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EFFECTS OF MODIFIED ADAPTIVE BASED OCCUPATIONAL THERAPY INTERVENTION TO IMPROVE SLEEP AMONG NURSES

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ABSTRACT

Objectives: Sleep deprivation is distinguished by an absence of sleep, an inadequate sleeping pattern, insufficient sleep, or a disrupted sleep–wake cycle. The two most prevalent forms of sleep deprivation are acute sleep deprivation and chronic partial sleep deprivation. Sleep duration should range between 7 to 9 hours for young and middle-aged adults aged 18 to 65 years. The study aimed to determine the Effects of Modified Adaptive Device based Occupational Therapy intervention to improve sleep among Nurses. **Methods:** Thirty individuals having sleep disturbance and affected quality of life were selected based on

convenient sampling method and divided into two groups. A pretest and post-test evaluation was administered with the Insomnia Severity Index. A statistical analysis was performed using Wilcoxon signed rank test and Mann–Whitney U test. Result: The Results indicated that modified adaptive device based occupational therapy significantly intervention significantly improved sleep, and quality of life among nurses with insomnia ($p=0.002$). Conclusion: The study concluded that modified adaptive device based occupational therapy intervention was effective among nurses population on improving sleep, and quality of life.

Keywords: Sleep deprivation, Nurses, Modified adaptive device, Occupational therapy

INTRODUCTION:

Occupational therapy (OT) is a health field focused on assisting individuals in performing daily activities that are significant and meaningful to them through participation in their valued occupations, promoting function, and enhancing well-being. Well-being is a complex concept that encompasses various factors, including physical, mental, social, and environmental dimensions of an individual's life. Mental health issues are linked to challenges in managing emotions, thoughts, and behaviors, as well as difficulties in executing everyday tasks [1].

Within the realm of mental health, occupational therapy seeks to empower individuals to achieve favorable mental health outcomes, avert mental illness, and assist in recovery by employing purposeful activities to encourage engagement in tasks [2].

Sleep is a fundamental human requirement vital for sustaining health, conserving energy, enhancing appearance, and ensuring

physical wellbeing [3]. Sleep deprivation is distinguished by an absence of sleep, an inadequate sleeping pattern, insufficient sleep, or a disrupted sleep–wake cycle. It is described as failing to get enough sleep in relation to one's physiological and developmental needs to preserve optimal alertness during the day. The two most prevalent forms of sleep deprivation are acute sleep deprivation and chronic partial sleep deprivation [4].

As per recent findings from the National Sleep Foundation, suitable sleep duration should range between 7 to 9 hours for young and middle-aged adults aged 18 to 65 years [5]. Short-term effects of sleep interruption encompass heightened stress reactivity, physical pain, decreased quality of life, emotional turmoil and mood disorders, as well as deficits in cognitive abilities, memory, and performance. For teenagers, sleep disruption affects psychosocial well-being, academic performance, and engagement in risk-taking behaviors. In

children, sleep disruption correlates with behavioral issues and cognitive performance. Long-term effects of sleep disruption in otherwise healthy individuals consist of hypertension, dyslipidemia, cardiovascular illnesses, weight-related problems, metabolic syndrome, type 2 diabetes mellitus, and colorectal cancer. Symptoms include fatigue, irritability, mood changes, and trouble concentrating [6].

We might experience sleep deprivation due to various factors. Lifestyle elements like shift work, stress, and the use of media and electronic devices prior to sleep have been noted to affect the physiological changes in melatonin secretion, resulting in sleep deprivation. The aging process also interferes with the sleep physiology and diminishes total sleep duration. Individuals with sleep disorders such as insomnia, restless leg syndrome (RLS), periodic limb movements (PLM), and sleep breathing disorders (SBD) are more likely to experience sleep deprivation [7].

Chronic insomnia was seen in 33% of the adult population sampled. Increasing age and diabetes were significantly associated with insomnia, while other socioeconomic factors and comorbidities were not significantly associated. Twenty-seven percent of patients who had insomnia did not perceive the condition, which was statistically significant [7].

Cognitive Behavioral Therapy:

CBTi is a systematic program designed to enhance sleep by recognizing and altering the negative thoughts and behaviors associated with it, including cognitive traps and beliefs about sleep restriction. CBTi is typically implemented weekly and assessed through various evaluations, such as a sleep diary. Two of the studies incorporated CBTi as the foundation of their sleep management program. They discovered that CBTi could substantially enhance the capacity to manage sleep problems in patients with PTSD, alleviate their sleep difficulties and nightmares, diminish dysfunctional sleep beliefs, and boost their capability to engage in social roles [8].

Lifestyle Interventions:

Among the chosen articles, there exists one extensive RCT that centers on lifestyle changes to enhance sleep in elderly individuals living in the community. The lifestyle modification focuses on encouraging healthy sleep practices and adjusting daily activities, aiding in the transition of roles during aging through education, sharing experiences, and establishing goals. Both excessive and insufficient daytime activities are closely linked to nighttime sleep patterns; rearranging daytime activities assists individuals in achieving a more balanced lifestyle to promote better sleep at night. The

program shows favorable shifts in sleep habits, such as an increase in sleep duration, a decrease in sleep issues, and a reduction in nightmares. Participants also showed a decrease in napping during the day and an increase in activities during the day, particularly social engagements. This research implies that managing sleep encompasses not only sleep itself but also daytime activities [8].

Sleepmask:

The primary purpose of using a sleep mask is to block out artificial light. It creates an ambience for resting well, which aids in catching on a good night's sleep. The internal clock control sleep-wake patterns in humans, and exposure to light at night can disrupt its functioning. It occurs because artificial light suppresses the release of melatonin, a sleep inducing hormone responsible for signaling the brain that is time to rest. When you come in contact with light, the release of this hormone is disrupted, and a wrong sign is sent to the brain. This negatively affects your ability to fall asleep quickly. (ResMed 2022) [7]. Thus, individuals are advised to reduced exposure to streetlights, ambient lights, and blue lights to sleep well. They should be mindful of avoiding intrusive lights as they can result in shallower sleep periods. This is how eye masks prove helpful. They act as a shield that blocks artificial light. In this way,

they realign the internal biological clock with rising and setting sun and help to sleep better [9].

Sleep-Inducing Music:

The ability to hear music depends on a series of steps that convert sound waves coming into the ear into electrical signals in the brain. As the brain intercepts these sounds, a cascade of physical effects is triggered within the body. Many of these effects either directly promote sleep and reduce issues that interfere with sleep. Music enhances sleep because of its effects on the regulation of hormones, including the stress hormone cortisol. Music. The-release can boost good feelings at bedtime and address pain, another common causes of sleep issues. Music improves sleep through calming parts of the autonomic nervous system, leading to slower breathing, lower heart rate, and reduced blood pressure [10].

MATERIALS AND METHODOLOGY

This study involved 30 nurses experiencing sleep deprivation, divided equally into two groups: 15 in the experimental group and 15 in the control group. The research was conducted at Saveetha Hospital, Thandalam. The independent variable was a combination of sleep masks and sleep-inducing music-based occupational therapy, while the dependent variable was sleep deprivation. Participants were selected based on specific criteria.

Inclusion criteria were nurses aged between 22 to 30 years and scoring above 8 on the Insomnia Severity Index (ISI). Exclusion criteria included nurses with neurological conditions, such as migraines, or psychiatric conditions, such as schizophrenia or depression. The study utilized the Insomnia Severity Index (ISI) scale to assess sleep deprivation levels among participants. This tool helped quantify the severity of sleep deprivation and monitor changes in response to the intervention.

The nurses were selected for the study from Saveetha Hospital. A Insomnia severity index scale was used to assess the sleep quality for control group and experimental group, 15 patients in each group. The pretest was assessed for both the group. The experimental group progressive muscle relaxation with sleep music and sleep mask and the control received conventional occupational therapy intervention. The intervention was continued for 3 months and a post-tests were taken both the groups.

RESULT AND DISCUSSION

Table 1 showed scores in the pre and post test of control group. The mean value in the pre test is 16.8667 and in post-test 16. The 'z-value is -3.127 and the 'p' value is 35 0.002 It is considered to be statistically significant since the control group underwent conventional OT. The positive results with previous study In a previous

article Relaxation technique as an intervention for chronic pain: A similar result (2021) published by Sara Magelssen Vambheim, Tonje Merete Kyllø, *et al*, [11] they have proved relaxation techniques are effective in sleep deprivation and they have an significant difference between pre and post test in control group.

Table 2 It showed the scores in pre and post test of Experimental group. The mean value in pre test is 15.7333 and in post test is 12.2. The 'Z-value is -3.535 and the 'p' value is 0.00*. It is considered to be statistically significant since the experimental group underwent Modified Adaptive device for sleep deprivation patients. The positive results are in accordance with previous study. This study was supported by in an previous study Effects of earplugs and eye masks combined with relaxing music on sleep, melatonin and cortisol levels in ICU patients: a randomized controlled trial (.2020) published by Rong-Fang Hu, cmXiao-Ying Jiang, Kathleen M Hegadoren, and You-Hua Zhang they have proved that modified adaptive device are effective in randomized controlled trial (2020) published by Rong-Fang Hu, cmXiao-Ying Jiang, Kathleen M Hegadoren, and You-Hua Zhang [12] they have proved that modified adaptive device are effective in treating sleep deprivation and they have showed the significant

difference between pre and post-test in experimental group, hence my study also shows an significant difference in pre and post test in experimental group.

Table 1: Statistical analysis of pre- test and post- test in control group

Test	Mean	SD	N		Z value	p value
Cntr1_Pre	16.8667	3.56304		15	-3.127	0.002*
Cntr1_Post	16	3.7985		15		

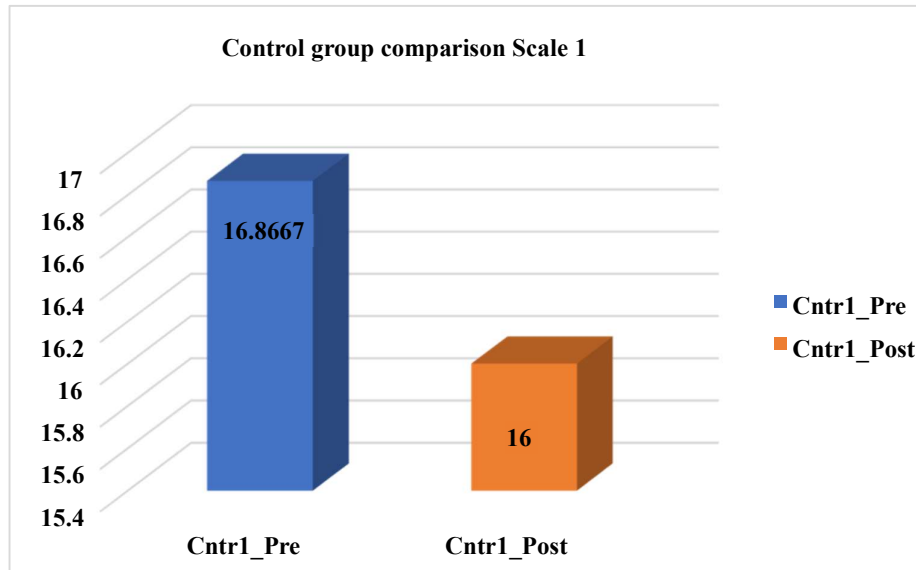


Figure 1

Table 2: Statistical analysis of pre- test and post- test in experimental group

Test	Mean	SD	N		Z value	p value
Expt1_Pre	15.7333	2.46306		15	-3.535	0.00*
Expt1_Post	12.2	2.33605		15		

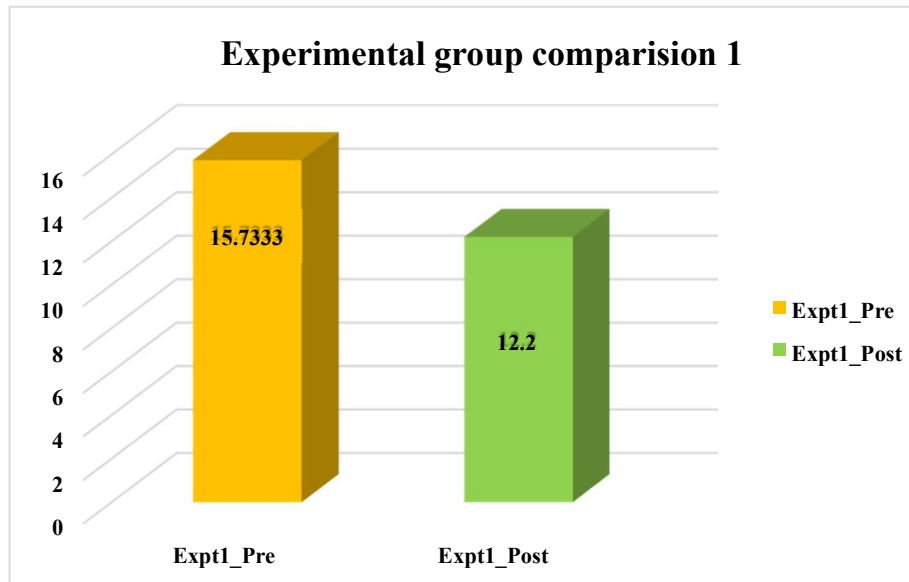


Figure 2

Table 3: Statistical analysis between the post- test scores of the control and experimental group

Group	Mean	SD	N	Z value	p value
Cntr1_Post	16	3.7985	15	2.82	0.005*
Expt1_Post	12.2	2.33605	15		

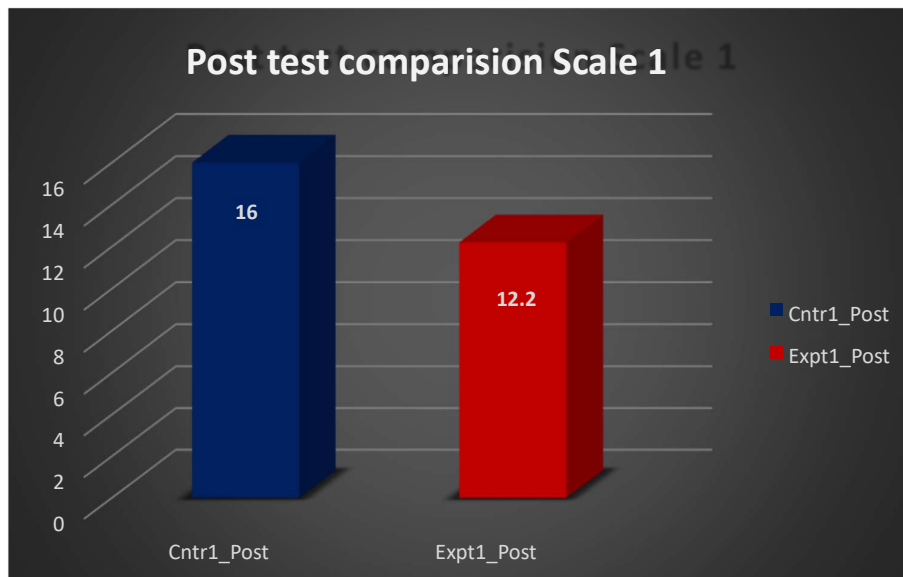


Figure 3

It showed the comparison of post test scores between control and experimental group. The mean value of the control group is

16.8667 and the experimental group is 15.7333. The 'Z-value' is 2.82 and the 'p' is 0.005. Since the p-value 0.005 is lesser than

0.05 alternate hypothesis is accepted. There was an statistical significant difference in post test between the experimental and control group. there was an improvement in post test scores of experimental group compared to the controlled group. This result was supported with previous 36 article The effects of eye masks and earplug on sleep quality, anxiety, fear, and vital signs in patients in an intensive care unit: a randomized controlled study (2023) published by Gulcan Bahcecioglu *et al* [13] they have proved that modified adaptive are effective in treating sleep quality, anxiety, fear and vital signs and they have showed the comparison of post test scores between control and experimental group. Hence my study also shows a comparison of post test scores between control and experimental group. It has been observed that intervention and the daily usage of modified adaptive device along with progressive muscle relaxation techniques resulted in a noticeable improvement in the nurses with sleep deprivation. This study shows the level of sleep among nurse. The study was conducted over a period of 3 months. Thirty nurses were selected with moderate to severe range of sleep, where 15samples were experimental group they underwent modified device based occupational therapy intervention 15 samples in control group they underwent relaxation technique for

intervention. There result found that the statistically difference was there in the scores of pre-test and post-test for control and experimental group.

This further analysis reveal that there was a significant improvement in experimental group compared to control group after receiving modified device based occupational therapy intervention to reduce sleep among nurses.

Hence, there is statistically significant difference Hence, there is statistically significant difference in post test scores between experimental and control group. This suggests that the intervention received by the experimental group had more improvement when compared to control group.

CONCUSION:

This study shows the level of sleep among nurse. The study was conducted over a period of 3 months. Thirty nurses were selected with moderate to severe range of sleep, where 15samples were experimental group they underwent modified device based occupational therapy intervention 15 samples in control group they underwent relaxation technique for intervention. There result found that the statistically difference was there in the scores of pre-test and post-test for control and experimental group. This further analysis reveal that there were a significant improvement in experimental

group compared to control group after receiving modified device based occupational therapy intervention to reduce sleep among nurses.

Hence, there is statistically significant difference in post test scores between experimental control group. This suggests that the intervention received by the experimental group had more improvement when compared to control group.

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