

Deep Breathing Exercise and Quality of sleep: An Experimental study among Geriatrics

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Abstract: *Background: Sleep is a necessary and vital biological function. It is required for a person's physical and emotional wellbeing. Barring adequate rest, the brain's ability to function can quickly deteriorate. Aging is a lifelong process, which begins before we are born and continues throughout life. The main purpose of this study is to promote sleep among geriatrics as the sleep disturbance is more common and prevailing among the older age group. Promotion of sleep aids in a better and healthier lifestyle by which most of the serious health consequences and imbalance can be avoided. Objectives:-the primary objective is to assess the level of sleep and finding the effect of deep breathing exercises on the quality of sleep. the secondary objective is to find out the association between quality of sleep with selected socio-demographic variables Methods:-This was a true experimental study, conducted among 60 geriatrics residing in Nirmal Hriday, Under Missionaries of charity, Satya Nagar, Bhubaneswar, Odisha. The samples were selected through simple random sampling and interviewed through a self-structured demographic Performa and Pittsburgh sleep quality index to assess the quality of sleep. Result:-the result shows that the geriatrics who received the intervention show the level of sleep quality is enhanced compared to routine care without exercise. It shows that deep breathing exercises were very much effect on the quality of sleep for geriatrics.*

Keywords: *Deep Breathing Exercise, Quality of Sleep, Geriatrics*

Introduction

An average of 7 to 8 hours of sleep each night is necessary to feel fully alert during the day. This is usually also true for elderly people for both sex men & women. ^[1] Old age people have some

specific problems but these can be elevated because of the unparalleled speed of socio-economic transformation leading to several changes in different aspects of living conditions. The needs and problems of the elderly differ suggestively according to their age, health, socio-economic, living status and other such background features.²

In a study it is seen that, more than 50% of senior patients reported sleeplessness while 80% of those reported insomnia was a prolonged condition. Women complained of insomnia more than men. Sleep is a dynamic biological process with vital curative functions that are crucial for optimum daytime running. Insufficient or poor-quality sleep has been allied with neuron cognitive impairments, and organ dysfunction and chronic health situations. Aging is connected with both the qualitative and quantitative changes in our sleep pattern and distribution^{3,4}

A study of a British cohort in 2014 showed that people ranging between 45-90 years exhibited 63% of men reporting that they had never experienced difficulty falling asleep compared to 40% of women. 12% of men and 15% of women reported that the most common sleep complaint is early awakening. The prevalence of sleep disorders in the older age group is about 50%.⁵ Hence in old age people are the extreme ones who suffer from sleeping disorders and the researcher chose this area of specialty to conduct the study and find ways for undisturbed sleep for Geriatrics. If these groups of people are educated the outcome would be beneficial to them and can lead a normal healthy life.⁶

Methods and materials

The current study is a true experimental study under a quantitative approach where a total of sixty number of sixty samples were taken, out of which 30 were under the experimental group & rest 30 were in the control group. The data were collected by using self-structured demographic Performa & Pittsburg sleep quality index to assess the quality of sleep from the Nirmal Hriday, Under Missionaries of charity, Satya Nagar, Bhubaneswar, Odisha. Information gathered through a face to face interview from the geriatric by using simple random sampling technique. Geriatric with mentally challenged and visual hearing impairment were excluded from the study. The researcher also excluded the participants who exhibited an unwillingness to participate in the study during informed consent. Both written and verbal information about the study(study objectives, benefits, problems and period) was explained through the consent form. Risk minimization and benefit maximization was ensured to all the study participants.

Result

A total of 60 geriatrics participated in the study, about 41.6% sample belongs to the age group of 60-65 years, 31.7% of sample belongs to the age group of 66-70 years, 26.7% of sample belongs to the age group of 70-80 years, In education, 25% of samples are under primary education, 36.7% of samples are under secondary education, 18.3% of samples are under graduation & above, 20% of samples are under illiterate. Where 45% of samples are married, 28.3% of samples are unmarried, 26.7% of samples are widows. Such as 15% are having pulmonary disease, 18.3% are having cardiac disease, 16.7% are having neurological disease and 50% are absents of disease. It seems that 25% of samples are doing no exercise, 35% of samples are doing usual daily activities, 26.6% of samples are doing extra activities, 13.4% of samples are doing structured exercise. Whereas usually, 31.8% could sleep with no light, 31.6% could sleep with dim light, 20% could sleep with average light, 16.6% could sleep with too much light on the

other hand majority of samples 51.7% are not exposed to noise during sleep, and 48.3% are exposed to noise during sleep as well as 28.4% samples are having substance use, 71.6% samples are not. (This should be table 1)

Table 2 illustrated that as per PSQI pre-intervention Mean \pm SD quality of sleep in the experimental group was (13.5 \pm 2.6) & in control group mean \pm SD quality of sleep was (13.13 \pm 2.5) at t= (0.64), p>0.5247, (df=58) which is not statistically significant. So here the null hypothesis is accepted. As per PSQI post-intervention mean \pm SD quality of sleep in the experimental group was (7.1 \pm 2.77) & in control group mean \pm SD quality of sleep was (12.4 \pm 2.28) at t= (8.08), P<0.0001, (df=58) which was extremely statistically significant.so here the research hypothesis is accepted.

Table 3 illustrates that as per PSQI scoring criteria in the experimental group the pre-intervention mean (13.56), SD (7.1) and post-intervention mean (2.60), SD (2.77), at t=16.06, df=29, P<0.0001 which was very statistically significant.

Table 4 shows that there was no statistical association between quality of sleep score with age, education, marital status, presence of disease, kind of exercise, place of sleep, exposed to noise during sleep & substance use as the chi-square value are (1.09) at P=0.9546, (0.07) at P=0.9949, (0.12) at P=0.9418, (1.22) at P=0.7482, (2.96) at P=0.3978, (1.84) at P=0.6063, (0.57) at P=0.4503, (0.001) P=0.9748, As P<0.05 hence null hypothesis was accepted.

Table 1. Description of samples according to socio-demographic variables

Sl no	Sample	Characteristics	Frequency	Percentage
1	Age in year	60-65	25	41.6
		66-70	19	31.7
2	Education	71-80	16	26.7
		Primary	15	25
		Secondary	22	36.7
		Graduation above	11	18.3
		Illiterate	12	20
3	Marital status	Married	27	45
		Unmarried	17	28.3
		Widow	16	26.7
4	Presence of disease	Pulmonary	9	15
		Cardiac	11	18.3
		Neurological	10	16.7
5	Kind of exercise	Absent	30	50
		No exercise	15	25
		Usual daily activities	21	35
		Extra activity used	16	26.6
		Structured exercise practices	8	13.4

6	Place of sleep	No light	19	31.8
		Dim light	19	31.6
		Average light	12	20
7	Exposed to noise during sleep	Too much light	10	16.6
		Exposed	29	48.3
8	Substance use	Not exposed	31	51.7
		Yes	17	28.4
		No	43	71.6

Table 2. Comparison between the experimental and control group

Item	Experimental Group	Control group	Un paired 't' test	df	P-value	Inference
	Mean ± SD	Mean ±SD				
Pre Intervention	13.5±2.6	13.13±2.5	0.64	58	0.5247	Not statistical significant
Post intervention	7.1±2.77	12.4±2.28	8.08	58	0.0001	Statistical significant

Table 3. Comparison between pre and post-intervention in the experimental group

Item	mean	SD	Paired t value	Df	P-value	Inference
Pre Intervention	13.56	7.1	16.06	29	0.0001	Statistically Significant
Post Intervention	2.60	2.77				

Table 4 Association between quality of sleep with selected demographic variables

SI No	Socio-Demographic variable	Chi-square value	Df	P-Value	Inference
1	Age	1.09	2	0.9546	Not statistically significant
2	Education	0.07	3	0.9949	Not statistically significant
3	Marital status	0.12	2	0.9418	Not statistically significant

					significant
4	Presence of disease	1.22	3	0.7482	Not statistically significant
5	Kind of exercise	2.96	3	0.3978	Not statistically significant
6	Place of sleep	1.84	3	0.6063	Not statistically significant
7	Exposed to sleep During sleep	0.57	1	0.4503	Not statistically significant
8	Substance use	0.001	1	0.9748	Not statistically significant

Discussion

After conducting the study, it was observed that the distribution of samples according to age represent 25(41.6%) are age group between 60-65 years, 19(31.7%) are age group between 66-70 years, 16(26.7%) are age group between 71-80 years. Distribution of sample according to education represents 15(25%) of the study sample are achieve their primary education, 22(36.6%) are achieved secondary education, 11(18.3%) are achieved graduation & above, 12(20%) are illiterate. Distribution of sample according to marital status represents 27(45%) of study samples are married, 17(28.3%) are unmarried, 16(26.6%) are widow. Distribution of sample according to the presence of disease represents 9(15%) of study samples are having pulmonary disease, 11(18.3%) are having cardiac disease, 10(16.7) are having neurological disease and 30(50%) are the absence of disease. Distribution of sample according to kind of exercise 15(25%) of study samples are not doing exercise 21(35%) are doing usual daily activities 16(26.6%) are doing extra activities 8(13.3%) are doing structured exercise. Distribution of sample according to place of sleep represent 19(31.6%) are sleeping with no light, 19(31.6%) is sleeping with dim light, 12(20%) are sleeping with average light, 10(16.6%) are sleeping with too much light. Distribution of sample according to expose to noise during sleep represent 29(48.3%) are expose and 31(51.6%) are not exposed. Distribution of sample according to substance use represent 17(28.3%) are using and 43(71.6%) are not using. Frequency & Percentage distribution of subjects according to pre-test score of level of sleep (mild and moderate) in both experimental and control group shows that level of sleep in pre-test score of control & experimental group (15)50%, (13)43.3% of samples belong to mild group(0-13) score and (15)50%, (17)56.6% samples belong to the moderate group(14-21)score. Frequency & Percentage distribution of subjects according to the post-test score of level of sleep (mild and moderate) in both experimental and control group shows that the level of quality of sleep in post-test of control & experimental group (22)73.3%, (28)93.3% sample belongs to the mild group(0-13) score and (8)26.6%, (2)6.6% samples belong to the moderate group(14-21)score. Findings related to the effect of Deep breathing exercise on quality of sleep among the geriatrics. Comparison of pre-intervention & post-intervention of deep breathing exercise

between experimental group & control group as per PSQI. Mean score of quality of sleep pre-intervention of experimental and control group are (13.5 ± 2.6) & (13.13 ± 2.5) , at $t=0.64$, $P > 0.5247$, $df=58$, which was not statistically significant. Mean score quality of sleep post-intervention of both experimental and control group are (7.1 ± 2.77) & (12.4 ± 2.28) , at $t=8.08$, $P < 0.0001$, $df=58$, which was statistically significant. The mean score of quality of sleep in pre-intervention was (13.56 ± 7.1) and post-intervention of mean (2.60 ± 2.77) $t=16.06$, $P < 0.0001$, $df=29$ which is statistically significant. There was no statistically association between quality of sleep score with age, education, marital status, presence of disease, kind of exercise, place of sleeping, exposed to noise during sleep & substance use as the chi-square values are (1.09) at $P=0.9546$, (0.07) at $P=0.9949$, (0.12) at $P=0.9418$, (1.22) at $P=0.7482$, (2.96) at $P=0.3978$, (1.84) at $P=0.6063$, (0.57) at $P=0.4503$, (0.001) at $P=0.9748$, As $P < 0.05$ respectively.⁶⁻⁹

Conclusion

The findings of this study reveal that providing deep breathing exercises with appropriate tools to assess the quality of sleep in geriatrics aged between 60-80 years. In the present study experimental group shows after doing deep breathing exercise the mean score of global sleep quality as per PSQI, quality of sleep is increased. The above findings reveal that the geriatrics who received the intervention show the level of sleep quality is enhanced compared to routine care without exercise. It shows that deep breathing exercises were very much effect on the quality of sleep for geriatrics. So the present study findings by doing deep breathing exercises the geriatrics quality of sleep can be improved.

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Ethical Statement: This study was approved by the institutional ethical committee and the prior consent was taken before the collection of samples.

Conflict of interest: The authors declare that there is no conflict of interest.

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