

The Effectiveness of Occupational Therapy Based Mindfulness Program on Sleep Quality and Stress Level in Elderly Population

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ABSTRACT

Elderly are more vulnerable to stress and sleep problems than other age groups resulting from declining health and social relationship. The elderly tend to wake up more often during sleeping at night. In order to overcome stress and sleep problems, not only the drug treatment but also cognitive behavioral programs such as Occupational Therapy based Mindfulness program can be presented. Hence the study was set out to analyse the effect of Occupational Therapy based Mindfulness program on sleep quality and stress level in elderly population. Experimental study was done on 80 elderly subjects aged over 65 years, taken from community in West Delhi, India. The mean age of the participants was 59.05 ± 4.04 years. The participants were assessed on Pittsburgh Sleep Quality Index, Cohen Perceived Stress Scale. Occupational Therapy based Mindfulness program was provided to the participants and its effect was analyzed on sleep quality and stress level. Results showed that Occupational Therapy based Mindfulness program found to be effective in improving the sleep quality of elderly ($M \pm SD =$ pre: 16.08 ± 2.10 , post: 6.83 ± 1.85 , $t = 23.46$, $p = 0.000$). We identified that maximum number of participants had high stress level (56%) and there was significant improvement in Stress level (with 91% of participants experienced stress relieve) after the implementation of Occupational Therapy based Mindfulness program. From the result we concluded that Occupational Therapy based Mindfulness program an important tool which is easily approachable and effective intervention method for improving the sleep quality and stress level of elderly.

KEYWORDS: Occupational Therapy; Mindfulness; Sleep Quality; Stress Level; Elderly Population

INTRODUCTION

World Health Organization classified old age as: 65 - 75 years as young old, 75 to 85 years as old and above 85 years as elderly. Old age is considered to be near about 70 years in developed countries where life expectancy is more due to advancement in health care techniques, as compared to developing countries where the old age is considered near about 60 years because of low life expectancy. Globally, 1% of population over age of 60 years is increasing and it is likely to reach 30% of world population by 2050. According to Census of India (2001), about 7.7% population is over 60 years of age [1] This is expected to increase to 17% in 2050. The increasing population of the elderly people needs special attention because elderly people are included in the group of a population at risk [2]

Perceived stress is defined as the perception that the situational demands exceed his or her resources. Elderly people have higher probability of suffering from multiple health problems. Chronic diseases such as diabetes mellitus, coronary heart diseases, osteoporosis and cerebrovascular diseases are most common problems in elderly people and predispose them to increased risk to develop stress. Elderly people also experience gradual or sudden loss of his

physical capabilities, physiological resources of body functions, occupations, friends, and spouse and may be independence and these factors are the major sources of stress [3, 4]

These situational stressors when become too severe they may affect the physical and psychic equilibrium producing mental and physical disorders [5]

Among Geriatric illnesses, geriatric sleep disturbance accounts for as high as 25% through 60%. Half of elderly individuals report some form of sleep problems, which may include longer sleep onset times, lower rates of sleep efficiency, more time in bed, more awakenings during the night and earlier wake up times, as they experience changes in bio rhythm to make them sleep early in the evening and wake up early in the morning [6]

Despite the significant impact of stress and sleep problems reported above, awareness in the community is low. It has also been recognized that Occupational Therapy programs could be an effective solution in addressing this deficiency. Occupational therapist by using Mindfulness Principles can

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help the Elderly people enabling participation in everyday resulting in maximized independence and enhanced wellbeing. These mindfulness principles are becoming increasingly popular when working with Elderly in improving self-regulation skills, physical and mental health problems. Mindfulness means actively staying and retaining your attention fully on something in the present moment and not allowing your attention to drift. Being mindful means actively staying aware and consciously keeping your attention fully focused [8]

Therefore, in order to overcome sleep disorder and stress, not only the drug treatment but also cognitive behavioral programs such as Occupational Therapy based Mindfulness program can be presented.

Objectives

The little is known about the stress level and sleep disorder faced by the elderly population and few research studies are available on effectiveness of Occupational Therapy based Mindfulness program. Hence a need was felt to analyses the effect of Occupational Therapy based Mindfulness program on sleep quality and stress level in elderly population.

MATERIAL AND METHODS

Subjects

The Experimental study was conducted from January 2020 to March 2020 in West Delhi, India. A convenience sample of 80 elderly subjects was taken from community. All male and female elderly participants aged over 65 years and willing to participate were included. Participants not able to respond to the questions and not willing to participate were excluded. The mean age of the participants was 59.05 ± 4.04 years.

Procedure

The purpose of study was explained to all the eligible participants in their local language. Verbal consent and written consent were obtained from participants who were elected in the survey. Data was collected by face to face

interview method using different questionnaires. Questionnaires were filled by the investigators at the time of interview. Following that all the participants were provided with Occupational Therapy based Mindfulness program and then its effect was analysed on sleep quality and stress level among the sample.

Occupational Therapy based Mindfulness program

The Occupational Therapy based Mindfulness program consisted of 4 sessions per week, over a period of 7 weeks [9]. Each session last for 1.5 hours. Weekly follow up of participants was done through telephonic interview method. Table-1 shows the Occupational Therapy based Mindfulness program developed by the researchers in the study.

Session 1

Session 1 was the Educational sessions in which participants were taught about what is stress and sleep disorder, what causes stress and sleep problems and how it affect daily functioning. They were introduced also about the Importance of Mindfulness program in life. Then they practiced 5 minutes Mindful breathing meditation.

Then Occupational Therapy Based Mindfulness program was divides into 3 parts and each part was practiced each week.

Session 2

Part 1 of the Program included: Aerobic Exercises, Autogenic Training program, daily life strategies that Elderly show follow.

Session 3

Part 2 of the Program included: Deep breathing, Different Forms of meditation (One form each week), Progressive muscle relaxation

Session 4

Part 3 of the Program included: Mindfulness based stress reduction, Mental Imagery and a small discussion on participants experience and opinions for Occupational therapy based Mindfulness programs.

Table 1: Occupational Therapy based Mindfulness program

No. Of Sessions	Topics Discussed	Details
1	Educational Programs: Discussion on Stress and Sleep disorder	<ul style="list-style-type: none"> What is stress? What are the causes of stress and Sleep problems? How stress and sleep problem effects overall functioning? Occupational Therapy Based Mindfulness program: Introduction 5 minute Mindfulness Breathing Meditation
2	Occupational Therapy Based Mindfulness program: Part 1	<ul style="list-style-type: none"> Aerobic Exercises Autogenic Training Other strategies that you should follow (One strategy each week) <ul style="list-style-type: none"> ➤ <i>Drink plenty of water</i> and Healthy drinks: Warm milk, Herbal tea, fresh juices. ➤ <i>Take Good Sleep:</i> Sleeping for 7-8 hours per night is ideal. ➤ <i>Balanced meals, regularly: Eat mindfully</i> ➤ <i>Aromatherapy using Aromatherapy products:</i> Aromatherapy candles, bath products, essential oils, and other products are widely available.
3	Occupational Therapy Based Mindfulness program: Part 2	<ul style="list-style-type: none"> Deep Breathing Exercises Meditation: (One form each week) <ul style="list-style-type: none"> ➤ Mindfulness breathing meditation ➤ Body Scan Meditation: track or scan over whole body from head to toe. ➤ Walking Meditation ➤ Progressive muscle Relaxation

4	Occupational Therapy Based Mindfulness program: Part 3	<ul style="list-style-type: none"> • Mindfulness based stress reduction: Grounding, Opening, Resting, Lying yoga. [By G Ross Clark, The Mindful Coach.] • Mental Imagery • Group discussion on how occupational therapy based Mindfulness program is effective.
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Outcome Measures/Scales

Perceived Stress Scale (PSS): Perceived Stress Scale is an effective instrument used to assess the degree to which people perceive their lives as stressful. Subjects indicate how often they have found their lives unpredictable, uncontrollable, and overloaded in the last month. It has 10 items. Each item is rated on a 5-point scale ranging from never (0) to almost always (4). Positively worded items are reverse scored, and the ratings are summed, with higher scores indicating more perceived stress. The PSS has good reliability and validity [1, 10]

Pittsburgh sleep quality index (PSQI): The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adults. It differentiates “poor” from “good” sleep quality by measuring seven areas (components): subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction over the last month. The PSQI has high test-retest reliability and a good validity [1, 11]

Data Analysis

Complete data was gathered in the form of a master chart made on Microsoft Excel 2010. The statistical analysis was conducted using Statistical Package for the Social Sciences 21 (SPSS v.21). Statistical significance at $p \leq 0.05$ was assumed. A paired-samples t-test was conducted to analyze the effect of Occupational Therapy based Mindfulness program on sleep quality. Descriptive analysis included percentages, means and SD. Pearson correlation coefficient was calculated to find out the correlation between sleep and stress.

Result

Table 2: Participants response to different Components of PSQI Score

Components	Score	No of participants
Subjective sleep quality	Fairly Bad Very Bad	43 37
How long does it usually take to fall asleep (in minutes)	31-30 min. >60 min.	48 32
Sleep Disturbance due to...	Cannot breathe Cough or snore loudly Have bad dreams Have Pain Have to get up to use the bathroom	25 14 12 24 5
Sleep duration	5-6 hours < 5 hours	42 38
Use of sleep medication	Less than once a week Once or twice a week Three or more times a week	32 36 12
How much of a problem has it been for you to keep up enough enthusiasm to get things done?	Somewhat of a problem A very big problem	34 46

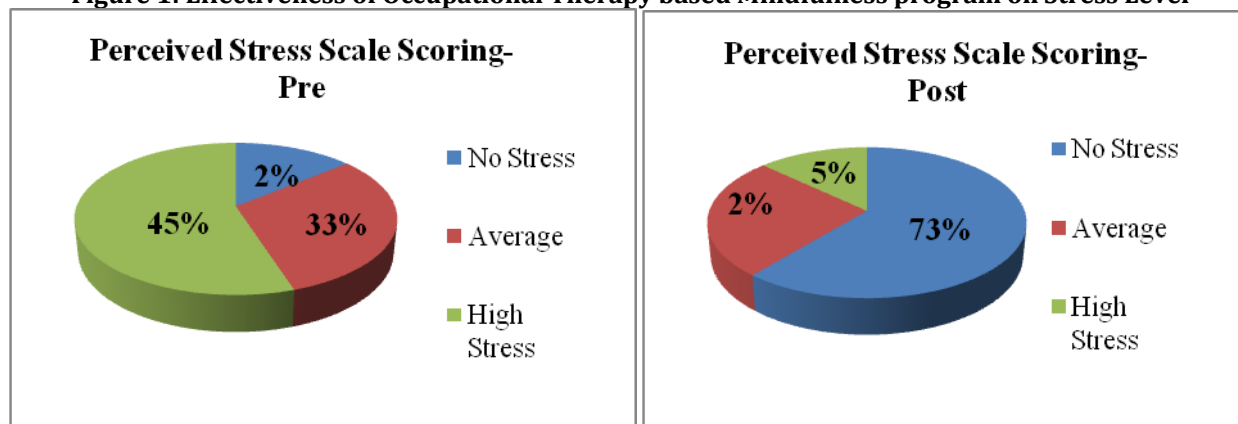
Table 3: Percentage Analysis of different factors of PSQI & PSS Score

Variables	Pre		Post	
	Frequency	Percentage	Frequency	Percentage
PSQI SCORE				
Poor Sleep	26	33%	5	6%
Very Poor Sleep	53	99 %	-	-
Good Sleep	1	1%	75	94%
Perceived Stress Scale (PSS) Score				
No stress	2	3 %	73	91%
Average	33	41%	5	6%
High stress	45	56%	2	3%

Table 4: Effectiveness of Occupational Therapy based Mindfulness program on sleep quality

Variables	N	PRE	POST	t- value	Significance level
		M±SD	M±SD		
PSQI	80	16.08±2.10	6.83±1.85	23.46	0.000**

**significant at 0.005 level; NS: not significant

Figure 1: Effectiveness of Occupational Therapy based Mindfulness program on Stress Level

Discussion

This study was set out to analyse the effectiveness of sleep hygiene program on sleep quality and stress level among elderly population. Sample of 80 elderly subjects were taken from the community and they were analysed on the basis of different factors.

Sleep Quality Status of Elderly

Our result showed that the Sleep quality of the Elderly population found to be fairly or very bad. Most of the participants were able to sleep for < 5 hours and breathing, coughing and physical pain found to be the most common reasons for poor sleep quality, which in turn affected their daily living. (Table-2)

Association between Stress and Sleep

We also found that increase in stress level was significantly associated with poor sleep quality. Pearson correlation coefficient was calculated to find out the correlation between sleep and stress. Within the study it was found that stress and sleep was negatively associated, with Pearson's r values= pre: -0.24. Thus more the stress the Elderly have poor would be the quality of sleep.

Effectiveness of Occupational Therapy based Mindfulness program on Sleep Quality

Our study also showed that the Occupational Therapy based Mindfulness program found to be effective in improving the sleep quality of elderly (M±SD= pre: 16.08±2.10, post: 6.83±1.85, t= 23.46, p=0.000) Table-4

Our result was supported by *Black, D. S-et-al* in 2014; they did the study to test the treatment effect of the Mindful Awareness Practices (MAPs) program versus sleep hygiene education for improving sleep quality, as the main outcome, in older adults with prodromal sleep disturbances.. Each condition consisted of weekly 2-hour group-based classes over the course of the 6-week intervention. Results showed that the mindfulness meditation practice as engaged through the MAPs program leads to improved sleep quality relative to sleep hygiene education in older adults with prodromal sleep disturbances.

Similar result was shown by *Kiran-et-al* in 2018; they did a study to investigate the effect of sleep hygiene program on Sleep quality and stress among Elderly population living in some local communities. They provided Occupational therapy based sleep education and Sleep management program for 6 weeks. Result showed that the Sleep Hygiene program found to be very effective in improving the sleep quality as well as reducing the stress among the elderly. Also Pittsburgh sleep disorder score was much lower after implementation of the program. (t=9.77, p=0.00)

Effectiveness of Occupational Therapy based Mindfulness program on Stress Level

Cohen Perceived Stress Scale (PSS) was used to analyse the stress level and we identified that Stress was also one of the main factor that was very common among the elderly. 56% of Elderly found to have high stress within the study. Our study provided the evidence that the stress level of the participants was reduced after the implementation of the Occupational Therapy based Mindfulness program with 91% participants experienced relief in stress level. (Table-3 and Figure 1)

Our result was supported by *Rizky Erwanto-et-al* in 2017; they did a research to determine the effectiveness of progressive muscle relaxation and deep breathing to reduce the stress in elderly people in the Hanna Nursing Home Yogyakarta. There were 40 elderly people who live in Hanna Nursing Home involved in this study. DASS instrument was used to measure the stress levels among elderly people. Result showed that there was a decline in mean value for about 4.4 points on DASS with p=0.000. Thus authors conclude that the interventions of progressive muscle relaxation and deep breathing in reducing the stress among elderly people were effective.

Therefore, on the analysis of different factors it was clearly found that, Occupational Therapy based Mindfulness program is very effective and easily approachable and effective intervention method for elderly population.

Limitations and Future Recommendations

There were some limitations found during the study as both its small sample size and the age group. Moreover, its cross-sectional design didn't permit us to completely evaluate the casual relationship. The scope of the study was also limited primarily to the population of one area.

Future studies could focus on the larger sample size and participants of different age group, from different settings. Focus could also be given on comparison of sleep pattern and quality, stress level among Elderly from Urban and Rural area. Other areas to consider exploring would be Comparison of different interventions for Managing the stress level and sleep problems among elderly.

Conclusion

Our study is one of the few available on the stress level and sleep disorders faced by the elderly population. Sleep quality of the Elderly population found to be fairly or very bad and breathing, coughing and physical pain found to be the most possible reasons for poor sleep quality. We also identified that Stress was one of the main factor that was very common among the elderly and the possible reason could be 'change in sleeping habits, problems in area of daily living and sudden loss of physical capabilities, occupations, friends, and spouse and independence. From the result we concluded that Occupational Therapy based Mindfulness program is an important tool for improving the sleep quality and stress level of elderly. Within the study we found the negative association between sleep and stress. Thus our study concluded that the high stress level can lead to significantly greater poor sleep quality which had severe impact on elderly population [13] and implementing the Occupational Therapy based Mindfulness program can be the best practice to improve the sleep quality and stress level in elderly population.

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Declarations

Conflicts of interest: The authors report no conflicts of interest in this work.

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Ethical clearance: Verbal consent and written consent were obtained from all the elderly subjects who elected to participate in the study.

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