their outlook. I used epoché to bracket my own knowledge, question my own viewpoints and ideas, and minimize personal bias while analyzing the information.

My preconceptions about sleep deprivation and online university students were created during my experience as an online university student who has a full-time job, family responsibilities, and is attending school online. My biases subsequent to conducting this study include the following:

- The majority of online university students experience sleep deprivation and they are unaware of it.
- Online university students are engaged in schoolwork the majority of their time during the 24-hour schedule.
- Sleep deprivation among online university students is increasing and it seems likely that it is not a major concern in their lives while in school.

The full epoché can be found in Appendix D.

At the listing and preliminary grouping stage, I read the transcripts to gain an awareness of the views and opinions of the participants. During the reading process, I highlighted significant statements, which are, according to Moustakas those that describe the experiences of the individuals. These statements provided information about the students' sleeping patterns, social media, family, and work-related duties. The significant statements were recorded on an Excel spreadsheet and coded according to meaning. Duplicate statements were identified. The data analysis phase involves identifying significant statements, described as "horizontalization" (Moustakas).

In the reduction and elimination stage, I read the transcripts repeatedly to identify and review expressions presented by the participants. Overlapping, repeated, and

ambiguous expressions were removed or presented in more direct terms. Expressions that were deemed to be relevant were identified by a color code, because they were related to the phenomena studied. Whatever information was left was significant and formed the core information to group as themes. The themes for this study emerged from the core of the discussions. However, students' understandings of how sleep deprivation affects their academic performance varied, and this difference was retained.

Clustering and thematizing, as recommended by Moustakas allowed me to highlight significant statements from the participants' experience and develop themes. Thomas and Harden (2008) suggested that thematic analysis of qualitative data involves three stages: the coding of text, developing descriptive themes, and generating analytical themes. The interview questions evolved from these codes and formed the basis for the data during the interview. The theme of distractions was aligned with Questions 1 and 2, the theme of academic responsibilities was aligned with Question 3, and the themes of work and family responsibilities and information to enhance sleep patterns were aligned with Questions 4 and 5. As such, Theme 1 emerged from the first two questions, Theme 2 emerged from the third question, and Theme 3 emerged from the fourth and fifth questions. The clusters were labeled and form the themes of this research study. For example, statements about distractions were identified and placed under Theme 1. Statements about academic responsibilities were placed under Theme 2. The data for this study were displayed according to the major elements in the conceptual framework related to sleep deprivation.

The final stage consisted of identifying the invariant constituents and themes by application. According to Moustakas, cluster and invariant/labeled constituents are the core themes of the experience. These labeled themes were the central themes of the online university students' experience. This stage entailed checking the identified theme against each participant's significant response. The purpose of checking was to find out if the responses were expressed clearly and explicitly in the transcript. Responses that were found to be inaudible, incomplete, unrelated, or irrelevant to the participant's experience were omitted. Individual textural description, according to Moustakas is described as documenting each participant's experience verbatim from the interview. This process provided a verbatim description of words, sentences, and phrases that allowed me to extract deeper meaning from that particular individual's experience. Providing a structural description of the experience ensured a transparent summary of how the phenomenon was experienced by the participant. I attached meaning to the essence of the participants' lived experiences. At this stage, I had the opportunity to examine or view the phenomenon from various angles and seek the meaning of the experience without bias. I chose the pen-and-pencil method to initially analyze the data, group them into themes, and used the NVivo software to complete the analysis.

The objective of this study was to present the experiences of the participants. However, one participant's experiences varied from the other cases. After analyzing the varied experience, it was considered to be a discrepant case. I searched for any elements in the data that did not support, or seemed to dispute, the descriptions emerging from the

data analysis (Maxwell, 2012). More specifically, Maxwell recommended that analyzing discrepant cases is an important aspect of validity testing in qualitative research.

### **Issues of Trustworthiness**

Qualitative verification involves the researcher checking for the accuracy of the findings by utilizing strategies like member checking (Creswell). After listening to the tape recordings, I compared the transcripts to the recordings and put together a summary of the interview. I made use of member checking by returning a summary of the interview to each participant so that they could verify whether the facts were accurate. The participants were given the opportunity to edit the summary of the interview before the document was finalized.

Creswell identified several approaches to determine the correctness of the results; one is triangulation, which refers to how well various forms of data are utilized in the study. For this qualitative study, triangulation can be described as connecting data from various sources related to the topic studied (Flick, von Kardoff & Steinke, 2004). The triangulation format used for this study was the literature review, which provided various findings on the topics researched. The literature provided information on sleep deprivation distractions, academic performance, social media, family, and work-related duties. The literature also provided information on online university students' sleep patterns while balancing sleep time and completing assignments. Based on my views, questions were formulated for the interviews and provided information about the participants' lived experiences.

The next approach in verifying the findings was providing a thick, rich description of the results of the study. According to Mathie and Camozzi (2005), trustworthiness in quantitative analysis is reflected in the large standardized sample size. In contrast, qualitative research relies on a thick, rich description of the data. Mathie and Camozzi stated that a thick, rich description denotes the way in which data are transformed into a thorough explanation of the phenomenon studied. Everything that was observed should be included in the narrative—even things that sounded insignificant. Thick, rich description is the core element of qualitative analysis. The sample for this study was between seven and 10 participants, and the detailed description of each participant's response and their nonverbal cues denoted the trustworthiness of the data. A description of the data analysis included the inclusion criteria, a copy of the participant recruitment letter (Appendix C), the informed consent form, and member checking (Appendix E). The interview process and the audio recordings comprised the detailed description of the data analysis. Providing a thick, rich description of this methodology will benefit future researchers who aim to investigate the phenomenon even further (Schensul, Schensul, & LeCompte, 1999).

### **Transferability**

Transferability can be described as the ability of the results of a study to be applied to different situations (Shenton, 2004). However, because the findings of this qualitative study were specific to a small number of individuals from a particular setting, it was not possible to determine that the findings and conclusions can be applied to a

similar population. A thick and rich description of the contextual factors was provided. As such, readers have the option to make a comparison and determine the extent to which the results can be transferred to other situations. For the purpose of this research, member checking, triangulation, and providing a thick, rich description was used to verify the research findings. Creswell reported that a thick, rich description takes the reader into the scenery being described and adds background history to the total experience. Nikander suggested that verbatim transcription enhances a valid description and reduces erroneous data in addition to the use of cautious sampling, triangulation, and auditing methods.

### **Dependability**

Dependability requires that the findings of the study be consistent so that it could be repeated by other scholars with the aim of repeating the results (Shenton). In addressing dependability for this study, this chapter has included a detailed description of the research design and how it was implemented. Additionally, the data gathering process was presented explicitly in the methodology section. The research questions were well thought out from the beginning, allowing me to continue sampling until the research questions were answered fully. Given the many audits and revisions that lead to the data analysis, it was necessary to maintain accurate documentation to trace the course of the research process step-by-step (Finfgeld-Connett, 2010). Documentation for this study included comprehensive notes and research memos about the findings and analysis of the study.

### **Confirmability**

Vivar, McQueen, Whyte, and Armayor (2007) wrote that confirmability relates to the objectivity of the data collected. For this study, I provided transcripts with detailed descriptions that establish the significance of the experiences. After listening to the tape recordings, I compared the transcripts to the recordings and compiled a summary of the interviews. I transcribed the interviews verbatim within 2 weeks. This schedule was reasonable to allow for sufficient time to analyze and transcribe the audiotapes before emailing a summary to the participants for member checking. I described how the study was completed and was aware of any concerns that may have arisen from the study. According to Kingdon, O'Donnell, Givens, and Turner (2015), reflexivity is the method related to the researcher's recognition of how her own experience and background can influence and alter the research she conducts. Therefore, the reader of the final product can measure the degree to which the researcher's prior understanding may have influenced the research design, data collection, and understanding of the study. Steps were put in place to ensure that the findings accurately represent the direct ideas of the participants rather than my personal opinions. Because I am considered part of the research tool, the credibility of the study rests on me (Kingdon et al.).

### **Ethical Procedures**

Lakeman, McAndrew, Macgabann, and Warne (2013) advised researchers to take care to minimize harm to participants. However, it is sometimes challenging to preemptively predict the ethical concerns and risks that may arise in qualitative research

(Lakeman et al.). All participants of this study were adult male or female volunteers able to make informed decisions. As such, this study did not pose any risk to the participants' health and well-being. The Institutional Review Board (IRB) approval was obtained before the data were collected. Walden University's approval number for this study is 09-27-16-0148715, and its expiration date was September 26, 2017. All data have been stored for the specified length of time in a locked location that was available only to me and was protected from inclement weather. The transcripts were stored electronically in Microsoft Word to help in easy retrieval and back-up. Folders were labeled to help manage and organize the themes related to the study. The folders aided in storing the information in Word and Excel in an orderly manner. Similarly, separate, pertinent information related to aliases used in identifying participants has been stored safely. All electronic files and related documents will be destroyed after a period of 5 years.

Seidman explained that informed consent is essential because there is no guarantee as to how the participants may respond to unanticipated sensitive issues that may occur during the interview process. Participants were given the option to withdraw at any time if they were not comfortable with the interview process. The informed consent form guaranteeing confidentiality was signed by the University Review Reviewer (URR). The informed consent agreement for this study described: (a) the background of the study, (b) the voluntary nature of participation, (c) a clear statement that the participant could opt out of the study at any point, (d) the planned data collection procedures, (e) the expected time commitment from the participant, (f) a statement about

confidentiality for participation, (g) a statement that the interview would be audio-taped, and (h) a statement that there would be no compensation for participation. In the initial meeting, I discussed the consent form and the terms of the agreement, highlighting that the interviews would be audio-taped to safeguard the integrity of data collection, and that their signature would confirm their understanding to participate. In terms of member checking, I explained to the participants that they would receive a summary of the interview findings to verify and add any information that may have been omitted.

The ethical protection in the treatment of human participants is discussed in the American Psychological Association (APA; 2011) framework. In addition, I followed the rigorous procedures of coding as described by Saldana (2009). According to Saldana, coding is a confidentiality arrangement that safeguards the records of research studies. Coding is when a researcher identifies the sections of data with a design, emblem, expressive words, or even grouping of names. The coding of the data can only be decoded by the researcher to protect the participants. Coding also helps to maintain trust with the participants, promote reliability of the research, and guard against misconduct and accidental or mischievous release for private use. I reviewed the data for different perceptions and groupings and separated the data into two categories: general headings and subheadings. For example, if the participant used the term *sleep deprivation* repeatedly, other terms related to *sleep deprivation* (e.g., *adequate sleep or sleep habits*) were grouped into subheadings. I then transferred the subcategories onto a coding form. The values were documented, citing each category, followed by a space for the

appropriate code. Saldana discussed that the form should be designed in a simple and clear manner because the accuracy of the ultimate data is contingent on the simplicity of the coding form.

### **Summary**

The purpose of conducting this phenomenological study was to understand the experiences and effects of sleep deprivation on the academic performance of online university students. In the review of the literature, it was found that the topic of sleep deprivation among online university students was not explored. Also absent in the literature is information about how distractions, social media, and other responsibilities, such as family and work-related duties, impact the sleep patterns of online university students. Moreover, no previous researcher has identified ways in which online university students can enhance their sleep practices and increase their knowledge about the effects of sleep deprivation.

The participants identified were current online university students. The interviews were conducted in two separate parts. The interview questions were designed to allow the participants to provide rich, thick descriptions of their experiences as online university students who may be experiencing sleep deprivation that affects their academic performance. Data were collected, transcribed, and analyzed by the researcher. In Chapter 4, I will present the findings of the research questions.

## Chapter 4: Results

### **Introduction**

In this chapter, I will present my analysis of the data collected for this study. The purpose of this phenomenological study was to develop a deep understanding of the participants' experiences in order to describe the effects of sleep deprivation on the academic performance of online university students. I will briefly review the purpose of the study, the research questions, and then discuss the setting. Following these sections, I will discuss the participants' demographics, data collection, data analysis, and evidence of trustworthiness. Lastly, I will present the results and conclude the chapter with a summary.

This phenomenological study involved face-to-face interviews with the 10 participants that I conducted via Skype. The sample was drawn from the participant pool of an American-based, online university population consisting of graduate and undergraduate students. Several researchers, such as Jovanovski and Bassili have investigated the challenges to optimal functioning when sleep-deprived, particularly as this relates to academic performance among students. What had not yet been explored was how sleep deprivation affects online university students' performance. The results of this study fill that void in the literature to better understand online university students' experience of how sleep deprivation affects their academic performance.

### **Setting**

The setting of the study was varied by the choice of the participants. I interviewed the participants in the setting that was most comfortable to them because all the interviews were conducted via Skype. There were no obvious changes in personal or organizational conditions that influenced the participants or their experiences at the time the study was conducted. None of the participants mentioned any personal conditions before or during the interview.

### **Demographics of Participants**

The participants in this study were 10 online university students (six women and four men) who were married, with full-time jobs, and family responsibilities. One participant attributed having adequate sleep to spousal support. Seven participants stated that they did not get adequate sleep because of ongoing family and job responsibilities, while two participants mentioned that their inadequate sleep was due to family and school responsibilities. Table 1 shows the demographics of the participants.

Table 1

*Participant Demographics*

Participant	Gender	Adequate sleep	Reasons for adequate or inadequate sleep
Fin	M	No	Family and job
Ada	F	No	Family and job
Sia	F	No	Family and school
Wyn	M	Yes	Spouse support
Sue	F	No	Family and job
Deb	F	No	Family and job
Liz	F	No	Family and school
Mia	F	No	Family and job
Kev	M	No	Family and job
Sid	M	No	Family and job

At the time of the study, the 10 participants I interviewed were all registered active students at an American-based online university and resided in the United States. I provided all participants with aliases to protect their identities, and each was screened to determine their eligibility for the study. In the following subsections, I will provide descriptions of the participants.

**Fin**

Fin is a male student at an American-based online university who was recruited via the University's Participant Pool's website. He contacted me via phone and volunteered to participate in my study. The screening process was finalized, and Fin met the criteria to be a participant in the study. He had a family and multiple family responsibilities while working full time. Fin resides in the southeastern United States and chose the Skype interview because of his location, which was in another state from where I resided. Fin indicated that he felt it was important to volunteer for my study because he is also a current researcher.

**Ada**

Ada is a female student of an American-based online university, who was recruited through the University's Participant Pool's website. After the screening process was completed, I found Ada to meet the criteria to be a participant. Ada resided in the northeastern United States but chose a Skype interview because she has two jobs and did not have enough free time to meet with me in person. Ada had a family, two jobs, and multiple family responsibilities.

**Sia**

Sia is a female student of an American-based online university, she was recruited via the University Participant Pool's website. Sia contacted me via phone, stating that she was interested in being a participant in my study. The screening process was completed and Sia was determined to be a qualified participant. She resided in the

eastern United States and agreed to be interviewed via Skype because of her location.

She had a family, family responsibilities, and worked full time.

### **Wyn**

Wyn was recruited via an American-based online university Participant Pool's website. Wyn contacted me via phone and volunteered to be a participant. After conducting the screening process, I deemed him to be a qualified participant. He was a male student who, had a family and family responsibilities, and worked full time. Wyn had the option to have his interview in person because he resided in the same area of the northeastern United States as I did. However, he opted for the Skype interview due to convenience.

### **Sue**

Sue was recruited through an American-based online university, Participant Pool's website. Sue made contact with me via phone and volunteered to participate in my study. She went through the screening process and met all the inclusion criteria. She was a current female student at an American-based online university, had a family and family responsibilities, and worked full time. Sue chose a Skype interview because of the easier logistics.

### **Deb**

Deb had a full-time job and was a registered female student at an American-based online university. She had a family and family responsibilities in addition to being an online university student. Deb was recruited using the alternative snowball method. I

contacted two of the participants who were recruited via the university Participant Pool and asked if they could spread the word and refer other students. Deb was one of the students that resulted from that effort and contacted me via phone to indicate that she would like to volunteer to be a participant. The screening process was conducted, and Deb possessed the requirements to be a participant. Deb resided in the northwestern United States and chose the Skype interview because of distance.

### **Liz**

Liz was recruited via the snowball sampling method (see Bloomberg & Volpe). She contacted me via phone and said she heard about my study and visited the university, Participant Pool's website. After the screening process was completed, Liz was deemed a suitable candidate for the study. Liz was a registered female student at an American-based online university. She was a full-time employee and had a family and multiple family responsibilities. Liz resided in the northeastern United States and chose the Skype interview due to convenience.

### **Mia**

Mia was a current female student of an American-based online university, and was recruited via the University Participant Pool's website. Mia contacted me via phone and volunteered to participate in my study. Mia was considered qualified to be a participant after completion of the screen process. She resided in northwestern United States and agreed to be interviewed via Skype because of her location. She had a family, family responsibilities, and worked full-time.

**Ken**

Ken was recruited via an American-based online university Participant Pool's website. Ken contacted me via e-mail and indicated that he was interested in participating in my study. After the screening process was completed, Ken was considered a suitable candidate for the study. Ken was a registered full time male student at an the American-based online university. He had a family and family responsibilities. Ken resided in the southern United States and chose the Skype interview due to his location.

**Sid**

Sid was recruited via the snowball sampling method. Sid contacted me via phone and indicated that he heard about my study and would like to participate. Sid was deemed a suitable candidate for my study after completing the screen process. Sid had a family and multiple family responsibilities, and worked full time. Sid resided in the southern United States and chose the Skype interview because of his location.

**Data Collection**

From December 4, 2016 through April 15, 2017, I interviewed a total of 10 participants using the interview questions in Appendix A. After completing the screening process, I e-mailed the informed consent forms to each participant, asking them to read, sign, and return the forms. During the screening process, the participants were notified that they could ask me any questions about the informed consent. The participants were informed during the screening process that their signature was required before the

interviews to confirm their willingness to be participants. The participants were given the choice to be interviewed face-to-face or via Skype. All 10 interviews occurred via Skype, and the interviews were recorded on a Skype digital V2.6.1 call recorder. I conducted all the interviews in a private room in my home. The interviews took place at a time and date that suited the participants. This was vital because the well-being and privacy of the participants is crucial when discussing intimate experiences (Suzuki, Ahluwalia, Arora, & Mattis, 2007). Although the interviews were being recorded, I kept written notes in case of a technological failure and made observations regarding body language.

The interviews varied in duration, with the longest lasting for 1.5 hours and the shortest lasting for 1 hour. Because there were no consecutive interviews, I had enough time to transcribe the interviews between appointments. I transcribed the interviews by listening intently, then pausing the device, followed by typing the information into a Microsoft Word document. The transcribed interviews were shared with my chair and stored on my computer to help with easy retrieval and back-up. Each participant's transcript was labeled and kept in a folder to help in managing and organizing the data. All participants were provided with a pseudonym to protect their identity.

Variations in the plan I presented in Chapter 3 involved data collection. The initial review of the interview protocol was completed by a panel of two experts. The feedback from the panel was useful in creating the interview questions so they were clear and all-inclusive for use with the selected sample of 10 participants who were full-time students,

worked full time, and had a family and family responsibilities. I learned that well-structured interview questions resulted in the researcher making effective connections with the participants as they related their stories (Suzuki et al.,) and the outcome was that I obtained rich data. The validity and reliability of the interview protocol verified the integrity of the data. The interview protocol helped me build rapport and trust with the participants.

In Chapter 3, I discussed that the data would be hand coded using the traditional pen-and-pencil method. However, after a conversation with my chair, she suggested that I sign up for a tutorial on using the Nvivo software to code my data. Before the tutorial, I started hand coding the data using colored markers to identify common phrases and common quotes. The data were partially coded by hand, then transferred to the Nvivo software to complete the coding of the data analysis.

As explained in Chapter 3, the total number of participants to be interviewed were between seven and 10. After the seventh participant was interviewed, I contacted my chair, who suggested that all 10 participants should be interviewed. Beune et al. stated that saturation is reached when interviewing additional participants does not yield any new themes. When the last two participants were interviewed, saturation was reached.

Unusual circumstances encountered during the interviews involved two participants whose children were crying and needed attention. The recording device was paused, giving the participants time to intervene. The device was equipped with noise cancellation capabilities that allowed the sound of crying to be muted. One other issue

that came up was that some of the participants' answers contradicted the questions, even though the questions were repeated at their request. I allowed the participants to express their views, then informed them that they did not answer the questions. The participants agreed that the questions were not answered and asked for the questions to be repeated. After the questions were repeated a second time, the participants answered the questions.

### **Data Analysis**

The data were analyzed using Moustakas's modification of the Stevick-Colaizzi-Keen method of analysis for phenomenological data.

At the listing and preliminary grouping stage, I read the transcripts to gain an understanding of the views and opinions of the participants. The process that I used to move inductively from coded units to larger representations included placing similar responses into categories. I started to identify similar phrases and words by using a highlighter to make markings on the transcripts. In the reduction and elimination stage, I read the transcripts repeatedly, to identify and review expressions presented by the participants. I continued with NVivo version 11 for Mac software to help in identifying the four themes. The analysis process included developing a response coding scheme, justifying the findings, producing the analysis, and reporting the information. First, each group of common phrases and common words were identified by the software. Next, important phrases that were relative to the phenomenon studied were established as responses relevant to be coded. Following these, all ambiguous and repetitious statements were removed, which led to the software producing invariant constituents

(codes) connected to each research question. Clustering and thematizing as recommended by Moustakas allowed me to highlight significant statements from the participants' experiences and develop themes. The invariant constituents were clustered according to their similarities and validated across the 10 participants to create and develop the themes associated with the research questions. Lastly, I compiled a narrative of the phenomenon as experienced by the 10 participants by using their direct responses to each research question.

Four themes emerged from the data analysis:

- Theme 1: Effects of sleep deprivation
- Theme 2: Adjustment to daily lives
- Theme 3: Factors affecting sleep deprivation
- Theme 4: Impressions of online education.

### **Theme 1: Effects of Sleep Deprivation**

The theme effects of sleep deprivation emerged when participants described how sleep deprivation affected their lives at home, work, and school. Liz described how her academic performance is affected when she is tired and sleep deprived compared to when she is fully rested. She stated,

It takes me longer to get the work done as opposed to times when I'm more restful. When I'm more restful, the task that I have to do will take me way shorter time to do to, in completing the task, as opposed to when I'm deprived of sleep

and very tired. I am getting it done but it takes me longer to get it done, more hours, so at times it will affect my performance.

Sid suggested that it is not even important to have eight hours of sleep, because as an adult, he has the responsibility to fulfill his school obligations. He stated,

Growing up as a kid I saw my mom working two jobs; as for me, I don't think she slept. If she is not working one job, she is working another job, so that instilled in me that sleep is secondary compared to what you got to do to make ends meet.

So, to me, don't take offence to this, but I think sleep is for the lazy people. I teach my son that. I tell them that success is not by chance. You have to make it happen, and the difference between success and failure is your motivation.

While Sid was reflecting on how his mom survived with less sleep, he felt that maybe he may not need to sleep that much. He stated,

I think we sometimes get caught up in it, and especially if it's something you're passionate about, and that passion alone can burn your batteries enough where you say, "maybe I don't need that much sleep." I mean, I've gone to sleep thinking about this stuff and you know, that was one of the things that makes me tired and I still can't go to bed.

Each participant viewed sleep as an important activity; however, even though all 10 participants had prior experience with sleep deprivation, adequate sleep seems to be a secondary concern at this point in their lives. Fin reported that he was used to taking power naps and not getting enough sleep. He described his sleep as follows:

Yes, it's adequate. I mean, like I said, I'm a retired soldier. So, as an infantry guy, we can go—I'm used to going, staying up 24 hours a day. Straight, 24 hours, no sleep. So my body is conditioned to go 72 hours without sleep. But that doesn't mean I'm unaffected doing that. We need to plan it to where we get sleep rest. I call it power naps. I've taken many power naps. I can stand up for 15 minutes, put my head on the wall and sleep, and it felt like I slept for four hours. I'm trained to do stuff like that with my body. But I don't think everyone can do that without training because I've been doing that since I was like 19, 18, 19, all the way 'til now. For me, it's a little bit different than probably the average person that has never been in a situation like I have.

Another common advantage expressed by Wyn about the effects on his sleep habits is that his body adapts to his sleep cycles and he thought he may be unique. Wyn stated, "But I guess it depends on you as a student, because I know that for some people, that their sleep cycles are very set. Mine is not. I'm probably an exception."

The difficulties with having less sleep were accentuated by Kev:

If you're deprived of sleep, you're not going to function as well, and I know that from personal experience, so you know, it's just not learning, but it's from personal experience. I've been there; I've done that. Sleep deprivation is probably the cause of motor vehicle accidents, accidents at work, it can cause safety issues, so yeah, sleep deprivation is not a good thing.

Sue stated that she becomes cranky when she is not fully rested: Sue shared,

When I don't get enough sleep, my work is affected. I start to become cranky, I don't follow through with certain things, or, I will leave things and procrastinate, so it affected my professional and personal life a lot. So, it is a double-edge sword because I sometimes work under pressure, and I got you know praise for it, but it also impacted me you know negatively, you know people's view of how I did my work differ, even though I did a good job, it did impact me negatively from time to time.

## **Theme 2: Adjustments to Daily Lives**

Many of the participants discussed how they adjusted their daily lives. This theme was developed because most of the participants stated that they have had to make adjustments in their lives. Compartmentalizing their time and planning for each area of their responsibility is necessary for them. Fin indicated that his sleep time is never stable:

When I come from work, a certain time I have to get myself together, get the kids together, and I get my study time together, which is from like 11:00 to 1:00 in the morning. So instead of going to bed—I usually go to bed like 10:00—I'm going to bed at 1:00. So that kind of affects my sleep time because I have to get up at 5:30, 6:00 in the morning to get the kids ready to go to school and go to work. In short, my sleep time, from getting eight hours down to getting five, sometimes six hours, sometimes four hours.

Fin's involvement as an online student, a full-time employee, and an individual with family was part of his experience. Fin felt that he had to modify his time to afford

his children the attention they need. He stated:

And I've got the kids, they want that attention, you have to give it to them. So I break it down, I won't do anything until after they go to bed, which is like 10:00.

And from like 10:00, I take care of my stuff that I have to take care of, prepare for the next day, and from 11:00 to 1:00, that's my time to study.

When describing their attempts to maintain high academic standards, participants pointed out that they engaged in tradeoffs. Fin acknowledged the fact that he had to make sacrifices:

Sacrifice some things. Going out, you know, you have to sacrifice some things.

So like, going out on the weekends, watching a lot of TV, a lot of those things you have to curtail to make sure you get your study in.

The importance of a balanced life also involved making time for his wife. Fin continued,

There's certain things I have to do to make sure my kids are squared away, cause they're the most important. And then I have to keep—my family has to stay happy, my wife has to stay happy, because she don't want to see you always talking about class, class, class, not her, her, her, so you have to balance that too, balance that with the family.

In analyzing and reviewing the data, I noticed that some participants normalized sleep deprivation as part of adjusting their lives. Sue stated:

You know the one thing I had to do . . . was, I had a lot going on and was bringing my school to work. And that became a problem. It became a problem also for my professional life. I had to cut back on doing that, I try to get things done at work because there is a printer, access to certain things that I don't have access to at home. I try to work with the situation because I have to get my schoolwork done at any cost.

While some participants normalized sleep deprivation, others felt like they were in a constant state of playing catch up. Liz expressed concerns about her eating habits and the priority that her schoolwork takes over sitting down to eat a meal. Liz stated:

Sometimes I don't eat properly, sometimes I forget to eat, and sometimes it's just one meal for the day. The information, I've heard about it, in my course of studies, and at workshops, I actually heard about sleep deprivation and it is important to have sleep but what are you going to do?

Kev reported: "I feel like I would like to have eight or more hours. When I sleep at least eight hours I feel like I'm energized. I'm rejuvenated, but it has become a part of my routine sleeping those hours".

Participants mentioned the challenges they faced as they adjusted their lives to maintain a high level of academic performance. Deb described how family responsibilities take up the majority of her 24 hours:

As far as taking care of my children, entertaining them, and taking them to child play groups is a lot of responsibility, I'm writing books, as well as I'm working

on my nutrition certification, then making corrections to my dissertation, resubmit it, working on my proposal, URR, and all that good stuff, and then cooking dinner, spending time with my husband when he does come home, putting my children to bed, and stuff, so it's just a whole lot of responsibilities I have to deal with on a daily basis. I have to tend to the family.

Mia stated that she still found it difficult to find enough time in the day to meet her deadlines. Mia stated:

The lack of sleep contributes to problems in meeting deadlines. Well, it slows you down quite a bit, in regards to even the amount of time you want to get to log on in the classroom and also completing your homework, doing it in the right amount of time, you know, the deadlines you have deadlines and if you're not, you don't have enough sleep you wouldn't be able to make those deadlines just because you're trying to rush and stuff like that.

Sid described how he broke it down into hours:

Yes, that is a challenge. I work eight hours a day. I have to take my kids to school. When they come home from school, I have to make sure their homework is done, everything is read. You know, make sure they prepare for bed. Then I study, and after I study, then I go to bed. So it is a big challenge as far as me trying to get that timeline. So I try to break it down, like after my eight hours of work, I get home. So I've got two hours, 11:00 to 1:00, to do what I need to do, then I go ahead and get my sleep.

Wyn's discussion focused on his daily schedule that included times when he is able to get some school-work done on his job. Wyn stated:

I realize that sleep deprivation is a direct result of having a full schedule during the day. So with that in mind, you have to take things in proportion. I do some of my school work at work when the time is available and do some at home. You can't overdo things.

Deb was in a program that required her to complete her residency. Because she had to go into residency as a requirement for the PhD program, she mentioned that she had to stop breastfeeding her child. She stated that she believes in breast feeding and the decision was difficult for her.

Well I would have to say my time with the residency was a big change because I actually had to stop breastfeeding my daughter as a result of having to go to my residency. Going to my residency, and then you know that was two weeks that I had to be in classes and leave my family. Then I had to come back and business as usual. So that was a major change in terms of being an online student having going back and have to deal with the changes personally with the family structure and stuff like that. Now, in terms of sleep, whether it impacted me in terms of sleep, that's a different story. That was more so because of the breastfeeding.

Speaking about adjustments to daily lives, Mia stated:

You know, I go to bed later and later every night for some reason. And now it's normal to go to bed late. As for my personal and professional life, I don't have a

lot of friends. I have a family and sometimes I neglect them, which is not right, but they understand the challenges I am going through studying at home. I even take a lot of days off to take care of schoolwork.

### **Theme 3: Factors Affecting Sleep Deprivation**

Another theme that emerged from the interviews and that forms the core of this analysis is the factors contributing to sleep deprivation. Contributing factors such as personal factors and family involvement were identified as affecting sleep deprivation. The participants' experiences varied because of different family dynamics. Nonetheless, results from the interviews showed similar factors affecting each family. Taking into account that most of the participants are adults who are employed full-time, their situations were noted to be similar, and factors that impeded their sleep habits and academic performance were also similar. Most participants indicated that distractions at home relate largely to their family responsibilities. Understandably, it was hardest for those who have young children. Deb mentioned:

Well like you know, family responsibilities take up the majority of the time, the fact that I have three children, I have to get my son at up and out the door to drive him to school. Sleep deprivation is basically not attaining enough REM rest, basically like insomnia, staying up for whatever reason, it could be like PTSD, like in my case I can relate to PTSD coming from the military environment, it could be as a result of studying, also I have three children and sometimes they get

sick, I'm nursing a newborn you know, all of those factors, so there is a lot of contributing factors that goes into sleep deprivation.

Factors affecting sleep deprivation applied to all participants relating to their home and work environments. Some participants highlighted specific factors and personal characteristics that interfered with sleep habits or cause sleep deprivation. Sue mentioned that being in school has become part of her life: "Well the thing is, I've been in school all my life and hasn't really stopped. So I'm always not sleeping well on a regular basis."

The difficulties some of the participants experienced while trying to maintain a high level of academic performance are exemplified in Liz's words. She verbalized that her social life was virtually nonexistent and she was perpetually overwhelmed:

My social life has been taken away actually, because online school DEMANDS, it DEMANDS my attention like how a child will demand the attention of a mother, especially if the father is not around. In my case daddy is there, it's good that I have a supportive husband and my mother-in-law helps me with my kids. My husband is very supportive, sometimes when I'm overwhelmed I feel like giving up. I am motivated intrinsically, so I wouldn't really give up. But sometimes it overwhelms me, makes me feel like I'm seeing this for the first time. But of course, the intrinsic motivation will kick in, and sometimes my husband will say, "you have come this far, I will support you." He will help with stuff, my mother-

in-law will help, but my kids will find me wherever I am. I have to help them with their homework, but my personal life is affected.

Wyn spoke about how he cannot escape the distraction at home with his children.

He did bring to my attention that his son was running around. He stated:

As you can see my little son is running around here so that's a distraction. I think the distractions would be family matters or having family around. I know when holiday season comes by, if I have a lot of family coming then that definitely leads to distraction with my schoolwork.

Mia discussed her responsibilities as completing eight hours of work followed by taking care of family responsibilities:

I get up in the mornings, fix breakfast for the family, take a shower, trying to rush and get to work in the mornings, it's crazy. Then I'll do my eight-hour shift, come back home and then just kind of clean up a little bit, spend time with my family, work a little bit on my paper, which some days I don't.

The personal factors preventing the participants from obtaining adequate sleep and maintaining their academic performance included the television. Mia stressed that the television was her major distraction:

This TV, it is ridiculous, I'm the type of person I got a TV in my room that is bad. So, I try not to study in my room but it's there. Definitely, the TV is the biggest distraction to me. My phone doesn't ring as much, I look on Facebook, but I'm not checking on everybody on Facebook, but the TV definitely is a distraction.

Kevin concluded that sometimes he can't help himself, and watches TV despite understanding that it is a distraction. He expressed, however, that he catches himself and returns to what he is doing, but feels guilty that he wasted time:

But now let's say, I'm in the middle of something, and they say something is on TV that will catch my attention, so I'll stop and look, and then I get sucked into it for 10 or 15 minutes and say, "Oh no wait, I've got to go back to this." So it's 10 or 15 minutes I could have been using to get my work done, but now was distracted by the TV, now I'm gonna be up late, but guess what, I'm not getting enough sleep because if that continues, it builds up.

Sue put into words her experience of being distracted by the television in the following way:

It's interesting because I am distracted at home by the TV. Some of the programs are so interesting that it's hard to resist, but I do my best. However, at times I will go to sleep and end up not getting in my daily schoolwork. I get up in the morning and blame it on the TV.

Sid discussed distractions other than the television. He articulated his experience of being distracted by going online:

I occasionally hop online, and I think my vice is going to Yahoo and reading through their news articles. I didn't equate that to the tabloid trash, there is no sense or rhyme or reason with any of the articles on Yahoo.

Wyn emphasized that his personality traits and personal characteristics work positively for him because he is a creature of the night:

Okay great, alright so, like I said, to be honest, with the exception of the last class, I don't think that I've experienced a lot of sleep deprivation. Again, like I've said, I'm a creature of the night so I'm typically up late up at night doing my assignments. So, even if I am not doing an assignment, I'm up late at night anyway. To try to answer your question, there have been times where, like I said with my last course, where I was up a little bit past my usual hours especially on a Sunday. There has been maybe one or two separate occasions where I crawled out from bed the following morning, you know, because I was a little bit tired, up until 4:00.

On the other hand, Fin stated that as a result of being in the military, he was diagnosed with sleep apnea and experienced sleep deprivation prior to attending school online. He summed up his experience this way:

So I guess I can say I'm a prodigal at sleep deprivation, because I do have sleep apnea. And like I said before, that could have been from me being in the military not sleeping, not getting my right amount of sleep. It could have impacted me later on like it does probably now. So it's a whole bunch of information, I know about it cause I'm a prodigal.

Sid discussed how his personal sleep habits have changed. Sid stated:

I can tell you for sure, before I started this program my sleep habits had been, I would say really erratic. I would stay up maybe one or two or three, o'clock in the morning just messing around, on the computer just watching TV or pretty much playing games, Nintendo or whatever. So there were no consequences to my sleep habits, but now I realize that having responsibility with the schoolwork, I tend to be harder on myself, to be strict, regimented. I know I wasn't this way before I started this program.

There was one participant (Deb) who talked about sleep as a regimen. She mentioned that she has a general rule that works best for her: if she has not completed her work by a certain time, she stops and goes to sleep. Deb was the one participant who mentioned that she has a routine to deal with sleep deprivation. She stated:

To be honest, it's the same. And this is just a general rule. I did my undergraduate studies at the Maryland College, it was a brick-and-mortar school. I lived on campus. I had roommates, I did the whole traditional college experience and had the general rule if that if it's not done by 11:00 p.m., then it's not getting done. That the rule that I'm proud to say that I basically maintain throughout my academic studies, undergraduate and graduate, there's only been like a couple of times when I actually had to burn the midnight hour and stay up really late to complete a task or to study. Yeah, but yeah, my general rule is that if it's not done by 11:00 p.m., then it's not getting done. I'm going to go get some sleep.

Conversations with participants revealed how their families' involvement was personal to their success. It is important to mention that participants highlighted some positive family factors that enabled their academic performance and may have reduced the effects of their sleep deprivation. Sia stated,

I think, for me, I have always tried to articulate to my family that we have to make some changes while I'm at school. I talk with them and tell them what my responsibilities are as a student. I communicate to my family what my requirements are as it relates to having my schoolwork done. I isolate myself in my room for a few hours and get my work done. I tell my family that I need some private time. I take my food and water and make myself [unavailable] for a few hours. I get my work done without necessarily taking my family space or making them feel as though they are involved. Having a good support system is key.

Kev stated:

I have great social support doing my school work, people know, even my youngest son, if he sees the laptop coming out, he knows what going to happen. Unless he needs something, you know, and even my wife, she supports me and my entire family supports me. It's not a big issue, if I say, "hey, I've got schoolwork to do."

The recognition of factors that affect sleep deprivation was a prominent discussion within participants' families. Our sleeping patterns and family lives are intricately intertwined. One participant recognized the importance of losing time with

family and friends. Discussion among family members was crucial to participants getting their required amount of time to complete schoolwork while taking care of family responsibilities.

The decisions and agreements made not only affect whether each family member is supportive and involved, but also can either cause conflict or provide opportunities for the student family member to be successful. Therefore, the spouse stepping in to provide moral support is equally important. Wyn stated:

Family life, wife is very flexible, very understanding. She's also a graduate student so she understands this well. So, you know, we try to make it work. Maybe I'm not the perfect candidate for your study.

Liz echoed similar sentiments:

If I'm getting too stressed, my husband will come and help me with a lot of the domestic chores, my mother-in-law helps me with what she can help with, but the major things that I have to do, I'm doing it.

Participants also verbalized some of the negative factors that relate to the amount of family responsibilities and distractions within the home. While coding, I observed that some of the factors that affect sleep deprivation overlap. Fin noted that sometimes day-to-day tasks vary and can affect the time parents devote to their children:

If you have kids, it's a big distraction, because they want their time. And, you know, you have to be able to balance that time, because you can't always tell

them to get away, I'm studying, because they have homework and school, and they don't tell you to get away when they—you know, you have to balance that.

Liz spoke about her experiences within the home and the challenges of being a mother and a student at the same time:

Home is never usually the best place to do online class if children are there. If you don't have young children the story is different, but if you have young children who are there, you're not going to get anything done, I can speak for me again. But my children, they are very lively and very demanding, they will always want my attention, and always demanding, and it is always something legitimate for whatever reason there is, to do online class if children are there, if you don't have young, and hey just come and you have to give them that attention, you have to, and of course they work on your emotion, they have something to show me they say, "look" and you have to, so the work is always there. They will get into trouble. I can always ask my mother in law, she is a senior person; I still have to give time to them, and that when I have to weekends is usually very harassing.

#### **Theme 4: Impressions of Online Education**

All the participants viewed online education positively even though they faced challenges as online students with family responsibilities and full-time jobs. Most participants pointed out their mistaken assumption that online education was going to be much easier. However, they found out that it was not easy compared to the brick-and-

mortar school experience. Sid stated that he was shocked when he realized his misconception about online education, and that it takes a lot of effort and sacrifice. He used humor as he described his experience:

I'll tell you what, it was like a smack in the face when I first got online. It's not as easy as I thought it was, nobody pushes you but yourself. Now putting that aside, here doing online work, I thought compared to that, that this was going to be a breeze, but you know as well as I do, you know what, I have the highest respect for anybody that heckles [sic] online school. It is nowhere near brick-and-mortar and anybody who scoffs at that, have no idea, or have never taken online classes. Oh my gosh! The greatest lesson obtained from all this is not to take anything lightly when it comes to online schooling. I thought it was a joke to do online, but that was before I got into it. Now I have the utmost respect for people who do it because people who have gone before me, it takes a humongous amount of dedication and sacrifice.

According to the participants, online education is very rigorous and is much more demanding than traditional brick-and-mortar programs. In discussing the question about the changes in her personal and professional life, Liz acknowledged that online education requires more commitment than a brick-and-mortar school: Liz said:

Online university demands excellent work and full participation, it's unlike the brick-and-mortar school, where you can piggyback on other people, leave the class, you don't necessarily have to stay. In online you have to be your OWN,

and represent yourself in everything, it takes a whole lot more demands than brick-and-mortar school, that's my experience. Going for my bachelor's and master's in brick-and-mortar school, going for my PhD online is way more demanding than physically going into a class room.

The participants' experiences varied with regards to their approach to online education and to maintaining a high level of academic performance. Their techniques were based on their unique family situations and work schedules. As adult learners, the participants realized that they must adhere to some form of discipline to be successful because there is no time to mess up. Sid stated:

So having the structure and the discipline to adhere to the best of my ability to that schedule, albeit, it's a small section of my daily schedule. School time, it's so profound now that when I enter that portion of my schedule I know I cannot mess around. When I did my undergraduate my nickname was "the prodigal son." I don't know why. Oh, I think they were being mean. When I have a study group, I would just come along, not much sweat, have a snack or whatever, I just roll up there with my backpack, they were like, "Oh, the prodigal son returns." As an undergraduate I could be hiding at the back of the class and my teacher, if he doesn't get to me then I could you know, skimp by for the day even though I might be clueless, if he were to ask me anything about that subject I might not know what the heck he might be asking. Here, online, every spotlight is on you. You can't hide behind the guy in front of you. You have to present every week.

Two participants said that they valued online education because they have dedicated themselves to pursuing it at great cost. They also talked about how much effort it takes. No one complained about the course of study being too light, or the quality being substandard. According to Sia, “I think a good education doesn’t necessarily mean—it doesn’t matter where you go for school, it matters how much time and effort you put in to learn.” Breastfeeding was a choice for Deb. But as a student who had to attend her residency, she took a different approach that corresponded with her identity as a mother and made a decision to stop because of the importance of her education. Deb chose to curtail the period of maternal-infant attachment that plays an important role in a child’s development.

In relation to online education, participants compared the brick-and-mortar campus with attending school online. Some participants indicated that they missed the face-to-face interaction with professors and peers. They did not feel a sense of attachment to the university or support from their class members in the online environment. Fin stated:

Brick-and-mortar school is different ‘cause you have the face-to-face contact. Everything you need is right there. You can ask your professor something; you’ll get the answer back immediately. I don’t have to go online to check and see if the professor answered. I mean, it’s a lot better ‘cause when you’re in that classroom, you already have everything that you need to do for your work. You got all your questions answered, all that stuff. So, you’re not wasting all that time. You can

be focusing on the study. So to me it's a big difference between online and brick-and-mortar as far as my studies.

Sid's experience differed from the others with respect to this comparison, and his struggle to stay on course with family disruptions influenced his views:

Obviously, being an online student is much harder than being in a brick-and-mortar school. You're subject to any sort of disruption, whereas if you're a brick-and-mortar student, you're in a self-contained environment.

Each participant voiced his or her opinion about online education, some of which were positive and some of which were negative. Some participants' approach to online education was that it is an isolating experience and their family and friends were not always understanding. In discussing the question about strategies to help them get adequate sleep and juggle school, a full-time job, and family responsibilities, Ada indicated that she has classmates with whom she can speak about her concerns. There is a large emphasis on ownership of her education and the need to access support to help her stay on track:

I feel like if I was in a brick-and-mortar school, that there might be more support and there might be more socializing. What I mean in support is that face to face, I see you, I can talk to you, I can tell you about my issues or my concerns.

Versus—like I'm telling people, in the beginning with the online program, I was telling my friends and family who weren't going through this like I was. They didn't quite completely understand.

In contrast to the negative aspects of online education, participants also outlined positive aspects. Some participants made full use of the flexibility of online education, took ownership of their educational path, and gained confidence in what they were doing.

Liz stated:

The advantage of the online for me, is that, because I'm in charge of my learning, it pushes me to be a real professional, I have to do the work, I feel more confident in my work. I did this and I know it's of substantial quality, so, it will be helpful. . . . The advantages of an online school over the brick and mortar is that you can just log in on your computer and you're in class, that's what I mean by brick-and-mortar, one more advantage is that you will learn.

While some students approached their education with experience and knew what they were getting into, for some this was a shock. Sid stated, "I'll tell you what, it was like a smack in the face when I first got online. It's not as easy as I thought it was, nobody pushes you but yourself."

Participants found themselves on a continuum of flexibility. While some participants reported that they could study at work, others could not. While some could print out notes and papers at work, others had to work eight hours, drive an hour to and from work, and did not have any time left. According to Soo, Zippay, and Park (2012), flexibility allows individuals to meet family needs, personal responsibilities, and life commitments conveniently. Wyn stated that he has a lot of flexibility at work:

In terms of work, because of my role at my current job, I have a lot of flexibility. In so much I had more flexibility when I was working in a residential apartment. When I speak about flexibility in terms of your study and staying up at night, I could be up late at night and I could get up at whatever time I feel like it. I would get ready and go to work, because that job afforded me that type of flexibility. However, now I am in that day services where I still have some flexibility but not as much. So it hasn't really impacted my professional life. I can say I'm fortunate. In terms of personal life, day to day, I get up in the morning, go to work, like I said, very flexible schedule. As long as I do eight hours for the day, they don't bother me. What I think is that as an online student, I think that we have some degree of flexibility. So, for me, I think that being an online student would afford us a little bit more opportunity to have, to get better rest.

Kev shared his outlook and created a schedule to help him stay on track:

You can't necessarily say, well I'm going to stay up these nights to do this; you have to get that rest. Otherwise you're not going to go anywhere, I mean you're just going to be spinning your wheels. So, that being said, yes, I've got a set schedule and I stick to it as much as I can. There are times that I do stay up later than I should, you know, with schoolwork, and I end up depriving myself of some sleep.

Liz's experience and approach to her online education was articulated well when she mentioned that she is responsible for her own learning:

The online library is there, that is very useful, and I can use that since I am responsible for my own learning. I have to answer every question, and whether I do the work or not, there will be a grade at the end of the quarter, and there are doing it for the whole book, whatever book you use it is already preset, and whether you complete it or not the work is there, they are expecting you to perform, so you can't shift an assignment to the following week or whatever reason. The advantage of the online for me, is that, because I'm in charge of my learning, it pushes me.

Overall, the majority of the participants agreed that online education is not as easy as they thought. It was also a common perception that online learning demands full responsibility because each person is responsible for his or her own learning. One participant had the luxury of flexibility at his work, which works well for him. The value of online education was underscored by a participant when she made the decision to stop breastfeeding her infant to attend her residency.

### **Evidence of Trustworthiness**

#### **Credibility**

In order to establish credibility as suggested by Creswell, member checking was implemented. After listening to the tapes and compiling the narratives, I emailed a copy of a summary of the interview to each participant for member checking. All participants verified that the facts were accurate. No participant edited the summary.

**Transferability**

As stated in Chapter 3, the findings from this qualitative study are specific to a small number of individuals from a particular setting. As such, it was not possible to determine how the findings and conclusions could apply to a larger population. To make the data credible and allow this study to apply to different situations, I provided a thick, rich description of the participants' lived experiences. Direct quotes were used from the transcribed interviews to support my descriptions. Participants were recruited via an American based online University Participant Pool and snowball sampling. All 10 participants were screened using the inclusion criteria identified in the participant recruitment letter. The interview context was described and sample questions were provided. The duration of the interview and the interview tools (video and audio recording using Skype) and informed consent were described. Verbatim transcriptions of the data provided a valid description and reduced erroneous data. Nikander suggest that thick, rich description would allow other researchers to investigate the research further.

**Dependability**

I provided a thick rich description of the study as reported in Chapter 3. Because the research questions were well thought-out from the beginning, I was able to continue interviewing until the research questions were answered fully. Also, because of my concern about the possibility of my biases affecting both the data received and the analysis, I followed the recommendations suggested by Patton and adopted the bracketing procedure and took note of my biases and preconceptions. I disregarded my opinions,

expectations, prejudices and biases as an online university student and surrendered them to observe the participants' experiences from their perspective. Documentation for this study included comprehensive notes and research memos about the findings and analysis of this study.

### **Confirmability**

Confirmability was achieved by listening to the tape recordings, comparing the transcripts to the recordings, and compiling a summary of the interview. I transcribed the interview verbatim within two weeks and emailed a summary to the participants for member checking. I ensured that the findings were a result of the direct ideas of the participants rather than of my own opinions.

The interview questions for this study were answered by interviewing participants face-to-face via Skype. This phenomenological study described the lived experiences of sleep deprivation on online university students' performance. The emphasis was on how they make meaning of sleep deprivation as a factor in maintaining academic performance. All of the interview questions were open-ended, which allowed the participants to provide robust answers.

Following are the results related to individual research questions. The central research question was: What are the effects of sleep deprivation on the academic performance of online university students? All the interview questions were asked and the themes for the central research question were developed. Ten online university students participated in this study. All participants were knowledgeable about the

positive and negative effects of sleep deprivation. There was commonality in participants' experiences regarding distractions in the form of family responsibilities that impacted academic achievement.

### **Results**

The study's research questions were addressed through the analysis of codes identified from the participant's responses. I used the codes to develop the overall themes that addressed the central research question. I interviewed 10 participants who answered all the research questions. The central research question was What are the effects of sleep deprivation on the academic performance of online university students? After the first interview question was asked, the first major theme characterized the experience of the participants. The results showed that sleep deprivation causes tiredness and included the reasons why individuals function on a daily basis with inadequate sleep. When the participants were sleep deprived, they reported their time management skills became weaker. Sue pointed out that when she feels exhausted, the evidence is in her "sluggish thinking," "cranky responses," and "not being alert." Most of the participants mentioned that time management was their problem. However, they never made the necessary changes to practice good time management skills. Fin described his problem as just not having enough time. He stated: "Time, time is one of my problems. I don't think it's a sleep habit; it's just that the problem of just having the amount of time I need to study and do all the things that my school requires."

In response to Question 2, all 10 participants stated that they adjusted their daily schedule at home and/or at work to accommodate their schoolwork. I found that participants with younger children reported they had to make further adjustments to take care of their children. I learned that some participants established having less sleep as a routine. In Question 3 I found that all 10 participants stated that distractions within the home, especially family responsibilities and the demand of their daily jobs affected their sleep patterns. All 10 participants thought that their personal and social lives were reduced because of the demands of completing schoolwork to maintain good academic grades. Two participants stated that the television was their biggest distraction in the home. In response to interview Question 4, 9 out of 10 participants felt that online education is more demanding than a brick and mortar school. One participant specified that online education is not difficult. He shared that his job is very flexible and he can complete his schoolwork on the job. He echoed that he is used to staying up late at night and uses the time to complete his schoolwork. It is necessary for online students to find the correct balance between work, school, family, and finding time to have adequate sleep, and often that balance is miscalculated.

The discrepant case involved one participant (Liz) whose responses were mostly dissimilar from all other responses. Her responses were related to her strong faith in her religious beliefs that she thinks are responsible for her success in handling school, work, and family responsibilities. She emphasized that her faith is what enabled her to cope with the challenging situations in her life. She declared that her faith is the internal

mechanism that empowers her to cope with challenging situations in her life. In this way, she did not really answer the questions with any descriptions of how or whether sleep deprivation affected her online university work.

### **Summary**

This phenomenological study was undertaken with 10 online university students. In this chapter, I presented examples from Skype interviews conducted with these 10 students. According to Alderfer and Sood qualitative research is specifically intended to capture the opinion of participants and provide data so the research can interpret the lived experiences of participants. The results of qualitative research are descriptive and those who work in this research tradition seek to advance new theories or to explain a phenomenon (Alderfer & Sood). I wanted to understand the phenomenon of sleep deprivation as experienced by the participants I interviewed.

All the participants' experiences were similar. After analyzing the varied experiences, one of the participants' experiences was considered to be a discrepant case. All the elements in the data supported the data analysis and all 10 cases are accounted for in this study. The information I present in Chapter 5 will include a discussion of the interpretation of the findings, limitations of the study, recommendations, and implications for social change.

## Chapter 5: Discussion, Conclusions, and Recommendations

### **Introduction**

The purpose of this study was to identify the effects of sleep deprivation on online university students' performance. Prior researchers have shown that 24 hours of sleep deprivation hinders attention and affects sleep patterns and results in an overall decrease in response times and a notable reduction in alertness (Jugovac & Cavallero). The opponent processing model developed by Sutcliffe helped me develop the purpose, problem, and central research question of my study and understand the effects of sleep deprivation on online university students' performance. Findings from my study may help to provide further credence to Sutcliffe's opponent processing model by my use of the scientifically-based transcendental phenomenological approach (see Moustakas).

In the literature I reviewed, several researchers (i.e., Asaoka et al., 2010; Nadeem et al., 2012; Shochat et al., 2010) suggested the importance of exploring the sleep patterns and effects of sleep deprivation among college and university students. I used Sutcliffe's opponent processing model as the conceptual framework of my study to understand how sleep deprivation affects online university students' performance. The opponent processing model is comprised of two basic processes needed for individuals to function at their optimum ability: (a) the sleep-wake homeostatic process and (b) the circadian rhythm process (Sutcliffe). Sutcliffe's opponent processing model is based on the premise that the homeostatic process determines the interface in the circadian process between the time to sleep and time to be awake.

This conceptual framework provided the lens for me to analyze and interpret my findings. In this study, I compared my key results with the findings from the literature I reviewed in Chapter 2, and in the process, contributed to scholarly knowledge of sleep deprivation in a specific student population. After analyzing and interpreting the responses from all 10 participants, I concluded that the findings showed that sleep deprivation does affect online university students' performances. In Chapter 5, I will interpret the research findings, identify limitations of my study, offer recommendations, discuss implications for positive social change, and finish with a conclusion.

### **Interpretation of the Research Findings**

I asked each participant four interview questions and four dominant themes emerged from their responses. The first interview question was: How do online university students define sleep deprivation and what factors do they think contribute to it? The principal theme that emerged from participant responses to this question was effects of sleep deprivation. The second interview question was: How do online university students maintain good academic standards while being sleep deprived? The theme related to this question was adjustment to daily lives. The third interview question was: What factors within the home environment may affect the sleep patterns of online university students' performance? Factors affecting sleep deprivation emerged as a theme from participants' responses. The final interview question was: What have online university students found useful for enhancing their sleep patterns? The theme associated with this question was

impressions of online education. I then analyzed these themes in the context of the effects of sleep deprivation on online university students' performance.

**Effects of sleep deprivation.** All 10 (100%) of the participants reported that sleep deprivation affected their lives at home, school, and work. According to Chua, Fang, and Gooley (2017), sleep deprivation is prevalent among university students who live in a culture that endorses reduced sleep as a result of the commitment of academic work. My finding aligned with those in prior research by showing that inadequate sleep may decrease performance level and increase minor stressors on a daily basis. Even though the participants were aware of how sleep deprivation can affect them negatively, they ignored the fact and focused on completing their education. A recent study on the effects of total sleep deprivation on divided attention performance indicated that sleep deprivation, irregularities in the circadian rhythm, and interruption of the natural sleep wake cycle are responsible for impairment of cognitive functions (Chua et al.). Thus, poor quality of sleep and inadequate sleep among the participants as a result of having a full-time job, being a full-time online student, and having family responsibilities may have affected their performance.

Although some of the participants expressed different levels of sleep deprivation, it was clear that the students had made several changes in their personal sleep habits and their professional lives to accommodate online schooling. Daviaux et al. suggested that sleep is the main characteristic of a person's well-being, and it is a usual state for human beings to yield to sleep when they are tired. Research conducted by Dixit and Mittal

(2016) showed that students who were deprived of sleep for 24 hours were irritable and complained of pain. Researchers have also noted that poor sleep results in a reduction of students' cognitive abilities and affects their intellectual achievement (Dixit & Mittal).

**Adjustment to daily lives.** All 10 (100%) of the participants expressed the importance of compartmentalizing time and planning their daily lives to be successful as online university students. Given such a wide scope of highly important daily activities, it may be expected that sleep-deprived persons would perform poorly in their daily tasks. Remarkably, the results from this study showed that sleep-deprived participants performed well in their academic tasks, indicating that sleep deprivation does not completely hinder their academic performance. Still, the findings also showed that sleep-deprived participants took a significantly longer time to complete their assignments. The inflexible work schedules of participants made alternative sleep arrangements challenging.

Cazan and Stan (2015) conducted a study on self-directed learning and academic adjustments with Romanian students and found that adjustments are a helpful strategy in reacting to the stresses of academic obligations. The researchers determined that when students make modifications to accommodate their studies, the growth in their metacognitive skills and their competence to check and assess their own learning improves (Cazan & Stan). In this study, I found that the participants considered time management the Number 1 necessary adjustment. All of the participants had multiple obligations that intruded on the time allocated to learning. One possible observation and

explanation is that students who have a set time schedule and adhere to it are more likely to maintain high academic standards. Perhaps the students were becoming used to living on less sleep, while trying to meet all their academic obligations.

Three participants in my study pointed out that flexibility was helpful because they were in charge of their own learning. I observed that participants in my study used flexibility as a strategy to complete their schoolwork, although they possessed varying degrees of flexibility outside of school.

**Factors affecting sleep deprivation.** All 10 (100%) of the participants in my study expressed that they experienced inadequate sleep because of their combined family, school, and work responsibilities. I found that divided attention performance was prominent during times of work, school deadlines, and routine childcare. Additional effort was not enough to maintain adequate sleep among participants. Adequate sleep is a priority for parents to maintain their roles; therefore, inadequate sleep is not only a problem for parents but also their children as well (Dixit & Mittal,). The concept of working in twos (mother and father) fosters autonomy and the ability for parents to partition their time in the best interest of their families (Inoescu) . My findings regarding sleep deprivation among individuals who had full-time jobs and family responsibilities aligned with findings from the previous studies I reviewed in Chapter 2.

The experiences described by the participants in this theme also aligned with findings from previous studies (Barclay et al., 2012; Couyoumdjian et al., 2010; Dixit et al., 2015; Gilbert et al., 2010; Heuer et al., 2003; Kang et al., 2009; Litwiller et al., 2017;

Merikanto et al., 2013; Neubauer, 2009). Participants identified the support they received from their spouses and older children. The participants' focus was not only caregiving but also maintaining a sleep regiment as time allowed.

The most common factors affecting sleep deprivation were distractions and family responsibilities. All the participants were adult learners and realized the importance of earning a degree. To them, adequate sleep was a subjective experience that could be maneuvered to accommodate their daily agenda. Dixit and Mittal found that there is a slowing of reactions without change in executive functions after 24 hours of sleep deprivation. However, it is likely that 24 hours of sleep deprivation in healthy individuals does not trigger change in areas of the brain affecting executive functions if they maintain a normal sleep cycle (Dixit & Mittal). All the participants in this study adjusted their lives and used strategies and techniques that were in their best interests. The participants could improve their academic performance and reduce their fears of disappointment as adult learners because revival sleep varies from individual to individual (see Trivedi, Holger, Bui, Craddock & Tartar, 2017).

**Impressions of online education.** All 10 (100%) participants expressed a positive feeling about online education even though they experienced challenges in their various roles as students, parents, and full-time employees. The participants were focused not only on the short-term goals, to be a parent or a committed employee, but also on the longer-term goal of completing their education. Online education supports adult learners by enabling them to achieve a degree while maintaining family responsibilities. The

findings from this study substantiated information from other studies that indicated the freedom and flexibility of online education. Rogo and Portillo (2015) agreed that online learning is a leading method of higher education, particularly among nontraditional, graduate-level students. Asynchronous education offers many benefits and challenges to students who are trying to pursue their degree while fulfilling employment and family responsibilities.

Existing literature suggested that one of the best strategies to decrease sleep deprivation is to engage in sleep extension (Sonnetag, Venz, & Casper, 2017). Practicing appropriate sleep hygiene habits, such as maintaining a regular sleep pattern and engaging in napping and lively daytime activities, are equally important (Sonnetag et al.). My analysis of the data from this study showed that all participants utilized unique ways to cope with sleep challenges. One participant, although overwhelmed, relied heavily on her faith and family to cope. The participant depended heavily on her spouse and children to support her as she managed her time to accommodate their schedules. Although sleep patterns were influenced by a variety of factors, coping strategies were most likely to be effective when tailored by the participant based on his or her particular situation.

One result I expected from this study that did not bear out was the problem with daytime sleepiness. Prior research (i.e., Field et al., 2012; Nadeem et al., 2012; Orsal et al., 2012; Shochat et al., 2010) found that inadequate sleep leads to daytime sleepiness, anxiety, fatigue, and poor academic performance. Whether the 10 online university

participants from this study were more likely to experience daytime sleepiness remains an open question in this study. Nevertheless, current literature pointed out that daytime sleepiness is one effect of sleep deprivation (Isara & Aigbokhaode, 2017).

Results from this study showed that the participants used strategies such as additional readings, encouraging conversations, and applying the knowledge they have acquired to succeed. One participant emphasized that his impression of online education was that it was going to be easy. Two of the participants reflected on their online experiences. The first, Sid, said,

The greatest lesson obtained from all this is not to take anything lightly when it comes to online schooling. I thought it was a joke to do online, but that was before I got into it. Now I have the utmost respect for people who do it because people who have gone before me, it takes a huge humongous amount of dedication and sacrifice. Just to go from one course to the next, frankly I feel the tuition is a lot more for online students than it is for brick-and-mortar.

The second, Liz, stated,

Online university demands excellence and full participation, it's unlike the brick-and-mortar school, where you can piggyback on other people and leave the class, because you don't necessarily have to stay. In online, you have to be your OWN, and represent yourself in everything; it takes a whole lot more demands than brick-and-mortar.

Overall, participants valued online education because they had dedicated themselves to pursuing it at any cost. The prospect of completing an online degree can be daunting for adult learners. The participants mentioned that online learning could be isolating and having internal motivation and resiliency was imperative for their success.

### **Limitations of the Study**

All of the 10 participants were young, healthy, educated individuals and may have been more resistant to sleep deprivation than others in the general population. It could be argued that for some individuals, sleep deprivation does not affect or disrupt their cognitive functions and memory. Some of the participants did note that sleep deprivation slowed their process of completing assignments in a timely manner.

I designed this study to examine the effects of sleep deprivation on online university students' performance. Time constraints were a limitation of this study because the interviews were only scheduled according to the participants' availability. The word-for-word transcription, organizing, managing, analyzing, and interpreting the data were time consuming.

Another limitation of this study was that it included a small number of participants and cannot be assumed to be representative of the larger population. Creswell (2009) suggested that a sample size for a qualitative study could be as few as five and as many as 25. The number chosen for this study was 10. This study represents participants from only one online university, so the results may not be generalizable. Another limitation is that purposive sampling resulted in homogeneous participants, all

having the same educational background as online students from the similar university. Gender and age differences were not considered in the study. A more diverse sample (in terms of race, gender, and sexual orientation) may have provided different results.

Because this was a qualitative method of inquiry, this study was limited to interpretation instead of quantitative analysis. This means that readers can form their own analysis of what this study signifies. Readers can also assess the data and construct their own version of what the results mean (Bloomberg & Volpe). Another limitation is that the participants' responses were affected because of my presence during the interview and data collection process. Participants were made aware of my status as an online university student. Even though I was aware of my own bias, the participants provided responses based on knowing that I was an online university student. The final limitation is that I chose particular variables to study that include family responsibilities, work, and participants being an online university student. Other variables such as financial difficulties, family conflicts, and family members' ongoing medical conditions that may contribute to sleep deprivation were not part of this study.

Finally, one limitation that was apparent is that one participant avoided the questions. Every answer the participant provided related to her faith and her religious belief, which made it difficult for her to talk about the questions in context. This limitation may be of some relevance because of the participant's religious belief and faith that she thinks is responsible for her success. Some participants' answers contradicted the questions, even though the questions were repeated at their request. Despite these

limitations, this study provided an account of the effects of sleep deprivation on online university students' performances.

### **Recommendations**

Listed below are recommendations for future research in the field of sleep deprivation among online university students. Recommendations include suggestions for exploration of Eysenck's recovery theory of sleep. The paucity of research on the four themes related to this study and the lack of current literature on the effects of sleep deprivation on online university students' performance can be a motivating factor for this study.

In the review of the literature, I found that no previous researcher had identified how online university students view sleep deprivation as it relates to adjustment to their daily schedule or understanding the factors that may affect sleep deprivation. Researchers (i.e., Akdemir, Atunbas, Ercan, Arslan, & Davutoglu, 2013; Poryazova, Werth, Parrino, Terzano, & Bassetti, 2011; Roy & Campbell, 2013; Vu, Hurni, Mathis, Roth, & Bassetti, 2011) all suggested that sleep deprivation can lead to reduced academic performance, family-related conflict, decreased performance at work, depression, anxiety, stress, heart disease, and high blood pressure. I found that participants made adjustments to their family activities and job responsibilities to maintain good academic standards. These adjustments differed according to the schedule of the family, the distance between home and work, and the age of children in the family. The data showed that many participants felt that it was time management, and not sleep deprivation, that determined whether they

were able to maintain high academic standards. Even though time management was identified as one of the hindrances, none of the participants mentioned strategies to improve their time management skills.

Based on previous findings that sleep deprivation was associated with impaired cognitive reasoning, it was expected that the findings would show an interaction where the effects of sleep deprivation increased during difficult times. In fact, the findings indicate that the opposite occurred. Compared with the participants who had a full night's sleep, sleep-deprived participants responded significantly to greater degrees of adjustments.

In respect to effects of sleep deprivation on online university students, future researchers should consider using the recovery theory of sleep, because individuals need a period to recover from the experiences of sleep deprivation (Eysenck, 2004). The role of the recovery theory of sleep is important in future research as recovery can be related to how people spend their free time, with specific focus on what activities individuals are involved in during the evenings after work. Recovery theory claims that sleep is used to repair the body, including the brain (Eysenck, 2004). Sonnentag et al. suggested that slow-wave sleep is when the body repairs and REM sleep is when the brain is repaired. According to Trivedi et al. there is an increase in the secretion of growth hormones during the REM sleep period. Educating students on how to implement activities that will help in replenishing their depleted resources as it relates to family responsibilities, having a full-time job, and being a full-time student is very important.

Adjustment to daily lives is a theme significant to consider in future research. Researchers are encouraged to examine how sleep deprivation affects students' performance even though they have made adjustments to their daily lives. A student's academic performance is determined by how he or she can successfully make adjustments and obtain adequate sleep. A comparison of adjustment to daily lives and continued sleep deprivation is particularly important because a healthy amount of sleep is paramount to leading a productive lifestyle (Thompson et al.)

Factors affecting sleep deprivation are based on distractions within the home environment, including the television and children in need of attention. The findings from this study supports that distractions takes away from quality time when completing schoolwork (Rogo & Portillo). The topic of distraction in the home and how it affects online university students' performance should be explored.

Impressions of online education and how it relates to online university students' performance (Pfautsch & Gray) should be considered in future research. Future researchers should also examine impressions of online education as it relates to individuals' views of the brick-and-mortar schools compared to online education. Pfautsch and Gray suggested that students' impressions can determine educational attributes that define their identity as online university students. Future research should consider students' opinions of online education and sleep deprivation by analyzing the online university process compared to that of education in a physical location.

Students' views, their experiences, factors affecting their performance, and the way they cope with distractions while trying to complete an online education are all fertile topics for future research. The implication is that online university students may experience one or many of these issues that may affect their academic performance. Of the literature researched, most researchers focused on sleep deprivation among in-person university students as opposed to online university students. The majority of participants in studies conducted on sleep deprivation were adolescents and college students, with a noticeable exclusion of online university students.

Current studies (Ocak and Boyraz,) have found that poor time management contributes to declining academic performance, while distractions and inflexible work schedules result in fatigue and decreased cognitive performance. Effective time management skills are necessary for ongoing academic achievement. Students who fail to plan and who practice poor time management skills experience academic challenges very early in their studies. Providing students with help and support around time management should help improve their academic performance. This study was conducted with students from one online university and purposive sampling was chosen. If a quantitative research design had been used, the results would have been dissimilar. The final recommendation is that future research should be completed with an online university student population, using a larger sample size. The data can be used to examine cause-and-effect relationships, which can be used to make predictions about the effects of sleep deprivation on online university students' performance.

### **Implications for Positive Social Change**

Findings from this study may have the potential to create positive social change for educators. The potential for positive social change in universities towards online learning is fitting because current knowledge to better guide the aspects of online learning can foster positive social change (Koç). The role of universities is to help students achieve their goals and grow intellectually in every domain of their studies. Building a community of healthy students past and present will maintain an alumni base that can foster mentoring and empowering others to be healthy and maintain academic standards.

The potential for positive social change in past participants' experiences is that they either are or become the experts and positive change agents (Koç). Past participants can work with university administrators to create programs to help in integrating sleep deprivation issues in the schools' programs. The probability for social change in educational institutions that promote online learning was reinforced by the findings in this study.

An upsurge in collective teamwork and building a partnership of likeminded universities may be important. An alliance of online universities should include the effects of sleep deprivation on online university student's performance in their course of studies that could reach the needs of online students internationally. The findings from this study could provide important information to ancillary staff who may be willing to transfer their fresh knowledge about the effects of sleep among online university students

to other organizations that exist in their communities.

Finally, this study will provide novel information about the factors that contribute to sleep deprivation among online university students. The themes from this study can be a valuable and highly inspiring goal for future researchers. By fostering a community of support from past participants, other institutions can contribute to solving the problem and creating a large number of educated students who understand the effects of sleep deprivation on online university students' performance.

### **Conclusions**

The aim of the current phenomenological study was to explore the effects of sleep deprivation on online university students' performance. Based on my review of the literature, this study is the first to focus on the effects of sleep deprivation among online university students and provides a unique perspective of the 10 students' lived experiences. The intention of this study was to understand participants' lived experiences and to examine how they managed with having a full-time job, family responsibilities, and being a full-time online university student. I examined the participants' opinions about strategies they used to incorporate adequate sleep and still fulfill their duties. Findings from this study showed that ineffective time management contributed to participants having less sleep and inadequate time to complete their schoolwork. Ocak and Boyraz suggested that ineffective time management could cause individuals to give up and let a situation take its course. Findings in the current study also found that distractions in the home prevented the participants from staying focused to complete their

schoolwork in a reasonable time. This study contributed to the literature by providing the idea to develop a community of support from past participants and integrating a topic about sleep deprivation in the online university school's program that could reach students globally.

The 10 participants in this study concurred that their contribution to this study by sharing their lived experiences helped to increase their knowledge about the effects of sleep deprivation. Such knowledge, with ongoing education and determination to maintain their academic performance can contribute positively to participants' overall health and success. The significance of the findings is underscored by the fact that participants made significant adjustments in all aspects of their daily lives to secure time to complete their school activities.

Through open-ended interview questions, the participants identified four essential themes. Themes emanating from the participants' experience include effects of sleep deprivation, adjustment to daily lives, understanding factors that affect sleep deprivation, and participants' impressions of online education. The main view from all participants was that it was challenging to include time in their daily schedule have 8hours of sleep nightly. The opponent processing model discussed in Chapter 3 complemented the findings and revealed that the homeostasis processes and the circadian rhythm processes collaborate and support each other to promote restful sleep. The experiences of the 10 participants were discussed in Chapters 4 and 5. The data were analyzed using Moustakas's modification of the Stevick-Colaizzi-Keen method of analysis for

phenomenological data. Interpretation, discussion, and the findings supported the participants' experience in his study.

It is apparent that there is a need for future research on the effects of sleep deprivation on online university students' performance because of the increased popularity of this education model. Several researchers (Poryazova et al. 2011; Roy & Campbell, 2013; Vu, et al. 2011) have documented the effects of sleep deprivation among university students who attend onsite universities and have stated that sleep deprivation leads to excessive daytime sleepiness and fatigue. Additional research is needed to understand the effects of sleep deprivation on the academic performance of online university students. The information obtained from this study may shed light on this understudied phenomenon and be a useful tool to enhance the lives of online university students.

The qualitative research method used in this study was well suited to achieve the goals. The depth of information gained through the analysis of interviews, observations, and data provided a level of understanding that quantitative methodology could not have. The phenomenological method of inquiry was best suited to understand the lived experiences of this phenomenon of sleep deprivation among online university students. All participants were recruited through an American based online University Participant Pool's website.

Additional results from this study showed that participants possess both positive and negative experiences of online education, even though their experiences of sleep

deprivation inclined toward the positive with regards to their way of life. Factors that added to students' adverse experiences were lack of time management and distractions in the home including the television, a sense of isolation, inflexible work schedules, and tiredness from lack of adequate sleep. These results are reinforced by the bulk of the literature that was researched for this study. Self-paced studies, flexibility, and family understanding are reported as positive attributes by several researchers (i.e Cho & Heron, 2015; Oliveira, Huang, & Azevedo, 2015; Pintz & Posey 2013). Jorgensen, Mancini, Yorgason, and Day (2016) pointed out that religion and therapy are considered to provide mental stability and peace that families rely on, especially in challenging circumstances. Some causal factors in relation to the participants' challenging experiences could also be found in comparable studies in the literature.

When participants were asked to evaluate what they have found useful for enhancing their sleep patterns, their answers were neutral. An impartial response infers that either they were not very satisfied with the quality and quantity of sleep they received, or that they did not sense that online education would be so demanding. The participants' personalities may have influenced how accountable they felt for their own learning.

Administrators can use the results from this study to develop teaching and learning resources designed to improve the online learning environment. Findings from this study can be used by the administration of online universities to create programs that may improve sleep patterns for students. Results may also be used provide information

to reduce sleep deprivation, which may enhance academic performance. Although there was sufficient knowledge to help participants make informed decisions about their sleep patterns, students' lifestyles and responsibilities presented challenges towards adequate sleep. An awareness of the risks of poor sleeping habits were clearly evident in the participants' knowledge of sleep deprivation.

Finally, I hope this study can inform all students, including those who have not experienced sleep deprivation, to be aware of the long-term effects that sleep deprivation may cause and share their knowledge and experiences. The 10 participants in this study can be considered pioneers who possess the knowledge and experience and are aware of the challenges of having a full-time job, attending school online, and taking care of family responsibilities. The implications of this study, therefore, expand to the larger community of students, nationally and internationally, who can learn new ways to cope with family responsibilities and having a full-time job while being an online university student.

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## Appendix A: Interview Questions and Probes

### **Central Research Question**

What are the effects of sleep deprivation on the academic performance of online university students?

**Research Subquestion 1:** How do online university students define sleep deprivation and what factors do they think contribute to it?

#### **Related interview questions:**

1. (rapport) Can you briefly tell me your thoughts about sleep deprivation?
2. In what ways do you think a decrease in the quality and quantity of sleep may affect your academic performance as an online university student?

#### *Probes:*

1. How have your sleep habits changed since being an online university student?  
What changes in your personal and professional life do you associate with your experience of being an online university student?
2. What are some of the challenges you experience while trying to maintain a high level of academic achievement?

**Research Subquestion 2:** How do online university students maintain good academic standards while being sleep deprived?

#### **Related interview questions:**

1. What has it been like for you to deal with the challenges of being an online university student and how does being aware of sleep deprivation relate to your academic performance?
2. Describe your 24-hour schedule as you fulfill your duties as a student, a full-time employee, and your family responsibilities.

*Probes:*

1. What are your thoughts about the time you have scheduled for sleep in your 24-hour schedule? Is this time adequate? If yes, tell more. If no, tell me why.
2. What adjustments do you make to fulfill your student responsibilities and maintain good academic standards?

**Research Subquestion 3:** What factors within the home environment may affect the sleep patterns of online university students performance?

**Related interview question:** In what ways do you think online university students are distracted in their home environment and how does this distraction affects their quality and quantity of sleep?

*Probes:*

1. How do you manage to avoid distractions in the home environment, maintain adequate sleep, and fulfill your responsibilities as a full-time employee and a student taking care of family responsibilities?
2. What have you learned from your experience of being an online university student who also has to fulfill job and family responsibilities?

3. After a reality check, what was your reaction and what changes have you noted in your sleep habits?

**Research Subquestion 4:** What have online university students found useful for enhancing their sleep patterns?

**Related interview question:** What strategies have you devised to get adequate sleep, juggle school, work full-time, and fulfill your family responsibilities?

*Probes:*

1. How do you think your quality and quantity of sleep as an online university student is different compared to your sleep experiences if you were in a brick-and-mortar school?
2. Tell me about your reaction when you realized that there is substantial information out there about sleep deprivation that can benefit you?
3. Have you ever used this information and how has it worked for you?

Thank you for your thoughtful responses to my questions.

## Appendix B: Participant Recruitment Letter

Research on “The Effects of Sleep Deprivation on Online University Students’ Performance”: Participants needed.

Online learning is an increasingly noticeable component in the development of modern-day education. However, little research exists on how sleep deprivation may affect online university students’ performance.

Maureen Cort, a doctoral student in clinical psychology at Walden University, is conducting research on the effects of sleep deprivation on online university students’ academic performance. She is looking for current online university students who are interested in participating in this important research study. Participation would involve face-to-face interviews with Maureen in a private room in a public library in your neighborhood, or via Skype. Please see the criteria for participating below.

- Students must be located in the United States.
- Students can be of any age but must be registered students of an American-based online university..
- Students must be living with their immediate family.
- Students can be male or female in an undergraduate or graduate program from across all disciplines.
- Students must be documented as full-time and currently in the first quarter or beyond.

- Students must have a full-time job working 35-40 hours per week in addition to attending school online and having a family.

All information from the interview will be kept confidential; the names of the participants will only be known by the researcher, information that may identify the students will not be used. The students will be asked to confirm the information from the interviews to ensure the interview responses are accurately represented.

To take part in the research please contact:

Maureen Cort @ xxx-xxx-xxxx

## Appendix C: Researcher's Sample Journal Entry

### **The Effects of Sleep Deprivation on Online University Students'**

#### **Performance: A Phenomenological Study**

Date and time of Interview: April 27, 2017

#### **Sleep Deprivation**

I believe that my experience of being an online university student is relevant to the way I have felt about responses to the experiences of sleep deprivation from the participants. As a matter of fact, I think that my own lack of sleep due to being in the classroom between 9:00 p.m. and 2:00 a.m. was a motivating factor for me to study this topic. I was raised in a traditional family and in a society where eight hours of sleep is recommended for the entire family to be healthy and productive. I think that adequate sleep was the perfect scenario even as an online university student. I have been practicing healthy sleeping habits (eight hours of sleep nightly) for all my childhood and adult life until attending school online. My "perfect" sleeping habits took a turn because I found myself staying up sometimes most of the night and also during the day when time permits. I evolved into a student who burns the candle at both ends, a student who takes care of a family, and carries the responsibility of working full-time. As a student, I think that not having adequate sleep has both advantages and disadvantages. I believe that in the short term, lack of sleep can affect judgment, ability to learn and comprehend information, and the ability to have fun.

Performing my duties on my job is highly important to me, and I see the need to coordinate adequate sleep with optimum job performance. What I believe is that we all have to contribute to society and perform well in our environment. I believe that even if I have less sleep, I should be forthcoming with my job and do it without blaming ineffectiveness on lack of sleep.

I pursued this degree based on my profound interest in finding out how sleep deprivation may or may not affect online university students' performance. During the literature review stage, I gained a deeper understanding of sleep deprivation in various professions and students in different cultures and environments. I came across interesting articles by researchers such as Jovanovski and Bassili who conducted a study to compare the results between students participating in an online lecture and students who attended the conference in person. I also researched articles by Orsal et al. Van Gundy et al. Cheung and Wong (2011), and Vitasari et al. who stated that sleep deprivation may lead to anxiety, fatigue, and daytime sleepiness among students. This program provided an in-depth investigation into academic study and the lived experiences.

One last belief: Even though I believe that individuals should make adjustments in theory in their personal life to accommodate online learning, I believe that the disruption of the circadian rhythm, combined with sleep deficits can have long-term effects on the body to function effectively.

## Appendix D: Member Checking

Name of Participant:

Address:

Date:

Dear (Name):

I would like to thank you for your cooperation during the interview process. After listening to the tape recordings, I compared the transcripts to the recordings and compiled a summary of the interview. In order to complete the interview process, I am emailing you a summary of your responses for you to have the opportunity to check to see if everything you mentioned was included. Likewise, you can also include any information that you might have forgotten.

Below is a copy of the summary of your responses.

XXXXXXXXXX XXXXXXXXXXXX XXXXXXXXXXXX

I thank you for your time.

Sincerely,

Maureen Cort

Doctoral Candidate

Walden University

## Appendix E: Expert Panel Invitation Letter

Dear Dr. XXXXX,

I am pursuing a PhD in clinical psychology and am studying how sleep deprivation may affect online university students' performance. The design of my dissertation is a qualitative study using face-to-face interviews to ask questions of the participants. I would like to invite you to be part of an expert panel to assess my interview questions. I have selected you because of your knowledge and expertise in qualitative methods.

Sleep deprivation among online university students is an understudied phenomenon. Attending school online presents many challenges as students convert the comfort of their home into a virtual classroom. They may experience difficulties because of the distractions, including TV, family, and work-related duties, which are daily occurrences. Changing sleep times and sleep patterns may contribute to sleep deprivation among online university students.

I have devised a list of questions that will serve as the primary data collection instrument for my dissertation. Because of your expertise and knowledge on qualitative research, I would very much appreciate your feedback regarding my proposed interview questions. I anticipate your review will take no more than 30 minutes. I recognize the time this will take from your busy schedule, and I would like to give you a gift card to Amazon.com as a token of my appreciation. I would appreciate your feedback on the

attached matrix by **August 15, 2015**. Please let me know via e-mail if you will NOT be able to assist me.

In the matrix that follows, you will see I have developed three types of interview questions: central research questions, research sub-questions, and probe questions. I expect the interviews with each participant to be completed within 90 minutes.

I have included a series of probes I will use if responses do not address the concerns in the interview questions directly.

**In your review, I would appreciate your comments on the following:**

1. Fit of central/research and sub-questions with focus of study;
2. Appropriate language and wording of central research questions and sub-questions;
3. Appropriate language and tone of interview questions, including probes;
4. Suggestions for changes in wording, tone, language on central research and sub-questions; and
5. Suggestions for changes in interview questions.

I have included space for your response directly on the matrix.

I sincerely appreciate your expert help with the structure of my questions. Having an expert panel review my central research question, sub-questions, and interview questions will enrich the quality of my dissertation study. If you have questions you may wish to contact me, or my committee/expert panel member, XXXXXXXX.

Sincerely,

Maureen Cort

### Attachment

Panel Instructions:

Please make your comments in the white space under Panel Feedback.

- 1) Fit of central research and sub-questions with focus of study;
  - 2) Appropriate language and wording of central research questions and sub-questions;
  - 3) Appropriate language and tone of interview questions, including probes;
  - 4) Suggestions for changes in wording, tone, language on central research and sub-questions; and
  - 5) Suggestions for changes in interview questions.
- 6) Panel Instructions:
- 7) Please make your comments in the Panel feedback column on the following topics. The purpose of this phenomenological study is to understand the effects of sleep deprivation on the academic performance of online university students.

Research sub-questions	Interview questions	Panel feedback
Q1: How do distractions and family and work-related duties affect the sleep patterns of online university students?	1) Do you think that social media, family, and work-related duties hinder your sleep patterns? 2) What has been your reaction when you realize that social media, family, and	

	<p>work-related duties hinder your sleep patterns?</p> <p>3) To what extent is adequate sleep important in your schedule?</p>	
<p>Q2: What have online university students found useful for enhancing their sleep patterns?</p>	<p>4) Are there any ways that you have heard of, that people can improve their sleep?</p> <p>5) Have you ever used these techniques? How have they worked for you?</p>	
<p>Q3: How have online university students increased their knowledge about how sleep deprivation may affect their academic performance?</p>	<p>6) Tell me about your reaction when you realized that there is information out there about sleep deprivation?</p> <p>7) How might adequate sleep contribute to enhanced performance?</p>	

8) Thank you very much for taking your time!

9) Expert Panel: Dr. XXXXXX XXXXX