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Effect of Yoga and Meditation on Sleep Disturbance at Dhule

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ABSTRACT

Background- Sleep plays an important role in individual's physical as well as mental health. The incidence/prevalence of sleep disturbances is rising day by day this indirectly affects the closely related cardiovascular system, immune system and metabolic functions of the body. However, a comprehensive and systematic study has not been conducted.

Objective-To evaluate the effect of long term yoga and meditation on sleep quantity, quality as well as physical well being of a person.

Methodology- This was a questionnaire based descriptive case control study conducted by asking questions from a predesigned Performa which included questions about ones sleep hours, problems and factors which may be contributing to it.

Results- We conducted the study among 60 participants. Out of which 38(61.29%) were male and 24(38.70%) were female. The mean age of the participants was 37.21 years (SD=14.463). **The chi-square** statistic is 10.314. **The p-value is .00132 and is significant at p<0.05.** So it was found that there was strong association between Yoga-meditation and Sleep disturbances. Odds ratio came out to be 0.4156, which shows that there Yoga and Meditation are protective against sleep disturbances.

Conclusion- Yoga and Meditation can be effective in treating sleep disturbances and improving sleep quality for healthy individuals and clinical patients. More high quality and well controlled studies are needed to make a better conclusion in further study.

Key-Words- Sleep disturbances, Yoga, Meditation, Sleep quality.

I. INTRODUCTION

According to recent epidemiological studies, almost 25% of adults had sleep complaints, 10-15% had insomnia symptoms accompanied with daytime consequences, and 6-10% met the diagnostic criteria of insomnia disorder [1–4]. Thus, it is necessary to find effective therapies for sleep disturbances. Pharmacological treatment and cognitive behavioral therapy for sleep disturbances (CBT-I) are widely used and have shown effectiveness. Pharmacotherapy is a traditional treatment for insomnia and has been tested and proven to improve sleep outcomes. Due to the risks of daytime residual effects and substance dependence, non pharmacological treatments have attracted clinicians' attention [5,6]. CBT-I is an effective non pharmacological treatment that is most commonly used. Many studies have shown that CBT-I can significantly improve sleep quality and reduce insomnia severity [7-9]. However, CBT-I is intensive, requiring administration by highly trained therapists [16]. Many other mind-body therapies (MBTs) also have effects on mitigating sleep disturbances and produce various psychological and health functioning benefits. Examples include mindfulness meditation, tai chi, yoga [10, 11], relaxation therapy, and music. In this research, we focus on two types of MBTs—meditation and yoga—which have been researched in a large number of studies and are widely used for clinical patients and community populations.

As an ancient practice, meditation is part of many spiritual traditions and types that emphasize training the mind, especially attention. Mindfulness meditation is mostly researched and used in both clinical and normal populations.

As one of the meditative movements, yoga has its origins in ancient India and has gained popularity among adults over the last two decades. Yoga also concentrates on the body-mind integration. In recent years, a growing number of studies have reported the above mentioned MBTs' promising results for physical and mental health, including improving sleep quality [12-15] and reducing insomnia severity. In recent years, some systematic reviews have also been conducted with or without a meta-analysis of the cited issues.

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However, in these studies, only a small part of the evidence has been covered. In this study, we aim to examine the evidence that MBTs may have effects on improving the sleep health of patients with insomnia and adults who have sleep complaints and to produce an overall picture of contemporary research on this field by making a simple comparison of each intervention.

As a prevalent sleep disorder, insomnia has become a public health problem, including subjective sleep complaints (e.g., poor sleep quality, inadequate sleep time), difficulties in sleep onset/maintenance, waking up too early, or non-refreshing sleep. Insomnia is associated with significant distress or daytime impairment. It can occur independently or with other physical disorders and diseases (e.g., cancer, hypertension) and psychiatric disorders (e.g., anxiety, depression [2]) at a high rate of co morbidity. Sleep plays an important role in individual health. The functions of the brain, the cardiovascular system, the immune system, and the metabolic system are closely associated with sleep.

Table no.1 = Distribution of Male and Female participants in studies

Study	Male	Female
Our study	38	25
CSU, Hunan, China	80	45
Others	x	x

OBJECTIVES

1. To study the adequacy of sleep in different age groups.
2. To know whether Yoga and Meditation are helpful in induction of sleep.

II. METHODOLOGY

Design-

This was a case control questionnaire-based survey. Participants were asked to complete a questionnaire only once for this study. Two groups were taken. One having disturbances in their sleep while the other group had people with normal sleep.

Case group had people from surrounding villages (Morane, Ner), colleges and also some batch mates of ours from ACPM Medical College, Dhule.

Control group had people from yoga classes, meditation classes in Dhule and also those who do yoga and meditation in their home.

The inclusion criteria were the willing and cooperative participants and exclusion criteria were those not willing to participate in the study. Informed consent was taken from all the participants. Both cases and controls were selected by systematic randomization to avoid selection bias.

Settings and Samples-

Survey samples consisted of two groups: Yoga-Meditation and Non Yoga-Meditation group. In the first group, 29 volunteers were included whereas the later group consisted of 34 participants.

Different Yoga exercises performed by these participants were physical postures (Various asanas like mountain pose [Tadasana], triangle pose [Trikonasana], revolved triangle pose [Parivratta Trikonasana], standing forward bend [Uttanasana], Hands to feet [Pada Hastasana], tree pose [Virksasana], lotus pose[Padmasana], half spinal twist [Ardha Matsyendrasana], wind relieving poses [Pavanamuktasana], bow pose [Dhanurasana], locust pose [Salabhasana], fish pose [Matsyasana], cobra pose [Bhujangasana], bridge Pose [Setu Bandhasana] etc.) Bandhas (Jalandhar bandh, Mulabandha, Uddiyanbandha Nadi Shuddhi Pranayama or Anuloma-Viloma [Alternate nostril breathing-I], Anuloma-Viloma [Alternate Nostril Breathing-II], Surya Bhedan [Right Nostril Breathing], Ujjayi, Bhramari, Pranayama from Hatha Yoga [Surya Bhedan, Bhasrika, Ujjayi, Shitali, Sitkari, Bhramari, Murchha, and Plavini Pranayama]).

Different Meditations performed by participants were- Mindfulness Meditation, Transcendental Meditation, Guided Meditation, Vipassana Meditation, Metta Meditation, Chakra Meditation and Yoga Meditation.

Prior to survey, participants were given complete information about the study procedure and all doubts regarding this study were clarified.

Data Collection-

Data collection was done by visiting each participant at his/her home, Yoga classes, and Meditation classes and nearby Colleges and hostels. For better understanding of these

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questionnaires by participants, we translated each questionnaire into Hindi, Marathi and Ahirani (regional language) and as per request of the participant; suitable versions were administered to them. The study was done in between 15 september and 30 september 2021.

Statistics:

The questions of this survey were such that responders were asked yes-no kind of questions also some questions had options as many as they found fitting to their understanding, and the analysis of the data was done with the help of Excel sheets and trial version of SPSS software. Hence, the assessment and interpretation were based on collected data and the calculated percentage. This study was approved by Institutional Ethical Committee (IEC).

Sample Size Calculation:-

FORMULA :$[(Z1 + Z2)^2 \times P (1-P)]/ (P1 - P2)^2$

Where,

Z1 = Z value associated with confidence (1.95)
Z2 = Z value associated with Power (0.84)
P1 = Probability of exposure in cases (0.6)
P2 = Probability of exposure in controls (0.32)
We have done a pilot study and the values of P1 and P2 were taken from our pilot study.
P= Arithmetic average of P1 and P2 (0.095)
According to the formula our sample size is 24.86.
We have taken the sample size as 31 in each group and total participants were 62.

III. RESULT

The pre-validated questionnaire survey was done.

62 people had willingly participated in the same out of which 38(61.29%) were male and 24(38.70%) were female. The mean age of the participants was 37.21 years (SD=14.463) (youngest participant was 21 years old and the oldest participant was 69 years old).
Odds Ratio came out to be 0.4156

Table no. 2: ODDs Ratio findings of association between yoga-meditation and sleep.

Odds ratio	0.4156
95%CI	0.1409 to 1.2254
Z statistics	1.592
Significant level	P=0.1115

Table no.3: Adequacy of sleep in different age groups

Sleep adequate	**21-30 age group**	**31-40 age group**	**41-50 age group**	**Above 50 age group**	**Total**
Yes	10	12	4	5	31
No	14	5	6	6	31
Total	24	17	10	11	62

Table no. 4: Age wise distribution of difficulty in sleep induction.

Difficulty in induction of sleep	**21-30 age group**	**31-40 age group**	**41-50 age group**	**Above 50 age group**	**Total**
Yes	18	7	6	7	38
No	6	10	4	4	24
Total	24	17	10	11	62

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Chart 1: Sleep hours of participants in the study.

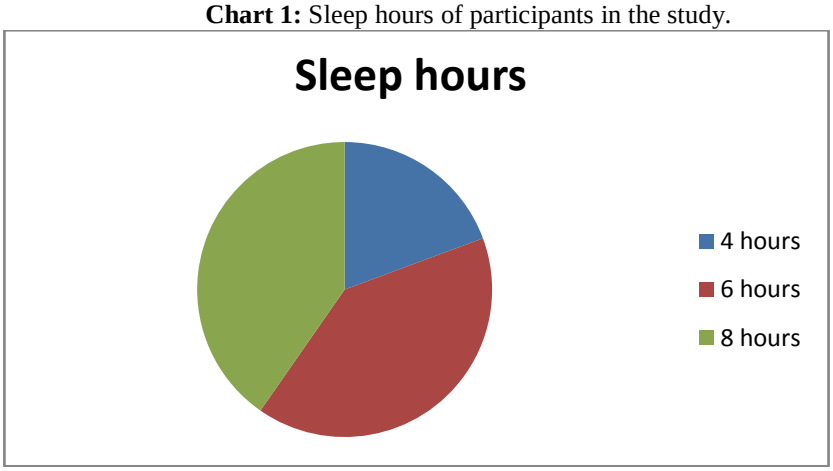

Chart 2: Adequacy of sleep of participants in the study.

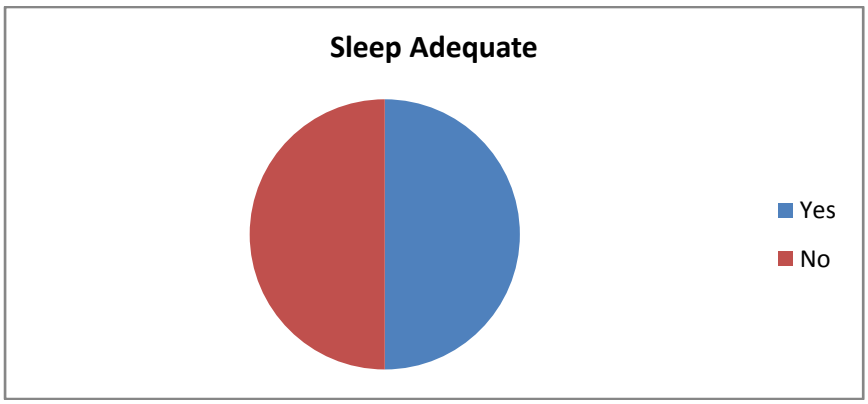

Chart 3: Difficulty in sleep induction, maintenance or both.

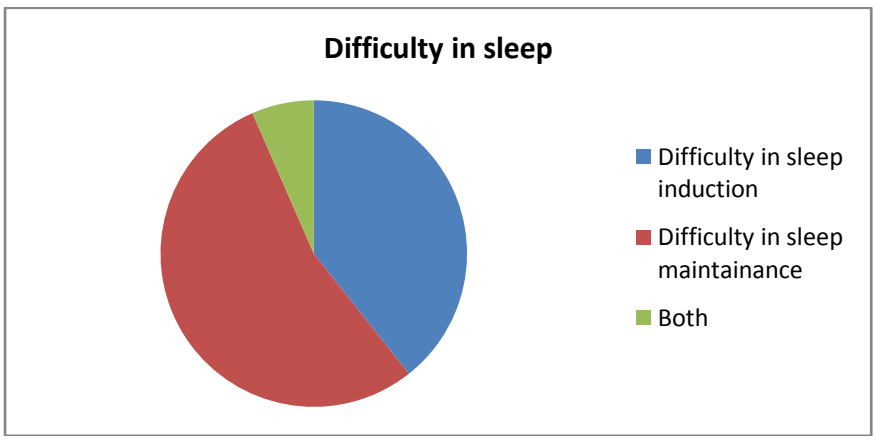

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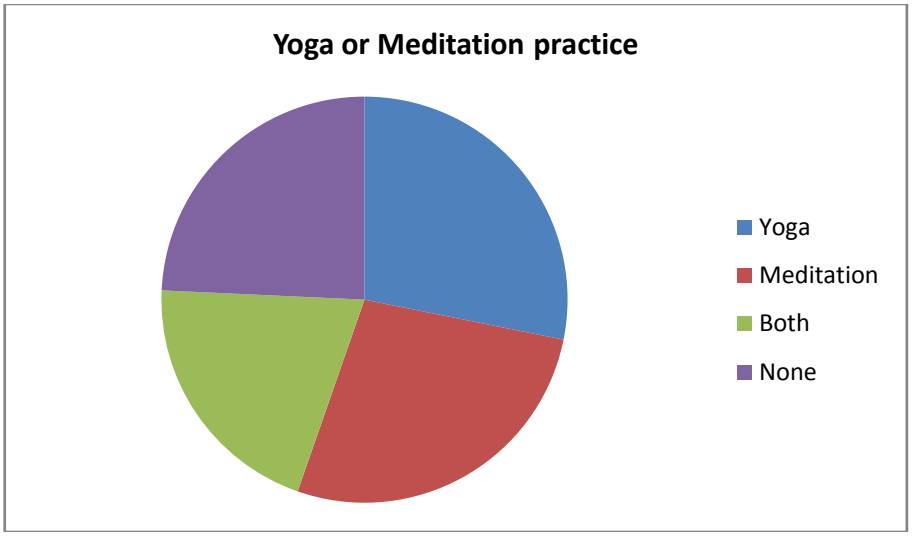
Chart 4: Participants doing yoga, meditation, both or none.



The chi-square test: Showing association between yoga-meditation and sleep
The chi square statistic is 10.314. **The p-value is .00132 and is significant at p<0.05.**
The chi-square statistic with Yates correction is 8.7327. The p-value is .003125. Significant at p<0 .05

IV. DISCUSSION

Results of our study indicate that those practicing Yoga and Meditation regularly had:
1. Better overall sleep quality
2. Less episodes of disturbed sleep
3. Took less time to fall asleep
4. Less day time dysfunction
5. Less use of sleep medications and
6. Also felt more rested and energetic in the morning.

These results were in accordance to previous studies where effect of 6 months Yoga intervention on elder people was studied and found that Yoga group participants had better sleep quality and less sleeping disturbances when compared with the control group.

One possible reason explained for better sleep quality in Yoga practitioners is that Yoga exercises involve stretching and relaxing of muscles causing significant physical and mental exertion resulting in less sleep latency, more deep sleep, less sleep disturbances, and better sleep efficiency.[16–18] We also can say that benefits of Yoga were retained even after long-term Yoga practice in Yoga group of our study. However, exact relationship between Yoga and better sleep quality still remains to be elucidated.

Similarly, in a study reported by Dam et al., association between poor sleep quality and low wake time oxygen saturation (less than 90%) resulting in poor physical performance in the form of decreased grip strength and walking speed was observed.[19] Soni et al., concluded that Yogic breathing exercises can improve strength of the respiratory muscles which resulted in better tissue perfusion and improved oxygen saturation. Considering the fact that sleep apnea is associated with decreased oxygen saturation, improved oxygen saturation due to Yoga exercise might be another possible explanation for less sleep disturbances in Yoga group of our study.[20]

Snoring increases the chances of sleep disturbances two fold and this has been attributed to the weakened upper airway muscles, narrowing of the respiratory passage that causes snoring. Regular Yogic breathing exercises might have beneficial effect by strengthening upper airway muscles resulting in less sleep disturbances observed in this population.[21,22]

Previous studies of Yoga on health volunteers have shown that after short term Yoga exercises; there is significant increase in the vagal tone, decrease of sympathetic discharge in the form of significantly decreased heart rate response on standing as well as decreased catecholamine levels in plasma. This decreased physiological arousal effect of Yoga has been cited as one of the reasons for less sleep disturbances.[23,24]

Earlier studies have demonstrated association of poor quality of sleep with a poor physical function score; however, the exact mechanism behind this association is still not known.[19] Aging is associated with decreased muscular strength and muscle mass which results in decreased exercise capacity. Functional abilities are reduced, and hence restrictions in performing daily activities and loss of self-sufficiency can occur.

V. CONCLUSION

1. Adequacy of sleep in 21-30 years age group is less.
2. Yoga and meditation helps in induction of sleep.
3. Yoga and Meditation is effective in treating sleep disturbances.

VI. RECOMMENDATIONS

1.Our findings on the larger effect of Yoga and Meditation on the sleep quality of healthy adults compared with clinical patients should also be further explored.

2.Further research should include high-quality and well-controlled RCTs, published in English and other languages. Future studies should conduct more detailed subgroup analyses to confirm the accuracy of the effect sizes of Yoga and Meditation; the changes observed in the follow-up period should also be considered.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest.

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