

THE IMPACT OF SMARTPHONE USAGE ON THE SLEEP ROUTINES OF  
UNIVERSITY STUDENTS

A Thesis submitted to the faculty at Stanbridge University in partial fulfilment of the  
requirements for the degree of Master of Science in Occupational Therapy

by

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## Certification of Approval

I certify that I have read *The Impact of Smartphone Usage of the Sleep Routines of University Students* by Haley Jamtgaard, Rachel Lwin, Adrian Ricasata, and Ashley Roberts, and in my opinion this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.



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## **Abstract**

This mixed methods study describes the impact of smartphone use on the sleep routines of university students from one of three campuses, Irvine, Los Angeles, and Riverside, at Stanbridge University. Fourteen university students who attend Stanbridge University participated in this study. Semi-structured Zoom interviews, recording of sleep hours using Google Forms, the Occupational Self-Assessment Short Form (OSA-SF), and the Pittsburg Sleep Quality Index (PSQI) were utilized for data collection. Three main themes emerged from qualitative data analysis: (1) Sleep Preparation and Participation, (2) Mental Health, and (3) Self-Control. The findings of this study suggest that smartphone use has both positive and negative effects on one's sleep routines depending on what the phone was used for.

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### **The Impact of Smartphone Usage on the Sleep Routines of University Students**

The use of smartphones is exponentially growing throughout several populations. Particularly, the use of smartphones within the graduate student community has posed benefits and problems. Benefits of smartphone use include assistance with time management, calendars, educational apps, and communication (Ventola, 2014). Problems include smartphone overuse, smartphone addiction, and daytime dysfunction. Smartphone overuse or addiction can lead to disruptions with daily and nightly routines in the graduate population, impacting daytime function and academic performance. Smartphone addiction involves, “four main components: compulsive behaviors, tolerance, withdrawal, and functional impairment” (Lin et al., 2016, p. 2). Smartphone overuse is described as phone usage exceeding the recommended amount two hours per day (Wang et al., 2020). Daytime dysfunction is common among those addicted to smartphones, and Wang et al. (2020) defined this as the difficulty in performing daily occupations. In our study, we used surveys and interviews to examine sleep and smartphone use routines among graduate students for the intervention. We then gathered data from our surveys to compare the relationship between sleep quality and smartphone usage. The study's outcomes are to understand sleep routines, sleep management skills, and sleep quality in relation to smartphone use. Understanding how smartphone use impacts sleep routines, sleep management, and sleep quality is essential to occupational therapy because sleep is a daily occupation and essential to one's quality of life and well-being. Moreover, the habits and routines regarding smartphone use impact how one engages in the daily occupation of sleep.

### **Statement of Problem**

Problematic smartphone use before bed can lead to a decrease in occupational and academic performance. According to Demirci et al. (2015), high smartphone use in university students increases the likelihood of daytime dysfunction. Rathakrishnan et al. (2021) also found that an increase in smartphone use can decrease academic performance, sleep quality, and grade point average (GPA). The Rathakrishnan et al. study also concluded that if a student falls within the addicted category for smartphone use, they are more likely to have a decreased quality of sleep.

This problem is significant to occupational therapy due to sleep being a crucial occupation that can be assessed by occupational therapists. As occupational therapists, it is our goal to promote healthy habits and routines with our clients, advocate for better sleep habits, and raise awareness about sleep health. According to the American Occupational Therapy Association (AOTA, 2020), the domains of occupational therapy include occupations, context, performance patterns, performance skills, and client factors. Our current study examines the occupations of rest and sleep as well as the performance patterns of habits and routines. Smartphone use can inhibit one's daily occupation of rest and sleep and therefore impact one's daytime function. Further, one's habit and routine of using smartphones can influence daytime function, night-time routines, and quality of sleep.

Conducting this study brought to light the positive and negative impacts of smartphone use on sleep quality, duration, and nighttime routines. This project addresses the limited research on if limiting smartphone usage before bed could be beneficial to an individual's quality of sleep. There is an increasing need for this project because of the

limited research on how occupational therapy can relate to sleep and smartphone use in the United States. University students, specifically from Stanbridge University in California, were chosen due to the increase of technology uses within our target population. According to Krishnan et al. (2020), 90% of adults under 30 use some technological device the hour before bed.

### **Literature Review**

#### **Argument About the Social Significance**

Over the past few decades as technology usage has continued to increase, it is estimated that more than 5 billion people have a mobile device (Silver, 2019). This is an extraordinary statistic considering that most of our population will be impacted by some of the unknown side effects that consistent usage could have on individuals' daily occupations. Continuous research must be conducted promptly to help discern these impacts.

According to Al-Harrasi and Al-Badi (2014), individuals have become dependent on smartphones to function in today's society. Olsen et al. (2022) discovered that smartphone usage has impacted people both psychologically and physiologically, as he reported decreased sleep with smartphone use. If these trends continue to increase exponentially, many individuals will be facing consequential effects from smartphone usage. Sleep is an essential occupation that enables individuals to fully engage in their daily lives (AOTA, 2020). By understanding how smartphone use impacts sleep, different preventative measures could be implemented to avoid these outcomes.

### **Occupational Performance**

Various studies have mentioned the effects of smartphone use on occupational performance. Rathakrishnan et al. (2021) examined smartphone addiction and its relationship to academic performance in university students. They used questionnaires to evaluate smartphone addiction and sleep quality and used the respondents' GPA as a measure of academic performance. Rathakrishnan et al. found a significant relationship between smartphone addiction and academic performance; as smartphone addiction increased, academic performance decreased. Further, they found a significant relationship between sleep quality and academic performance; as poor quality of sleep increased, GPA decreased. The results of the study indicate that excessive smartphone use impacts one's occupation of being a student and their academic performance.

Luqman et al. (2020) looks at smartphone-based social networking sites (SNS) and their impact on cognitive function and academic performance in university students. Researchers used the online survey method to collect data from 701 students during one week of the school year on SNS use, cognitive performance, cognitive function depletion, sleep quality, and GPAs for academic performance. The study's results indicated that smartphone-based SNS before bedtime impacts sleep quality, which is related to cognitive function depletion during the day. Luqman et al. (2020) highlighted how decreased sleep reduces brain activity, specifically neurocognitive functioning, which is needed to solve complex tasks and for higher-order functioning. Cognitive functions are important for the academic performance of students. The results imply that awareness of how reducing SNS usage on smartphones before bed can positively impact academic performance.

In an article by Krishnan et al. (2020), researchers investigate the impacts of smartphone usage before bed on daytime dysfunction. Researchers divided a group of undergraduate medical students into three groups according to their self-reported smartphone usage. Group 1 consisted of students who reported less than an hour of usage, Group 2 reported one to two hours of usage, and Group 3 reported greater than two hours of usage. A sleep questionnaire, the Pittsburgh Sleep Quality Index (PSQI), was used to assess sleep quality and daytime dysfunction. Researchers found that Group 3 had a more significant daytime dysfunction compared to Group 1, as they had difficulty engaging in daily activities. The results of the study imply that the hours of smartphone use impacts sleep, daily functioning, and occupational performance.

### **Routines**

Several studies have shown the effects of smartphone use in a nighttime routine. A study by Krishnan et al. (2020) observed how the sleep routines of university students were impacted by using a smartphone before bed. Research has shown that 90% of young adults under 30 used some technological device the hour before bed (Krishnan et al., 2020). Using electronic devices before bed can contribute to a lack of sleep and in turn decrease daytime productivity in preferred occupations. To measure the quality of sleep these students were receiving, PSQI was used. This scale included seven domains: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. Results showed that 72% of respondents had an overall poor global PSQI score, and that smartphone use in a nighttime routine was associated with increased sleep latency, reduced sleep duration, sleep inefficiency, and increased daytime sleep disturbances significantly (Krishnan et al., 2020). These results

suggest that incorporating a smartphone into a bedtime routine can drastically impact sleep and functioning.

In a qualitative analysis by Kheirinejad et al. (2022), researchers examine smartphone use routinely both before bed and outside of bed and the impacts smartphones have on sleep. Previous research has shown that intense use of smartphones is a risk factor for poor sleep quality. In the study by Kheirinejad et al., 100 participants wore a sleep-tracking ring collecting sleep quantity and quality for 4 months. Researchers used the toolkit named AWARE to track smartphone usage. The results of the study indicated that sleep latency, awake time, average heart rate, and heart rate variability were adversely impacted by smartphone use in bed. However, researchers also found that smartphone use outside of bed does not necessarily decrease the quality of sleep or negatively impact well-being. Researchers mention that not all smartphone users use their phones in the same way. For instance, different types of apps such as social, entertainment, wellness, and the amount of time used can have different impacts. The study indicates that the winding down period or “proposed winding down routines before bed” rely on passive and relaxing activities rather than active activities (Kheirinejad et al., 2022, p. 14). Researchers suggest that there should be further investigation into types of activities or apps that could be used to wind down before bed instead of stimulating the brain with incoming information.

### **Habits**

There have been studies that examined the positive and negative impacts of smartphone use and how individuals developed both positive and negative habits of smartphone use. A study by Alotaibi et al. (2022) examined the different perspectives and

experiences of smartphone use among university students. The researchers were able to identify different factors which had various impacts. It was found that students developed positive and negative habits of smartphone use. Although the study did not directly discuss its relation to sleep, it discusses how specific uses of smartphones could lead to the development of harmful habits, which may impact other factors of an individual's life. Smartphones are an integral part of daily life (Alotaibi et al., 2022). The increase in smartphones and the accessibility of information through smartphones has been seen to contribute to the development of both positive and negative habits among smartphone users. The researchers found that personal factors, social factors, and smartphone factors, such as engaging smartphone apps, contribute to the increase in smartphone use. Factors such as extended free time, low self-confidence, lack of responsibility, societal pressure, and interactive smartphone applications played a pivotal role. Participants developed detrimental habits such as addictive behavior and using smartphones in class, meetings, and when waking up in the morning.

Another study looked at the relationship between smartphone use severity and depression, anxiety, and sleep quality in university students (Demerci et al., 2018). It was found that college students spent an average of nine hours on their smartphones daily (Roberts et al., 2014). The functionality and accessibility of cell phones continue to increase and spread, smartphone overuse may lead to mental or behavioral problems. This interferes with school or work, reduces real-life social interaction, and may lead to relationship disorders (Demerci et al., 2018). The results of the study showed the development of negative sleep habits such as later bedtimes. The researchers found that daytime dysfunction was high in those with high smartphone use, this may be due to

sleep dysregulation. Ultimately, the study found that depression, anxiety, and sleep quality are associated with smartphone overuse. Smartphone overuse led to the development of negative habits, which may contribute to an increase in depression and anxiety, as well as sleep quality.

### **Statement of Purpose**

Our study aimed to investigate the impact of smartphone use on the sleep routines of university students, as well as how it impacts their occupational performance. Surveys and qualitative interviews are used to collect data from a diverse sample of university students. Our study intends to provide valuable insight into the relationship between smartphone use, sleep, and occupational performance among university students, contributing to current research and discussion of healthy sleep habits for this population.

### **Theoretical Framework**

We chose the Person-Environment-Occupation-Performance (PEOP) model for our study. The model views the function in the system as a whole and considers the interaction among its components (Baum et al., 2015). Baum et al. (2015) mentions that occupational performance is emphasized in the PEOP model. There are four components to the model. The person includes intrinsic characteristics such as physiological, psychological, motor, sensory/perceptual, cognitive, or spiritual. The environment includes features such as cultural, social support, social determinants, social capital, physical and natural environments, health education and public policy, and assistive technology. Occupation is the characteristics of the activity, task, or role (Baum et al., 2015). Performance is one's ability to engage in the activity task or role. The combination of these components determines one's level and ability of performance.



The PEOP model is relevant to the project because it looks at the individual holistically and the different components that influence one's occupation. People may be addicted to using their smartphones or lack sleep for several reasons. The PEOP model can help us determine the different angles that impact smartphone use and sleep routines. By adopting the PEOP model, we gain a comprehensive view of the multifaceted factors influencing smartphone use and sleep routines among university students. The PEOP model's holistic approach allows us to explore various angles and interconnections that contribute to smartphone use and sleep patterns in university students. By examining how these components interact, we can gain a more profound understanding of the underlying factors contributing to problematic smartphone use and sleep disturbances.

The PEOP model's incorporation in this study enhances our understanding of the contextual, social, and environmental influences. By taking a comprehensive view of individuals, their environment, occupations, and performance, we can gain valuable insights to inform future research, interventions, and advocacy efforts aimed at fostering healthy sleep habits and promoting balanced smartphone use in this population.

## **Methodology**

### **Design**

Our study used a mixed-methods research design to comprehensively investigate the impacts of smartphone use on the sleep routines of university students. We recruited from three Stanbridge University campuses: Irvine, Los Angeles, and Riverside.

Participants expressed interest through the informational email about the study and researchers followed up with the informed consent form and scheduling interview dates. We obtained qualitative data by conducting semi-structured zoom interviews and we

obtained quantitative data by administering the Occupational Self-Assessment Short Form (OSA-SF) and the PSQI. Participants were also asked to record their sleep daily over the course of one week and input their data into a Google Form that we have created. They chose to input this data daily or input it at the end of the week.

### **Participants**

The inclusion criteria for the participants included the following:

- Currently enrolled at Stanbridge University
- Between the ages of 18 and 65
- Currently engaging and interacting with a smartphone

Individuals who use any type of sleep medication or are diagnosed with a sleep disorder will be excluded from our study. The data collection period took place over the span of seven weeks. Recruitment began with flyers and an email being sent out to students currently enrolled at Stanbridge University. Our final participant count was thirteen, consisting of seven women and six men, ranging in age from 22 to 47 years. One participant was excluded due to failure to complete assessments. On average, participants sleep 6.85 hours per night. Programs that were included in our study were Masters of Science in Occupational Therapy (MSOT), Physical Therapy Assistant, and Bachelor of Science in Nursing. Among the participants in the study, ten out of the thirteen participants were MSOT students from the Irvine campus, making them the most prevalent group in our study.

### **Setting**

This study was conducted through Stanbridge University. Stanbridge University is a private college whose “central purpose is to prepare people for occupations and

professions” (Stanbridge University, 2020, para. 2). There are three separate campuses located in Irvine, Los Angeles, and Riverside. The university offers multiple programs in allied health, such as occupational therapy, physical therapy, and nursing.

### **Instruments**

Participants filled out three individual forms, one being the PSQI. This assessment is designed to measure sleep quality and disturbance over the past month. This assessment is comprised of a series of self-reported items, covering various aspects of sleep such as sleep duration, sleep quality, and sleep disturbances. PSQI’s multidimensional approach allows for the identification of specific sleep disruptions that can be associated with smartphone use. For our study, the PSQI serves as a relevant tool for assessing the implications of smartphone use on sleep, contributing to a greater understanding of the issue.

The next assessment is the OSA-SF which is the condensed version of the Occupational Short-Assessment. The OSA-SF measures one’s perceived competence and value in 12 categories of activities of daily living (Popova et al., 2019). For our study, we focused on the value or importance level of the activities of daily living to the individual’s life. OSA-SF aligns with our study’s theoretical framework, the PEOP model, as it considers the daily occupations that may influence one’s life habits, sleep routines, and smartphone use.

Participants were each involved in semi-structured interviews. Interviews were conducted by two student researchers and interviewed one participant at a time. The use of the semi-structured interviews allowed for a better understanding of the participants’ sleep routines, sleep environment, smartphone use, as well as ways the participants’

smartphones impact their sleep. The interview consisted of 20 questions, including: “What is your typical routine when you want to go to bed?” “Describe your ideal sleep environment?” and “Do you experience difficulty falling asleep or staying asleep after using your smartphone?”

### **Data Analysis**

Qualitative data was obtained through semi-structured interviews and were transcribed and input into Dedoose ([www.dedoose.com](http://www.dedoose.com)). Dedoose is a data analysis application for quantitative and qualitative data which allows for the coding of each interview. Main themes were found and highlighted by researchers. Quantitative data obtained through OSA-SF and PSQI were analyzed using Jamovi ([www.jamovi.org](http://www.jamovi.org)) and an Excel spreadsheet. Jamovi is a statistical software for data analysis. Jamovi and the Excel spreadsheet allowed for an organized view of the data from participants.

We utilized triangulation in our study to increase the validity and credibility of our research. Triangulation is the gathering of information through different methods and sources. Quantitative techniques of questionnaires, qualitative techniques of semi-structured interviews, and the comparison of these results allowed an increased quality of research.

### **Ethical and Legal Considerations**

The ethical issues that were addressed were confidentiality, informed consent, and anonymity. When agreeing to participate, there was the potential for a breach of privacy due to the online survey and the recorded Zoom session. Participants may also have experienced perceived risks such as the faculty advisor being their professor and assuming that participating or not participating may impact their academics. Participants

may have also perceived that choosing to participate or not may impact their relationship with the university and may also perceive that they are coerced to participate.

To minimize risks, the confidentiality of participants was achieved through de-identifying each participant, organizing, and storing confidentiality forms, surveys, and recorded Zoom sessions in a password-protected Google Drive. Further, the transcriptions of the Zoom sessions were destroyed immediately after coding. The psychological risks of discomfort and emotional responses were addressed by recommending the appropriate healthcare provider or emergency services if needed. If needed, students were directed to the Stanbridge Student Assistance Program and our principal investigator, Dr. Shane Gemoto, was also notified. Perceived risks of the impact on academics and relationships with the university or faculty members were minimized through the assurance of not holding interviews during their class time and their participation being unknown to the university and other professors. Participants were also be reminded that being in the study is completely voluntary and are able to discontinue participating at any time.

The materials used were the OSA-SF and the PSQI. Both the PSQI and the OSA-SF are copyrighted assessments. Consent to use the OSA-SF and PSQI was obtained via email from their respectful organizations, the University of Illinois at Chicago (OSA-SF) and the University of Pittsburgh (PSQI).

### **Results**

The data collected from the PSQI, OSA-SF, and the interview questions gave us a glimpse into how smartphone usage affects university student's sleep. In the OSA-SF, participants ranked their occupational activities based on what they deemed important, more important, and most important. Participants indicated that being involved as a

student, worker, volunteer, and/or family member, working towards their goals, and handling their responsibilities were most important. Managing finances and finishing tasks were ranked as more important. They ranked the categories of “getting where they need to go” and “identifying and solving problems” as least important (See Table 1).

In the PSQI, participants reported having trouble sleeping because of waking up in the middle of the night or early morning. Participants also reported feeling too hot when attempting to sleep. The PSQI also revealed participants were not able to get to sleep within 30 minutes.

Upon completion of the analysis of the interviews, PSQI, and the OSA-SF three themes surfaced from our mixed methods study: (1) sleep preparation and participation, (2) mental health, and (3) self-control.

### **Sleep Preparation and Participation**

During the interview process participants were asked, “How does your smartphone impact your sleep routine and habits?” Responses to this question varied, however, participants commonly answered that their smartphone either was sleep promoting or sleep demoting when used during their nighttime routine. After the analysis of participants’ interview responses, a common theme emerged regarding smartphone effects on sleep preparation/participation. This includes: (1) preparing for sleep, (2) sustaining sleep state, and (3) waking up. Sleep preparation is defined by the AOTA (2020) as, “engaging in routines that prepare the self for a comfortable rest, such as grooming and undressing, reading or listening to music, saying goodnight to others, and engaging in meditation or prayers; determining the time of day and length of time desired for sleeping and the time needed to wake; establishing sleep patterns that support growth

and health (patterns are often personally and culturally determined); preparing the physical environment for periods of sleep, such as making the bed or space on which to sleep, ensuring warmth or coolness and protection, setting an alarm clock, securing the home (e.g., by locking doors or closing windows or curtains), setting up sleep supporting equipment (e.g., CPAP machine), and turning off electronics and lights” (AOTA, 2020, p. 32-33). Similarly, sleep participation can be defined as, “Taking care of personal needs for sleep, such as ceasing activities to ensure onset of sleep, napping, and dreaming; sustaining a sleep state without disruption; meeting nighttime toileting and hydration needs, including negotiating the needs of and interacting with others (e.g., children, partner) within the social environment, such as providing nighttime caregiving (e.g., breastfeeding) and monitoring comfort and safety of others who are sleeping” (AOTA, 2020, p. 33).

### ***Preparing for Sleep***

Each participant was asked to describe their typical nighttime routine during their interviews. Participants described working on educational materials, working out, reading, skincare, preparing their sleep environment, and using smartphones to relax in various ways before going to sleep. Interviews additionally revealed the different ways smartphones were utilized during nighttime routines. Some included smartphones being used as alarm clocks and calendars, as well as leisurely using applications such as YouTube and TikTok. “Chase” describes how he prepares for sleep without the use of his smartphone:

When [I] go to the room, I’ll throw my phone over on the side the second I enter the room. I throw my phone to my side of the bed, and then when I get over there,

I plug it in. I set my alarm, and I put it face down, and then sometimes I will usually put it in airplane mode. That's it. So as far as before bed, I don't use it [smartphone].

Chase prefers to not go on his phone before bed and connect with his partner instead. His preparation for sleep does not require the use of his phone. Another participant, however, uses her smart devices for multiple things before going to bed. When asked about the most important part of her nighttime routine, "Daisy" describes:

Oh, yeah, I always tell my Alexa dim the lights to 10. I love doing it it's so convenient. I don't know why I've never had it before, but I would say, that's the most satisfying part of my night routine because it just changes the obvious.

The environment plays a crucial role in how we prepare for sleep. Daisy likes to use a smart device to dim lighting to optimize her sleep. Daisy then goes on to describe how she utilizes her smartphone as a part of her nighttime routine:

I sleep right next to my phone only cause I rely on it, for, like my alarms. And then when I do fall asleep, it's just like right next to like my pillow, or like the edge of my bed. So I say I do use it pretty often at the end of the night.

She describes how using her smartphone at night has become a part of her nighttime routine, using it as a tool to prepare for sleep as well as to wake up on time the next morning.

### ***Sustaining Sleep State***

Participants often talked about whether their smartphone use affected their sleep duration. "Roxanne" was asked during the interview, "Do you experience any difficulties falling asleep or trying to stay asleep after using your smartphone before sleeping?" She



responded, “When I'm initially like transitioning from like getting into bed and going to sleep. I do find it difficult.”

“Martha” additionally shares, “I guess, with my routine. If I do like end up scrolling in bed and like staying up on my phone. Then I like, have more trouble falling asleep, but not like how I usually use it.” Although Martha does not typically use her smartphone before bed, during the times she does, she experiences some difficulty getting into a sleep state. Participants reported noticing an increase in the time it takes for them to fall asleep after using their smartphone before bed.

### *Waking Up*

Another part of a sleep routine is waking up, whether that be waking up and performing a morning routine or waking up in the middle of the night. During the interview, some participants also reported the effects of smartphone use before bed on when they wake up the next morning. Participants often talked about how the amount of sleep and quality of sleep they get at night impacts how they feel when they wake up the next morning. Some participants reported using their smartphone longer before bed impacts their sleep. During the interview, “James” was asked whether the longer he spends on his phone before bed affects his ability to fall asleep. James responded:

I think, because, like, I'm just letting in so much light. You know. I'm kind of like tricking my body that it's not a time to fall asleep. But the most important thing with that, for sure is, I'll like, wake up the next day, and my eyes will feel like as if it's like heavy.

James reports that the long exposure to screens interferes with his ability to fall asleep resulting in disruptions to his sleep, which then leads to him having heavy eyes when he wakes up. Another participant, “Sue”, talks about waking up in the middle of the night:

I know that if [I use my smartphone] in the middle of the night. If I do use my phone, it's like, all right, I'm gonna be up. So like I try not to touch my phone if I wake up in the middle of the night.

For Sue, the process of going on her smartphone keeps her awake longer in the night, therefore she limits herself from touching her phone if this occurs.

### **Mental Health**

Another common question asked during our interview process was, “Have you ever experienced anxiety associated with your smartphone?” Although not everyone has experienced this, some participants discussed how smartphones affect mental functioning either before bed or while engaging in preferred occupations. The interviews lead us to three important concepts regarding smartphone effects on mental health. This includes (1) addiction, (2) anxiety, and (3) distraction.

#### ***Addiction***

Smartphone addiction can be defined as involving, “four main components: compulsive behaviors, tolerance, withdrawal, and functional impairment” (Lin et al., 2016, p. 2). Many participants stated that they would engage with their smartphone by “mindlessly” scrolling through applications and losing track of time. “Timmy” shares how using a smartphone negatively impacts his sleep:

I think it definitely has a negative effect on me, cause I can hyper-focus on my phone at times and just mindlessly scroll. And next thing you know, it's like I'm on my phone for like an hour and just in bed. And I'm telling myself, go to sleep.

“Ron” shares a similar experience with using his smartphone before bed:

I mean, for me, I know it's a big distraction. So I know it's probably more negative than positive. I'll just get stuck on the loops and either scrolling or I'll just be watching YouTube videos...and I'll go scroll to watch another one.

Timmy and Ron both find their smartphone to have a negative effect on their sleep routine. Martha shares how this “mindless scrolling” contributes to her energy levels the next day. When she stays up late on her smartphone, she in turn is more fatigued the next day, “Once every couple of weeks or so. I do just like go down a rabbit [hole] scrolling and then it's late and I'm tired the next day.”

### *Anxiety*

Some participants have found that their smartphone causes some form of psychological duress. This “anxiety” may stem from overuse of the smartphone or by just simply having it nearby. Ron discusses his experience with feelings of anxiety revolving around his smartphone, “I would say, Yeah, or like, sometimes I think I get a text message. It's not text message. Or I think my phone's buzzing. It's not. I just wanna feel for it.”

He describes that his anxiety stems from thinking that he is getting a notification on his phone. This happens when Ron is not using his smartphone. On the other hand, Timmy describes his anxiety while using his smartphone:

It is just probably the anxiety of like I need to get off my iPhone or my smartphone like, I know, I should be like, Okay, I gotta get off of this [smartphone]. But I'm like staying on it. And that's where I have an increase in anxiety like knowing that I should be in bed.

Similarly, Roxanne discussed her dilemma with going on her smartphone before bed, “Yeah, I just kinda worry myself like, if I don't get enough rest, I'll probably be grumpy the next morning. So I kind of like, put it down and okay.”

Ron and Roxanne both have an increase in anxiety due to fear of not getting enough sleep.

### ***Distraction***

We found a consistent theme around the relationship between smartphone usage and becoming distracted from the present moment. When asked about whether she experienced any anxiety associated with using a smartphone “Alice” replied: “Sometimes I can get overwhelmed with stuff on my phone but other times I see it as distracting from reality. Like when I'm procrastinating. I just scroll away.” Although she stated she had never experienced any direct anxiety from interacting with her smartphone Alice made it clear that the presence of a smartphone can be distracting especially when it is being used as a tool to procrastinate doing something meaningful. Alice used the phrase “scroll away” when referring to her phone usage. To this point, Timmy states, “Yeah, sometimes it can be really distracting, cause I if I don't put it down, I'll start scrolling through the mindless apps like Tik Tok, Instagram.” This term “mindless scrolling” resurfaces here again.

On the other hand, some participants discussed how distracting smartphones can be. During the interview, Chase discussed the importance of only using his phone during times he needs it. Chase states:

I genuinely try to leave the thing alone as much as possible. Like if we go on walks, I don't take it. If we go to get dinner. I don't take it like, if I can at all help it. If we're hanging out with people I make a point to like, leave it on the counter, and then we'll all go out and do stuff. So I'm just like, you know. Don't wanna be distracted by a smartphone when I'm with people.

### **Self-Control**

Participants were asked, “Do you set limits to your phone prior to sleep (ex. Limit apps, dim your screen, or turn on do not disturb mode)? If so, why?” Many responses indicated that these features were used, however, the participants commonly stated that self-discipline was needed in conjunction with these features when using their smartphones before bed. One participant, “Stefan”, stated, “So I think [that] smartphones will help make things easier for all of us. [The] hardest part is actually to control yourself, overdoing it.” During the interviews, certain themes emerged regarding self-control when using a smartphone. This includes (1) setting limits, (2) mindfulness, and (3) positive habits.

### ***Setting Limits***

The analysis of the interviews suggests that participants find setting application limits on their smartphones beneficial but only when they followed through with the set limit. Alice talks about her experience with setting app limits on her smartphone:

I used to have restrictions, but then I noticed that I just say more time, or like add ignorant, or whatever, my phone's always on, do not disturb. But I don't really think that makes a difference that much besides like incoming text messages and other stuff.

When Alice set an app limit, she oftentimes chose to ignore this notification once it appeared. However, when participants adhere to their set time limits, they are more likely to go to sleep earlier. Timmy discussed his experience with this, “Yeah, I try to put in like a 45-minute limit on Instagram, and probably like an hour for TikTok, because TikTok is the one that you can get pretty easily scrolling on for hours.”

### *Mindfulness*

Some participants expressed the importance of being mindful of one's smartphone use. People often shared that before bed they would engage in “mindless scrolling”. They shared their own experiences and how they are conscious about how much time is spent on their phone and how they use it. “Drake” states, “I'd say it's I'm very conscious of it. It's such a wasteful thing... but I shouldn't really be dependent on it.” There was a common theme expressed by participants that being connected to the physical world was more important to them than knowing what is going on through social media. Chase states this point clearly:

There's way more important things to worry about than whatever's going on in this technological world. And that's a part of the shame of it all, too, is, you know people get. So [caught up in social media] they lose sight of the more important things because they're so consumed with social media.

### *Positive Habits*

Smartphone use can also be beneficial depending on how an individual decides to use their device. Some of our participants describe how they use their smartphones to create positive habits. Drake describes how he tries to limit his phone use to only consume certain types of media. He states, “I try to use my phone consumption for beneficial things, beneficial information that I can use in everyday life.”

More specifically, Timmy talks about how he uses his smartphone to help him fall asleep:

Music or the white noise. That's what I use my phone for to have those white noise or maker brown noise maker. It really depends on what I'm in the mood for that night. Sometimes, I play it through my phone. Sometimes I use an external speaker. Other times I use my phone to play sounds through my Alexa.

### **Discussion**

The purpose of our research was to discover whether smartphone use before bed affected the sleep routines of university students. Participants willingly shared their experiences using smartphones and other electronics before bed. The viewpoints of the participants varied but, there were similarities in the ways university students used their phones before bed. Due to the lack of studies on the topic conducted in the United States, we sought to educate students about the benefits of occupational therapy, specifically implementing sleep-promoting activities in your nighttime routine. The results of our study indicate that smartphone use during nighttime routines impacts university students in the areas of (1) sleep preparation/participation, (2) mental health, and (3) self-control.

Data collected from the OSA-SF, PSQI, and interview questions depicted how each participant preferred to use or not use their phone during their nighttime routine. Results from the OSA-SF revealed how participants prioritize their daily occupations and responsibilities. Their emphasis on roles as students, workers, volunteers, and family members, along with their personal goals and responsibilities, highlights the significance of these areas in their lives. Results from the PSQI revealed insights into the sleep patterns and issues experienced by participants. Participants reported difficulties maintaining consistent sleep patterns. Waking up in the middle of the night or early morning was a common concern among the participants, and this can be attributed to various factors. The inability to fall asleep within 30 minutes is another noteworthy issue, suggesting an extended time to initiate sleep. These findings highlight the complexity of sleep disturbances and emphasize the importance of addressing environmental and psychological factors to improve sleep quality.

### **Limitations**

The first limitation of our study includes a small sample size and a low variety of campuses and programs. The small sample size contributes to a limited number of perspectives and opinions on smartphone use and habits and routines. Furthermore, many participants were from the Irvine campus and from the MSOT program. This limits the perspective of how different programs and campus life may contribute to one's sleep routines and smartphone use. The second limitation includes the participant end of where the Zoom sessions occurred. One participant was in a coffee shop during the interview portion and the background noise and internet connection made it difficult to interpret and build off their answers for a quality interview. A third limitation was participant



completion: one participant was unresponsive and did not send back the entirety of the documents needed for the questionnaire's analysis. Excluding their data decreased our sample size and perspective from a different campus.

### **Conclusion**

Overall, there was not a direct correlation with increased smartphone use and decreased quality of sleep. To our surprise, various participants suggested specific ways in which their smartphone was in fact sleep promoting rather than sleep demoting. Aspects such as reading on their smartphone, utilizing it as an alarm, and even scrolling through social media were mentioned during the interview process as sleep promoting aspects of smartphone use. Conversely, multiple participants claimed that their smartphones contributed to anxiety, distraction, and lower quality of sleep. For instance, some participants mentioned that they stay up much later than intended due to being captivated by their smartphone, whether that be through social media, or simply communication with someone else via messages and calling. We concluded that being on your phone does keep you up for a longer period. However, it is vital to consider the other intrinsic and extrinsic factors that come into play other than smartphone use. These factors that may impact one's sleep include an individual's stress levels, noise levels in the surrounding environment, and even temperature. In conclusion, smartphone usage can impact sleep, but it may be hard to draw a direct correlation between the two when accounting for confounding variables. Further research should be conducted to determine whether poor sleep quality is due to smartphone usage, intrinsic factors pertaining to an individual such as circadian rhythm, or the environment.

Occupational Therapists can implement tactics into their practice that encourage sleep promoting activities. Numerous techniques were mentioned by participants throughout this study. Some participants discussed the settings that they set on their phone prior to falling asleep such as time limitations on certain applications, do not disturb mode, and even night mode which changes the screen brightness and color. Occupational therapists can encourage and explore the usage of these features with their clients to promote higher quality of sleep.

### References

- Al-Harrasi, A. S., & Al-Badi, A. H. (2014). The impact of social networking: A study of the influence of smartphones on college students. *Contemporary Issues in Education Research (CIER)*, 7(2), 129–136.  
<https://doi.org/10.19030/cier.v7i2.8483>
- Alotaibi, M. S., Fox, M., Coman, R., Ratan, Z. A., & Hosseinzadeh, H. (2022). Perspectives and experiences of smartphone overuse among university students in Umm Al-Qura University (UQU), Saudi Arabia: A qualitative analysis. *International Journal of Environmental Research and Public Health*, 19(7), 43-97. <https://doi.org/10.3390/ijerph19074397>
- American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process - fourth edition. *American Journal of Occupational Therapy*, 74(Suppl. 2), 1-85.  
<https://doi.org/10.5014/ajot.2020.74S2001>
- Baum, C. M., Christiansen, C. H., & Bass, J. D. (2015). The person-environment-occupation-performance (PEOP) model. In C. H. Christiansen, C. M. Baum, & J. D. Bass (Eds.), *Occupational therapy: performance, participation, and well-being* (4th ed., pp. 49-56). SLACK Incorporated.
- Demirci, K., Akgönül, M., & Akpınar, A. (2015). Relationship of smartphone use severity with sleep quality, depression, and anxiety in university students. *Journal of Behavioral Addictions*, 4(2), 85–92. <https://doi.org/10.1556/2006.4.2015.010>
- Popova, E. S., Ostrowski, R. K., Wescott, J. J., & Taylor, R. R. (2019). Development and validation of the occupational self-assessment–short form (OSA–SF). *The*

*American Journal of Occupational Therapy*, 73(3).

<https://doi.org/10.5014/ajot.2019.030288>

Kheirinejad, S., Visuri, A., Ferreira, D., & Hosio, S. (2022). “Leave your smartphone out of bed”: Quantitative analysis of smartphone use effect on sleep quality. *Personal and Ubiquitous Computing*, 27(2), 447–466. <https://doi.org/10.1007/s00779-022-01694-w>

Krishnan, B., Sanjeev, R., & Latti, R. (2020). Quality of sleep among bedtime smartphone users. *International Journal of Preventive Medicine*, 11(1), Article 114. [https://doi.org/10.4103/ijpvm.ijpvm\\_266\\_19](https://doi.org/10.4103/ijpvm.ijpvm_266_19)

Lin, Y.-H., Chiang, C.-L., Lin, P.-H., Chang, L.-R., Ko, C.-H., Lee, Y.-H., & Lin, S.-H. (2016). Proposed diagnostic criteria for smartphone addiction. *PLOS ONE*, 11(11), Article e0163010. <https://doi.org/10.1371/journal.pone.0163010>

Luqman, A., Masood, A., Shahzad, F., Shahbaz, M., & Feng, Y. (2020). Untangling the adverse effects of late-night usage of smartphone-based SNS among university students. *Behaviour & Information Technology*, 40(15), 1–17. <https://doi.org/10.1080/0144929x.2020.1773538>

Olson, J. A., Sandra, D. A., Colucci, É. S., Al Bikaii, A., Chmoulevitch, D., Nahas, J., Raz, A., & Veissière, S. P. L. (2022). Smartphone addiction is increasing across the world: A meta-analysis of 24 countries. *Computers in Human Behavior*, 129, 1-20. <https://doi.org/10.1016/j.chb.2021.107138>

Rathakrishnan, B., Bikar Singh, S. S., Kamaluddin, M. R., Yahaya, A., Mohd Nasir, M. A., Ibrahim, F., & Ab Rahman, Z. (2021). Smartphone addiction and sleep quality on academic performance of university students: An exploratory research.

*International Journal of Environmental Research and Public Health*, 18(16), 82-91. <https://doi.org/10.3390/ijerph18168291>

Roberts, J. A., Yaya, L. H., & Manolis, C. (2014). The invisible addiction: Cell-phone activities and addiction among male and female college students. *Journal of Behavioral Addictions*, 3(4), 254–265. <https://doi.org/10.1556/JBA.3.2014.015>

Silver, L. (2019, February 5). *Smartphone ownership is growing rapidly around the world, but not always equally*. Pew Research Center's Global Attitudes Project. <https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/>

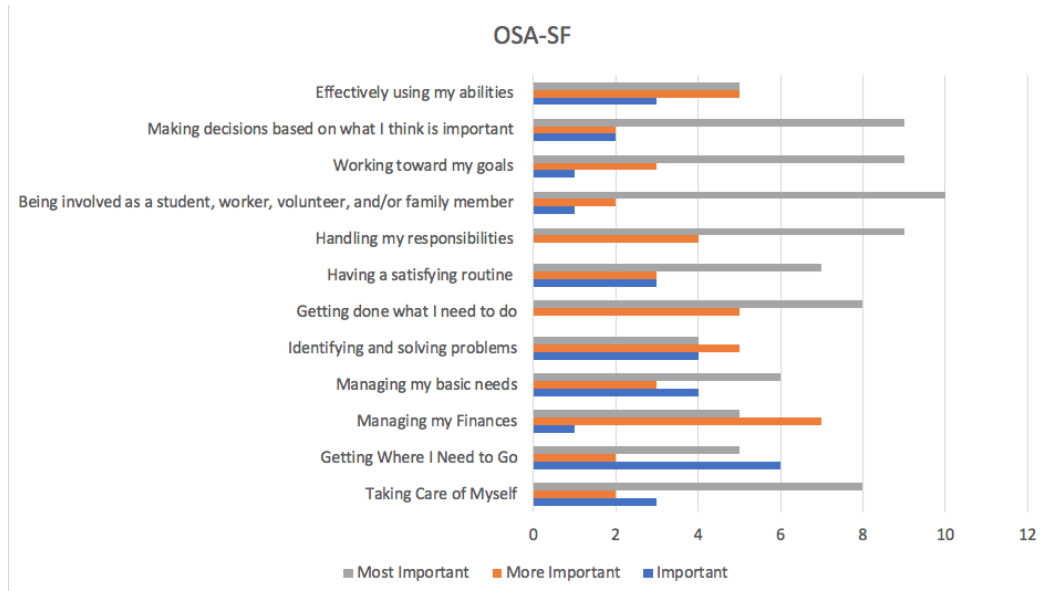
Stanbridge University. (2020). *About us*. <https://www.stanbridge.edu/about>

Ventola, C. L. (2014). Mobile devices and apps for health care professionals: Uses and benefits. *Pharmacy & Therapeutics: A Peer-Reviewed Journal for Formulary Management*, 39(5), 356–364.

Wang, J., Li, M., Zhu, D., & Cao, Y. (2020). Smartphone overuse and visual impairment in children and young adults: *A systematic review and meta-analysis*. MedRxiv. <https://doi.org/10.1101/2020.09.11.20192476>

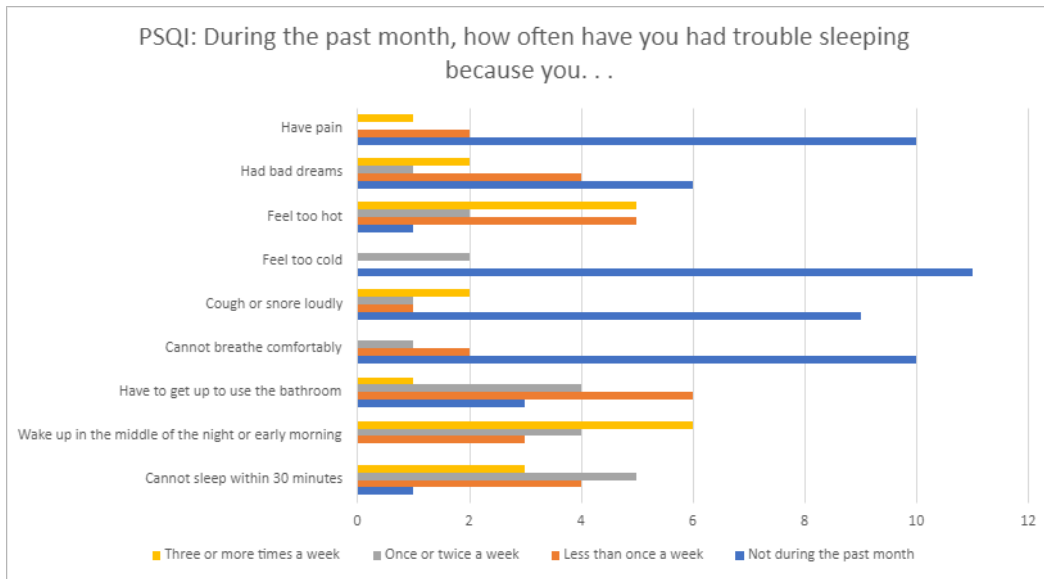
**Table 1**

*OSA-SF*



**Table 2**

*PSQI*



**Table 3***Participant Demographics*

Participant Demographics <i>N=14</i>							
Pseudonym	Sex	Age	Children	Primary Language at Home	Lives With	Race/Ethnicity	Religion
Alice	F	24	0	English	Mom	Asian/Pacific Islander	Catholic
Chase	M	32	0	English	Spouse	Caucasian	Christian
Daisy	F	26	0	English	Parents	Asian/Pacific Islander	Christian
Drake	M	28	0	Indonesian	Mom	Asian/Pacific Islander	Christian
James	M	24	0	English	Parents and Siblings	Asian/Pacific Islander	Muslim
Jill	F	25	0	English	Parents and Sibling	Caucasian	Christian
Martha	F	24	0	English	Roommate	Caucasian	Christian
May	F	23	0	English	Grandparents	Caucasian	Christian
Ron	M	27	0	English	Roommates	Hispanic/Latino	Christian
Roxanne	F	26	0	Spanish	Parents and Siblings	Hispanic/Latino	Catholic
Stefan	M	47	1	English	Alone	Asian/Pacific Islander	Christian
Sue	F	25	0	English	Roommate	Caucasian	Jewish
Timmy	M	28	0	Tagalog	Parents, Grandparents, Siblings	Asian/Pacific Islander	Buddhist

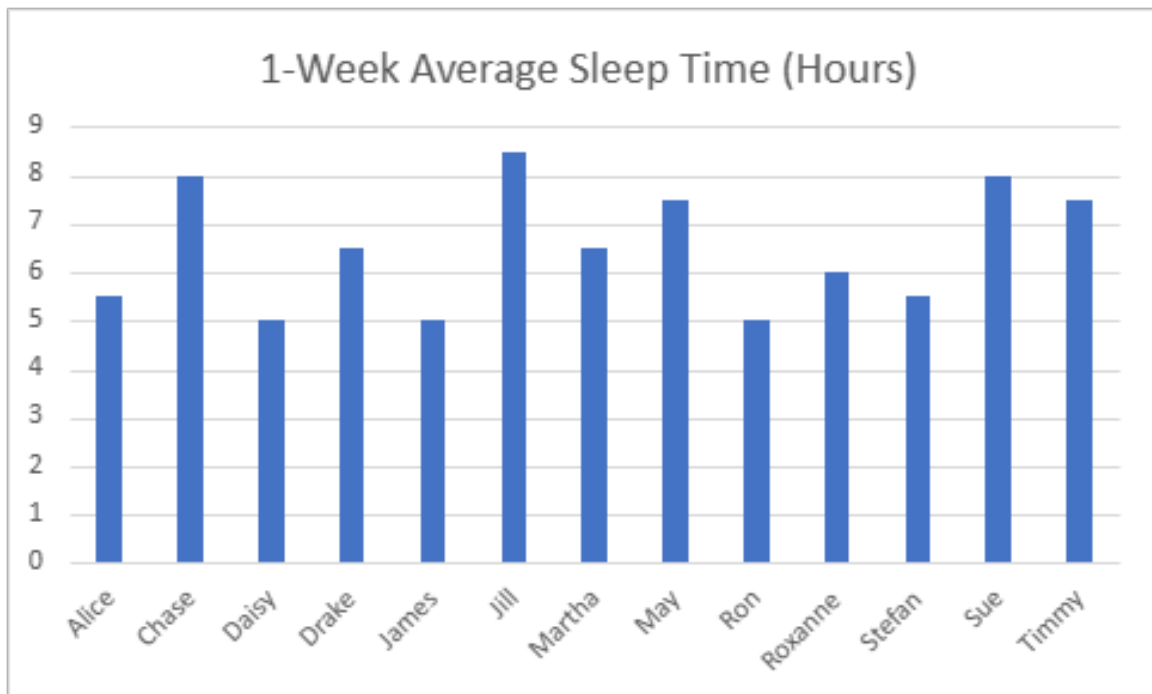


**Table 4***Participant Demographics Continued*

Participant Demographics Continued *N*=14

Pseudonym	Sleeps With	Education	Campus	Employment	Hours of Sleep Per Night	Apps Used
Alice	Alone	MSOT	Irvine	Student	5 to 6	IG, Twitter, TT, YT
Chase	Partner	MSOT	Irvine	Student	6 to 7	None
Daisy	Alone	MSOT	Irvine	Student	5 to 6	IG, TT
Drake	Alone	PTA	Los Angeles	Health Care	7	Game Apps
James	Alone	MSOT	Irvine	Student, Health Care	5 to 6	IG, TT, YT
Jill	Alone	MSOT	Irvine	Student, Child Care	6 to 7	IG, TT
Martha	Alone	MSOT	Irvine	Student	7	None
May	Alone	MSOT	Irvine	Student	7	IG
Ron	Alone	PTA	Irvine	Student	5	Snapchat, YT
Roxanne	Alone	BSN	Los Angeles	Education	5 to 6	TT, Twitter, FB
Stefan	Alone	MSOT	Irvine	Health Care	5 to 6	None
Sue	Alone	MSOT	Irvine	Student, Healthcare	6 to 7	TT, Kindle
Timmy	Alone	MSOT	Irvine	Student, Healthcare	7 to 8	IG, TT, 9gag

*Note:* MSOT = Masters of Science in Occupational Therapy, PTA = Physical Therapist Assistant, BSN = Bachelors of Science in Nursing, IG = Instagram, TT = TikTok, YT = Youtube, FB = Facebook

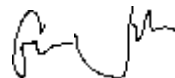
**Table 5***1-Week Average Sleep Time*

## Appendix A

### Institutional Review Board Approval

Dear Dr. Shane Gemoto and Students,

The Stanbridge University Institutional Review Board has completed the review of your application entitled, "The Impact of Smartphone Use on the Sleep Routines of University Students." Your application (#07MSOT012) is approved and categorized as Expedited.

IRB Application Number	#07MSOT012
Date	08/21/2023
Level of Review	<b>Expedited</b>
Application Approved	X
Conditional Approval	
Disapproved	
Comments	The requested Minor changes have been reviewed and confirmed as completed by the IRB. (08/21/2023)
Signature of IRB Chair	

Please note that any anticipated changes to this approved protocol requires submission of an IRB Modification application with IRB approval confirmed prior to their implementation.

Sincerely,  
Julie Grace, M.S., M.A.  
IRB Chair

## Appendix B

### Site Approval Forms

#### Research Site Agreement Form Master of Science in Occupational Therapy

##### AGREEMENT

Research Site: Stanbridge University

Research Site Address: 2041 Business Center Dr, Irvine, CA 92612

Title of Proposed Research: The Impact of Smartphone Use on the Sleep Routines of University Students

##### STANBRIDGE UNIVERSITY MASTER OF SCIENCE IN OCCUPATIONAL THERAPY DEGREE PROGRAM

##### Student Investigator(s) Name(s):

1. Rachel Lwin
2. Ashely Roberts
3. Haley Jamptgaard
4. Adrian Ricasata

Principle Student Investigator Name: Shane Jorwin Gemoto, OTD, OTR/L

Email address: sgemoto@stanbridge.edu Phone Number: (951) 542-2024 ext. 5174

Duration of the study: 16 weeks

Authorization Effective Date: August 7, 2023 Authorization Expiration Date: December 15, 2023

Allowed Number of Contact Hours: N/A The study will be completed by (date): December 15, 2023

##### Description of Research:

The study aims to explore how university students use smartphones and how it affects their occupational performance in sleep routines, sleep management, and sleep quality.

Researchers will examine these affects through quantiative and qualitative approach, using questionnaires, interviews, and assessments (i.e. Occupational Self-Assessment Short Form and Pittsburgh Sleep Quality Index).



**Research Site Agreement Form  
Master of Science in Occupational Therapy**

**Intellectual Property Statement:**

Stanbridge University reserves the right to use, publish, and disseminate the results of the research findings. The University shall provide the research site with a copy of the final research product at the earliest practicable time.

**Thesis Advisor Contact Information:**

Name: Shane Gemoto

Email address: sgemoto@stanbridge.edu Phone Number: (951) 542-2024 ext. 5174

**RECRUITMENT PLAN**

Means by which the researcher(s) will contact and/or recruit participants:

The strategy for recruiting participants is through email and word of mouth. Strategies to retain the participants are reminders about Zoom session interviews and scheduling the interviews in advance. Recruitment plans are to send out an email inviting Stanbridge students to participate and to verbally tell people around campus about the study and invite them to participate. There are 3 recruitment locations: All participants will be recruited from Stanbridge University (Irvine, Riverside, Alhambra). We will recruit about 15 students to participate. Participants will be screened through examining the completion of the questionnaire and if they adhere and follow through to the scheduled interview.

**SITE REPRESENTATIVE AGREEMENT**

I agree to the recruitment and data collection methods to be used in this study, and I authorize the investigator to conduct research at:

Facility Name/Research Site Name: Stanbridge University (Orange County, Los Angeles, and Riverside Campuses)

Representative authorizing agreement: Dr. Kelly Hamilton

Title: Vice President of Instructions

Kelly Hamilton  
Signature

Digitally signed by Kelly Hamilton  
DN: cn=Kelly Hamilton, o=Stanbridge University, ou=Office  
President of Instructions, email=kelly.hamilton@stanbridge.edu,  
c=US  
Date: 2023.06.22 15:40:21 -0700

6/22/2023  
Date



Research Site Agreement Form
Master of Science in Occupational Therapy

STANBRIDGE UNIVERSITY AGREEMENT SIGNATURES

I/We accept the terms of this agreement.

Student Investigator 1: Ashley Roberts Title: Student Investigator

Signature: [Handwritten Signature] Date: 6/13/2023

Student Investigator 2: Rachel Lwin Title: Student Investigator

Signature: [Handwritten Signature] Date: 6/13/2023

Student Investigator 3: Adrian Ricasata Title: Student Investigator

Signature: [Handwritten Signature] Date: 6/13/2023

Student Investigator 3: Haley Jamptgaard Title: Student Investigator

Signature: [Handwritten Signature] Date: 6/13/2023

Faculty Thesis Advisor: Shane Gemoto Title: Principal Investigator

Signature: [Handwritten Signature] Date: 6/13/2023

Program Director: Myka Persson Title: Program Director

Signature: [Handwritten Signature] Date: 6/16/23

Yasith Weerasuriya
President and CEO, Stanbridge University

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



## Appendix C

## Sample of Demographic Questionnaire

**Name:** Male  Female

1. **What is your age?** \_\_\_\_\_
2. **How many children do you have?**  0  1  2  3 or more
3. **What is the primary language spoken in your home?** \_\_\_\_\_
4. **Who do you live with? (Check all the applies)**  
 Mom  Dad  Grandparents  
 Spouse  Other: \_\_\_\_\_  
 Siblings. If so, how many?
5. **Which Stanbridge University campus are you attending?**  
 Irvine  Riverside  Los Angeles
6. **What program are you enrolled in at Stanbridge University?**  
 MSOT  BSN  OTA  
 PTA  LVN  Other: \_\_\_\_\_
7. **What is your religion?**  Christian  Buddhist  Hindu  
 Muslim  Jewish  
 Other: \_\_\_\_\_  Prefer not to say
8. **What is your primary area of employment?**  
 Health Care  Education  Finance  Business Services  Retail  
 Student  Retired  Unemployed  Other: \_\_\_\_\_
9. **Race/Ethnicity? (Check all that applies if applicable)**  
 Caucasian  Black/African American  
 Hispanic/Latino  Asian/Pacific Islander  
 Native American/American Indian  
 Other: \_\_\_\_\_  Prefer not to say
10. **Approximately how many hours of sleep do you get each night?** \_\_\_\_\_
11. **Do you sleep alone or with a partner?**  
 Alone  Partner  Other (ex. Pet)
12. **What applications do you use most before bed? (Check all that apply)**  
 Pinterest  Facebook  Twitter  Snapchat  
 Instagram  BeReal  TikTok  Other: \_\_\_\_\_

Appendix D

Sample PSQI Form

280

67 Pittsburgh Sleep Quality Index (PSQI)

Page 1 of 4

Subject's Initials \_\_\_\_\_ ID# \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ AM  
 \_\_\_\_\_ PM

**PITTSBURGH SLEEP QUALITY INDEX**

**INSTRUCTIONS:**

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

1. During the past month, what time have you usually gone to bed at night?  
 BED TIME \_\_\_\_\_
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?  
 NUMBER OF MINUTES \_\_\_\_\_
3. During the past month, what time have you usually gotten up in the morning?  
 GETTING UP TIME \_\_\_\_\_
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)  
 HOURS OF SLEEP PER NIGHT \_\_\_\_\_

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

5. During the past month, how often have you had trouble sleeping because you . . .
  - a) Cannot get to sleep within 30 minutes
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------
  - b) Wake up in the middle of the night or early morning
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------
  - c) Have to get up to use the bathroom
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------



- d) Cannot breathe comfortably
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- e) Cough or snore loudly
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- f) Feel too cold
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- g) Feel too hot
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- h) Had bad dreams
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- i) Have pain
 

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
---------------------------------	-----------------------------	----------------------------	----------------------------------
- j) Other reason(s), please describe \_\_\_\_\_

How often during the past month have you had trouble sleeping because of this?

- |                                 |                             |                            |                                  |
|---------------------------------|-----------------------------|----------------------------|----------------------------------|
| Not during the past month _____ | Less than once a week _____ | Once or twice a week _____ | Three or more times a week _____ |
|---------------------------------|-----------------------------|----------------------------|----------------------------------|

6. During the past month, how would you rate your sleep quality overall?

- Very good \_\_\_\_\_
- Fairly good \_\_\_\_\_
- Fairly bad \_\_\_\_\_
- Very bad \_\_\_\_\_

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

Not during the past month \_\_\_\_\_ Less than once a week \_\_\_\_\_ Once or twice a week \_\_\_\_\_ Three or more times a week \_\_\_\_\_

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

Not during the past month \_\_\_\_\_ Less than once a week \_\_\_\_\_ Once or twice a week \_\_\_\_\_ Three or more times a week \_\_\_\_\_

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

No problem at all \_\_\_\_\_  
 Only a very slight problem \_\_\_\_\_  
 Somewhat of a problem \_\_\_\_\_  
 A very big problem \_\_\_\_\_

10. Do you have a bed partner or room mate?

No bed partner or room mate \_\_\_\_\_  
 Partner/room mate in other room \_\_\_\_\_  
 Partner in same room, but not same bed \_\_\_\_\_  
 Partner in same bed \_\_\_\_\_

If you have a room mate or bed partner, ask him/her how often in the past month you have had . . .

a) Loud snoring

Not during the past month \_\_\_\_\_ Less than once a week \_\_\_\_\_ Once or twice a week \_\_\_\_\_ Three or more times a week \_\_\_\_\_

b) Long pauses between breaths while asleep

Not during the past month \_\_\_\_\_ Less than once a week \_\_\_\_\_ Once or twice a week \_\_\_\_\_ Three or more times a week \_\_\_\_\_

c) Legs twitching or jerking while you sleep

Not during the past month \_\_\_\_\_ Less than once a week \_\_\_\_\_ Once or twice a week \_\_\_\_\_ Three or more times a week \_\_\_\_\_

## d) Episodes of disorientation or confusion during sleep

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

## e) Other restlessness while you sleep; please describe \_\_\_\_\_

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

This form may only be used for non-commercial education and research purposes. If you would like to use this instrument for commercial purposes or for commercially sponsored research, please contact the Office of Technology Management at the University of Pittsburgh at 412-648-2206 for licensing information.

Copyright 1989 and 2010, University of Pittsburgh. All rights reserved. Developed by [1] of the University of Pittsburgh using National Institute of Mental Health Funding.  
Buysse et al. [1].

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**References**

1. Buysse, D. J., Reynolds, C. F., Charles, F., Monk, T. H., Berman, S. R., & Kupfer, D. J. (1989). The Pittsburgh sleep quality index: a new instrument for psychiatric practice and research. *Psychiatry Research*, 28(2), 193–213.
2. Dudley, W. N. (2004). Psychometric evaluation of the Pittsburgh sleep quality index in cancer patients. *Journal of Pain and Symptom Management*, 27(2), 140–148.
3. Osorio, C. D., Gallinaro, A. L., Lorenzi-Filho, G., & Lage, L. G. (2006). Sleep quality in patients with fibromyalgia using the Pittsburgh sleep quality index. *Journal of Rheumatology*, 33(9), 1863–1865.

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**Representative Studies Using Scale**

- Dolberg, O. T., Hirschmann, S., & Grunhaus, L. (1998). Melatonin for the treatment of sleep disturbances in major depressive disorder. *American Journal of Psychiatry*, 155, 1119–1121.
- Jennings, J. R., Muldoon, M. F., Hall, M., Buysse, D. J., & Manuck, S. B. (2007). Self-reported sleep quality is associated with the metabolic structure. *Sleep*, 30(2), 219–223.

## Appendix E

### Sample of OSA-SF Form

#### Occupational Self Assessment - Short Form (OSA-SF)

Name: \_\_\_\_\_ Date: \_\_\_\_\_

	Does not apply	A lot of difficulty	Some difficulty	Well	Extremely well	Important	More important	Most important	I would like to prioritize
<p><b>Step 1:</b> Below are statements about things you may do in everyday life. If an item does not apply to you, select N/A. For each item that does apply, select how well you do that activity.</p> <p><b>Step 2:</b> Next, for each statement, select how important that activity is to you.</p> <p><b>Step 3:</b> Choose up to 4 priority areas which you would like to target for improvement.</p>									
1. Taking care of myself	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
2. Getting where I need to go	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
3. Managing my finances	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
4. Managing my basic needs (food, medicine)	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
5. Identifying and solving problems	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
6. Getting done what I need to do	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
7. Having a satisfying routine	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
8. Handling my responsibilities	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
9. Being involved as a student, worker, volunteer, and/or family member	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
10. Working towards my goals	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
11. Making decisions based on what I think is important	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	
12. Effectively using my abilities	<input type="checkbox"/> N/A	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	

**Competence total**  
(Range 0-48)      **0**

**Value total:**  
(Range 0-36)      **0**

## Appendix F

### Interview Questions

1. What is your typical routine when you want to go to bed?
2. How do you feel about your current quality of sleep?
3. What is the most important step/condition to ensure that you have the best quality of sleep?
4. Do you engage in any sleep-promoting activities before bed? (ex. Meditation, journaling, reading, tea)
5. Do you use any substances before bed? (ex. alcohol, tea, eating, marijuana, vapes)
6. Describe your ideal sleep environment.
7. How does your current environment affect your sleep routine and habits
8. How does your smartphone impact your sleep routine and habits?
9. Do you set limits to your phone prior to sleep (ex. Limit apps, dim your screen, or turn on do not disturb mode)? If so, why?
10. In what ways does your smartphone help you fall asleep?
11. How often do you use your smartphone to communicate with others throughout the day?
12. How frequently do you use your smartphone before going to bed?
13. How long do you typically spend on your smartphone before attempting to go to sleep?
14. Do you experience difficulty falling asleep or staying asleep after using your smartphone?

15. Have you ever experienced anxiety associated with your smartphone? During sleep routines?
16. Do you believe in naps? How often do you nap?
17. If in a relationship, does the sleep routine of your significant other affect you? How?
18. Does anything else other than your phone affect your sleep routine?
19. Do you engage in any late-night occupations such as jobs or meaningful activities?
20. Do you have anything else you want to share?

## Appendix G

### Verbal/Email Script

Hello! My name is \_\_\_\_\_, and I'm an occupational therapy student at Stanbridge University. I am doing research through the Department of Occupational Therapy at Stanbridge University under the supervision of our principal investigator, Dr. Shane Gemoto. I am interested to see how screen-based media like cell phones, computers, and social media applications impact university students' sleep routines. The study title is: "The Impact of Smartphone Use on the Sleep Routines of University Students." Our study aims to look at the sleep routines, sleep duration, and sleep quality of university students who use smartphones during their nighttime routines. Is this something you might be interested in? You qualify for this study if you use screened-based technology such as a cellphone.

If you agree to participate, you will be asked to meet with me for two separate 45-minute Zoom meetings. During the first meeting, you will complete a demographic questionnaire and two assessments: Occupational Self-Assessment - Short Form (OSA-SF) and the Pittsburgh Sleep Quality Index (PSQI). The OSA-SF will help identify any challenges you may have in your daily life. The PSQI will assess sleep quality and disturbances. At the second meeting, you will be asked to complete an interview to further understand your successes and challenges when using technology in your daily life. This will be done over Zoom and at an agreed-upon time. We will also be asking for you to share your screen time data at the end of each week. This data will be collected through the use of a Google form. The information that you share will help us find what more can be done to help other university students succeed as you take on more responsibilities once you graduate while using technology. You will:

- Be scheduled to meet at your convenience.
- Be given a pseudonym (fictitious name) to protect your identity and maintain confidentiality

Do you have any questions? Would you like to participate in this study? If so, I will need to go over a consent form with you and schedule a time to meet for our sessions.

Student researchers:

Rachel Lwin: [rachel.lwin@my.stanbridge.edu](mailto:rachel.lwin@my.stanbridge.edu)

Adrian Ricasta: [adrian.ricasta@my.stanbridge.edu](mailto:adrian.ricasta@my.stanbridge.edu)

Hayley Jamtgaard: [haley.jamtgaard@my.stanbridge.edu](mailto:haley.jamtgaard@my.stanbridge.edu)

Ashley Roberts: [ashley.roberts@my.stanbridge.edu](mailto:ashley.roberts@my.stanbridge.edu)

Faculty advisor:

Dr. Shane Gemoto: [sgemoto@stanbridge.edu](mailto:sgemoto@stanbridge.edu)

Thank you for your time,

---

**Appendix H**

**Recruitment Flyer**

THE DEPARTMENT OF OCCUPATIONAL THERAPY AT STANBRIDGE UNIVERSITY INVITES YOU TO PARTICIPATE IN A STUDY:

**The Effects of Smartphone Use on Sleep**



The Objective:

To understand how the usage of smartphones impact individuals' quality of sleep.

Benefits:

This research could help occupational therapists and other health professionals gain insight on universities poor sleep quality.

Description of Study:

- 45-minute zoom sessions
  - 1st zoom session
    - Demographics questionnaire
    - Occupational Assessment Short Form (OSA-SF)
    - Pittsburg Sleep Quality Index (PSQI)
  - 2nd zoom session
    - Interview with researchers discussing sleep hygiene and iPhone usage.
- Participants will be asked to provide researchers with hours of sleep received for one week.
  - This will take the participant around five minutes.

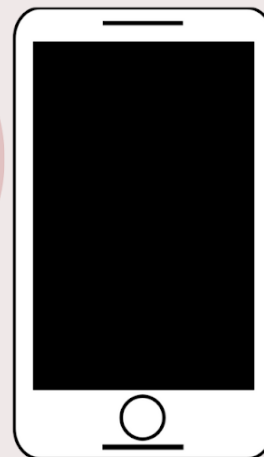
Who Can Join:

- Stanbridge Students aged 18-65
- Those that engage in various screen-based technology.
- Those who are not on sleep medications or diagnosed with a sleep disorder.

Participants will be entered in a raffle to win a \$20 gift card. Giving them each a 1 in 15 chance to win.

**To SIGN UP:**

Contact: Dr. Shane Gemoto  
 sgemoto@stanbridge.edu  
 or thesis students  
 (see attached emails below)



**THESIS STUDENTS**

HALEY JAMTGAARD: HALEY.JAMTGAARD@MY.STANBRIDGE.EDU  
 ASHLEY ROBERTS: ASHLEY.ROBERTS@MY.STANBRIDGE.EDU  
 RACHEL LWIN: RACHEL.LWIN@MY.STANBRIDGE.EDU  
 ADRIAN RICASATA: ADRIAN.RICASATA@MY.STANBRIDGE.EDU





## Appendix I

### Approval to use Assessments

#### Approval for PSQI:

Research use of the **PSQI**:

Dear Adrian,

Thank you for your interest in our **PSQI** instrument. I can give you permission to use the **PSQI only** in non-commercially funded research or education or the product or service you are testing is not a commercial product or is in development by a commercial entity. It cannot be used for patient care either. If your use does **not** fall under those conditions, you can use the survey according to the following provisions:

This copyright in this form is owned by the University of **Pittsburgh** and may be reprinted without charge only for non-commercial research and educational purposes. You may not make changes or modifications of this form without prior written permission from the University of **Pittsburgh**. If you would like to use this instrument for commercial purposes or for commercially sponsored research, please contact the Innovation Institute at the University of **Pittsburgh** at 412-383-7669 for licensing information.

Thank you,

Carolyn

**Carolyn J. Weber, MBA**  
**Licensing Associate**

University of **Pittsburgh** | Office of Innovation & Entrepreneurship  
1st Floor Gardner Steel Conference Center (GSCC)  
130 Thackeray Avenue  
**Pittsburgh**, PA 15260  
Office: 412-383-7670 | Direct Dial: 412-383-7140  
<https://innovation.pitt.edu/>

[cweber@innovation.pitt.edu](mailto:cweber@innovation.pitt.edu)

**Approval for OSA-SF:**

June 12, 2023

University of Illinois at Chicago  
Occupational Therapy-CAHS (MC811)  
ATTN: MOHO Clearinghouse  
1919 West Taylor Street,  
Chicago, Illinois  
60612-7250

Adrian Ricasata  
Occupational Therapy Student  
Stanbridge University  
E: [adrian.ricasata@my.stanbridge.edu](mailto:adrian.ricasata@my.stanbridge.edu)

Dear Adrian Ricasata,

This letter constitutes permission to use the Occupational Self-Assessment Short Form (OSA-SF) in your academic research. Your methods regarding administration and use of the OSA-SF must be accurately and transparently reported in your manuscript.

You are receiving a free copy of OSA-SF for your research purposes, and you are not allowed to administer and distribute this assessment tool for clinical purposes unless you are a licensed user.

Sincerely,

A handwritten signature in black ink that reads "Renee Taylor".

Renee Taylor, PhD  
Director, MOHO Clearinghouse



**Purchase Receipt**

Date: 1/27/2023 5:07:40 PM  
 Order Number: 3832558427012

Vendor Information:	Customer Information:
University of Illinois at Chicago Occupational Therapy-CAHS (MC 811) Attn: MOHO Clearinghouse 1919 West Taylor Street Chicago, Illinois 60612-7250 USA	Gemoto, Shane sgemoto@stanbridge.edu

Title of Publication	Price	Quantity	Amount Due
Occupational Self Assessment (OSA) Version 2.2, 2006 - Digital License	\$40.00	1	\$40.00
<b>Total Cost USD</b>			<b>\$40.00</b>
<b>Amount Paid</b>			<b>\$40.00</b>

The product(s) you have purchased can be accessed electronically via your [MOHO-IRM Web account](#). This charge will show up on your credit card statement as [University of Illinois Web Urbana, IL](#).

Thank you for your order!

**Appendix J****Google Form for Participant Data**

**Sleep Hours**

Please record what time you go to bed, what time you wake up, and what your bedtime routine looked like for that specific day.

**Day of the Week \***

1. Sunday
2. Monday
3. Tuesday
4. Wednesday
5. Thursday
6. Friday

**Bedtime \***

Time

**Wake Time \***

Time

**Nighttime Routine \***

Long answer text

### Appendix K

### Google Form for Participant Data

**Sleep Hours**

Please record what time you go to bed and what time you wake up as well as what your bedtime routine looked like that specific day

**Monday bedtime**

Time

**Monday wake time**

Time

**Monday nighttime routine:**

Long answer text

**Tuesday bedtime**

Time

**Tuesday wake time**

Time

**Tuesday nighttime routine:**

Long answer text

**Wednesday bedtime**

Time

## Appendix L

### Consent Form

**Title of Study:** The Impact of Smartphone Use on the Sleep Routines of University Students

Please contact the principal investigator if you have any questions about this research study.

Principal Investigator: Dr. Shane Gemoto; (951) 542-2024 Ext. 5174

Email: [sgemoto@stanbridge.edu](mailto:sgemoto@stanbridge.edu)

**Thesis Students:** Ashley Roberts; [ashley.roberts@my.stanbridge.edu](mailto:ashley.roberts@my.stanbridge.edu); (949) 529-8198

Rachel Lwin; [rachel.lwin@my.stanbridge.edu](mailto:rachel.lwin@my.stanbridge.edu); (661) 525-8702

Adrian Ricasata; [adrian.ricasata@my.stanbridge.edu](mailto:adrian.ricasata@my.stanbridge.edu); (650) 534-8160

Haley Jamtgaard; [haley.jamtgaard@my.stanbridge.edu](mailto:haley.jamtgaard@my.stanbridge.edu); (303) 718-6587

If you have any concerns about this research and how it is conducted, please contact our institutional officer-in-charge: Stanbridge University VP of Instruction/Independent

**Contact:** [VP.instruction@stanbridge.edu](mailto:VP.instruction@stanbridge.edu)

You are invited to participate in a research study on the impacts of smartphone use on sleep quality, duration, and nighttime routines. We are occupational therapy students at Stanbridge University conducting research through the Department of Occupational Therapy. We will be under the supervision of our principal investigator, Dr. Shane Gemoto. We are interested in how smartphone use impacts university students. The study title is: “The Impact of Smartphone Use on the Sleep Routines of University Students.” This study aims to research the effects of smartphone use on the sleep routines of university students. The purpose of researching this topic is to gain insight into what causes a decrease in sleep quality in university students.

You will be asked to:

Participate in two zoom meetings. The first meeting will include responding to a demographic questionnaire, the Occupational Assessment Short Form, and the Pittsburgh Sleep Quality Index. The second meeting will consist of an interview (which will be video recorded) with one of the research members regarding smartphone use and sleep quality. Each meeting will take around 45 minutes. Participants will also be asked to log their sleep hours via google form. Results may be presented at a conference.

The total length of time required for participants is one week. There will be two 45 minute zoom meetings, one at the beginning of the week and one at the end. After consenting to participate, participants will also be asked to complete a demographics questionnaire, an occupational self assessment form, and the Pittsburgh Sleep Quality Index questionnaire. Each form will take approximately 5 minutes to complete, a total of 15 minutes. Further, participants will complete a daily recording of their bedtime, wake time, and a description of their nighttime routine 5 minutes per day, for a total of 35 minutes over the week. An optional sleep journal can be used by participants who do not wish to use their smartphone before and after bed. This will take an extra 5 minutes per night for a total time of 35 minutes. Therefore, over the week, the total number of hours of participation would be 2 hours and 25 minutes. An additional 35 minutes will be optional time for the sleep journal.

There are minimal risks to participants. One being the risk of breach of confidentiality for each participant, given data will be transmitted online. Steps to protect data include organizing and

storing data in a password-protected Google Drive. Psychological risks are also present given the sensitive nature of several of the study instrument questions. Contact information for free counseling services available to ALL Stanbridge University students through the Stanbridge Student Assistance Program, as well as the noted free comparable resources available outside of the University for participants who may be uncomfortable seeking assistance directly through their own academic institution, are provided should subjects wish help due to any psychological distress they may experience. As mandated reporters, any disclosures made to members of the study team regarding subjects potentially being a danger to self or others must be immediately reported to the required authorities following any such disclosure. If this occurs our principal investigator, Dr. Shane Gemoto, will also be notified and the student will be given the contact information for free counseling services available to all Stanbridge University students through the Stanbridge Student Assistance Program, as well as the noted free comparable resources available outside of the University (provided below).

There will be no direct benefit to you from participating in this study. However, the information you provide when participating in this study may help occupational therapists and other health care professionals gain insight into university students' poor sleep quality. There is potential for subjects to benefit directly from participation in the study through self-reflection as a result of the completion of the study which later leads them to make beneficial changes to their smartphone habits and sleep routines.

\*Considering the potential psychological risks associated with participating in this study, counseling resources are provided below:

Students may contact the **Stanbridge Student Assistance Program (SSAP)** by dialing (888) 977-7728 or by visiting <http://stanbridgesoar.acisoar.com/>. The SSAP is free and available 24 hours, 365 days a year. It is designed to help students manage a wide range of difficult situations and overcome personal challenges.

Students may also seek *outside* support through the **Office of Student Assistance and Relief (OSAR)** by dialing (888) 370-7589 or by visiting <https://osar.bppe.ca.gov/>. OSAR is designed to advance and promote the rights of students in private colleges. This program is committed to assisting students who are experiencing economic loss due to unlawful activities or the closure of a private college.

If you have read and signed this form, you consent to participate in this study. Participation in this study is voluntary, and you have the right to withdraw at any point without penalty. Your alternative is to not participate in this study. You have the right to refuse to answer specific questions. As a Stanbridge student, your participation is completely voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time or skip any questions during data collection without penalty or loss of benefits to which you are otherwise entitled. Your data will not be shared with your instructors, program, or the University. Your identity will not be disclosed at any time, and you will be given a pseudonym. If you do not meet the eligibility criteria or choose not to enroll in the study, then your demographics will be removed from the study and destroyed within 48 hours.

There will be no compensation for participants. However, participants will be entered into a raffle at the end of the study where one random participant will be selected to receive a \$20 gift card from

Starbucks. All 15 students will be placed in the drawing giving each participant a 6% chance at winning.

Confidentiality will be protected by assigning pseudonyms to each participant. Digital recordings and transcripts of Zoom interviews will be organized in a password-secured Google drive with the assigned pseudonym as the file name. It will remain separate from the informed consent forms. This will ensure any identifying information will not be breached. Per the code of Federal Regulations of the Department of Health and Human Services 45 CFR 45.115, the records of study data, consent records, and IRB documentation shall be retained for at least 3 years, and records relating to research which is conducted shall be retained for at least 3 years after completion of the research by the Faculty Advisor. All records will be accessible for inspection and copying by authorized representatives of the department or agency at reasonable times and in a reasonable manner. Principal investigator and thesis students will have access to the data. Anticipated future sharing of data will include deidentified data only. Further, releases will be kept within the subject study data and consent forms are to be maintained separately from all other study data.

I give consent to be audio-taped during this study.

Yes  No

I give consent to be photographed for this study and for my photograph to be used in any materials (poster, video) resulting from this study.

Yes  No

I give consent to be videotaped for this study and for my image to be used in any materials (poster, video) resulting from this study.

Yes  No

1. I have read the above information and have received answers to any questions I may have asked.
2. I am 18 years or older.
3. My participation is voluntary.
4. I may withdraw from this study at any point.
5. I consent to take part in the study.

**Printed Name of Participant** \_\_\_\_\_

**Signature of Participant** \_\_\_\_\_ **Date** \_\_\_\_\_

Include the researcher's signature if the project requires informed consent)

**Printed Name of Researcher Obtaining Consent** \_\_\_\_\_

**Signature of Researcher Obtaining Consent** \_\_\_\_\_ **Date** \_\_\_\_\_



## Appendix M

### Video/Photo Release Form

Any person taking a video or still photograph for Stanbridge University related research dissemination must obtain a signed release form from all persons who are visibly recognizable in the video or photograph. Crowd scenes are exempt where no single person can be identified.

#### **PARTICIPANT/PARTICIPANT CONSENT**

I am 18 years of age or older and hereby grant the researcher designated below from Stanbridge University permission to photograph and/or video, my voice and likeness and to use my voice and likeness in photograph(s)/video for publication/ dissemination. I understand that my name will not be used in any publication/dissemination. I will make no monetary or other claim against Stanbridge University for the use of the photograph(s)/video.

**Printed Name** \_\_\_\_\_

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

If Participant is under 18 years old, consent must be provided by the parent or legal guardian:

**Printed Name** \_\_\_\_\_

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

Stanbridge Researcher:

**Printed Name** \_\_\_\_\_

**Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone Number:** \_\_\_\_\_

**E-mail Address:** \_\_\_\_\_