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Original Article

Sleep Quality among Older Adults in Mehriz, Yazd Province, Iran

Hassan Rezaeipandari[1], Mohammad Ali Morowatisharifabad[1*], Seyed Jamal Hashemi[2], Vali Bahrevar[2]

[1.] Elderly Health Research Center, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[2.] Department of Health Services, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

A B S T R A C T

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Introduction: Decrease in sleep quality is an age-related problem which appears in different features such as difficulty in sleeping, over sleeping and unusual behaviors during sleep. Regarding the importance of sleep quality among older adults and also its effects on their quality of life and physical and mental status, the study was conducted to determine the status and quality of sleep in older adults in Mehriz, Yazd province, Iran.

Methods: The cross-sectional study used cluster random sample of 126 older adults. Data collection tool was a two-part questionnaire including demographic and sleep-related questions and Pittsburgh Sleep Quality Index. Data were analyzed with SPSS software using one-way ANOVA and chi-square tests.

Results: The most reported sleep quality related problems were pain (32.8%), waking up for toilet (28.6%) and nightmare (3.2%); waking up problem for driving was the least reported problem (0.8%). Sleep quality was worse among women than men ($p = 0.02$). There was a statistically significant relation between sleep quality score and morbidity to thedisease of cardiovascular, diabetes, osteoporosis, breathing problems, visual and hearing problems, obesity and depression ($p < 0.05$).

Conclusion: Regarding the significant relation of sleep quality and some chronic conditions, the importance of educatingthe older adults who suffer from chronic conditions and also their families in this area is displayed. As with planning suitable interventions, we may not only increase the sleep quality among older adults but also treat or reduce the risk of chronic conditions among them.

Keywords: Aging, Sleep, Iran

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Introduction

Sleep is an essential and critical physiologic process for body. It has benefits such as physical and mental relaxation, intellectual and physiologic refection, readiness for acceptance of new role, and tasks and repair function of the body. The sleep cycle quantity and quality will change as age increases (1). One of the problems which will be emerged by aging is the reduction of sleep quality as insomnia and sleep disorder (2). Insomnia is defined by lack of satisfaction from sleep quality and quantity for a long period of time (3). Sleep problems are very common among older adults in which insomnia increases as people age. Generally, older people sleep 30 to 60 minutes less than do younger people and their sleep is less deep and more disturbed compared to younger people (4-6). Sleep disorder in aging includes any disturb pattern of sleep such as problems associated with falling asleep, over-sleeping or abnormal behaviors in sleep. The most important sleep problem in older adults is hardly sleeping, hardly remaining slept, and early waking up in the morning (7).

[*] **Corresponding Author:** Elderly Health Research Center, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran. **Tel:** +989133530374, **Email address:** morowatisharif@yahoo.com

Sleep disorder may directly or indirectly affect people's personal and family life (8). Sleep disorder among older adults has a negative effect on their quality of life and causes problems such as reduction of daily function (9), fatigue, dementia, and anxiety (10, 11), drowsiness during the day, memory and attention deficit, fall, and the need to use sleep medications (11). There are many reasons for sleep disorder such as Alzheimer, alcohol consumption, change of sleep hours and natural body rhythm, chronic diseases, various medications, depression, and musculoskeletal pain (4, 5). Studies also reported that there is a relation between sleep disorder and diseases such as depression, hearth diseases, obesity, arthritis, diabetes, and osteoporosis (12-15). In a study by National Institute on Aging, which included more than 9,000 persons aged 65 years and older, nearly half reported at least one chronic sleep complaint (12). A study in Iran reported that 67% of older people suffer from sleep disorder (16). It is also reported that sleep disorder is the third reason for physician referral among older adults after headache and gastrointestinal disorders (17). There are different types of sleep disorders. For example, it was reported that 10-39% have problems falling asleep, 18-60% tend to wake up during the night, and 12-33% have problems waking up in the morning (10). Sleep disorder is more prevalent among women and increases by age (18). Regarding the importance of sleep quality among aging people and limitation of studies in this area in Iran, the present study was designed and conducted with the aim of determining the sleep status and quality in a sample of older adults in Iran.

Methods

Procedures

The required sample size was estimated to be 120. A random cluster sampling was conducted. To do so, 10 geographic clusters in the City of Mehriz were selected at random. In six clusters, 13, and in four clusters, 12 subjects who met the inclusion were selected. The total sample size for the cross-sectional study was 126elderly people living at home. Those who were 65 years and above at the study time, aware of the place and time, and able to answer the questions were eligible to participate the study. Private interviews were done for the purpose of data collection and the participation was voluntarily.

Measures

The data collection tool was a two-part questionnaire. The first part was designed to gather data on demographic information and sleep status. The second part was the Pittsburgh Sleep Quality Index (PSQI), which is one of the best instruments for measuring sleep quality (19). It consists of 19 self-rated questions, which measure seven component scores, each ranging from zero to three. For the purpose of interpretation, zero (0) indicates no difficulty, while three (3) represents severe difficulty. The seven components are 1) subjective sleep quality, 2) sleep latency, 3) sleep duration, 4) habitual sleep efficiency, 5) sleep disturbances, 6) use of sleep medications, and 7) daytime dysfunction. The sum of the seven component scores is a global score, with a range of 0 to 21 points (0 = no difficulty, 21 = severe difficulties in all areas). A global score of > 5 distinguishes poor sleepers from good sleepers, with higher scores reflecting poor sleep pattern (20).

Statistical analysis

Data were analyzed with the SPSS software, using ANOVA and chi-square tests.

Results

A profile of subjects

The majority of the participants were female (56.3%). The average age was 71.9 years (SD = 6.8). Nearly 63% were living with their spouses and 32% alone. Only5.6% had a disability. The majority (60%) was illiterate, 13.5% were retired, 43% had a personal income source, and 48% reported TV as the main source of health information. Results are summarized in Table 1.

Sleep-related information

The health problem reported the most was pain in joints (84%), followed by hypertension (61%), and Osteoporosis (41%). Results are shown in Table 2. Regarding sleep quality, more than 30% reported problems with sleeping because of having pain three or more times a week. Getting up for bathroom three of more times a week was reported by 28.6%. More than 60% of the participants reported that their overall sleep quality was fairly good; 3.2% felt that it was very bad. Results are shown in Table 3.

Correlates of sleep quality

An examination of sleep quality PSQI components showed that sleep disturbance was endorsed the most and day time dysfunction was reported the least. Results are summarized in Table 4.

Women reported a lower level of sleep quality than did men ($p = 0.029$). There was not any statistically significant relation between sleep quality and other demographic variables, as shown in Table 5.

In studying the relation between sleep quality and existence of chronic diseases and conditions, the relations between sleep quality and cardiovascular diseases, vision and hearing problem, Osteoporosis, diabetes, breathing problems, obesity, and depression were statistically significant at the .05 level. Results are shown in Table 6.

One-way ANOVA with Tukey posthoc test, as shown in Table 7, revealed that elderly people with higher education level go to bed later than others and

get up later. Additionally, it was found that illiterate elders go to bed sooner and getup sooner. Also, it was revealed that widow eldersgo to bed sooner and wake up sooner than do the others.

Table 1. Frequency distribution of demographic characteristics of participants

Variable	Label Variable	N	%
Sex	Male	55	43.7
	Female	71	56.3
Education	Illiterate	84	66.7
	Primary	37	29.4
	Higher	5	4
Married	Married	89	70.6
	Widow	24	19
	Divorced	13	10.3
Job	Occupied	10	7.9
	Housewife	68	54
	Unemployed	14	11.1
	Income Without Work	11	8.7
	Pensioner	17	13.5
	Other	6	4.8
Living status	With wife	79	62.7
	With unmarried children	4	3.2
	With married children	3	2.4
	Alone	40	31.7
Home	Private	123	97.6
	No private	3	2.4
Income source	Private	54	42.9
	Retirement	31	24.6
	Children	18	14.3
	Supporting organization	17	13.5
	Kinsfolk	6	4.8
Information source	TV	61	48.4
	Radio	15	11.9
	Newspaper	1	0.8
	Friends	11	8.7
	Physician	38	30.2

Table 2. Frequency distribution of chronic diseases and problems among participants

Diseases and problems	Yes		No	
	N	%	N	%
Cardiovascular diseases	38	30.2	88	69.8
Cancer	3	2.4	123	97.6
Joint pain	106	84.1	20	15.9
Osteoporosis	52	41.3	74	58.7
Hypertension	77	61.1	49	38.9
Diabetes	34	27	92	73
Urinary incontinence	27	21.4	99	78.6
Gastrointestinal problems	44	34.9	82	65.1
Depression	14	11.1	112	88.9

Table 3. Frequency distribution of experience of sleep quality related problems among participants

Variable	Not during the past month		Less than once a week		Once or twice a week		Three or more times a week	
	N	%	N	%	N	%	N	%
Have pain	22	17.6	29	23.2	33	26.4	41	32.8
See Nightmare	79	62.7	32	25.4	11	8.7	4	3.2
Feeling cold	70	55.6	29	23	19	15.1	8	6.3
Feeling hot	81	64.3	25	19.8	13	10.3	7	5.6
Snore	56	44.4	37	29.4	21	16.7	12	9.5
Lack of comfort in breathing	84	66.7	25	19.8	10	7.9	7	5.6
Have to get up to use the bathroom	28	22.2	31	24.6	31	24.6	36	28.6
Wake up in the middle of the night	25	19.8	41	32.5	28	22.2	32	25.4
Cannot get to sleep within 30 minutes	53	42.1	37	29.4	18	14.3	18	14.3
Taken medicine to help sleep	88	69.8	15	11.9	10	7.9	13	10.3
Trouble staying awake while driving	112	88.9	8	6.3	5	4	1	0.8
	Very good		Fairly good		Fairly bad		Very bad	
Overall sleep quality	19	15.1	79	62.7	24	19	4	3.2

Table 4. Mean and SDs distribution of sleep quality components based on PSQI (self-report)

Sleep quality components	Mean	SD	Possible score range
Sleep quality subjective	1.10	0.67	0-3
Sleep latency	1	0.87	0-3
Sleep duration	1.23	0.85	0-3
Habitual sleep efficiency	1.05	1.20	0-3
Sleep disturbance	1.32	0.55	0-3
Use of sleep medication	0.58	1.01	0-3
Day time dysfunction	0.16	0.51	0-3

Table 5. Distribution of sleep quality scores among participants by some demographic variables

Variable	Variable label	Sleep quality		p
		Mean	SD	
Sex	Male	7.83	2.68	0.02
	Female	8.94	2.83	
Education level	Illiterate	8.44	2.76	0.99
	Primary	8.45	2.59	
	Higher	8.60	5.31	
Marriage status	Married	8.29	2.89	0.50
	Divorced	8.66	2.31	
	Widow	9.25	3.16	
Job	Occupied	7.20	3.15	0.14
	Housewife	8.86	2.82	
	Unemployed	8.85	2.76	
	Income without work	6.81	1.72	
	Pensioner	7.50	3.01	
	Others	8.64	2.80	
Age	65-74	8.47	2.95	0.95
	75-84	8.36	2.61	
	Higher than 85	8.71	2.13	

Table 6. Distribution of sleep quality scores among participants by chronic diseases and problems

Chronic diseases and problems	Yes		No		p
	Mean	SD	Mean	SD	
Cardiovascular diseases	10.10	3.20	7.73	2.29	< 0.01
Cancer	10.33	2.08	8.40	2.82	0.24
Vision and hearing problem	9.22	2.98	7.88	2.55	< 0.01
Pain in joints	8.47	2.84	8.35	2.70	0.85
Osteoporosis	9.19	2.67	7.93	2.81	0.01
Hypertension	8.76	2.87	7.95	2.67	0.11
Diabetes	9.76	2.91	7.96	2.63	< 0.01
Urinary incontinence	9	3.12	8.30	2.72	0.25
Gastrointestinal problems	9.09	3.08	8.11	2.61	0.06
Breath diseases	9.81	2.82	8.08	2.70	< 0.01
Oral problems	8.80	2.89	8.16	2.72	0.20
Obesity	9.37	2.93	8.10	2.70	0.02
Depression	10.07	2.20	8.25	2.82	0.02
Vehicle accidents	8.42	2.92	8.45	2.81	0.96
Fall	9.60	3.20	8.30	2.73	0.09

Table 7. Mean and SDs of usual sleep habits scores by some demographic variable

Variable		Sex		Marriage status			Education level		
		Male	Female	Married	Divorced	Widow	Illiterate	Primary	Illiterate
Bed times	Mean	21.42	21.37	21.55	21.53	20.75	21.26	21.46	23.20
	SD	1.23	1.24	1.22	0.51	1.39	1.21	1.15	0.83
	p	0.80			0.01			<0.01	
Time to sleep	Mean	29.54	34.57	33.53	28.46	30.20	33.92	25.67	56
	SD	28.88	28/76	29.75	16.88	30.94	29.20	14.39	72.23
	p	0.33			0.77			0.06	
Getting up time	Mean	5.11	5.12	5.17	4.73	5.12	5.02	5.18	6.20
	SD	0.89	0.95	0.73	0.97	1.35	0.85	0.92	1.09
	p	0.95			0.25			0.01	
Hours of Sleep in night	Mean	6.61	6.39	6.45	5.88	6.59	6.69	6.01	6.6
	SD	1.86	2.89	2.13	1.7	3.77	2.67	1.97	2.70
	p	0.69			0.44			0.38	

Discussion

The aim of the study was to document sleep quality among elders in Mehriz, Yazd province, Iran. The mean score of PSQI was 8.4 (SD = 2.8) out of 21, suggesting an inadequate sleep quality among the participants. In comparing the sleep quality scores among our participants with the scores in the studies in China (Mean=5.7) and US (Mean=7.7) (21, 22), our participants had a lower sleep quality but it was better in comparison with the participants of two studies in Tehran (23, 24). It may suggest that the living location may affect the sleep quality because of environmental and cultural factors which must be addressed in future studies. In studying the PSQI sleep quality components, mostly reported problem was in sleep disturbance component and the less reported problem was day time dysfunction component. Ahmadi et al (25) reported a higher level of problem in all components. Izadi et al (18) also reported the most problem in sleep disturbance component but they reported the less problem in habitual sleep efficiency component. The high frequency reported pain in sleep indicates that addressing the physical health of the elders is a priority. The other reported problems, such as getting up to use bathroom and waking up in the midnight, can also be attributed to some physical problems such as diabetes which emphasize the physical health of the elderly in the study community. Consistent with other studies (26, 27), females reported a lower level of sleep quality than did males. Also studies revealed that being females, alone, older than 65 years old, and retired influenced sleep quality (28-30).

The elders who were suffering from cardiovascular diseases and diabetes reported a lower level of sleep quality than did others, which may be due to the increased urinationand need for bathroom use that is common among diabetic patients. The study's results of associations between osteoporosis,breathing problem, vision and hearing problems, obesity, and depression with sleep quality is consistent with previous studies (12-15, 31). It partly can be attributed to the pain along with diseases such as osteoporosis which was also reported in some other studies (15, 19). The other problem which can affect the sleep quality among elders is breathing problem which is consistent with other studies (13, 15, 19). Breathe-related problems, including cough and pain in chest, may cause the patient to not fall asleep or awaking soon. The relation of the obesity and low sleep quality, also reported by Foley et al. can be because of

the pain due to pressures to joints. In addition to the abovementioned physical problems, depression, a mental problem,is also an important issue which must be addressed. The result in this area is also consistent with previous studies (14, 15, 31). Theresult of the study about the relation of sleep quality with demographic variables is not completely consistent with previous studies, and it must be considered in future studies.

Conclusion

Regarding the significant role of physical diseases and problems in decreasing sleep quality among older adults, interventional programs which target physical and mental health of elders could be appropriate for increasing sleep quality. In addition, educating older adults about appropriate medicine use, physical activity, a healthy and adequate diet, avoiding self-medication, and regular checkups may increase sleep quality. In this regard, educating the elder's relatives about a good care of older adults would be useful.

Study limitations

Due to non-experimental nature of the investigation, no causal inferences may be drawn. The study's limitations, such as small sample size and a small district in Yazd province, must be taken into consideration in examining the results.

Conflict of interest

None declared.

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References

1. Wolkove N, Elkholy O, Baltzan M, Palayew M. Sleep and aging: 1. Sleep disorders commonly found in older people. Canadian Medical Association Journal. 2007; 176(9): 1299–304.
2. Ferris LT, Williams JS, Shen CL, O'Keefe KA, Hale KB. Resistance training improves sleep quality in older adults. Journal of sports science & medicine. 2005; 4(3): 354-60.
3. Ohayon MM. Epidemiology of insomnia: What we know and what we still need to learn. Sleep Medicine Reviews. 2002; 6(2): 97–111.
4. Juergens TM, Barczi SR. Sleep. In: Duthie EH, Katz PR, Malone ML, eds. Practice of Geriatrics. 4th ed. Philadelphia, Pa: Saunders Elsevier; 2007.
5. Mahowald MW. Disorders of sleep. In: Goldman L, Ausiello D, eds. Cecil Medicine. 23rd ed. Philadelphia, Pa: Saunders Elsevier; 2007.
6. Neikrug AB, Ancoli-Israel S. Sleep disorders in the older adult - a mini-review. Gerontology. 2010; 56(2): 181-9.
7. Ford DE, Kamerow DB. Epidemiologic study of sleep disturbance and psychiatric disorders. An opportunity for prevention? Journal of the American Medical Association. 1989; 262(11): 1479–84.
8. Moosavi F, Golestan B, Matini E, Tabatabaei R. Prevalence of sleep disorders and related factors among medical students Islamic Azad University of Tehran. Medical Science Journal of Islamic Azad University. 2010; 20(4): 278-84. [Persian]
9. Drake CL, Roehrs T, Roth T. Insomnia, causes, consequences and therapeutics: an overview. Depression and Anxiety. 2003; 18(4): 163-76
10. Krishnan P, Hawranik P. Diagnosis and management of geriatric insomnia (guide for nurse practitioner). Journal of American Academy of Nurse Practitioners. 2008; 20(12): 590-9
11. Kryger M, Monjan A, Bliwise D, Ancoli-Israel S. Sleep, health, and aging. Bridging the gap between science and clinical practice. Geriatrics. 2004; 5(1): 17-22.
12. Neubauer D. Sleep problems in the elderly. American Academy of Family. Physicians. 1999; 59(9): 2551-58.
13. Garcia AD. The effect of chronic disorders on sleep in the elderly. Clinics in Geriatric Medicine. 2008; 24(1): 27-38
14. Ito Y, Tamakoshi A, Yamaki K, Wakai K, Kawamura T, Takagi K, et al. Sleep disturbance and its correlates among elderly Japanese. Archives of Gerontology and Geriatrics. 2000; 30(2): 85-100.
15. Foley D, Ancoli -Israel S.A, Britz P, Walsh J. Sleep disturbances and chronic disease in older adults. Results of the 2003 National Sleep Foundation Sleep in America Survey. Journal of Psychosomatic Research. 2004; 56 (5): 497–502
16. Nobahar M, Vafaaee A. Elderly sleep disturbances and management. Iranian Journal of Aging. 2007; 2(4): 263-68. [Persian]
17. Cotroneo A, Gareri P, Lacava R, Cabodi S. Use of zolpidem in over 75-year-old patients with sleep disorders and co morbidities. Archives of Gerontology and Geriatrics. 2004 ;(9): 93-6.
18. Adib-Hajbaghery M, Izadi-Avanji F, Akbari H. Quality of sleep and its related risk factors in hospitalized older patients in Kashan's Hospitals, Iran 2009. Iranian Journal of Nursing and Midwifery Research. 2012; 17 (6): 414-20.
19. Foley DJ, Monjan A, Simonsick EM, Wallace RB, Blazer DG. Incidence and remission of insomnia among elderly adults. An epidemiologic study of 6,800 persons over three years. Sleep. 1999; 1(22): 366-72.
20. Buysse DJ, Reynolds CF, Monk TH, Berman SR, Kupfer DJ. The Pittsburgh sleep quality index: A

new instrument for psychiatric practice and research. Psychiatry Research. 1989;28(2): 193–213.
21. Monk TH, Buysse DJ, Schlarb Je, Beach Sr. Timing, duration and quality of sleep and level of daytime sleepiness in 1166 retired seniors. Healthy Aging & Clinical Care in the Elderly. 2012: 433–40
22. Li J, Yao Y.S, Dong Q, Dong Y, Liu J, Yang L.S, et al. Characterization and factors associated with sleep quality among rural elderly in China. Archives of Gerontology and Geriatrics. 2013; 56(1): 237-43.
23. Hosseinabadi R, Noroozi K, Poorismaili Z, Karimloo M, Maddah S.S. Acupoint massage in improving sleep quality of older adults. Rehabilitation 2008; 9(2): 8-14. [Persian]
24. Abbasi B, Kimiagar M, Sadeghniiat K, Shirazi MM, Hedayati M, Rashidkhani B. The effect of magnesium supplementation on primary insomnia in elderly: A double-blind placebo-controlled clinical trial. Journal of Research in Medical Sciences. 2012; 7(12):1161-9.
25. Ahmadi Sh, Khankeh H, Mohammadi F, FalahiKhoshknab M, Rezasoltani P. The effectiveness of treatment with limiting on sleep quality in elderly. Iranian Journal of Aging. 2010; 5(2): 7-15. [Persian]
26. Bazargan M. Self-reported sleep disturbance among African-American elderly: the effects of depression, health status, exercise, and social support. International Journal of Aging & Human Development. 1996; 42(2): 143-60.
27. Chiu HF, Leung T, Lam LC, Wing YK, Chung DW, Li SW, et al. Sleep problems in Chinese elderly in Hong Kong. Sleep. 1999; 22(6): 717-26.
28. Lauri S, Lepistö M, Kappeli S. Patients' needs in hospital: nurses' patients' views. Journal of Advanced Nursing. 1997; 25(2): 339-46.
29. Tribl GG, Schmeiser-Rieder A, Rosenberger A, Saletu B, Bolitschek J, Kapfhammer G, et al. Sleeping habits in the Austrian population. Sleep Medicine. 2002; 3(1): 21- 8.
30. Ohayon M. Epidemiological study on insomnia in the general population. Sleep. 1996; 19(3): 7-15.
31. Rodin J, Mcavay G, Timko CH. A longitudinal study of depressed mood and sleep disturbances in elderly adults. Journal of Gerontology. 1988; 43(2): 45-53.