

OCCUPATIONAL THERAPY SLEEP INTERVENTIONS FOR ADULTS

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

by

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Certification of Approval

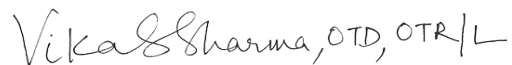
I certify that I have read Occupational Therapy Sleep Interventions for Adults by Eileen Batista, McKenna Louise Marmelstein, Andrea Oei, and Kristine Paragas, and in my opinion, this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.



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Dedication

We dedicate this project to occupational therapists who pour their heart and passions into their work and clients each and every day, and to occupational therapy students who are pursuing this profession to change lives. It is the combined effort that allows us to study methods and grow our evidence-based practice.

Acknowledgments

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Abstract

Implementing sleep interventions assists clients in increasing their activity levels, engagement in occupations, and to improve or maintain cognitive skills. Studies have been conducted on different occupational therapy interventions for specific adult populations, ranging from 18-65 years old, regarding improving the quality of sleep (Falck et al., 2020). However, additional research is needed to understand which interventions and therapeutic approaches are most effective and implemented by current licensed occupational therapists (OTs), since there is a lack of information regarding why OTs use them in the first place. Therefore, this study was directed towards understanding the opinions of OTs and why they choose specific interventions for adults 18-65 years old. We recruited from various domains such as the American Occupational Therapy Association (AOTA), Occupational Therapy Association of California (OTAC), flyers, social media, and through email. Screening was obtained from all anonymous participants, and no form of compensation was given for participating in this study. The participants completed an anonymous survey via Google Forms with various questions based on the population they work with, which interventions they prefer, how sleep education is implemented in their practice, how often they must address sleep quality improvement, and specific populations regarding conditions and diagnoses they work with. Dedoose software was utilized to identify common themes found in the survey responses. The study findings provide insight into what current OTs are using to improve quality of sleep for their patients.

Keywords: sleep disturbance, sleep quality, sleep intervention(s), occupational therapy, sleep hygiene, adult(s), insomnia, cognitive behavioral therapy, assistive device(s)

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Occupational Therapy Sleep Interventions for Adults

We spend about one-third of our lifetime sleeping or attempting to sleep (Aminoff et al., 2011). Sleep is the process by which the body recharges. The muscles relax, the heart rate and breathing slows down, and brain waves reach their lowest level (Mireku & Rodriguez, 2021). The National Sleep Foundation (2015) recommend newborns to sleep 14 to 17 hours, while school-aged children require 9 to 11, and teenagers 8 to 10 hours. As a person ages, less sleep is required. Adults over the age of 18 are recommended to sleep between 7 to 9 hours a night for proper cognitive and behavioral functions. A healthy sleep cycle is essential for human functioning, and sleep deprivation can have adverse effects on an individual's physical, mental, and spiritual well-being (Yildirim et al., 2020).

Occupational therapists (OTs) that work in the hospital, long-term care, skilled nursing facilities, and in the school setting (American Occupational Therapy Association [AOTA], 2017) see the consequences that lack of sleep creates by their client's performance, behavior, and engagement in activities. Sleep, however, is not primarily addressed by OTs, even though sleep is considered an occupation under the Occupational Therapy Practice Framework: Domain and Process and thus included among other important activities of daily living, which include eating, bathing, play, and leisure activities (AOTA, 2014). Improving quality of sleep is not commonly addressed in the occupational therapy therapeutic process, although sleep quality can potentially affect an individual's performance in other occupations. Sleep disturbance can be categorized as anything that disrupts the sleep-wake cycle, sleep stages, or the total time asleep.

Quality of sleep must be addressed by OTs as sleep affects other occupations. Since adults engage in multiple occupations throughout the day, participation in these occupations is ultimately affected by sleep performance. Sleep interventions that OTs can provide include addressing sleep quality through sleep preparation and sleep participation (AOTA, 2014). Common approaches include the use of cognitive behavioral therapy (CBT) and assistive devices like sound machines, weighted blankets, and sleep hygiene.

While various studies have been conducted on different occupational therapy interventions and OTs currently utilize sleep interventions for all age groups, there is a lack of information in the literature pertaining to the efficacy of specific interventions for the adult population (Falck et al., 2020). Therefore, the purpose of this present study was to gain more insight on the current interventions OTs use in their practice to address sleep disturbance, poor sleep hygiene, and how they implement them into their sessions in the adult population (18-65 years old). Another goal was to identify any links between specific settings and interventions that may reveal why certain interventions are used.

Literature Review

Social Significance

Sleep quality is affected by multiple physical, psychological, and social factors, and inadequate sleep quality can negatively affect an individual's well-being. For example, physical factors such as living arrangements can affect sleep if the individual feels uncomfortable or unsafe in their environment. Psychological factors such as anxiety and depression or social factors like family conflicts can also influence sleep quality, since an individual may be distracted by other thoughts and experience difficulties falling asleep. Health can be affected by sleep issues, and it can affect individuals with or

without any sleep-related medical conditions. Through a review of the literature, we found evidence these three populations such as students, working adults, and patients with TBIs are impacted by sleep deprivation. However, there are many other populations in different settings that are affected by lack of sleep, such as adults with mental health issues, cognitive impairments, and chronic pain.

For example, up to 60% of students in the USA have experienced poor sleep, as measured using the Pittsburgh Sleep Quality Index (PSQI; Morris et al., 2016). Academic performance is related to sleep quality, and students who experience greater levels of sleep deprivation have an increased risk of academic failure. Associations between poor sleep quality, anxiety, and depression for students have also been found, which suggests that sleep issues could also be a risk factor for the development or exacerbation of mental health conditions. Yildirim et al. (2020) conducted a study with 512 students to determine the different factors that influence sleep quality. This study used the PSQI and the results showed that 77.1% of students had problems during sleep and 97.5% did not receive professional help with their sleep problems. They found that low sleep quality was affected by various sociodemographic variables, living arrangements, and sleep patterns.

Additionally, a lack of sleep can increase the chances of a person developing insomnia (Arnedt et al., 2013). Insomnia is a sleep disorder that can make it difficult to fall asleep or stay asleep, and it is associated with a loss of productivity in the workplace. Employees are able to attend work, but consequently, underperform when completing their tasks and lose approximately 11.3 workdays annually due to unproductivity. Employees may not be able to process information as quickly, learn efficiently, or pay attention for long periods of time. This affects an employee's adaptive performance in the

workplace, which can negatively affect their ability to react to challenges, practice clear communication to other coworkers or customers, and contribute to a healthy work environment. The study also states that the average costs for adults with untreated insomnia are approximately \$1,200 greater compared to those who do not experience insomnia, which shows that sleep deprivation may lead to greater financial issues if sleep quality is not addressed.

Another example of a subset of adults who may experience sleep disorders are people who suffer from traumatic brain injuries (TBIs). Patients with a TBI experience sleep disorders that impact their quality of life and negatively affect their rehabilitation and recovery time. Sleep deprivation in TBI patients can lead to negative outcomes and worsening cognitive dysfunction such as lack of engagement and motivation in the rehabilitation process. Aoun et al. (2019) studied sleep disorders in people who suffer from TBIs and found that without sleep, cognition is impaired, irritability sets in, and activities of daily living become more difficult to attend to.

Sleep deprivation impairs work, social life, and family responsibilities, and overall well-being (Aoun et al., 2019). Sleep deprivation also plays a significant role in impacting an individual's roles, their everyday routines, and their various occupations. For example, a lack of sleep can ultimately affect a student's academic performance and can potentially put students at risk for anxiety and depression, which can hinder their participation in occupations both inside and outside of school. Working adults are also affected by insomnia, as they may be unable to meet employee productivity standards required by their employers. Additionally, patients with a TBI may be disengaged throughout the rehabilitation process due to sleep deprivation, making it difficult for them

to stay motivated to make progress in order to achieve their occupational goals.

Therefore, addressing sleep deprivation is fundamental to improving performance in occupations and increasing quality of life for these subgroups, and other adult populations previously stated including: students, clients suffering from mental health, and/or physical impairments.

Common Theme 1: Cognitive Behavioral Therapy

Although medications improve sleep, there is little evidence regarding the long-term side effects of such pharmacological interventions on occupational performance and efficacy (Morin et al., 2005). Long-term use of medications can create dependency, and a dependency can lead to fluctuating mental health problems. Because of this, CBT is the primary intervention for sleep disturbances such as insomnia, which addresses the behavioral and psychological factors known to restore sleep processes (Theadom et al., 2017).

Theadom et al. (2017) conducted a two parallel randomized control study on the effects of an online CBT intervention for 24 individuals ages 18-60 years old following a TBI. They used video presentations and interactive tasks to help participants understand their sleep patterns, and compared the results to a control group. Both the intervention group and the control group were asked to complete a 20-minute module every week for 6 weeks. In addition, the intervention group were provided video presentations and interactive tasks to help participants understand their sleep patterns, while the control group only received textual information about brain injuries and sleep hygiene videos. Both groups were asked to complete a Rivermead Post-Concussion Symptoms Questionnaire and the PSQI. The intervention group showed a significant improvement in

their self-reported sleep quality ($F = 5.47, p = 0.04$) in comparison to the control group. However, there were no significant group differences regarding objective sleep quality, cognitive functioning, post-concussion symptoms, or quality of life according to each group's PSQI findings.

Similarly, Morris et al. (2016) conducted a randomized control study to test the efficacy between two internet-delivered CBT programs, "Anxiety Relief" and "Insomnia Relief," in comparison to a wait-list control group for students who have anxiety and insomnia. Internet-delivered CBT consists of internet-delivered services that use CBT to address common mental health conditions. The study recruited 138 participants who were randomly assigned to one of the three groups, which included anxiety relief, insomnia relief, and a waitlist control group. Participants in the intervention groups were given access to modules for six weeks while the control group were only given access six weeks after. All participants were asked to complete the PSQI, the State-Trait Anxiety Inventory, the Beck Depression Inventory, and an open-ended questionnaire. The study resulted in within-group reductions in anxiety for participants who completed the anxiety program, but this change was not significant. There was, however, a significant increase in sleep quality for participants who completed both insomnia and anxiety programs post-intervention ($t[35] = 4.28, p = <0.001$).

Arnedt et al. (2013) conducted a randomized control parallel trial of adults aged (provide specifics), where they compared the efficacy of telephone delivered CBT for insomnia (CBTI) to an informational pamphlet control. CBTI was administered in eight weekly telephone sessions lasting 15–60 minutes while the control group were instructed to read and follow the informational pamphlet. Participants were asked to complete the

following assessments/questionnaires pretreatment, posttreatment, and during a 12-week follow-up sleep/wake diary, the PSQI, a 16-item dysfunctional beliefs and attitudes about sleep questionnaire, and daytime symptom assessment. The CBTI intervention group showed large improvements at posttreatment for diary-based sleep efficiency and had improvements in daytime symptoms such as fatigue ($t[28] = 5.9, p < 0.001$), depression ($t[26] = 7.0, p < 0.001$), and anxiety ($t[27] = 6.1, p < 0.001$). In addition, the CBTI group were in remission from insomnia at the twelve-week follow-up ($p < 0.05$).

Eakman et al. (2017) conducted a single-arm feasibility pilot study, which the researchers named the Restoring Effective Sleep Tranquility that can include sleep restriction therapy, cognitive therapy, stimulus control therapy, sleep hygiene, and psychoeducation. The intervention included 8 individual sessions of CBT for insomnia and 7 group sessions. Multiple surveys and questionnaires were used such as the Sleep problems index II of the medical outcomes study sleep measure, PSQI, Dysfunctional Beliefs and Attitudes about Sleep Scale. The study found a reduction in sleep disturbances ($t = 3.29, p = 0.02$), fewer dysfunctional sleep beliefs ($t = 3.63, p = 0.01$), reduction of nightmares ($t = 2.79, p = 0.03$), and a greater ability to participate in social roles ($t = -2.86, p = 0.03$).

CBT is effective in treating patients with comorbidities such as anxiety, pain, posttraumatic stress disorder, and depression (Theadom et al., 2017). However, a CBT specialist can be expensive, and a client will incur secondary costs such as gas, car maintenance, childcare, and lost time at work if the clinic hours do not align with the client's work schedule. These costs and travel time can deter patients from seeking CBT making telemedicine a possible option. Langarizadeh et al. (2017) suggests that

telemental health services offer quality care while being cost-effective. As discussed, CBT can be provided via the telephone and the internet allowing more opportunities for clients to obtain treatment, more privacy as the client can get receive care in the privacy in their own home. Furthermore, there are limited studies regarding sleep and CBT from OTs and further research should be conducted to test efficacy.

Common Theme 2: Assistive Devices, Low-Cost Environmental Modifications, and Accessible Alternatives for Sleep Interventions

Few studies were found that addressed non-CBT types of sleep interventions that OTs used with the adult population. The literature suggests that most non-CBT sleep interventions include the use of assistive devices or low-cost, accessible methods to address sleep issues.

Only two studies were found involving OTs that research assistive devices for sleep. Gutman et al. (2017) studied the effectiveness of three sleep interventions in older adults within occupational therapy's domain, including the Dreampad Pillow, iRest meditation, and sleep hygiene. This randomized control trial with community living adults ages 25–65 received 3 weeks of sleep intervention. Using both information from sleep journals and the General Sleep Disturbance Scale (GSDS), the researchers found that the iRest meditation group experienced longer sleep times compared to the Dreampad Pillow and sleep, hygiene groups. Green et al. (2020) studied the effectiveness of weighted blankets in adults ages 18–43 with autism. The participants reported an increase in sleep quality and a decrease in sleep disruption when using the weighted blankets. Both studies showed an improvement in sleep quality after implementing these

assistive devices, but further research needs to be done on the use of assistive devices and sleep aides administered by an OT in the adult population.

Since assistive devices can be expensive, OTs often find low-cost, easily accessible alternatives to use for client interventions. Heidt et al. (2016) looked at the use of sleep-enhancing tools—specifically eye masks, ear plugs, and white noise machines—to help participants reduce noise in the hospital to improve sleep quality. Adults ages 18–75 staying in a non-intensive care unit in the hospital used self-reported Patient-Reported Outcomes Measurement Information System assessment and short-form surveys using the Likert Scale to report a significant improvement in their fatigue, sleep, and wake disturbance using these 3 sleep-enhancing tools (Heidt et al., 2016). Low-cost environmental modifications are accessible and allow OTs to help their clients address sleep issues.

OTs are also well-versed in holistic, lifestyle-related techniques such as mindfulness, aromatherapy, and meditation. However, we could not find any studies done by OTs on the effectiveness of these types of interventions to specifically address sleep in general or to specifically address sleep in the adult population. However, other disciplines have provided evidence of the use of these holistic techniques and their effectiveness in the adult population. For example, in a study published in a nursing journal, Karadeg et al. (2017) studied the use of aromatherapy with lavender essential oils for sleep quality in adult patients in the Intensive Care Unit (ICU). Using the PSQI and the Beck Anxiety Inventory to measure sleep quality and anxiety levels, the researchers found that the intervention group—who inhaled 2 drops of lavender essential oils on a cotton gauze—had a significant difference in PSQI and BAI scores (Karadeg et al., 2017).

Sleep education using technology like cell phones can also help address sleep issues. In a study found within the public health discipline, Huberty et al. (2021) tested the effectiveness of using a mindfulness and meditation phone application (such as the Calm app) to manage sleep issues. Participants ages 18 and older were randomized into an intervention group and a control group. Using measures such as a Sleep Diary Questionnaire, Fatigue Severity Scale and Epworth Sleepiness Scale (ESS), the study found that participants showed an increased level of sleep quality, reduced levels of fatigue, reduced daytime sleepiness, and pre-sleep arousal—an individual's state of arousal as they attempt to fall asleep (Huberty et al., 2021). Gipson et al. (2018) studied the use of text messages about healthy sleep hygiene in university students ages 18–26. The study found that the intervention group that received the text messages had better sleep hygiene and reported 63.5% good sleep quality at baseline with 78% reporting good sleep quality at posttest, as measured by the Sleep Hygiene Index and the PSQI.

OTs that work with adults who are familiar with technological devices may turn to these easily accessible methods to help provide sleep education and interventions. However, there is no evidence that these interventions are used by OTs in the clinic; therefore, it is important to research the sleep interventions that OTs are using in the adult population.

Gaps in Knowledge

There is a lack of information regarding which interventions are most effective to use for the adult population. Most studies are based on pediatric or geriatric populations but are not addressed for adults ages 18–65. There is limited research from the perspective of current occupational therapists on what interventions are best used in a

clinical setting to improve their clients' quality of sleep. This is an important factor to recognize because sleep is a vital part of the rehabilitation process. Many current studies are qualitative and include semi-structured interviews and scales that are measurable only by the participants, which can lead to desired or biased responses. There is little to no research and studies that involve a controlled setting, which results in relying on the participant's judgment to establish if the assessments were successful instead of having concrete data. Removing complete biases is impossible; however, obtaining information from current OTs that have an interest in the study and can relate to this topic is more likely to give reliable and usable data to help further our research. There is a lack of data and understanding regarding which interventions are used in the adult population, as well as OTs' perspectives about the efficacy of sleep interventions in literature.

Clinical Significance

Sleep deprivation and chronic insomnia have been linked to reduced quality of life, an exacerbation of physical health conditions, and increased risk for psychiatric disorders such as anxiety and depression for adults (Arnedt et al., 2013). However, there is a lack of occupational therapy sleep interventions that specifically address the unique barriers to sleep experienced by adults. Determining which sleep interventions have the highest efficacy for adults would allow OTs to understand which interventions are suitable to target the needs of the adult population.

Adults ages 18 to 65 experience barriers to sleep that differ from other age groups, since many adults balance multiple priorities such as work, university, and relationships (Paterson et al., 2019). Therefore, it would be beneficial to find the most effective treatments for sleep that also take the busy schedules of the adult population

into consideration. For example, telephone- delivered CBTI was effective for treating chronic insomnia and sleep-related cognitions in adults and may be an easily accessible treatment option for working adults (Arnedt et al., 2013). OTs can utilize similar technology-based interventions that accommodate the schedules and various needs of adults, while also addressing mental health and other sleep-related conditions.

Theoretical Framework

We selected the Person-Environment-Occupation-Performance (PEOP) model to further understand the types of sleep interventions occupational therapists utilize for the adult population. The PEOP model is based upon the transactional relationship between the “person,” “occupation,” and “environment,” and any change in these components can directly affect an individual’s occupational performance (Cole & Tufano, 2020). Furthermore, each component of this model was used to shape and frame our survey questions and create the study design.

The person component of the PEOP model consists of characteristics and internal factors that reflect a person’s capabilities, such as physiological factors, cognitive factors, psychological factors, and spiritual factors. These factors can either support or limit occupational performance. For example, sleep disorders such as insomnia may cause an individual to experience decreased quality of sleep, leading to a lack of energy or motivation to perform occupations.

In this model, the environment component consists of external factors that can shape, support, or limit an individual’s well-being or their participation in their occupations (Baum et al., 2015). Some environmental interventions that might impact sleep performance include adaptation, social or therapeutic influences, or assistive

devices to improve quality of sleep. These interventions could involve weighted blankets, white noise machines, or a form of sleep education or preparation introduced by an OT. Using the environmental aspect of the PEOP model, we created questions that ask about environmental approaches, adaptations, or interventions that are commonly used by OTs used to improve quality of sleep.

The occupation component in the PEOP model focuses on what an individual wants or needs to do in their daily life, such as activities, tasks, and roles (Baum et al., 2015). Since sleep quality can affect participation in other occupations such as going to work, attending school, and participating in leisure activities, the OT can provide interventions that help the individual improve their engagement in these occupations. Therefore, we also framed our questions to touch upon the occupation aspect of the PEOP model by asking questions about clients' barriers to sleep and potential reasons clients may come to see an OT aside from sleep disturbances.

The performance aspect of the PEOP model is focused on the complex relationship between the person, occupation, and their environment (Cole & Tufano, 2020). These factors influence an OT's decision to implement specific sleep interventions, as an individual's occupational preferences shape their goals for participation, performance, and well-being. OTs select interventions that address the unique barriers to sleep experienced by the adult population, while taking into consideration how an individual's context will consequently affect their overall occupational performance. Our survey asks questions about the specific interventions that OTs used, as we wanted to understand the OTs' thought processes when selecting their interventions.

Methodology

The goal of this study was to explore which interventions are best utilized by OTs for their clients who struggle with sleep, such as those who struggle to fall asleep or who face disruptions in their sleep. The study also aimed to understand how sleep interventions can play a significant role within the occupational therapy community for everyday practice. Using their clinical reasoning and understanding of each client's needs, the therapists identified which interventions for sleep they used in their therapy sessions, as well as their opinions on what is the most useful for their clients. The study implemented the PEO model to design the questionnaire and utilized qualitative analysis.

All forms of data collection procedures adhered to COVID-19 guidelines to limit exposure. The survey was created and delivered through Google Forms. In the screening process, the survey first verified participants' involvement in using sleep interventions for the adult population. Participants were eligible if they answered yes to both questions. The study only obtained further information from the therapists who meet these criteria including demographic and population specific questions such as "What kind of diagnoses do you work with when utilizing sleep interventions?" and "Which intervention do you use the most?" There were 26 questions total—6 screening questions, 10 demographic questions, and 10 population-specific questions. There were a series of 14 open-ended questions along with 12 multiple-choice questions. Participants were able to omit answers they did not feel comfortable answering. The data was analyzed and processed with Dedoose software. Once the data was analyzed, the information was used to determine which sleep interventions are utilized by OTs for adult clients ages 18–65.

Advantages

Some advantages of the selected methodology included having a secure and reliable online survey platform to distribute and receive data, having access to a wide range of potential research participants, and utilizing a research design that adheres to the safety restrictions set in place due to COVID-19. We included both multiple choice and short answer questions as part of a semi-structured survey questionnaire, which allowed our participants to clarify and expand on their answers for certain responses. The data was processed using Dedoose, which increased the accuracy of the data by minimizing human error. In order to ensure the trustworthiness and validity of the qualitative data, each researcher individually coded the open-ended responses before having an intensive discussion on the agreed codes. Each code was checked and approved by our faculty advisor. Using the AOTA website to promote our research study was also beneficial, since this gave us access to a larger number of OTs from different states and occupational therapy settings who may have been interested in participating.

Participants

The study was presented and approved under application number MSOT10-04 by Stanbridge University's Institutional Review Board. Our target sample size was 25 participants, and we recruited through active subscriptions of American Occupational Therapy Association (AOTA), Occupational Therapy Association of California (OTAC), flyers, social media, and email. Inclusion criteria for participation in this study included: (a) a valid associate's, bachelor's, master's, or doctoral degree, (b) a license in occupational therapy, (c) to be practicing in the United States, (d) to be treating sleep disturbances, and (e) to have reliable internet access to complete an online survey.

Exclusion criteria for participation in this study included: (a) occupational therapy students, (b) practicing OTs who do not treat sleep disturbances, and (c) OTs who do not work with adults. Participants did not incur any costs for participating in the study and no compensation was given to individuals participating in the study.

Measures

Demographic information was collected during the prequalification questionnaire after obtaining consent. Once qualified, participants completed our population specific questionnaire composed of 8 questions that addressed interventions participants use when treating their clients who experience sleep disturbances (see Appendix B for survey questions). Responses consisted of a combination of multiple choice and open-ended questions. Qualitative data gathered from open-ended questions were coded and organized via similar themes using Dedoose software. To ensure validity, the questionnaire was focused on effective interventions used on clients with sleep disturbances. For the qualitative data, responses were coded and reviewed by each of the researchers.

Ethical Considerations

To ensure participant anonymity, all identifiable data such as name and age were not collected, and we did not implement informed consent. In terms of participant safety, recruitment was done online. Since our study involves less than minimal risks, Google Forms was utilized to collect responses from our participants. Since Google collects IP addresses, there was a risk of breach of confidentiality—however, extensive measures were taken to ensure that participant information was kept secure. We did not collect identifiable information regarding participants' clients. Data used within the study was

kept anonymous and was protected with a password protected email account through Stanbridge University. An official Stanbridge University email was used for all communication. Due to the survey nature of the study, the study did not include vulnerable populations and there were low potential risks for participants. However, there could have been questions that might have triggered or elicited a response or memory to a participant. For this reason, participation was strictly voluntary, and participants had the right to withdraw their information from the study at any time. There was a consent form in the beginning of the survey that addressed that by agreeing to answer the questions in the survey, each participant agreed to participate. No form of compensation was given for participating in this study. There was no intervention or withholding of an intervention from another group. This research study focused only on the experiences of registered and/or licensed occupational therapists regarding sleep interventions. Recruitment, data collection, and surveys were conducted utilizing the online platforms stated above.

Data Analysis

Survey questionnaires were used to collect data information on common types of interventions used by OTs working with the adult population that were then analyzed. All pre-survey questions, demographic questions, and survey results were analyzed and summarized using descriptive statistics due to the nominal and categorical nature of the answer choices. This data was then organized into a comprehensive chart that covered the number of participants with each characteristic (credentials, years practicing, state, setting, and so forth). Qualitative data gathered from open-ended questions were coded and organized via similar themes using Dedoose software.

Results

Participant Demographics

Of the 62 participants who participated in this study, $n = 40$ met the inclusion criteria. There was a disproportionate number of participants practicing in the state of California ($n = 22, 47\%$), followed by Indiana ($n = 3, 6.5\%$), Virginia ($n = 3, 6.5\%$), Colorado ($n = 2, 4.3\%$), and Massachusetts ($n = 2, 4.3\%$). Some participants reported practicing in multiple states, which led to a total of 46 states mentioned (see Figure D1). In regard to education level, most reported having a Master's degree ($n = 24, 60\%$), followed by a Doctorate ($n = 10, 25\%$), and a Bachelor's degree ($n = 6, 15\%$) (see Figure D2). Most participants reported practicing for more than 10 years ($n = 18, 45\%$; see Figure D3).

Participants were asked to identify where they learned the interventions they currently use and a majority of the participants reported continuing education courses ($n = 27, 67.5\%$), followed by learned from a colleague or coworker ($n = 22, 55\%$), and learned from an institution ($n = 16, 40\%$; see Table D1). To better understand the background of our participants, we asked them to identify which settings they have addressed sleep in; participants reported mental health ($n = 14, 35\%$), outpatient ($n = 13, 32.5\%$), and in the community ($n = 10, 25\%$; see Figure D4). Similarly, when asked which diagnoses they most commonly worked with, participants identified working with clients primarily with mental health (such as anxiety, depression, PTSD, etc.; $n = 37, 92\%$), TBI ($n = 15, 37\%$), chronic insomnia ($n = 14, 35\%$), and neuropathy ($n = 11, 27\%$; see Table D2).

All participants reported that they are not primarily seen for sleep concerns. Instead, clients most often came to see them for treatments for psychosocial issues (n = 16, 26%), diagnosis-specific issues (n = 15, 25%), rehabilitation (n = 9, 15%), and pain (n = 7, 11.6%; see Figure D5). When asked which interventions were most used, participants mainly reported that using sleep hygiene education (n = 32, 80%), relaxation techniques (n = 30, 75%), and breathing/calming techniques (n = 28, 70%) were most used (see Figure D6). Interventions that were also mentioned included CBT (n = 13, 32.5%), internet resources (n = 12, 30%), journaling (n = 11, 27.5%), and assistive devices (n = 9, 22.5%). Participants identified that the most effective interventions that they have used consists of breathing/calming techniques (n = 14, 35%) and sleep hygiene education (n = 13, 32.5%; see Figure D7).

Qualitative Item Results

This study asked participants about what sleep interventions they use in their practice, why they chose these interventions, what interventions were most used, and why these interventions may or may not be effective. After coding survey responses and analyzing the study findings, we determined four recurring themes. These themes encompassed the results we found from our qualitative questions from our population specific questionnaire (questions #1–6, 8, 10) and address how the OTs selected interventions and what impacted the OTs choice of sleep intervention for their clients. The OTs chose their interventions based on accessibility, client-centeredness, underlying conditions that impact sleep, and psychosocial components.

Accessibility

After analyzing the responses from our survey, we found that accessibility was a major theme and determinant of why our participants preferred to utilize some interventions over others. Out of 37 participant responses, 15 participants identified various components of accessibility that contributed to their decisions to use certain interventions, including the ease of intervention implementation, having the ability to access resources, being able to communicate with patients using terminology that is mutually understood, and the participants' level of comfort and knowledge they have regarding those interventions.

When the participants were asked why they used a certain intervention more often than other interventions, 11 participants mentioned that the ease of access and implementation of interventions were factors that influenced their decisions. For example, one participant said that “[The interventions] are easily accessible and fairly low effort,” which also allows for better patient follow through. Another participant stated that their interventions were “easiest to facilitate via telehealth,” while another stated that their choice was determined by “access to resources [and] housing locations.” Therefore, some participants chose interventions based on setting and the level of difficulty of accessing interventions within those settings. For example, relaxation and breathing techniques may be easier to implement in settings where an OT has access to a room with minimal noise and distractions, while OTs may find it easier to utilize group therapy interventions if they are working in a mental health setting with multiple clients. Another participant stated that they experience barriers such as “limited time and resources” as well, which further explains why OTs choose to use interventions that are

easy and convenient to use. Since most OTs only have a limited amount of time to work with each patient due to set scheduling and appointment times, it is ideal for an OT to choose interventions that are time efficient. Resources such as equipment, clinic space, and other materials may also be scarce, so OTs must also consider realistic and practical interventions that work with the available times and resources they are provided.

Additionally, two participants noted that having a common language and understanding of terminology contributed to their intervention choices. One participant stated how there is a “common language [therapists] can use when addressing sleep or even sleep restriction when necessary” which can make the chosen intervention more accessible for patients. A second participant also noted that the intervention of choice was “tangible and understandable to patients.” Therefore, when OTs use common terminology in their interventions and refrain from using medical jargon, it is easier for patients to follow and understand.

Moreover, two participants stated their own knowledge and experience level as a reason why they use certain interventions more than others. One participant stated that they are “more comfortable educating patients about [interventions],” and they “feel more knowledgeable with these [interventions].” Another participant stated that they had “more training and success with these interventions” as well. Therefore, comfort level, experience, and level of expertise are also factors considered by OTs when they choose the interventions that they use, as it is easier for the therapist to educate patients about an intervention they are already familiar with.

Client-Centeredness

Client-centeredness was seen as the second major theme that emerged from the survey in multiple questions of the survey. When asked why OTs utilize certain interventions more often than others, one participant wrote that “there is no one intervention that will apply to all so I provide as many different interventions in order to see which one the participants is most likely to utilize.” Another participant stated that they considered a client’s access to resources or their living arrangement, independent versus group housing. Lastly, one participant stated that it depends on the client’s diagnosis and a practitioner should also take into consideration social and environmental factors. Other responses mentioned interventions were chosen based on the client’s choice or interest.

When asked if participants change interventions used depending on the sleep issues a client presents with, 27 out of 35 responses stated yes. It is evidenced by this particular response that the reason for the changes were because “every client is unique and requires a different approach.” Factors including the specific needs of the client and social or environmental “may influence follow through.” Multiple participants expressed that accessing a client’s current sleep habits and history of treatment outcomes will change the intervention. If a strategy did not work for a client in the past, different strategies are explored if the client is willing to try. A participant wrote that they would not “force anyone to adopt to my ways and instead will adopt things to what they can handle.”

Underlying Conditions, Symptoms, and Causes

In the third dominant theme we found throughout our survey, 18 of the 40 total participants mentioned that there were several conditions, symptoms, or causes of sleep disturbances that they address in their clients related to the clients' sleep issues. Six of these participants further identified that first addressing underlying conditions which interrupt sleep was most effective in helping improve their clients' quality of sleep. To highlight this theme, a participant stated that in order to address sleep, they will tailor their intervention toward the underlying condition: "[For] someone who is in pain, I focus more on positioning, vs. Someone who is anxious, I work on nasal and diaphragmatic breathing." Similarly, another participant reported, "if my patients have insomnia, I send them to CBT-trained practitioner; most of my clients have limitations related to physical problems, and those I can work with."

Participants acknowledged that many of their interventions were related to the client's diagnosis or cause of sleep issues. One participant stated that they choose their treatment "based on cause of disrupted sleep (pain/anxiety/dysregulated arousal levels, etc.)." Similarly, a participant reported that they often work with clients whose "medical diagnosis [cause] exacerbated sleep issues." Examples of diagnoses mentioned throughout the responses include stroke, spinal cord injury, TBI, cerebrovascular accident (CVA), multiple sclerosis, Parkinson's disease, autoimmune conditions, and other chronic conditions where "sleep [is] often addressed as part of plan of care." Sleep is not the primary reason that clients are referred, with 15 participants stating that clients are referred to them for various diagnoses while 16 participants stated that clients are referred due to mental health and psychosocial reasons. One participant mentioned

occupational therapy referral for their clients was especially for “maladaptive thoughts & behaviors that disrupt ADL performance, which may include sleep.” We thus found that OTs consider their client’s diagnosis and how it may affect their daily occupations, which include sleep.

Thirty-two participants identified sleep hygiene education as their most used intervention, with 13 of those participants identifying that it was their most effective intervention, as expressed by a participant who reported: “I always start with sleep hygiene education and then can jump to other interventions after that educational session when I learn more about a client’s sleep practices.” Sleep hygiene was primarily used to address underlying symptoms. A participant who mentioned treating sleep disturbances in the ICU expressed: “My biggest goal is to prevent delirium. Education first, breathing second . . . and the Calm app or guided meditation . . . to drown out ICU noise and refocus.” Since the cause of the sleep disturbance is particularly due to the ICU setting, this participant utilizes sleep education and further interventions to target the sleep disturbance cause. Therefore, we found that sleep hygiene was thus found to be used first to inform the client on the importance of sleep hygiene target symptoms, followed by the strategies to implement the sleep education to focus on symptoms.

After implementing sleep education, the participants were found to target the clients’ underlying symptoms overall using symptom management to further address their clients’ sleep quality. Seven participants mentioned pain as being a common symptom that leads to sleep disturbances. One participant identified “fatigue, pain, or other symptom management” as symptoms that “often interfere with quality sleep.” Helping their clients with pain management due to their condition was a common response among

several of our survey questions. When asked what their most used intervention was, 28 participants reported working on breathing and positioning, particularly to address pain, with one participant expressing that “breathing and positioning are easy to access and often give results people can use right away.” One participant specified that “diaphragmatic breathing and bed positioning seems to give [patients] instant relief [from pain]” especially among their patients who have spinal cord injury and neuropathy, and thus providing relief from pain allows that participant’s patients to sleep better. One participant utilized sleep education to help the amputee population with their “increase in phantom pain at night, [so] they receive more education around that.” Another participant who identified most of their clients being referred to occupational therapy due to pain management mentioned that “all program [clients] receive all the interventions [breathing/calming techniques, relaxation techniques (e.g., progressive muscle relaxation, meditation, guided imagery), and daily exercise routine] except sleep hygiene, as they are also helpful for chronic pain.” Another participant also commented that they addressed the client’s “source of pain” such as shoulder pain and other pain management techniques to improve their patients’ quality of sleep.

Non-medical issues that led to sleep concerns were also addressed by participants. For example, a participant stated:

Scheduling and time management may be more of a daily routine concern than an actual sleep concern, so I address those components first. Addressing stress can be either directly related to sleep or related to other domains of life. Technology is often a barrier but usually not the primary barrier to sleep.

This was evident in the survey responses, as 36 participants stated that stress was the most common non-medical barrier to sleep that they treated for adults, along with 26 participants indicating time management, 20 participants indicating busy schedules, and 19 participants indicating the use of technology as barriers to sleep. Although not necessarily tied to a specific condition, these non-medical barriers are underlying causes that lead to lack of quality sleep, as revealed by participant responses. Overall, participants acknowledged that, in general, they use “different interventions [to] target different causes of sleep loss. We found that OTs consider how a particular intervention will target the underlying condition, symptom, or cause that further affects the patient’s sleep quality.

Psychosocial Components

Out of the 40 responses from licensed OTs, 35 stated they use sleep interventions with diagnoses dealing with mental health. One participant explained that some diagnosis with complex history of mental health related issues would benefit from “psychotherapy such as art therapy.” There seemed to be a common theme of keeping therapeutic interventions generally convenient and easy to follow when addressing sleep for those with psychosocial factors contributing to their sleep performance. Common issues relating to why people need an OT include psychosocial factors that hinder sleep habits and quality of sleep. These underlying conditions regarding stress, anxiety, and other mental health disorders were seen in our responses and were reasons for their client’s lack of sleep. When asked about the diagnosis of clients the OTs work with, adults with bipolar disorder, psychotic disorders, anxiety, and depression were mentioned multiple times with a description of their experience including “racing thoughts” and

“nightmares,” which impact their quality of sleep. CBT, group therapy, and relaxation training were mainly used as interventions with these psychosocial factors. CBT was used as an intervention 20 times, group therapy was used 10 times, and relaxation training was used 30 times. These chosen interventions were frequently seen in our anonymous responses.

Psychosocial approaches for mental health issues are important in the therapeutic process because it allows clients who have trouble sleeping and staying asleep so that they can be more focused, stable, and alert throughout the day and in their rehabilitation process. Being well rested in the therapeutic process and in their life can improve their engagement and participation in their own occupations. Interference of sleep can be detrimental for those who are already struggling with mental health diagnoses.

Discussion

This research study aimed to identify which sleep interventions were the most effective for adults ages 18-65, and also gave insight into the decision-making process of OTs by utilizing open-ended survey questions to further understand why certain sleep interventions were preferred. The data from this study provided information about specific interventions that may work for the adult population, and which interventions may be beneficial in various occupational therapy settings. Additionally, this study focused on gathering information from actual OTs, and highlighted the opinions and preferred interventions of therapists who have utilized those interventions in their practice. Data from actual OTs is critical for understanding the effectiveness of sleep interventions because OTs are the ones who have personal experience teaching, instructing, and facilitating interventions, as well as setting up treatment plans that are

tailored for each specific client. This emphasizes the importance of the therapist's perspective, as opposed to solely the patient perspective on sleep quality improvement.

Based on the survey results, 15 participants identified accessibility as a key reason for using certain interventions. The data indicated that 11 participants mentioned ease of access as a reason that influenced their decisions, which shows that OTs utilize interventions that are convenient and readily available in the setting they are practicing in. Additional research on this topic would be beneficial, since a more in-depth study may reveal if OTs actually prefer the interventions they mentioned in the survey, or if they are limited to using those interventions due to limitations in accessibility. For example, a participant stated that their choice was determined by "access to resources [and] housing locations," and another stated that they experienced barriers such as "limited time and resources." This may imply that some OTs are only using these interventions because the time restrictions, settings, or lack of widely available resources may be limiting their choices for sleep interventions. This raises the question of whether or not OTs would still choose these interventions if they had access to a wide range of other resources. Therefore, a follow up study would be beneficial to determine how accessibility and availability of resources impacts the participants' choices in occupational therapy sleep interventions.

Another aim with this study was to identify if clients seek OTs specifically for sleep disturbances. When we asked our participants if their clients seek them primarily for sleep concerns, all participants answered no. We have determined that sleep issues contribute to negatively impacting daily occupations such as work, activities, social performances, and client's overall well-being. Based on the survey results, the primary

reason clients are referred by a medical doctor are due to psychosocial reasons including stress, anxiety, addiction, and emotional regulation. The second ranked reason is due to diagnosis specific needs including clients with TBI or CVA. Lastly, the third ranked reason clients seek out services is for rehabilitation and environmental factors (see Figure D5). This may imply that sleep disturbance may be a secondary symptom to a primary diagnosis. This may also imply that clients may not be experiencing severe enough disturbances to seek assistance, or they may not know that OTs can address sleep. In an evidence-based practice article that reviewed the practice of sleep interventions from the OT perspective, Ho and Siu (2018) noted that the “environment can significantly affect one’s sleep, and a key occupational therapy intervention is the use of assistive aids or positioning to facilitate sleep onset.”

Having a client-centered approach was a common theme addressed by the participants, and it is because of that approach and the occupational profile that sleep disturbances are identified. The survey did not collect information on how many clients mentioned sleep disturbance but do not make sleep a priority while goal setting. More information regarding these reasons in a follow up study could provide information regarding possible failed attempts to address sleep or simply if this occupation is not as important to the client as the primary concern is.

Although clients did not receive occupational therapy treatment specifically for sleep disturbances, determining sleep interventions and the decision to use specific interventions for clients were primarily chosen based on accessibility, evidence of practice, and the easiest to use or requires low effort. The most frequently used interventions include sleep hygiene education, relaxing techniques, and

breathing/calming techniques. CBT was also used but not nearly as much as predicted. Education of using assistive devices was selected because this could limit factors that increase sleep disturbances. Ho and Siu's (2018) note that "the use of sleep tools to reduce environmental stimuli may facilitate sleep." Based on the research results, the interventions used were individualized and focused on the client along with what was accessible to the OT. Most participants identified that sleep hygiene is the most effective because it covers a lot of bases, it is all encompassing, and it can be incorporated into their daily routine more easily and individualistically.

Impact of Caseload and Settings on Interventions Chosen

Alongside identifying common themes, we looked at the settings the participants' worked in to find if there was an impact in the types of sleep interventions they utilized. We found that depending on the setting, each participant may utilize particular interventions that are most appropriate for the types of clients they see.

One participant who works in academia with graduate students with no reported diagnoses often addresses mental health issues and underlying causes of sleep issues, and thus mainly utilizes sleep hygiene education, creating a "wind-down routine," and focusing on stress and time management. Two participants who identified working as an OT in the work and industry setting in vocational rehabilitation with a variety of different diagnoses specified that they typically implement sleep hygiene education and routine-based interventions that are simple to learn. Since a vocational rehabilitation setting primarily provides services in both obtaining and maintaining a job, it is presumed that these OTs must provide simple and easy to learn strategies to achieve adequate sleep quality to help with job performance.

A participant who identified working in outpatient therapy mentioned that it is part of their initial evaluation to see how the patient is sleeping, which thus leads to them addressing sleep issues in their caseload of clients with neuropathy, mental health issues, and TBI. Another participant who also works in an outpatient clinic revealed that all their sleep interventions were part of an “intensive rehab program [that addresses] chronic pain.” Basing sleep interventions based on underlying conditions, symptoms, and causes was a common theme we found in our survey as the OT particularly addresses underlying chronic pain, which in turn targets sleep disturbances.

Similarly, participants who indicated working for inpatient therapy such as an acute care unit and ICU reported seeing patients with neuropathy as well as chronic insomnia. One participant working with a high caseload of 700/2000 clients that they address sleep issues by utilizing “mostly breathing and relaxation techniques.” Another participant stated that due to the high turnover rate, their main interventions tend to be breathing/calming techniques, sleep hygiene education, as well as internet resources such as phone applications or podcasts. These interventions are presumably easier to perform individually and can be easily done at home once the client is discharged. Furthermore, the inpatient hospital setting led one participant to report that another way to reduce sleep disturbances while in the hospital include “turning off as many alarms/beeps as practical for care, [having] nursing staff on board with pulling curtains and lights at a specific time and doing as few procedures/lab draws/IV changes as possible between 9[pm] to 7am.” This was the only participant to particularly mention how they increase sleep quality in that specific setting without it being a particular intervention that they implement during

treatment. Creating environmental changes depending on the setting can greatly impact a client's sleep quality.

Based on the survey responses, we found that half of the participants mentioned that a large portion of their caseload involved seeing clients with mental health issues and addressing sleep issues with these specific diagnoses. Many participants who primarily worked in a mental health setting and thus had mental health as the majority of their caseload indicated using relaxation practice, utilizing treatments targeting lifestyle and behavioral needs, and also incorporating CBTI in their practice. This was the case both for participants with a small caseload (i.e. seeing 10/10 clients with mental health diagnoses) or a large caseload (with 700/1000 clients having mental health diagnoses). For example, one participant who indicated seeing 20/200 clients with mental health issues mostly used sleep hygiene education to particularly target post-surgical pain. This relates to our findings that sleep hygiene education is often used to target underlying causes of sleep disturbances, particularly pain. Furthermore, we found that participants who have a high caseload (100+ clients who they address sleep issues with) that work with a variety of different diagnoses (TBI, insomnia, developmental disabilities, neuropathy, mental health) typically focus on addressing the underlying stress, anxiety, and especially high pain to help their clients sleep better. One participant who specified working in a community mental health setting identified using group therapy as it is “beneficial to develop insight and hear from others' experiences” as well as using an “activity-based approach . . . due to varying cognitive levels.” This was the only participant to identify utilizing a group therapy intervention to address sleep issues, most likely due to their community setting.

Also in the mental health setting, we found that two participants mentioned specific interventions with their clients to address mental health issues. One participant who worked primarily in a mental health setting emphasized in their responses that they mainly used Alpha-Stim cranial electrotherapy stimulation (hereby referred to as “Alpha-Stim”). Alpha-Stim is an electrotherapy device used for pain management, anxiety, insomnia, and depression by wearing small clips onto the earlobes that send small electrical currents to the brain (Electromedical Products International, Inc., 2021). While they only have a small caseload of 3/20 clients that they address sleep issues with, this participant stated that by first targeting the patient’s depression and anxiety, Alpha-Stim “works” and their patients have “excellent outcomes” utilizing this treatment for sleep. Similarly, another participant mentioned that stimulus control is one of their most effective interventions. Stimulus control is a behavioral intervention technique often utilized in CBTI to help the individual associate using the bed as a cue for sleeping and to re-establish a consistent sleep schedule (Newsom, 2020; Stanford Health Care, n.d.). While we did find usage of CBTI for sleep in our literature review, we did not find any mention of Alpha-Stim to be typically used by OTs in the literature. This leads to insight that there may be other types of uncommonly used interventions not particularly studied with OTs, and so more research should be done to recognize other types of interventions OTs can utilize and their benefits for sleep issues.

Limitations

Several limitations should be clearly mentioned in this study. First, due to the anonymous nature of the questionnaire and the multiple online delivery methods used to distribute the questionnaire, there was no way to verify eligibility. Consequently, this did

not guarantee our participants were practicing OTs who address sleep. A second limitation was that answering every question was not a requirement. Participants were able to skip questions they did not feel comfortable answering and therefore, many questions were left unanswered. Because no contact information was collected, follow up for clarification was not possible. This left a gap of information regarding sleep concerns and interventions used that could have been helpful when analyzing data to rule out misinterpretation of the responses or capture additional information. Third, various questions asked the participants to elaborate on a multiple-choice question, however, some participants did not. Because open-ended questions were not completely answered, we could not create conclusions based on specific implications. This may not have allowed us to capture an accurate representation of the participants' responses and analyze the data accurately. Lastly, only utilizing an online survey may have limited participation from those who may not have had access to the internet, have any limitations in vision, reading, or other physical difficulties.

OT Implications

The results of this research study allowed us to gain an understanding of which sleep interventions OTs prefer to use for the adult population, and why they utilize those specific interventions over other interventions. Multiple open-ended questions in the survey allowed participants to briefly explain their rationale for choosing certain interventions, which allowed us to compare and find similarities between responses. Determining which sleep interventions have the highest efficacy for adults allows OTs to understand which interventions are suitable to target the needs of the adult population. Since previous studies have addressed sleep interventions that cater to the geriatric or

pediatric populations, the results of this study provide information for OTs that specifically applies to adults ages 18–65.

After reviewing the data, we found that OTs made their decisions based on factors such as accessibility, client-centeredness, and the setting they are currently practicing in. Therefore, this study gives insight into which interventions OTs use with different clients and settings, as interventions vary depending on the environment and the client's unique needs and preferences. Some interventions may not always be accessible, so this allows OTs who are viewing the study results to see what other OTs may be doing with the resources they have available. The data allows other therapists to see what interventions are effective, what interventions other OTs have previously used or are currently using, and the clinical reasoning behind their choices. This is beneficial for practicing OTs, as it lets them see which types of interventions are working for other therapists. If an OT is currently working with adults ages 18–65 in a particular setting mentioned in this study, they can incorporate the strategies and information provided by other OTs into their practice. Furthermore, the study results are potentially beneficial for OTs who do not directly address sleep in their practice as well, as the majority of participants in the study indicated that their clients do not see them primarily for sleep conditions. The data from the study is useful for other OTs in general, since helping to improve a patient's sleep may also help the patient with their occupational performance in other tasks during occupational therapy. For example, if an OT is treating an adult who experiences psychosocial issues such as depression or anxiety, the patient's sleep quality may also be negatively impacted. It would be beneficial for the OT to consider implementing a sleep related intervention with their client as part of the treatment plan, as this may improve the

client's performance and engagement in other occupations. Therefore, the data from this study can help therapists in different settings who are treating a variety of patients, and further emphasizes the importance of OTs addressing sleep related issues.

Conclusion

The impact of lack of sleep for clients can be detrimental to their overall well-being and can hinder the progress of their rehabilitation or therapy treatment. This is because of the nature of how sleep plays a role in our lives and how important it is for rest and recovery. Based on the research, OTs have found various ways to incorporate different sleep interventions based on the clients' needs along with how accessible the intervention plan can be used at their facility. Our study found that OTs use a variety of different sources to address sleep for individuals with different diagnoses. Evidence-based articles suggest that results of specific interventions can be evaluated with standardized tests and can show the success rate of those tests. Based on the findings from our OT participants, we have found that sleep hygiene education and relaxation training were the most used to implement to their clients who have trouble sleeping. These interventions were used the most out of the other interventions and the OTs described them as accessible, easy to facilitate, and cost efficient. Interventions like CBT, assistive devices, and sleep journals were mentioned, but our participants explained that these are not used as often because of the time it takes to implement them, the cost of the devices, and the effectiveness of the intervention. Sleep hygiene education and relaxation training were mentioned in 21 out of the 40 responses with our data collection. The OT participants discussed how they found these techniques to be the most effective and efficient to address sleep. This information was collected by obtaining quantitative and

qualitative data through anonymous survey responses from practicing OTs from around the country.

The purpose of this study was to identify which interventions OTs used with the adult population ages 18–65 the most and why. The survey revealed which settings the OTs practiced in, what diagnoses or community they work with, what intervention they find more successful, and why they chose that specific intervention. Since we targeted OTs who work with the adult population, we found that there are a variety of settings and diagnoses that use sleep interventions to address sleep deprivation due to their diagnoses. Settings included inpatient and outpatient clinics, acute care, community based, and private practices. There were a variety of different diagnoses that these OTs worked with including TBIs, neuropathy, chronic insomnia, and other mental health conditions (anxiety, depression, etc.) We recommend further research in hopes to build a universal sleep manual that can be used in different occupational therapy settings and can be accessible to clients. A sleep manual will help narrow the gap between the lack of guidance in research for OTs and the variety of conditions we would see in the clinics. The manual would be a resource for OTs, across multiple settings, to use in order to address sleep dysfunctions among different populations. This study provided insights on how OTs select appropriate interventions for sleep issues in their clientele, and the interventions identified in this study provide a starting point in support of developing an occupational therapy manual aimed at addressing the vast impact that sleep dysfunction can have for adults in all areas of life. The importance of sleep and its effects on overall engagement in life and various occupations means OTs can play a role in addressing sleep issues that can lead to better quality and engagement in life.

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http://www.internationaljournalofcaringsciences.org/docs/69_1_serapyildirim_original_13_2.pdf

Appendix A**Survey Questions****Consent Form****Screening Questionnaire:**

1. Do you address sleep in your practice?
 - i. Yes, No
2. Do you work with adults ages 18-65?
 - i. Yes, No, Other __
3. What is your current educational level in terms of occupational therapy?
 - i. Associate's
 - ii. Bachelor's
 - iii. Master's
 - iv. Doctorate
4. What are your current credentials?
 - i. OTA
 - ii. OTR/L
 - iii. OT/L
 - iv. OTD
 - v. Other ____
5. How many years have you been practicing OT?
 - i. 0-3
 - ii. 3-5
 - iii. 5-10
 - iv. 10+
6. What state(s) are you currently practicing in?
 - i. (Explain box)

Appendix B

Survey Questions

Demographic Questions: ****Please Choose All That Apply****

1. Where did you learn about the sleep interventions that you use?
 - i. Journals – OT
 - ii. Journals – non-OT
 - iii. Learned from OT school
 - iv. Learned from colleague or coworker
 - v. Conferences
 - vi. Continuing education courses
 - vii. Other ____
2. What OT setting(s) have you worked in that address sleep?
 - i. Academia
 - ii. Acute Care
 - iii. Community
 - iv. Early Intervention
 - v. Geriatrics
 - vi. Health & Wellness
 - vii. Home Health
 - viii. Hospital
 - ix. Inpatient
 - x. Long-term care/Skilled nursing facility
 - xi. Mental Health
 - xii. Outpatient
 - xiii. Private Practice
 - xiv. Pediatrics
 - xv. Rehabilitation & Disability
 - xvi. Work & Industry
 - xvii. Other
3. What kind of diagnoses do you work with when utilizing sleep interventions?
 - i. Traumatic Brain Injuries
 - ii. Chronic Insomnia
 - iii. Developmental Disabilities
 - iv. Neuropathy
 - v. Mental health (Anxiety, Depression, etc.)
 - vi. Other ____
4. Out of your total caseload (past and present), how many clients have you addressed sleep issues with? (i.e. 50/100, 75/300).
 - i. Explain box

5. Please provide a breakdown of the number of clients in your total caseload with Traumatic Brain Injuries that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box
6. Please provide a breakdown of the number of clients in your total caseload with Chronic Insomnia that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box
7. Please provide a breakdown of the number of clients in your total caseload with Developmental Disabilities that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box
8. Please provide a breakdown of the number of clients in your total caseload with Neuropathy that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box
9. Please provide a breakdown of the number of clients in your total caseload with Mental Health (Anxiety, Depression, etc.) that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box
10. If you identified any other diagnoses that you work with when utilizing sleep interventions, please state the diagnosis and provide a breakdown of the number of clients in your total caseload that you address sleep issues with (i.e. 10/100, 25/300).
 - i. Explain box

Population Specific Questionnaire:

1. Which intervention do you use the most?
 - i. Cognitive Behavioral Therapy
 - ii. Assistive Devices (weighted blankets, sound machines, essential oils, eye mask, etc)
 - iii. Breathing/Calming techniques
 - iv. Sleep Hygiene Education
 - v. Journaling
 - vi. Relaxation techniques (e.g. progressive muscle relaxation, meditation, guided imagery)
 - vii. Group therapy
 - viii. Internet resources (phone apps, podcasts)
 - ix. Other ____
2. Why do you use this intervention more often than other interventions?
Please explain.
 - i. Explain Box
3. Which intervention is most effective from what you use most often?
Please explain.

- i. Explain box
4. If you have work experience with other populations (not just the adult population), do your sleep interventions differ compared to what sleep interventions you use for the adult population? If yes, please explain how the interventions differ.
 - i. Yes / No / N/A
 - ii. Explain box
5. What are some common non-medical issues or barriers to sleep that you treat for adults?
 - i. Technology
 - ii. Stress
 - iii. Busy schedules
 - iv. Time management
 - v. Familial issues
 - vi. Environmental issues/living arrangements
6. Do you change what interventions you use depending on the sleep issues the client presents with? If so, why? If not, why not?
 - i. Explain box
7. Do your clients come to you primarily for sleep concerns?
 - i. Yes/No
8. If your clients do not come to you primarily for sleep concerns, what is the primary reason clients come to see you?
 - i. Explain box
9. Are there adult clients that do not respond to certain treatments or interventions?
 - i. Yes / No
10. If there adult clients that do not respond to certain treatments or interventions, please explain who they are and why they do not respond. (Students, adults with specific conditions, adults ages 50+, etc.)
 - i. Explain box

Appendix C

Institutional Review Board Approval

03/22/2021

Re: IRB Application Number MSOT10-04

Dear Dr. Filemu,

The Stanbridge University Institutional Review Board has completed a review of your application entitled, "Occupational Therapy Sleep Interventions for Adults." Your research protocol MSOT10-04 is fully approved and categorized as exempt.

Should you wish to make modifications to this approved protocol, please submit a modification form for IRB review and approval. No changes may take place without IRB approval.

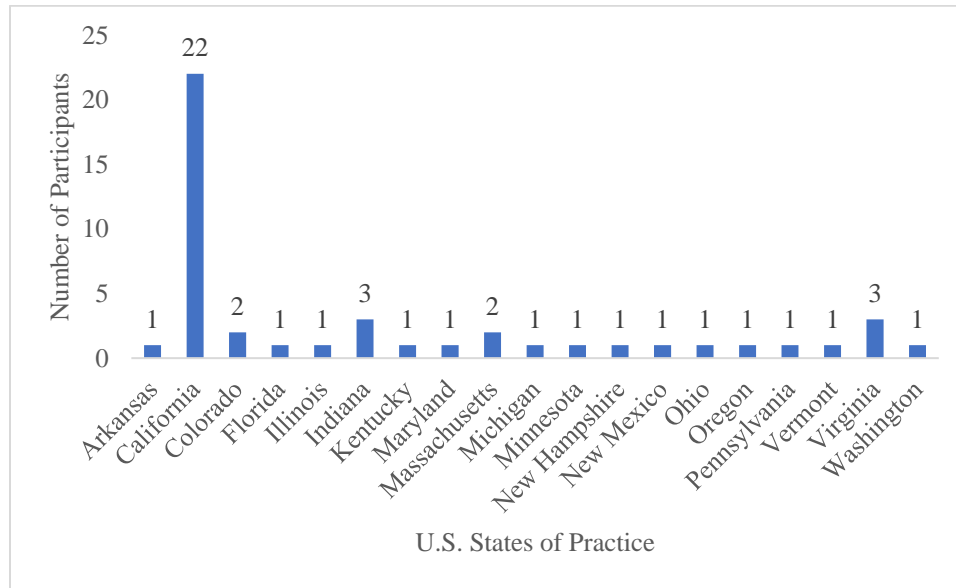
Sincerely,

Dominique N. Wascher, Ph.D.
IRB Chair

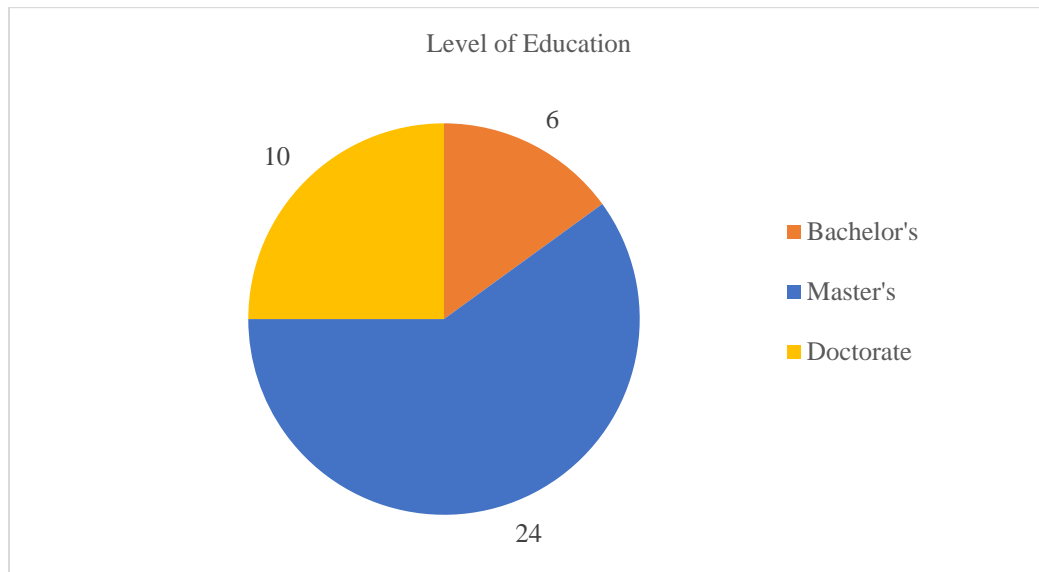
Appendix D

Figure D1

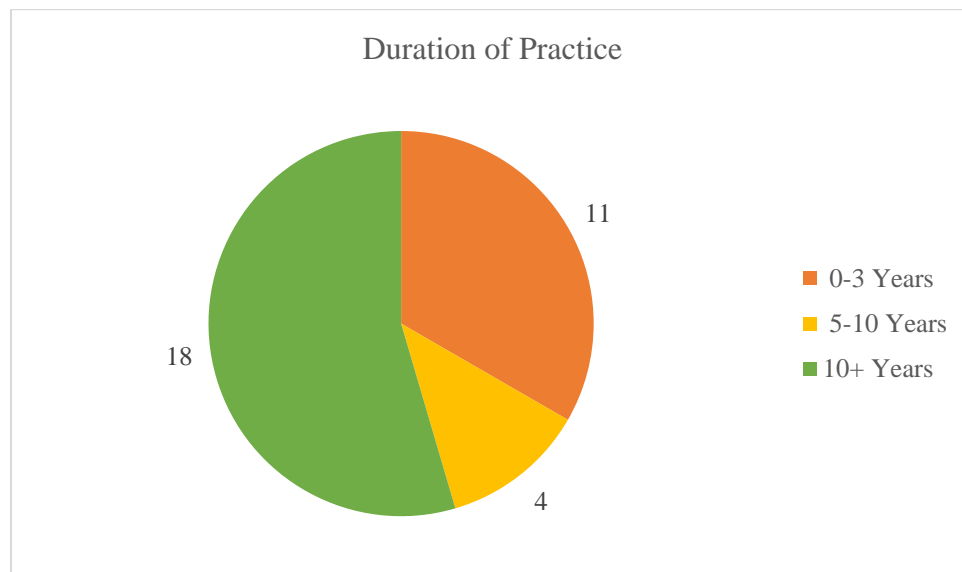
Participants' Different U.S. States of Practice



Note. The data in Figure D1 reports the x-axis as the number of participants practicing occupational therapy in a specific state. The y-axis reports which states were reported on the survey. Several participants indicated multiple states, leading to a total of 46 states mentioned in the survey from the 40 participants.

Figure D2*Participants' Level of Education*

Note. The data in Figure D2 represents the number of participants who obtained a certain educational level in occupational therapy.

Figure D3*Participants' Number of Years Practicing Occupational Therapy*

Note. The data in Figure D3 represents the participants' duration of practice in occupational therapy in years.

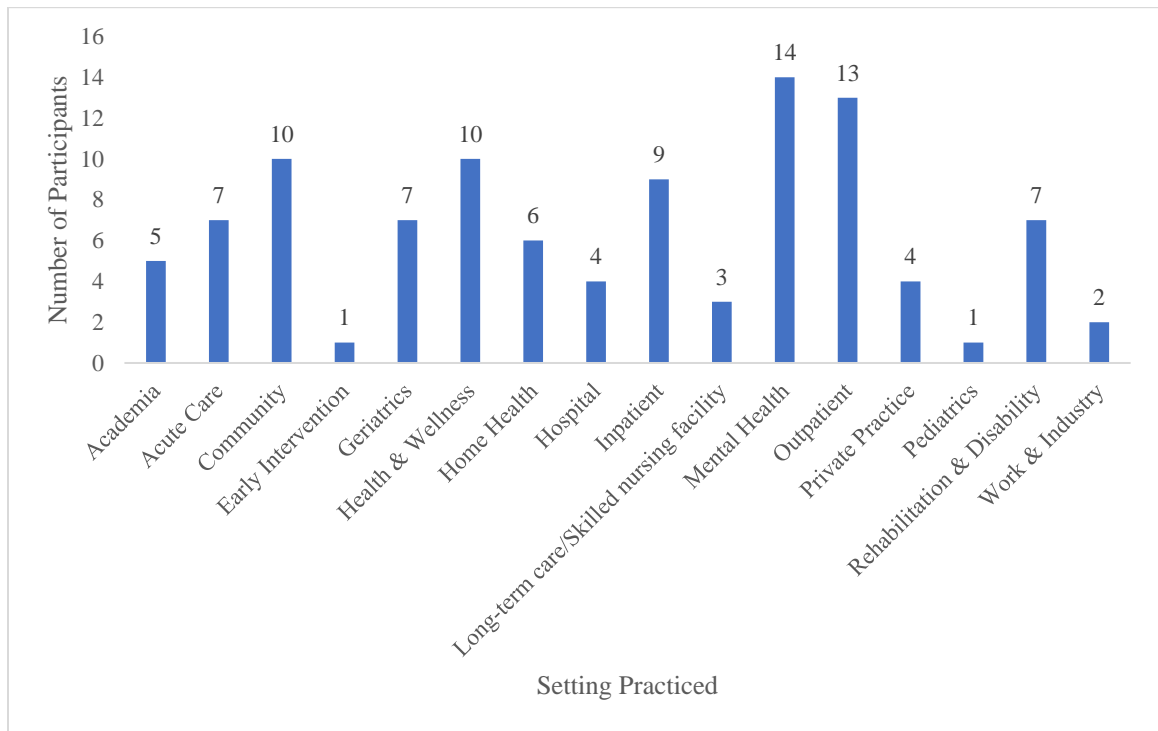
Table D1*Where Participants Learned Their Sleep Interventions*

| Where Learned Sleep Intervention | Number of Responses |
|---|---------------------|
| Journals – OT | 21 |
| Journals – non-OT | 12 |
| Learned from OT school | 16 |
| Learned from colleague or coworker | 22 |
| Conferences | 11 |
| Continuing education courses | 27 |
| Online Resources (blogs) | 1 |
| Job during OT school | 1 |
| Sleep Researchers from Conferences | 1 |
| Personal experience | 1 |
| Fieldwork educators | 1 |
| Residency Preceptor | 1 |
| Random reading of articles and research | 1 |
| Self-taught | 1 |
| National Sleep Foundation | 1 |
| Work experience | 1 |

Note. The data in Table D1 lists the areas where each participant indicated where they learned the sleep interventions they use in practice.

Figure D4

List of Settings Where Participants Practice



Note. The data in Figure D4 reports the x-axis as the setting where participants have practice occupational therapy. The y-axis reports how many participants indicated a certain setting. Several participants listed multiple practice settings, leading to 103 total responses.

Table D2*Diagnoses That Participants Have Worked With*

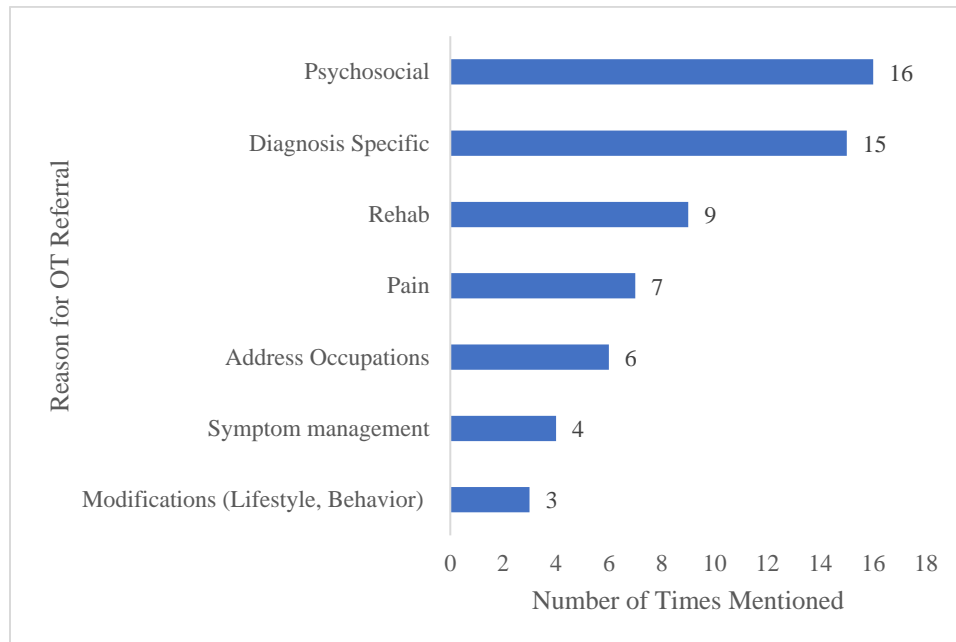
| Diagnoses | Number of mentions |
|---|--------------------|
| Mental health (Anxiety, Depression, PTSD, etc.) | 37 |
| Traumatic Brain Injuries | 15 |
| Chronic Insomnia | 14 |
| Neuropathy | 11 |
| Developmental Disabilities | 6 |
| Chronic pain (including CRPS) | 6 |
| Chronic illness (inc. fibromyalgia) | 6 |
| Intellectual Disabilities (inc. ADHD, ASD) | 5 |
| Neurological conditions (inc. migraines, epilepsy, CVA) | 5 |
| Pain Management | 4 |
| COVID-19 | 3 |
| SCI | 3 |
| Autoimmune conditions (incl. MS, PD) | 3 |
| Obesity | 2 |
| Respiratory (incl. COPD) | 2 |
| Addiction | 1 |
| Amputation | 1 |
| Cancer | 1 |
| Cardiac | 1 |
| Caregivers of clients with dementia | 1 |
| Diabetes | 1 |
| Fatigue | 1 |
| Grad students | 1 |
| Hypertension | 1 |
| Low back pain | 1 |

| | |
|-------------------------------------|---|
| Multiple trauma | 1 |
| Non-traumatic brain injury (anoxic) | 1 |
| Recent hospitalization | 1 |

Note. The data in Table D2 lists the different diagnoses that the participants have reported to work with.

Figure D5

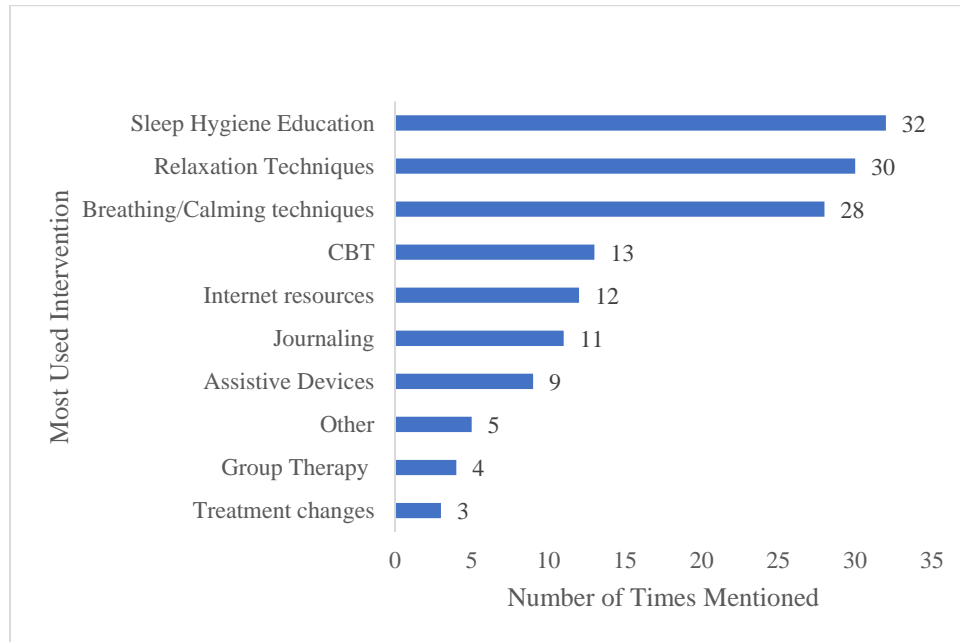
Primary Reason for Occupational Therapy Referral



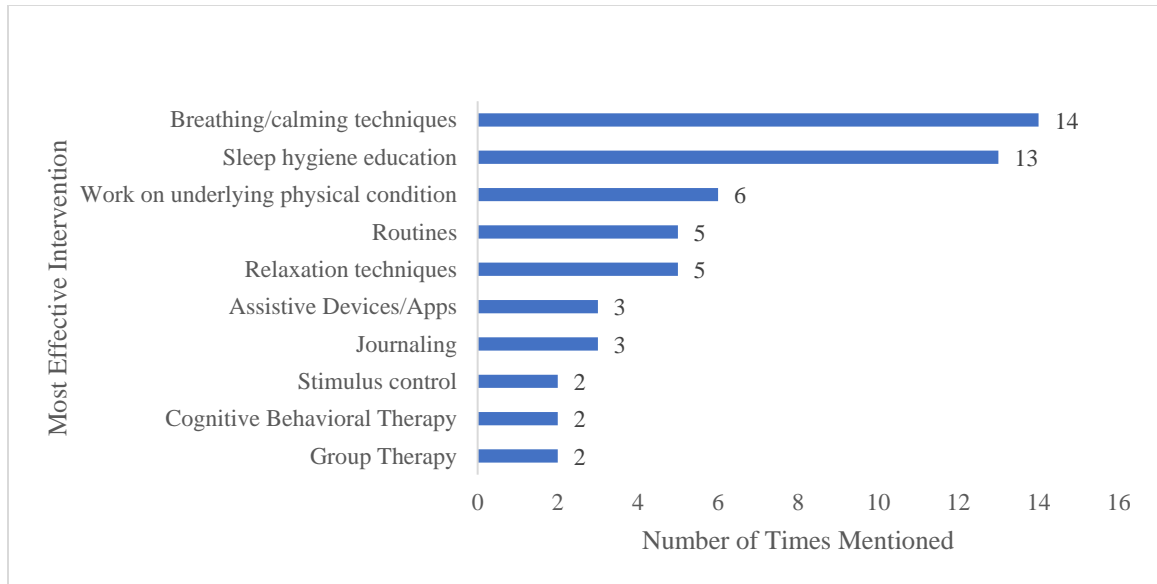
Note. The data on Figure D5 displays the y-axis as the primary reasons why clients are referred to occupational therapy services, as indicated by the survey participants. The x-axis displays the number of times each response was mentioned in the survey. Clients were not reported to have been referred for OT for sleep concerns specifically.

Figure D6

Most Used Intervention for Sleep Concerns



Note. The data in Figure D6 displays the y-axis as the most used interventions for sleep concerns as indicated by participants. The x-axis displays the number of times each response was mentioned in the survey.

Figure D7*Most Effective Intervention for Sleep Concerns*

Note. The data in Figure D7 displays the y-axis as the most effective interventions for sleep concerns, based off the responses from the question from Figure 6. The x-axis displays the number of times each response was mentioned in the survey.