Original Article

Study of sleep disorders in the elderly visiting geriatrics department

Maneesha Regati, Priya Vijayakumar

Department of Geriatrics, Amrita Institute of Medical Sciences, Kochi, Kerala, India

Abstract

Context: Sparse published data are available from India regarding sleep disorders in elderly, sleep quality, and daytime sleepiness. **Aims:** To study sleep disturbances in the elderly (>60 years) subjects. **Settings and Design:** Hospital-based cross-sectional study. **Methods and Material:** All the subjects underwent a thorough clinical evaluation which included detailed history and a thorough physical examination. The daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESS). The sleep quality (SQ) was evaluated with the Pittsburgh Sleep Quality Index (PSQI). **Statistical Analysis Used:** Association between categorical variables was studied by Chi-square (χ^2) test with continuity correction. All tests were two-tailed; a P value <0.05 was considered as significant. **Results:** During the period November 2019 to July 2020, 122 elderly subjects were studied; women (n = 70; 57.4%) outnumbered men. Only six (4.9%) patients presented with sleep-related complaints. Seven (5.7%) patients had an ESS score >10 suggestive of increased day time sleepiness. Sixty-four (52.5%) were labelled "bad sleepers" (PSQI >5). Compared with those with ≤3 comorbid conditions, a higher proportion of elderly with >3 comorbid conditions had significantly higher occurrence of poor sleep quality (PSQI >5) and daytime sleepiness (ESS >10). Increased daytime sleepiness (ESS >10) was significantly high in patients with osteoarthritis and cerebrovascular disease. **Conclusions:** Our observations suggest that a high proportion of elderly subjects who did not complain of sleep-related symptoms were found to have poor sleep quality. Therefore, incorporating SQ assessment as a part of routine geriatric assessment screening would be beneficial in early detection of this condition.

Keywords: Day time sleepiness, elderly, Epworth sleepiness scale, Pittsburgh sleep quality index, sleep quality

Introduction

Changes in sleep architecture, duration and quality that occur with ageing impact the lifestyle of the elderly.[1-4] In addition to the normal ageing changes, other factors that occur during ageing also have an impact on sleep quality (SQ). Sleep disorders can be primary and secondary sleep disorders. Secondary sleep disorders occur due to the effect of comorbid conditions that cause pain and discomfort like painful diabetic neuropathy, gangrene, peripheral arterial disease, pain due to malignancy, etc., Other causes of secondary sleep disorders include nocturia due to poorly controlled diabetes mellitus, benign prostatic hyperplasia (in men), breathlessness affecting sleep (e.g., orthopnoea due to cardiac failure), drugs that interfere with sleep, among others.[5]

Several of the sleep disorders in the elderly are treatable. Therefore, careful clinical assessment of sleep duration, quality, daytime sleepiness along with judicious use of sleep studies will be helpful in early diagnosis of these conditions. A meticulous documentation of lifestyle, environmental factors, detailed medical, psychiatric history is required and is helpful in choosing appropriate management plan for sleep disorders. Quality of life and functioning of the elderly can be considerably improved by targeting both the sleep disorders as well as any comorbidities that are present.

Address for correspondence: Dr. Priya Vijayakumar, Professor, Department of Geriatrics, Amrita Institute of Medical Sciences, Kochi - 682 041, Kerala, India.
E-mail: priyavijayakumar@aims.amrita.edu

Received: 23-05-2021 **Revised:** 08-10-2021
Accepted: 21-10-2021 **Published:** 16-02-2022

Access this article online

Quick Response Code:

Website: www.jfmpc.com

DOI: 10.4103/jfmpc.jfmpc_949_21

How to cite this article: Regati M, Vijayakumar P. Study of sleep disorders in the elderly visiting geriatrics department. J Family Med Prim Care 2022;11:614-22.

The present study was planned recognising the knowledge gap that exists regarding the burden of sleep disorders in the elderly in India. The objectives of the study were to identify the sleep disorders, study daytime sleepiness and SQ among elderly subjects visiting Geriatrics Department.

Material and Methods

Elderly subjects visiting the Department of Geriatrics, Amrita Institute of Medical Sciences, Kochi during the period November 2019 and July 2020 were screened for inclusion in this observational cross-sectional study.

Previously published studies on this subject included healthy individuals in the community. Hence, a pilot study was done to calculate the proportion of subjects with sleep disorders among the elderly attending the department of Geriatrics. In the pilot study, using the PSQI questionnaire, it was observed that 31 out of 68 subjects (proportion is 0.46) had sleep disorders. With a precision of 20% and 95% desired confidence level, the minimum sample size required was calculated to be 113.

Elderly (>60 years) subjects consenting to participate in the study were included. Subjects unwilling to participate were excluded. The study was initiated after obtaining clearance from the Ethics Committee of the Institute. From all the study participants, written informed consent was obtained.

All the subjects underwent a thorough clinical evaluation which included detailed history and a thorough physical examination. Detailed history included sociodemographic data, presenting complaints, history regarding sleep disturbances, background comorbid illnesses, past medical and surgical details, family history of sleep disorders, current medication history, personal habits like consumption and frequency of tea, coffee, tobacco and alcohol. The study subjects were categorized to eight groups which were illiterate, primary school education, secondary school education, high school education, pre-university, vocational course, graduation and postgraduation. Depending on the marital status, they were divided into married, unmarried, divorced and widowed. The study population was sorted into four types based on the employment status of an individual at the time of recruitment. The study subjects were labelled, on the basis of income, as self-sustaining or dependent.

Weight was measured (in kg); height was recorded to the nearest 0.1 cm. Body mass index (BMI) was calculated as weight (kg)/[height (metres)]^2. Based on the BMI, nutritional status was classified.[6]

The daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESS).[7] A total ESS of >10 indicates *excessive daytime sleepiness* (EDS). The *sleep quality* was evaluated with the Pittsburgh Sleep Quality Index (PSQI).[8]

Statistical analysis

Data were recorded on a predesigned proforma and managed using Microsoft Excel 2016 (Microsoft Corp, Redmond, WA). All the entries were double checked. Categorical variables were summarised as frequencies (percentages). Continuous variables were summarised by mean and standard deviation (SD); median [interquartile range (IQR)] as appropriate. Association between categorical variables was studied by Chi-square (χ^2) test with continuity correction. All tests were two-tailed; a *P* value <0.05 was considered as significant. Statistical software IBM SPSS, Version 20, (IBM SPSS Statistics, SomersNY, USA) was used for statistical analysis.

Results

During November 2019 to July 2020, 142 consecutive elderly subjects were screened for inclusion in the study. Of these, 20 were excluded as they were unwilling to participate in the study; 122 elderly subjects were studied.

Their mean age was 73.4 ± 6.2 years (range 60--88 years). Women (*n* = 70; 57.4%) outnumbered men. These details are shown in [Table 1]. Most of them were retired and home makers (*n* = 50, 41% each). Fifteen (12.3%) of them were still working and few were unemployed (*n* = 7,5.7%). More than half of the patients had self-supporting income (*n* = 66,54.1%) and

Table 1: Distribution of demographic variables

Variable	No.	%
Gender		
Men	52	42.6
Women	70	57.4
Educational status		
Illiterate	4	3.3
Primary school	11	9.0
Secondary school	15	12.3
High school	41	33.6
Pre-university	12	9.8
Vocational course	3	2.5
Graduation	25	20.5
Postgraduation	11	9.0
Marital status		
Married	89	73.0
Unmarried	2	1.6
Divorced	1	0.8
Widowed	30	24.6
Occupation		
Employed	15	12.3
Unemployed	7	5.7
Retired	50	41.0
Home maker	50	41.0
Income		
Self-sustaining	66	54.1
Dependent	56	45.9
Place of residence		
Urban	78	63.9
Rural	44	36

the rest were dependent on their family members for money. Seventy-eight individuals (63.9%) belonged to urban areas and the remaining 44 (36%) resided in rural areas.

Only 6 (4.9%) reported to the hospital with complaints related to sleep and 60 (49.2%) came with other symptoms not pertaining to sleep; 56 (45.9%) of them did not have any complaints and visited the hospital for regular review and refilling drugs. The patients who reported with sleep-related issues (n = 6, 4.9%) complained of lack of proper sleep at night, multiple awakenings at night, inability to fall asleep after awakening, midnight or early morning awakening etc.

Majority of the patients (95.9%) had comorbid illnesses. Hypertension was the most common comorbid condition (n = 88,72.1%) followed by diabetes mellitus (n = 70,57.4%).

Tobacco use was observed only in five patients (all males; cigarette smokers). History of alcohol consumption was recorded in 12 (9.8%). Several patients (39.3%) consumed two cups of tea/day; 23 (19.9%) consumed coffee.

The number of awakenings per night in the study subjects ranged from 0 to 6. Most of them had 1--3 awakenings per night. Out of 122 subjects, 65 (53.3%) took naps during the day, majority slept only once (n = 54,44.3%). Almost half of the study population did not sleep during the day (n = 57,46.7%).

One hundred and nineteen (97.5%) used medications for various medical illnesses. Insulin was being used by 14 patients out of 70 diabetics. Oral antidiabetic drugs were being used by 59/70 patients with diabetes mellitus. Most of them (20.5%) were taking two oral antidiabetic drugs. Pregabalin and/or gabapentin were used by 10 patients (8.2%). Twelve (9.8%) used antidepressants. Eight (6.6%) were taking benzodiazepines and five took medication for better sleep. Antihistamines were used by four only.

Angiotensin receptor blockers and/or angiotensin converting enzyme inhibitors alone or with other drugs, were used in 46 (37.7%), 23 (18.9%), 29 (23.8%), 39 (32%), 14 (11.4%) patients, respectively. Other cardiac medications were used by 9 (7.4%); 26 (21.3%) used bronchodilators. Thirty-three (27%) used single antiplatelet drug and dual antiplatelet drugs were used by 8 (6.6%). Sixty-five (53.3%) used 3-hydroxy-3-methylglutaryl-CoA (HMG CoA) reductase inhibitors (statins). Eight patients used fibrates along with statins. Corticosteroids were used by 6 (4.9%), levothyroxine by 21 patients.

Twenty-six (21.3%) used drugs to relieve dyspeptic symptoms. Other drugs acting on the gastrointestinal tract were used by 17 (13.9%). Nutritional supplements were used by 73 (58.8%); 10 (8.2%) used alternative medicine. Majority of the patients (n = 72, 59%) were unaware of sleep disorders in their family members. Only two reported a family history of sleep complaints.

The mean BMI was 24.1 ± 4.1 kg/m^2. Majority (n = 69,56.6%) were overweight; seven were underweight; 46 (37.7%) were normal weight.

Seven (5.7%) of the 122 patients studied had EDS (ESS >10). The usual bed time of the study subjects ranged between 8 PM and 1 AM. One third (n = 39, 32%) of them went to bed at 10 PM (PSQI1). More than one-fourth (n = 33,27%) were able to fall asleep immediately after going to bed. Another quarter of them (n = 31,25.4%) took 30 min. to fall asleep (PSQI2). The usual getting up time among the study population ranged between 2.30 AM and 7.30 AM. 36 (29.5%) of them got out of the bed at 6 AM (PSQI3). The number of hours of actual sleep per night among the study subjects ranged between 1 and 9.5.

The most frequent causes of severe sleep disturbances were difficulty to initiate sleep (n = 40, 40.2%), waking up in the middle of the night (n = 31, 25.4%), having to get up to use the bathroom (n = 34,27.9%). The other reasons that trouble the sleep of the subjects were night cramps over legs, thoughts, worry about family members, financial issues etc., More than half of them (n = 70,57.4%) felt they had slept 'fairly good' during the past month and seven individuals (5.7%) felt their SQ was 'very bad'. The subjective SQ was good according to 97 (79.5%) patients, however, the global PSQI score-labelled good sleepers were only 58 (47.5%).

Half of the study subjects (n = 65,53.3%) were able to fall sleep within 15 min. after going to bed and one- fourth of them (n = 32,26.2%) fell asleep in 15--30 min. However, nine patients (7.4%) took more than an hour to fall asleep. Majority of them (n = 54, 44.3%) slept for 6—7 hours at night; 96 (78.7%) patients had some sleep disturbances due to various reasons. Majority of the subjects (n = 101,82.8%) did not use any sleep medication; 16 patients (13.1%) have taken medicine (prescribed or over the counter) thrice or more per week to help them sleep. Less frequent use, that is, less than twice a week, was noted in 5 patients (4.1%). Daytime dysfunction was noted among 39 (32%) subjects. Fifty-eight (47.5%) were found to be good sleepers and 64 individuals (52.5%) were labelled as bad sleepers based on the PSQI score of ≤5 and >5, respectively.

Association of EDS with the study variables is shown in [Table 2]. Four of the seven patients with increased daytime sleepiness were men. Increased daytime sleepiness had no association with gender. Among the seven subjects who had EDS, the distribution of BMI (kg/m^2) was as follows: underweight (<18.5) none, at risk of obesity (23--24.9) one, obese class I (25--29.9) two and obese class II (≥30) one.

Compared to subjects with ≤3 comorbid illnesses, subjects with >3 comorbid illnesses had higher occurrence of EDS. Further, EDS was significantly more in patients with than those without osteoarthritis (P = 0.001). There was statistically significant association of EDS with compared to those without cerebrovascular disease (P = 0.001). However, there was no

Table 2: Association of excessive daytime sleepiness with study variables

Variable	No.	ESS <10 (*n*=115)		ESS >10 (*n*=7)		*P*
		No.	%	No.	%	
Gender						
Male	52	48	92.3	4	7.7	0.424
Female	70	67	95.7	3	4.3	
Body mass index (kg/m^2)						
Underweight (<18.5)	7	7	100	0	0	0.968
Normal (18.5-22.9)	46	43	93.5	3	6.5	
At risk (23-24.9)	20	19	95	1	5	
Obese I (25-29.9)	35	33	94.3	2	5.7	
Obese II (≥30)	14	13	92.9	1	7.1	
Comorbid conditions						
≤3	60	59	98.3	1	1.7	0.057
>3	62	56	90.3	6	9.7	
Diabetes mellitus						
Absent	52	48	92.3	4	7.7	0.424
Present	70	67	95.7	3	4.3	
Hypertension						
Absent	34	34	100	0	0	0.09
Present	88	81	92	7	8	
Dyslipidemia						
Absent	55	54	98.2	1	1.8	0.092
Present	67	61	91	6	9	
Benign prostate hyperplasia						
Absent	101	97	96	4	4	0.064
Present	21	18	85.7	3	14.3	
Chronic kidney disease						
Absent	112	106	94.6	6	5.4	0.545
Present	10	9	90	1	10	
Coronary artery disease						
Absent	104	99	95.2	5	4.8	0.288
Present	18	16	88.9	2	11.1	
Hypothyroidism						
Absent	100	94	94	6	6	0.791
Present	22	21	95.4	1	4.6	
Gastro oesophageal reflux disease or acid peptic disease						
Absent	116	109	94	7	6	0.535
Present	6	6	100	0	0	
Obstructive airway disease						
Absent	102	97	95.1	5	4.9	0.37
Present	20	18	90	2	10	
Osteoarthritis						
Absent	106	103	97.2	3	2.8	0.001
Present	16	12	75	4	25	
Psychiatric illness						
Absent	115	109	94.8	6	5.2	0.317
Present	7	6	85.7	1	14.3	
Cerebrovascular disease						
Absent	118	113	95.8	5	4.2	0.001
Present	4	2	50	2	50	
Parkinson's disease						
Absent	118	111	94.1	7	5.9	0.616
Present	4	4	100	0	0	
Neuropathy						
Absent	115	109	94.8	6	5.2	0.317
Present	7	6	85.7	1	14.3	

Contd...

Table 2: Contd...

Variable	No.	ESS <10 (*n*=115)		ESS >10 (*n*=7)		*P*
		No.	%	No.	%	
Hyperuricemia/gout						
Absent	114	108	94.7	6	5.3	0.395
Present	8	7	87.5	1	12.5	
Urinary urgency/overactive bladder						
Absent	119	112	94.1	7	5.9	0.665
Present	3	3	100	0	0	
Skin diseases						
Absent	117	111	94.9	6	5.1	0.161
Present	5	4	80	1	20	
Anemia						
Absent	117	111	94.9	6	5.1	0.161
Present	5	4	80	1	20	
Vertigo						
Absent	116	110	94.8	6	5.1	0.238
Present	6	5	83.3	1	16.7	
Head injury						
Absent	110	103	93.6	7	6.4	0.368
Present	12	12	100	0	0	
History of falls						
Absent	76	71	93.4	5	6.6	0.608
Present	46	44	95.7	2	4.3	
Complaints						
Sleep related	6	6	100	0	0	0.788
Other complaints	60	56	93.3	4	6.7	
No complaint	56	53	94.6	3	5.4	
Drugs						
≤3 drugs	33	33	100	0	0	0.97
>3 drugs	89	82	92.1	7	7.9	

association between EDS with other individual comorbid conditions [Table 2].

There was no statistically significant association of EDS with demographic variables, presenting complaints, family history of sleep disorders, history of tobacco consumption, alcohol intake, consumption of tea and coffee and the various medications used. Among the seven patients with EDS (ESS >10), 4 presented with non-sleep related complaints and 3 individuals did not have any specific complaints. None of the patients who presented with sleep complaints had increased daytime sleepiness.

Out of 64 patients with poor SQ, 39 were women. SQ had no association with gender. The distribution of BMI among poor sleepers is as follows: one individual was underweight, 12 were normal, 8 subjects were at risk of becoming obese and 27 individuals were found to be obese [Table 3]. SQ and the number of comorbid conditions (≥3) have a statistically significant association. However, there was no association between SQ and individual comorbid condition.

There was no association of SQ with the demographic variables. Similarly, there was no statistically significant association of SQ with presenting complaint, number of drugs (≤3 vs >3), family history of sleep disorders, tobacco use, alcohol intake, consumption of tea and coffee. There was statistically significant association of SQ with drugs for better sleep, antihistamines and proton pump inhibitors as shown in [Table 3].

Discussion

More than half of elderly subjects suffer with poor SQ. Several causes, such as changes in lifestyle, living environment, increased prevalence of co-morbid medical conditions, drug/medication usage, age-related changes in various circadian rhythms, are thought to be responsible for this.[9] Due to limited research in this discipline and sparse published data about the exact burden in older adults,[10-15] the present study was conducted.

The present study was similar to the Varanasi study[16] in that it was hospital-based single-centre study and was conducted at the Geriatric Medicine Department at a tertiary care teaching hospital. However, the study[17] from Malaysia was conducted in urban primary care centre. All three were observational cross-sectional studies.

The PSQI[8] instrument was administered to assess the SQ in the other two studies[16,17] as well as in the present study. However, only the present study utilised ESS[7] to assess excessive daytime

Table 3: Association between sleep quality and study variables

Variable	No.	PSQI <5 (*n*=58)		PSQI ≥5 (*n*=64)		*P*
		No.	%	No.	%	
Gender						
Male	52	27	51.9	25	48.1	0.404
Female	70	31	44.3	39	55.7	
Body mass index (kg/m^2)						
Underweight (<18.5)	7	6	85.7	1	14.3	0.137
Normal (18.5-22.9)	30	18	60	12	40	
At risk (23-24.9)	20	12	60	8	40	
Obese I (25-29.9)	35	15	42.9	20	57.1	
Obese II (≥30)	14	7	50	7	50	
Comorbid conditions						
≤3	60	34	56.7	26	43.3	0.047
>3	62	24	38.7	38	61.3	
Diabetes mellitus						
Absent	52	26	50	26	50	0.639
Present	70	32	45.7	38	54.3	
Hypertension						
Absent	34	18	52.9	16	47.1	0.458
Present	88	40	45.4	48	54.5	
Dyslipidemia						
Absent	55	30	54.5	25	45.5	0.160
Present	67	28	41.8	39	58.2	
Benign prostate hyperplasia						
Absent	101	47	46.5	54	53.5	0.625
Present	21	11	52.4	10	47.6	
Chronic kidney disease						
Absent	112	54	48.2	58	51.8	0.618
Present	10	4	40	6	60	
Coronary artery disease						
Absent	104	52	50	52	50	0.191
Present	18	6	33.3	12	66.7	
Hypothyroidism						
Absent	100	48	48	52	52	0.829
Present	22	10	45.5	12	54.5	
Gastro oesophageal reflux disease or acid peptic disease						
Absent	116	57	49.1	59	50.9	0.12
Present	6	1	16.7	5	83.3	
Obstructive airway disease (bronchial asthma or chronic obstructive pulmonary disease)						
Absent	102	48	47.1	54	52.9	0.81
Present	20	10	50	10	50	
Osteoarthritis						
Absent	106	51	48.1	55	51.9	0.745
Present	16	7	43.8	9	56.2	
Psychiatric illness						
Absent	115	55	47.8	60	52.2	0.798
Present	7	3	42.9	4	57.1	
Urinary urgency/overactive bladder						
Absent	119	58	48.7	61	51.3	0.095
Present	3	0	0	3	100	
Head injury						
Absent	110	54	49.1	56	50.1	0.299
Present	12	4	33.3	8	66.7	
History of falls						
Absent	76	39	51.3	37	48.7	0.283
Present	46	19	41.3	27	58.7	

Contd...

Table 3: Contd...

Variable	No.	PSQI <5 (*n*=58)		PSQI ≥5 (*n*=64)		*P*
		No.	%	No.	%	
Complaint						
Sleep related	6	2	33.3	4	66.7	0.141
Other complaints	60	24	40	36	60	
No complaint	56	32	57.1	24	42.9	
Drugs						
≤3 drugs	33	17	51.5	16	48.5	0.592
>3 drugs	89	41	46.1	48	53.9	
Drugs for better sleep						
Absent	117	58	49.6	59	50.4	0.030
Present	5	0	0	5	100	
Antihistamines						
Absent	118	58	49.2	60	50.8	0.053
Present	4	0	0	4	100	
Proton pump inhibitors						
Absent	96	50	52.1	46	47.9	0.0535
Present	26	8	30.8	18	69.2	

sleepiness. Similar clinical data were recorded in the present study as well as the other two studies.[16,17]

The mean age (years) of the patients in the present study (73.4 ± 6.2) was older compared to that reported in the studies from Varanasi[16] (66.5 ± 6.9) and Kuala Lumpur[17] (69.2 ± 5.3). However, in all the three studies, the denominator constituted elderly patients (who were older than 60 years). In the present study, females (male: female = 52:70) outnumbered males which is similar to that (male: female = 56:67) reported from Kuala Lumpur.[17] A similar female preponderance was observed in a recent study[18] conducted in rural area of Kerala. However, in the study from Varanasi,[16] the male: female ratio was 304:200. The gender distribution observed in the present study seems to reflect the health seeking behaviour of elderly patients in Kerala.

The present study showed that many subjects finished high school education (*n* = 41, 33.6%) and were graduates (*n* = 25, 20.5%). Most of the subjects in the present study were retired (*n* = 50, 41%) and home makers (*n* = 50, 41%); 54.1% the subjects had a self-supporting income (pension/commercial activity). The aforementioned educational status may have a bearing on the income of the patients and consequently may influence the cost involved in health care of the elderly individuals. In the present study, patients from urban area (urban: rural = 78:44) outnumbered those from rural area which is in contrast with that (urban: rural = 157:347) reported from Varanasi.[16] This reflects the urbanisation of the population in Kerala.

Only 6/122 (4.9%) patients in the present study presented with sleep complaints; in comparison 31.9% patients had sleep complaints in the Varanasi study.[16] The frequency of tobacco smoking (*n* = 5, 4.1%) was lower in the present study compared to that reported [tobacco smoking (*n* = 80), chewing (*n* = 64)] in Varanasi.[16] However, the frequency of alcohol intake was higher in the present study (*n* = 12, 9.8%) compared to that (*n* = 19) found in Varanasi.[16] This reflects the habit forming substance use among the elderly in Kerala.

The present study recorded family history of sleep disorders in 2 patients; 72 (59%) were not sure of the family history of sleep disorders. This indicates the lack of awareness among the study individuals about the sleep problems. More than half (*n* = 69, 56.6%) of the subjects in the present study were overweight. Data regarding family history of sleep disorders, consumption tea/coffee and BMI have not been reported in the other published studies,[16,17] indicating knowledge gap regarding these factors.

Hypertension (*n* = 88, 72.1%) and diabetes mellitus (*n* = 70, 57.4%) were the most frequent comorbid illnesses recorded in the present study, whereas the study from Kuala Lumpur[17] reported hypertension (*n* = 106, 86.2%), dyslipidemia (*n* = 62, 50.4%) and arthritis (*n* = 62, 50.4%) as the common comorbid illnesses. Cardiovascular disease emerged as the most common ailment among 27.3% patients with insomnia in the study conducted at Varanasi.[16]

Poor SQ was observed in 64/122 (52.5%) patients in the present study which is similar (58/123, 47.2%) to that reported in the study conducted in Kuala Lumpur.[17] The Varanasi study[16] reported poor SQ in 161/504 (32%) subjects. The present study did not show any significant association of the sociodemographic variables with SQ which was similar to the Kuala Lumpur study.[17] In the Varanasi study,[16] patients residing in urban areas had significantly higher occurrence of poor SQ than patients from rural areas which was attributed to stress-related issues. In the present study, there was no significant association of habituations like tobacco use or alcohol intake with poor SQ. This finding is in contrast with the study conducted at Varanasi[16] which revealed significant association of habit-forming substance use with poor SQ. This could be due to the predominant male gender comprising the study population who might have a habit-seeking

behavior. The study from Varanasi[16] revealed no significant difference in sleep complaints among all occupational groups, educational groups, socioeconomic groups and marital status.

The present study revealed a statistically significant association of poor SQ with the presence of >3 comorbid illness; similar observations were reported in an earlier community-based study from Kerala.[18] The study from Kuala Lumpur[17] found a significant association of poor SQ with heart disease and psychological distress. Excessive daytime sleepiness was noted in 7/122 patients (5.7%) in the present study which had a significant association with osteoarthritis and cerebrovascular disease. Medication usage and the association with daytime sleepiness and SQ have not been described in the other published studies.[16,17]

The differences in the observations of the published data from Varanasi,[16] Kuala Lumpur[17] and the present study might be due to socio-ethnic cultural variations. Periodic studies on this subject should be conducted at the community level to identify the magnitude and impact of the problem.

The present study was a single centred, cross-sectional, hospital-based study. The scales used in this study estimated the subjective sleep problems. Objective laboratory assessment with overnight in-hospital polysomnography was not included to record the sleep architecture and sleep-related disorders due to logistic reasons. The exact burden of various sleep disorders could not be classified in the study population. As the study was cross-sectional, time-trends in the SQ and excessive daytime sleepiness over a period in time could not be studied.

In conclusion, the observations of the present study suggest that a high proportion of elderly subjects who did not complain of sleep-related symptoms were found to have poor SQ. Also, this gives a reliable estimate of the problems encountered in the elderly so that the primary care physician can tailor the requirements of the older adults and can provide better care. Therefore, incorporating SQ assessment as a part of routine geriatric assessment screening would be beneficial in early detection of this condition.

Key points

- Individuals who presented to the hospital with sleep complaints were very few while the PSQI labelled-poor sleepers consisted of almost half of the study population. This probable reflects the health-seeking behaviour in the elderly.
- This study showed that, compared with those with ≤3 comorbid conditions, a higher proportion of elderly with >3 comorbid conditions had a significantly higher occurrence of poor sleep quality (PQSI >5) and daytime sleepiness (ESS >10).
- Increased daytime sleepiness (ESS >10) was significantly high in patients with osteoarthritis and in patients without cerebrovascular disease.
- It has been noted that patients who did not use medicines for better sleep had poor sleep quality and their number was higher than those who did use them.
- Poor sleep quality was observed in more patients who did not use antihistamines, proton pump inhibitors than those who used them.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Lutz W, Sanderson W, Scherbov S. The coming acceleration of global population ageing. Nature 2008;451:716-9.
2. Ferruci L, Gialluria F, Guralnik JM. Epidemiology of aging. Radiol Clin North Am 2008;46:643-52.
3. Raju YS. Successful aging and health belief model. In: Sanchetee P, editor. Textbook of Geriatric Medicine. Hyderabad: Paras Medical Publisher; 2014. p. 775-7.
4. Vitiello MV, Moe KE, Prinz PN. Sleep complaints cosegregate with illness in older adults: Clinical research informed by and informing epidemiological studies of sleep. J Psychosom Res 2002;53:555-9.
5. Neubauer DN. Sleep problems in the elderly. Am Fam Physician 1999;59:2551-60.
6. The International Association for the Study of Obesity and the International Obesity Task Force. The Asia-Pacific perspective: Redefining obesity and its treatment. Australia: International Association for the Study of Obesity and International Obesity Task Force; 2000.
7. Johns MW. A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. Sleep 1991;14:540-5.
8. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. Psychiatry Res 1989;28:193-213.
9. Roepke SK, Ancoli-Israel S. Sleep disorders in the elderly. Indian J Med Res 2010;131:302-10.
10. Ogunbode AM, Adebusoye LA, Olowookere OO, Owolabi M, Ogunniyi A. Factors associated with insomnia among elderly patients attending a geriatric centre in Nigeria. Curr Gerontol Geriatr Res 2014;2014:780535.
11. Ayoub AI, Attia M, El Kady HM, Ashour A. Insomnia among community dwelling elderly in Alexandria, Egypt. J Egypt Public Health Assoc 2014;89:136-42.
12. Ford ES, Cunningham TJ, Giles WH, Croft JB. Trends in insomnia and excessive daytime sleepiness among U. S. adults from 2002 to 2012. Sleep Med 2015;16:371-8.
13. Yu J, Rawtaer I, Fam J, Jiang MJ, Feng L, Kua EH, *et al.* Sleep correlates of depression and anxiety in an elderly Asian population. Psychogeriatrics 2016;16:191-5.
14. Sagayadevan V, Abdin E, BinteShafie S, Jeyagurunathan A, Sambasivam R, Zhang Y, *et al.* Prevalence and correlates of sleep problems among elderly Singaporeans. Psychogeriatrics 2017;17:43-51.
15. El-Gilany AH, Saleh N, El-Aziz Mohamed HNA, Elsayed E.

Prevalence of insomnia and its associated factors among rural elderly: A community based study. Int J Adv Nurs Stud 2017;6:56-62.

16. Gambhir IS, Chakrabarti SS, Sharma AR, Saran DP. Insomnia in the elderly—A hospital-based study from North India. J Clin Gerontol Geriatr 2014;5:117-21.
17. Razali R, Ariffin J, Aziz A. Sleep quality and psychosocial correlates among elderly attendees of an urban primary care centre in Malaysia. Neurol Asia 2016;21:265-73.
18. George S, Paul G, Paul N. Study on sleep quality and associated psychosocial factors among elderly in a rural population of Kerala, India. Int J Community Med Public Health 2018;5:526-31.