

A STUDY TO CORRELATE SLEEP QUALITY AND COGNITIVE FUNCTIONING AMONG INSTITUTIONALISED ELDERLY IN INDIA

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ABSTRACT

Advancing age deteriorates sleep quality which further affects cognitive functioning. Nearly half of the elderly population report difficulty in sleep quality and cognitive functioning. A study was conducted on 955 institutionalised elderly in India. Pittsburgh sleep quality index and Mini Mental Status Examination (MMSE) was used to assess the sleep quality and cognitive functioning respectively. The prevalence of disturbed sleep quality among the studied elderly in institutions in India was more than half 56.3%. Higher prevalence of disturbed sleep quality was found among age group 66-70 years of age and elderly who were having joint pains. Also disturbed sleep was associated with gender i.e. females were more affected. Majority 56.2% were taking sleep inducing medications. ANNOVA was applied to assess relationship of sleep quality according to socio demographic variables and not significant association was found expect sleep inducing medications ($F=5.16$, $df=1$, $p<0.05$). The prevalence of impaired cognition among the studied elderly in institutions in India was more than half 55.4%. Also disturbed sleep was associated with gender i.e. females were more affected. Majority 56.2% were taking sleep inducing medications. ANNOVA was applied to assess relationship of cognitive functioning according to socio-demographic variables and had significant association with gender and sleep inducing medications ($F=3.78$, $df=1$, $p<.05$; $F=3.491$, $df=1$, $p<.05$ respectively). This study reveals that careful health assessment is necessary to screen out sleep complaints and deviation in cognitive functioning of elderly living in institutions.

Key Words: Sleep Quality, Cognitive Functioning, PSQI, MMSE, Institutionalised elderly.

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INTRODUCTION

Jain DG (2007) stated that ageing begins immediately after conception and halts only with the cessation of the heartbeat. No one however high or mighty can escape it. The Nobel Laureate Physicist, Erwin Schrodinger has thus rightly defined life as a fight against degeneration. However, society and government with its perverted economic focus on taxation and the creation of a wealthy economy has failed to even acknowledge the needs and aspirations of India's elderly and ageing population.

MacMillan Dictionary (1981) found that sleep is a naturally recurring state characterised by reduced or absent consciousness, relatively suspended sensory activity, and inactivity of nearly all voluntary muscles. It is distinguished from quiet wakefulness by a decreased ability to react to stimuli, but it is more easily reversible than hibernation or coma. Sleep is a heightened anabolic state, accentuating the growth and rejuvenation of the immune, nervous, skeletal and muscular systems. It is observed in all mammals, all birds, and many reptiles, amphibians, and fish.

Asplund & Aberg (1998) described that sleep problems are among the most commonly reported health problems in the elderly, and the probability of experiencing sleep problems increases with advancing age. The average prevalence of sleep complaints in adulthood is between 8% and 18% but in those 55 years and older, it is considerably higher (up to 41%), depending upon the number of medical conditions that are reported.

Gomaldo AA et. al. (2010) conducted a study on exploring the within-person coupling of sleep and cognition in 50 older African Americans. A within-person daily change in sleep duration was significantly associated with worse global cognitive performance. The greater an individual deviated away from his or her average sleep duration on a particular day, the more likely his or her performance would decline. These results demonstrate that the sleep-cognition relationship can be observed at a within-person level of analysis.

PROBLEM STATEMENT

A study to correlate sleep quality and cognitive functioning among institutionalised elderly in India

SECTION I: Percentage distribution according to socio-demographic characteristics

SECTION II: Correlation between sleep quality and cognitive functioning

MATERIALS AND METHODS

A study was conducted on 955 elderly living in ten institutions. Pittsburgh sleep quality index and Mini Mental Status Examination was used to assess sleep quality and cognitive functioning respectively. Multistage cluster sampling was used.

RESULTS

The prevalence of disturbed sleep quality among the studied elderly in institutions in India was more than half at 56.3%. Higher prevalence of disturbed sleep quality was found among the age group 66-70 years and the elderly who were having joint pains. Also disturbed sleep was associated with gender i.e. females were more affected. Majority 56.2% were taking sleep inducing medications. ANNOVA was applied to assess relationship of sleep quality according to socio-demographic variables and not significant association was found except sleep inducing medications ($F=5.16$, $df=1$, $p<0.05$). The prevalence of impaired cognition among the studied elderly in institutions in India was more than half at 55.4%. Also disturbed sleep was associated with gender i.e. females were more affected. Majority 56.2% were taking sleep inducing medications. ANNOVA was applied to assess relationship of cognitive functioning according to socio-demographic variables and was found to have significant association with gender and sleep inducing medications ($F=3.78$, $df=1$, $p<.05$; $F=3.491$, $df=1$, $p<.05$ respectively).

DISCUSSION There was a negative correlation between sleep quality and cognitive functioning. Therefore, disturbed sleep quality impairs cognitive functioning. The findings are in consistent with **Haimov I, Vadas L (2009)** that observed sleep in 112 older adults: association between chronic insomnia and cognitive functioning. Older people suffering from late life insomnia exhibit significantly reduced performance in memory span, allocating attention to a target, time estimation, working memory and integration of two dimensions. **Amer ms, hamzasa, el akkad rm, abdel galeel yi. (2013)** conducted a study on self-reported sleep quality to predict poor cognitive performance among 100 elderly living in elderly homes in Egypt. The results showed that 52% of poor sleepers had impaired MMSE, while only 24% of good sleepers had impaired MMSE. Both orientation and (attention and calculation) were more affected ($P = 0.027$ and 0.035 , respectively). Linear correlation coefficient between PSQI and different variables revealed significant negative correlation with total MMSE score, attention and calculation.

Section-I Demographic Characteristics**TABLE – 1** Frequency And Percentage Distribution Of Elderly People According To Socio-Demographic Variables
N=955

Sl. No.	Demographic variables	Frequency (n)	Percentage (%)
1.	Age (In years)		
	60-65	301	32
	66-70	344	36
	71-75	194	20
	>75	116	12
2.	Gender		
	Male	440	46.1
	Female	515	53.9
3.	Education		
	Illiterate	300	32
	Primary/Middle	346	36
	Matric/Sen. Sec.	194	20
	Graduation and above	115	12
4.	Marital Status		
	Single	64	6.7
	Married	598	62.6
	Widower/widow	293	30.7
5.	Sleep Inducing Medications		
	Yes	537	56.2
	No	418	43.8
6.	Room Partner		
	Yes	433	45.3
	No	522	54.7
7.	Disease Condition		
	Diabetes Mellitus	294	31
	Joint Pains	354	37
	Eyes Problems	185	19
	Cerebro-vascular Accident	122	13

Table 1 shows the frequency and percentage distribution of characteristics of the study subjects. A total of 955 elderly people living in institutions for assessing sleep quality and cognitive functioning were studied. Demographic characteristics are analysed and presented in frequency and percentage distribution as given in Table - 1.

Distribution of study subjects according to age of the elderly people shows that majority i.e. 36% were in the age

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group of 66-70 years, followed by 32% in age group 60-65 years, 20% in age group 71-75 years and remaining 12% in age group >75 years. According to gender, majority i.e. 54% were females and remaining 46% were males. According to education, majority i.e. 36% studied up to primary/ middle school, 31% were illiterates, 20% had studied up to matric/ senior secondary level and only 12% were graduates or postgraduates. According to marital status, majority i.e. 62.6% were married, followed by 30.7% widower/ widow while only 6.7% were single. According to sleep inducing medications, majority i.e. 56.2% were taking medications, followed by those who were not taking medications i.e. 43.8%. According to room partner, majority i.e. 54.7% were living alone while 45.3% were living with room partner. According to disease condition, majority i.e. 37% were having joint pains, followed by 31% who were suffering from diabetes mellitus, 19% from eyes problems and 13% from cerebro-vascular accident.

Hence, it can be concluded that out of 955 elderly people, majority of elderly were in the age group 66-70 with qualification primary/ middle school. Maximum were having no room partner and were suffering from joint pains. Majority were taking sleep inducing medications.

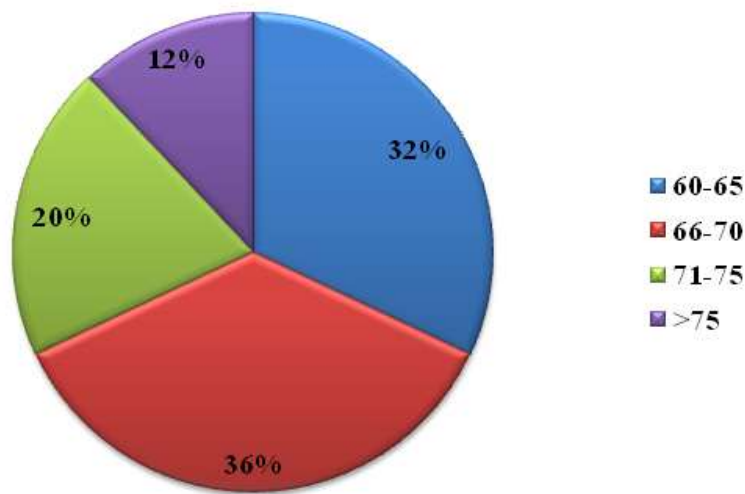


Fig. – 1: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO AGE (IN YEARS)

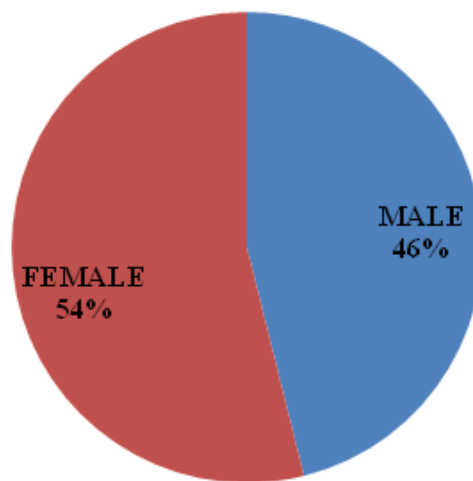


Fig. - 2: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO GENDER

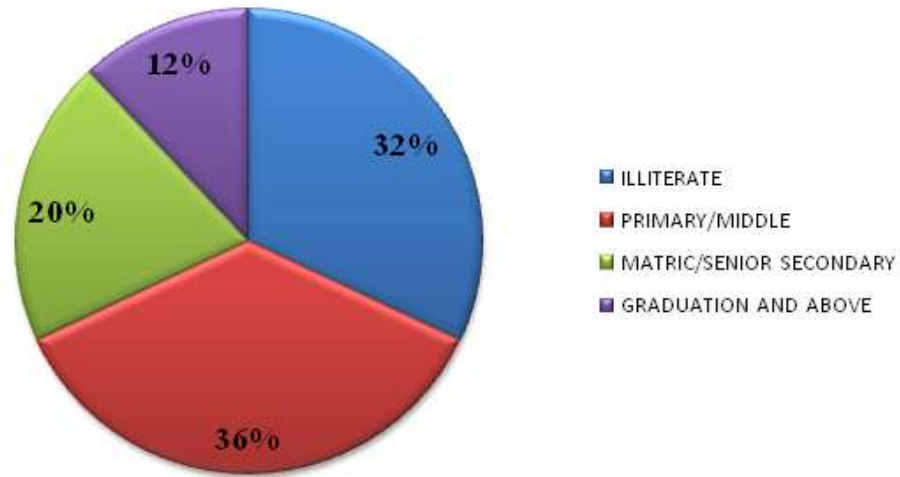


Fig. - 3: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO EDUCATION

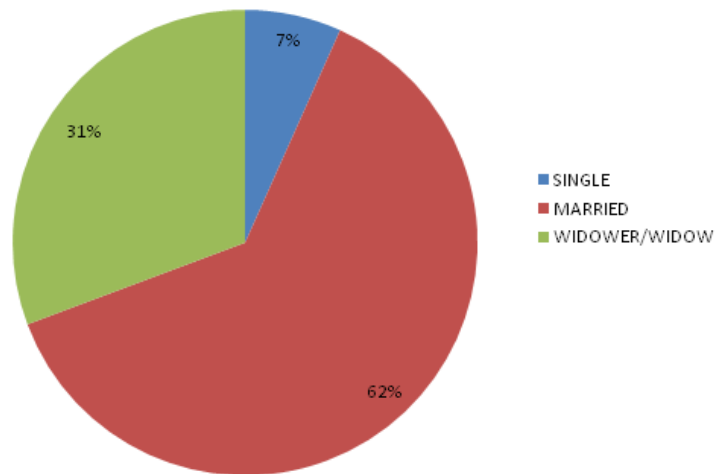


Fig. - 4: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO MARITAL

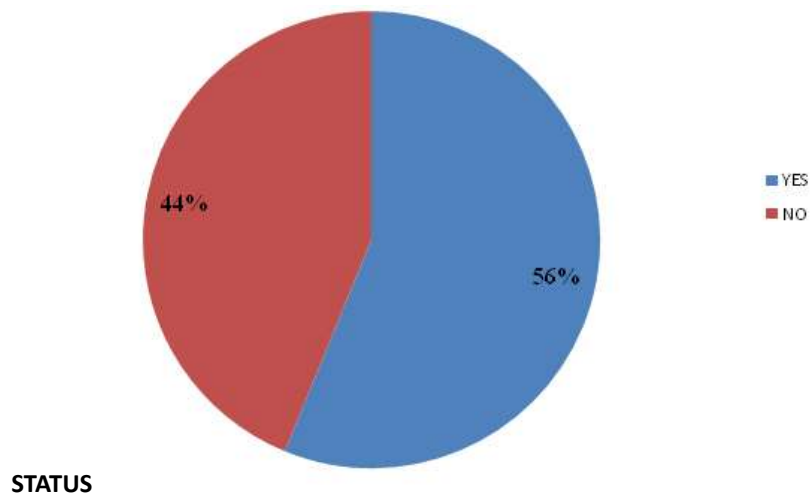


Fig. - 5: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO SLEEP INDUCING MEDICATIONS

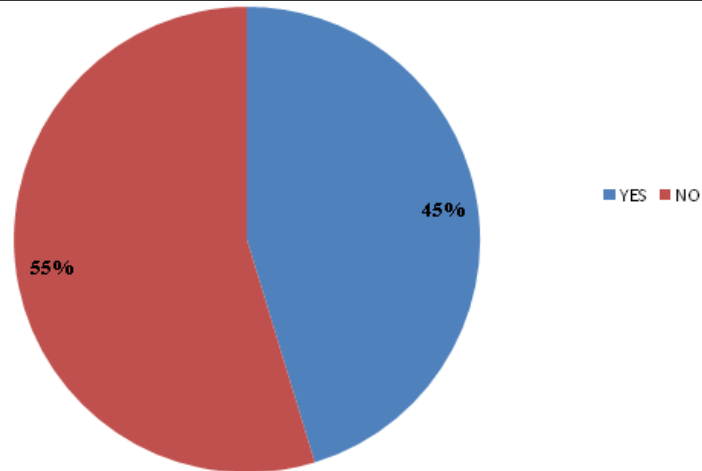


Fig. - 6: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO ROOM PARTNER

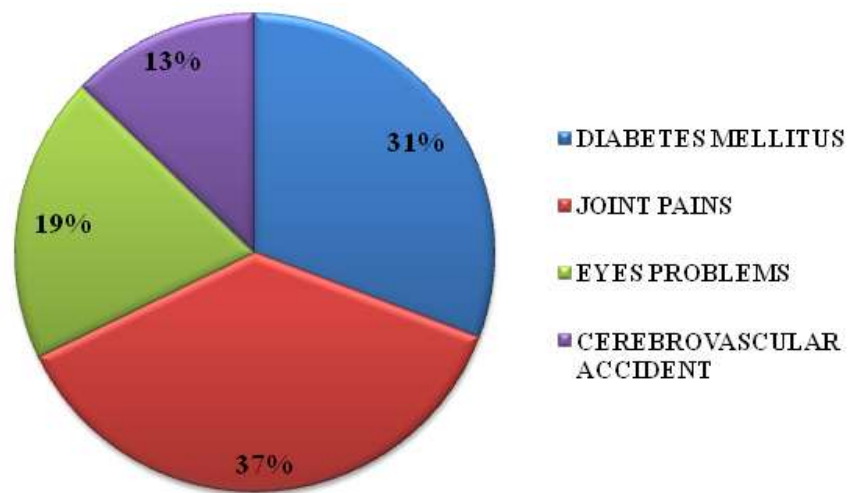


Fig. - 7: PERCENTAGE DISTRIBUTION OF ELDERLY ACCORDING TO DISEASE CONDITION

Section - II
Correlation between Sleep Quality and Cognitive Functioning

TABLE - 2
Correlation between sleep quality and cognitive functioning among elderly

N=955

	Orientation	Immediate recall	Attention & Calculation	Recall	Language
Sleep Quality	-.609**	-.344**	-.547**	-.376**	-.539**
Orientation	1**	.500**	.670**	.504**	.636**
Immediate Recall	.500**	1**	.550**	.486**	.352**
Attention & calculation	.670**	.550**	1**	.452**	.558**
Recall	.504**	.486**	.452**	1**	.513**
Sleep Quality	-.609**	-.344**	-.547**	-.376**	-.539**
Orientation	1**	.500**	.670**	.504**	.636**

**Correlation is significant at the 0.01 level (2-tailed)

Table – 2 and Fig - 1 reveal the correlation between sleep quality and cognitive functioning. There was a strong negative correlation between sleep quality and cognitive functioning which was statistically significant at 1% level of significance. This shows as the sleep quality score decreases, cognitive functioning score increases. Therefore, disturbed sleep quality impairs the cognitive functioning of the elderly living in institutions. Hence, the null hypothesis is rejected.

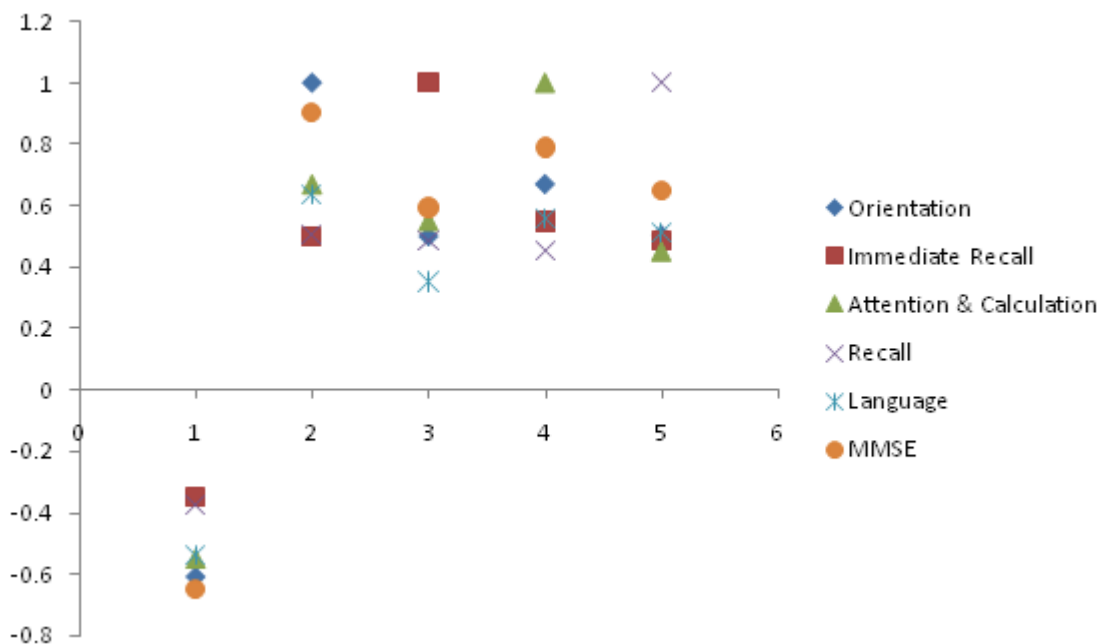


Fig. – 8: Correlation between Sleep Quality and Cognitive functioning

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