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Effect of practicing yoga versus reading books on better sleep quality in senior citizens residing in an old age home

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Abstract

The benefits of regular yoga practice have been demonstrated. Examining the advantages of yoga for senior citizens would be beneficial. This study aims to investigate how yoga intervention and reading books affects sleep quality in geriatric population. This is a randomized controlled study. One hundred participants from an old age home were randomly assigned to one of two groups: (a) the experimental group (n = 50) with an age range of 69 ± 6.56 years, and (b) the control group (n = 50) with an age range of 68.46±7.08 years. For two months, six days a week (daily for sixty minutes) yoga intervention was provided to participants in the experimental group. The control group's participants read a set of books simultaneously. Participants were evaluated with a Pittsburgh Sleep Quality Index for measuring sleep quality. The IEC approved the study, and prior to the baseline assessment, each subject completed a consent form. Repeated measures analysis of variance (RM-ANOVA) with SPSS version 24.0 was used to measure the difference in outcome measures between the two groups at baseline and after the study period. There have been significant changes in both the groups. After two months of yoga practice under expert supervision, seniors living in assisted living facilities seem to have better sleep quality and an increase in sleep deprivation was found in the control group over the same time period.

Key terms: Yoga, quality of sleep, senior citizen, old age home

INTRODUCTION

Every human being has a fundamental right to good health.(1) A person's daily schedule determines their state of health. Sleep is a vital component of a person's daily schedule.(2) Overall wellness is dependent on getting sufficient sleep.(3) Sleep is a typical, extended period of relative stillness during which there is a decrease in reaction to external stimuli and an ultimate loss of consciousness.(4) Sleep is directly associated with improved psycho-physiological well-being. As a matter of fact, human sleep patterns are influenced by a multitude of psychological and physiological factors.(2) Humans frequently experience sleep issues. One of the most prevalent conditions is chronic insomnia, which has a prevalence of between 10% and 22%.(5) A rise in sleep

disturbances is linked to ageing, and it is predicted about 67% of seniors experience at least one sleep-related problem. [6] Many personal and life-altering events occur to people as they get older, and these experiences might affect their psychological health and sleep quality.[7] According to projections from the World Health Organization, 15% of older persons will suffer from mental disease, with sleep deprivation being the primary reason.[5] Furthermore, there is a negative correlation between age and the likelihood of stress happening, which can significantly accelerate the ageing process.[8] In light of these age-related issues, it is imperative to address the needs and concerns related to senior citizen's psychological well-being.[5] Numerous well-documented changes in sleep patterns are associated with ageing. There is a phase advance in the typical circadian sleep cycle, meaning that seniors often go to bed earlier and get up earlier. They may also have irregular sleep schedules and wake up more frequently during the night.[9] Aging-related physiological changes have an impact on quality of sleep. Insomnia in the elderly that is not recognized and treated can have a negative impact on daily functioning and life satisfaction. Consequently, higher rates of morbidity and mortality among senior persons are associated with sleeplessness.[10] The most generally mentioned reasons of sleep disorders are inadequate exercise, poor sleeping habits, and extended naps during the day.[11] Despite the fact that sleep disorders in seniors burden healthcare systems and deplete valuable financial resources, many clinicians overlook this problem and accept it as a normal aspect of ageing.[12] While ageing does have an impact on sleep patterns, a change in sleep capacity is the main reason why seniors experience sleep problems. Getting too little sleep, rising too early, difficulty falling asleep, taking naps during the day, waking up at midnight, and difficulty sleeping or staying asleep are the most prevalent sleep disorders among the elderly. Many issues, including poor attention, slowed reaction times, memory issues, and decreased productivity, can result from getting too little sleep. In addition to the medications used to treat them, physical or psychological diseases might also be present in seniors experiencing sleep problems. Basic sleep disorders and circadian cycle abnormalities can potentially be the source of sleep difficulties.[11]

To treat sleep-related problems, a variety of drugs, including benzodiazepines and non-benzodiazepines, can be taken although there are some side effects associated with all of these drugs, especially for elderly patients. Short-term use of these medications has been connected to a number of adverse pharmacological reactions, including rebound insomnia, impairment of psychomotor performance, changes in REM sleep patterns, physical and psychological dependence, irregularities in cognitive function, etc.[13] In this sense, side effects from sleeping drugs may seriously lower a senior's quality of life. One's ability to fend for oneself is diminished by age-related physical discomfort, which lowers fitness levels. Thus, any alternative therapy that lessens the loss of muscle mass or interferes with sleep will improve the quality of life for the senior population. [14]

One of the non-pharmaceutical alternative therapy is yoga. Yoga incorporates breathing techniques, meditation, and a variety of postures. Positive effects of yoga have been demonstrated, such as decreased blood pressure, decreased anxiety, delayed functional decline, reduced sleep disturbances, and improved serum lipid profiles.[15] There could be a lot of unfavorable side effects from taking drugs to treat sleep issues. Short-term researches on

yoga have shown positive effects on sleep.[16] Yoga is beneficial for treating and recovering from substance abuse. It also helps with falling asleep and reduces symptoms of anxiety, tension, and sadness.[17] Yoga technique also help with addiction treatment and recovery, lower stress levels, anxiety, and depressive symptoms, and boost sleep quality.[18]

The current study focuses on the effects of yoga-based intervention on sleep quality in the geriatric population living in old age home. The evidence supporting the inclusion of yoga as a senior citizens' lifestyle practice will be reinforced by the confirmation of the positive effects of yoga on senior citizens' sleep quality.

RESEARCH METHODS

Sample and setting

A total of 100 participants (50 in each group; ages 60 years or above) were recruited from the elderly community at Aawasiya Vriddha Ashram Hapur, Uttar Pradesh which is located in the northern region of India and is run by the Social Welfare Department of the government of Uttar Pradesh. Participants were randomized into two groups i.e. experimental (yoga group) and control (reading group) by using standard method of randomization using random number generator (www.randomnumbergenerator.com). The required sample size (n=20) was calculated using G Power software version 3.1 based on a previous study related to a variable, 'balance' (Cohen's d= 1.74, alpha=0.05, power=0.95).[19]

Subjects having diagnosed cognitive impairment, past history of addiction and diagnostic illness were excluded from the study. Old age participants having age 60 years and above, those do not having major physical and psychiatric illness and naive to yoga were included in this study. Baseline characteristics of the participants are mentioned in Table 1.

Table 1: Baseline characteristics of the participants

Sl.no.	Characteristics		Experimental group	Control group
1.	Age	Age range (in years) Group average age ± SD (in years)	60-87 years 69 ± 6.56	60-86 years 68.46±7.08
2.	Gender	Number of participants Male: Female (in numbers)	50 36:14	50 27:23
3.	Education	Post-graduate (in numbers) Graduate (in numbers) Intermediate (in numbers) Matriculate (in numbers) Others (in numbers) Uneducated (in numbers)	02 02 07 11 07 21	08 09 02 04 05 22
4.	Health status (Disease)	Major physical and psychiatric illness Healthy Others (sleep, breathing, joint pain related issues)	0 23 27	0 23 27
5.	Diet	Vegetarian (in numbers) Non-vegetarian (in numbers)	50 00	42 08
6.	Yoga experience	Range of yoga experience (in months) Any other physical exercise (in months)	0 0	0 0
7.	Sleep scores	Mean ±SD	7.72±3.67	7.90±3.64

Study design

This is a randomized controlled study which was approved by the Institutional Ethical Committee (IEC) of the University of Patanjali, Haridwar (IEC reference no. is UOP/IEC/2022/08). Each participant was asked to sign an informed consent form and provide their socio-demographic information after being informed of the study's objectives and evaluation methods

Trial profile of the participants is shown in Figure 1.

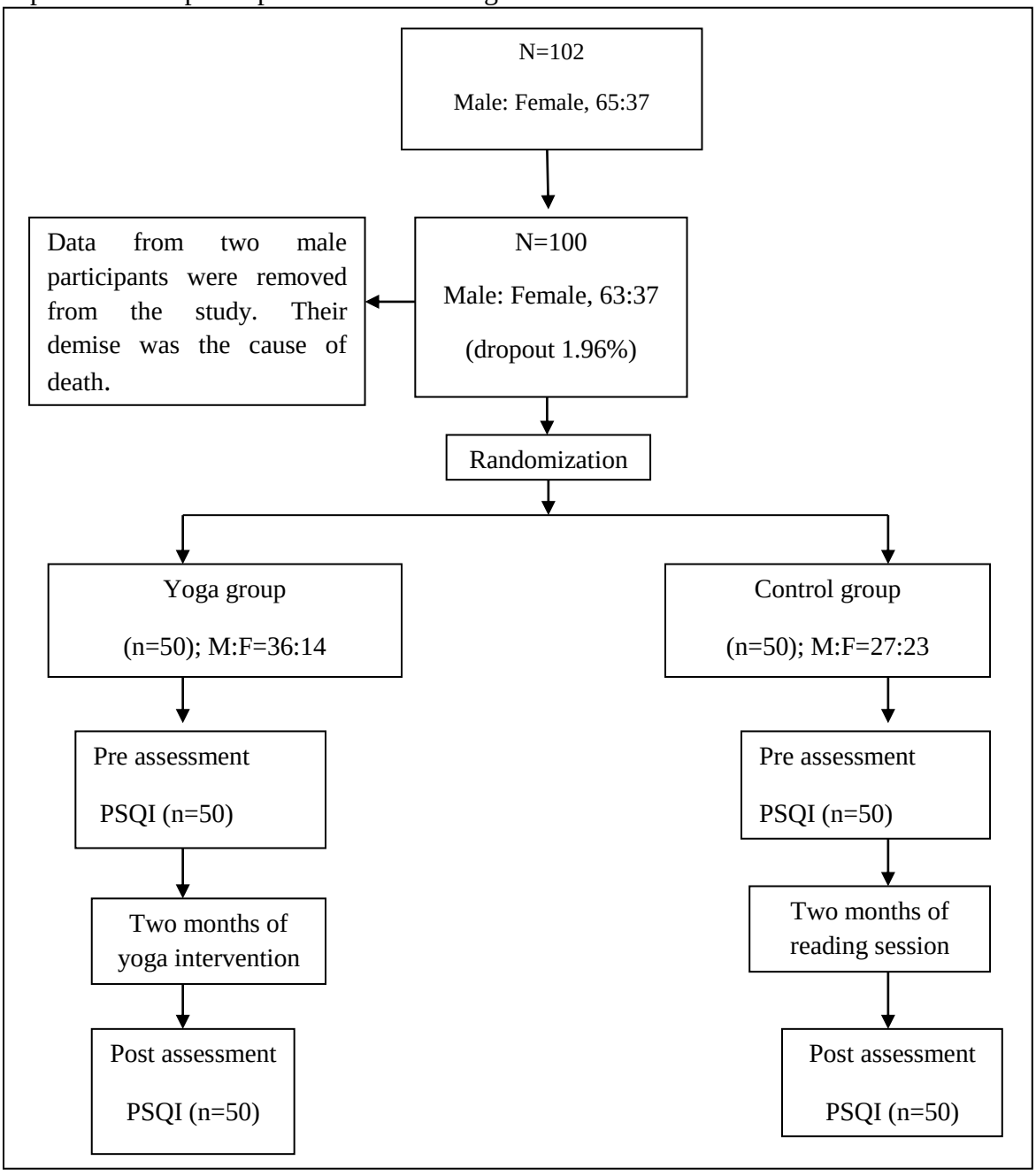

Figure 1: Trail profile showing number of participants in both groups at the time of baseline, post assessment and the reason for drop outs of the participants.
N= no. of participants, PSQI= Pittsburgh Sleep Quality Index

Assessment

Participants were tested with Pittsburgh Sleep Quality Index.[20] This is a 19-item standardized questionnaire assesses sleep quality using subjective ratings for 7 different components (i.e., sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication and daytime dysfunction). Cronbach's alpha for the questionnaire was found to be 0.736.[21] Scoring was done using standard method mentioned in the manual of PSQI-19. In scoring the PSQI, seven component scores are derived, each scored 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score (range 0 to 21). Higher scores indicate worse sleep quality.

Intervention

The yoga programme included prayer (gayatri mantra and om chanting), yogic sukshma vyayama (micro circulation practices), asanas (physical postures), pranayama (breathing exercises), clapping session and relaxation form of yognidra or meditation. Each participant completed two-month intervention that was made up of reading session for control group or yoga sessions for experimental group. Participants in the experimental group experienced offline yoga intervention for six days a week (daily for 60 minutes) under the direct guidance of a yoga teacher (more than 15 years of regular yoga experience). The control group participants read selected books and magazines (yog-sandesh, a research oriented monthly magazines of yoga, spiritualism, ayurveda culture and traditions) at the same time. The comprehensive yoga protocol has been designed after the consultation with the Esteemed Yoga-master Swami Ramdev ji, the Chancellor of the University of Patanjali. The detailed yoga program is mentioned in Table 2.

Table 2: Comprehensive yoga programme for geriatric participants

Sl. no.	Yoga protocol	Frequency	Duration
1.	**Prayer (*Gayatri mantra*, Om chanting)**	3 times	1 minute
2.	**Yogic *sukshma Vyayama* (micro circulation practices)** **(a) Neck movements:** • Forward and Backward bending • Right and Left bending • Right and Left twisting • Neck rotation (clock and anti-clock wise) **(b) Shoulder movements:** • Shoulder stretch • Shoulder rotation (forward and backward) **(c) Ankle movement and knee movement:** • Ankle stretch • Ankle movement **(d) Hand movements**	 3 rounds 3 rounds 3 rounds 3 rounds 3 rounds 3 rounds 5 rounds 5 rounds 5 round	10 minutes
3.	**Postures (*asana*)**		

	(a) Sitting poses (two on each day) *Janu Shirasana* (head to knee pose), *Sukhasana* (easy sitting pose), *Vajrasana* (diamond pose), *Vrishabhasana* (grounding and surrendering pose), *Baddha konasana* (butterfly pose), *Gomukhasana* (cow-face pose), *Vakrasana* (spinal twist position). (b) **Supine poses** (two on each day) *Ardha Halasana* (half-plough pose, one by one leg), *Shavasana* (corpse pose), *Markatasana* (monkey pose), *Dwichakrikasana* (cycling), *Pavanamuktasana* (wind relieving pose). (c) **Prone Poses** (two on each day) *Makarasana* (crocodile pose), *Balasana* (child pose), *Bhujangasana* (cobra pose), *Shashankasana* (rabbit pose). (d) **Standing pose** (two on each day) *Tadasana* (palm tree pose), *Trikonasana* (triangle pose), *Katichakrasana* (standing spinal twist pose), *Konasana* (angle pose).	3-5 times	15 minutes
4.	**Breathing exercises (*Pranayama*)** *Anulom-Vilom/Nadishodhana* (Alternative Nostril breathing), *Bhramari Pranayama*/*Udgeeth* pranayama *Kapalabhati pranayama*/ *Bhastrika* at slow pace	5 round 10-20strokes	15 minutes
5.	**Clapping session**		8 minutes
6.	**Relaxation (*Yognidra/Dhyana/Shavasana*)**		10 minutes
7.	***Shanti path***		1 minute
		Total	60 minutes

Statistical Analysis

With the use of SPSS version 24.0, repeated measures analysis of variance (RM-ANOVA) was performed to evaluate the effectiveness of yoga practices on sleep quality in senior citizens.

RESULT

For the study, a total of 100 residents from an old age home were enlisted. Fifty individuals with an age range of (mean±SD; 69 ± 6.56 years) participated in a two-month yoga intervention (six days a week for sixty minutes daily), whereas fifty individuals in the control group (mean age±SD; 68.46±7.08 years) read a selected books and magazines (related to yoga, culture & life-style) at the same time for same duration. Descriptive analysis and ANOVA values are shown in table 3 and 4 respectively.

Table 3: Mean and S.D. values of experimental and control group

Groups	Pre (mean± SD)	Post (mean± SD)	Cd	P value	95%CI UCL	95%CI LCL
Experimental group (n=50)	**7.72±3.67**	**4.18±2.60*** **	**1.11/-0.48**	**p<0.001**	**4.263**	**2.817**
Control group (n=50)	**7.90± 3.64**	**9.86±3.41*** ###**	**-0.55/-0.26**	**p<0.001**	**-1.237**	**-2.683**

*** p<0.001, pre data compared with post data in experimental and control group
p<0.001, post value of sleep quality in experimental group compared with post value of sleep quality in control group

Table 4: ANOVA for a variable: Sleep quality

Conditions	df	F value	Significance level	Partial Eta Squared	Huynh-Feldt
States (within subjects)	1,98	9.40	0.003	0.09	1.00
Group (between-subjects)	1,98	22.32	0.001	0.18	1.00
States x Group	1,98	113.96	0.001	0.54	1.00

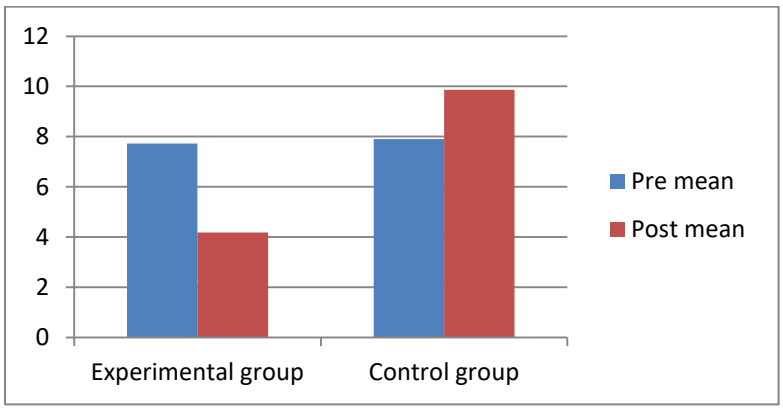

Figure 2: Graph showing the level of sleep quality in experimental and control group at baseline and after intervention

There have been significant changes in both the groups. The present study's findings suggest that a yoga-based intervention can improve the quality of sleep for elderly residents of assisted living facilities. The current study's findings support past research suggesting yoga intervention techniques can improve the quality of sleep. After two months of yoga practice under expert supervision, seniors living in assisted living facilities seem to have better sleep quality. During the same time period, there was an increase in sleep deprivation in the control group.

DISSCUSSION

Due to improvements in health care education, the elderly population is generally substantial and continues to expand.[22] As people age, their degree of contentment with their bodies and minds declines.[23] Researchers have found a direct correlation between inadequate sleep and increased rates of mental and physical illness, worse cognitive function, and a lower quality of life. Aging-related physiological changes have an impact on sleep quality.[24]

Insomnia in the elderly that is not recognized and treated can have a negative impact on daily functioning and life satisfaction. Consequently, higher rates of morbidity and mortality among senior persons are associated with sleeplessness.[10] In a randomized investigation, Manjunath and Telles found that consistent yoga workouts for a six-month period reduced the time it took for an elderly individual sample to fall asleep, reduced midnight disturbances in sleep, improved sleep quality, and reduced the need for sleep aids in contrast to the control group.[25] Equivalent outcomes have been identified in an investigation by Chen and Tseng, where Yoga supplementation was found to enhance many sleep-related features and reduce depression symptoms.[26] There is, however, a dearth of information on whether these advantages of yoga are sustained over time.[16]

Since yoga actively involves the mind and body, it is thought to be a supplemental treatment that is more effective than regular physical activity.[27] Some individuals have discussed the beneficial impact on a range of psychological or (neuro) psychiatric conditions, including depression, exhaustion, anxiety and anxiety disorders, eating disorders, or sleep issues.[28] Yogic workout additionally enhances sleeping conditions, reduces anxiety, stress, and indicators of depression in ages above 50 years.[18] Senior persons who receive yoga therapy see improvements in a variety of physiological functions and health-related quality of life parameters.[29]

Effectiveness of comprehensive yoga practice versus reading literature has not yet been observed in geriatric population (in terms of sleep quality) in previous studies. This fact has been considered in the present research's control group, which provides a new direction to this study. Previous researches have shown that regular yoga practice can significantly reduce the number of ailments while also improving sleep quality in people of all ages, including the elderly. While earlier studies are pointing towards positive impact on the sleep quality of the elderly by making them practice yoga. According to the present study, out of 100 elderly people who have neither done any yoga related activity in their life nor have time to do any special physical exercise, 50 such elderly people were given yoga for two months and 50 elderly people of control group did self-study of selected books and magazines. There have been significant changes in both the groups. Seniors living in old age homes reported better sleep quality after two months of practicing yoga under the guidance of a professional yoga teacher. The control group had a rise in sleep

deprivation throughout the same time period.

CONCLUSION

Present study came to the conclusion that yoga practice enhances overall quality of sleep in geriatric population. To achieve greater wellness and to increase quality of sleep, yoga has become a part of daily life. It significantly contributes to having a better sleep quality.

CONFLICT OF INTEREST

There is no conflict of interest.

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