Health status and behavior influencing sleep quality among community-dwelling elderly in Chanthaburi province, Thailand

Received August 2018
Accepted September 2018

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Abstract

Purpose - The trend of sleep disorder is typically common in age changes due to health status and behavior leading to poor quality of sleep. The purpose of this study was to examine the rate and factors associated to sleep quality among community-dwelling elderly in Chanthaburi province, Thailand.

Design/methodology/approach - A cross-sectional study was conducted among 208 elderly by multi-stage sampling. All participants were interviewed by questionnaire. Sleep quality was assessed by Pittsburgh Sleep Quality Index (PSQI). Sleep quality score ≥ 5 indicates poor sleep quality. Chi-square tests and multivariate logistic regression models were performed to find significant associations.

Findings - Approximately, 66.3% of respondents had poor sleep quality with score of ≥ 5 PSQI. The adjusted odds ratio (AOR) for gender, age, and BMI, and the multivariate logistic regression model showed that elders who had never participated social activities increased poor sleep quality 5.962-fold odds (p-value<0.05; 95% CI 1.459 – 24.361). Elders who had never prayed before sleep increased poor sleep quality 1.478-fold odds (p-value<0.05; 95% CI 0.273 – 0.838). Perception of musculoskeletal problem increased poor sleep quality 2.288-fold odds (p-value<0.05; 95% CI 1.249 – 4.192). Bladder problem perception (p-value<0.05; 95% CI 1.084 – 6.327), depression (p-value<0.05; 95% CI 1.179 - 9.095), and smoking (p-value<0.05; 95% CI 1.062 – 4.340) increased poor sleep quality.

Originality/value - Strategic development by promoting health activities and social participation among elderly should be done in order to prevent chronic diseases, depression and sleeping disorder.

Keywords Health status, Sleep quality, Elderly, Thailand

Paper type Research paper

Introduction

Sleep is a necessary daily routine for the body to be improved and repaired. The trend of sleep disorder is typically more common in aged changes due to health condition changes and degenerates leading to poor sleep satisfies [1]. National Sleep Foundation (NSF) recommends adequate sleep average 7 – 8 hours per night for ages 65 or over [2]. A cross-sectional study of China examined sleep quality that was assessed by Pittsburgh Sleep Quality Index (PSQI) with five cut off point indicated poor sleep quality. Seventy-seven percent individuals were assessed as poor sleep quality [3]. A greater number of complications, no alcohol drinking, poor glycemic control, depressive symptom, and anxiety (p-value< 0.001) influenced to poor sleep quality [4]. It can be confirmed by the longitudinal study conducted in health volunteer and follow-up long term sleep habits which it associated to development of chronically medical disease [5]. The second factor was social participation. The association between sleep and relationship was likely to be bi-directional and reciprocal. The quality of close relationships influenced to sleep disorder [6]. Several studies presented sleep quality also depend on behavior including caffeine drinking, alcohol drinking, smoking, secondhand smoking, smart phone use, and physical

activities [7-11]. Compared with general health education, in 12- month, moderate-intensity exercise program improved sleep disturbance score. The intervention group had sleep quality better than control group [12]. Additionally, there was an external stimulus to sleep disorder. The bedroom's environment also results in poor sleep which includes noise disturbance, light disturbance, electronic for ventilation, and bed characteristic [13, 14]. The study of Thailand had investigated sleep quality in elderly such as Banglamung nursing home that showed over 57.14% of poor SQ reported pain and senility were significantly associated with sleep quality. Study in young-old age at Songkhla Province found 67.6% poor sleep quality and presented muslims, those being alone, and low educational level were associated to sleep quality (p-value< 0.05) [15]. A little was known about the prevalence of poor sleep quality and the association between subjective health status, behavior, social participation, and environment factor to sleep quality among community-dwelling elderly in the rural. Therefore, the current study aims to assess sleep quality and examines factor associated with the poor sleep quality among Wang-sapparos community-dwelling elderly. The present study is carried out in order to promote and support properly sleeping among elderly through Long Term Care intervention.

Methodology

Study setting and study population

A cross-sectional study was conducted to investigate the rate and factors associated to sleep quality among elderly people in the rural. The sample size was calculated by the formula of Taro Yamane at the confident interval of 95%. Multi-stage sampling was applied to include the participants. This study consisted of 208 male and female were living in Wang-sapparos community and had registered in-house registration. Additionally, those elders did not diagnose with a psychological disorder, obstructive sleep apnea, surgery respiratory system, and took psychological drug and melatonin.

Data collection

A interviewing was designed in elderly people. The questionnaire was composed of socio-demographic, social participation, health status, behaviors, environment factors, and sleep quality assessment. Sleep quality was assessed using the validated Thai Pittsburgh Sleep Quality Index (PSQI). PSQI score ≥ 5 indicating poor sleep quality [16]. Social participation was identified as frequency of health activities, social activities, traditional and culture activities, praying, and meditation before sleep. Health status included Body Mass Index (BMI), Activities of daily living assessment by Barthel ADL index, frequency of health perception, and depression assessment by using of Patients Health Questionnaire-9 (PHQ-9). Behavioral part consisted of caffeine drinking, alcohol drinking, smoking, secondhand smoked, smartphone use, and physical activity by frequency identify. Lastly independent variables, environment factors were interviewed whether those elders got disturbance from light and noise while sleeping. Electronic for ventilation and bed characteristic were surveyed in this study.

Statistical analysis

The data was analyzed by computer program SPSS version 20. Basic descriptive statistic was used to summarize the general information of participants. Sleep quality level was coded to dichotomous variable. Chi-square test and multivariable logistic regression were used to test the influencing factors to poor sleep quality.

Ethical consideration

This research protocol was approved by The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University. All participants signed the consent form before involving in this study (CoA No. 160/2018).

Results

For sleep quality assessment

Among 208 study participants, 52 (68.4%) were male and 86 (65.2%) were female which were assessed poor sleep quality by PSQI indicating 5 score or more. However gender was not significantly associated to sleep quality. Table 1 found that 66.3% of participants had a poor sleep quality and 33.7% had a good sleep quality.

Table 1. Sleep quality of elderly

Sleep quality	n=208	%
Good sleep quality (PSQI <5)	70	33.7
Poor sleep quality (PSQI ≥ 5)	138	66.3

Table 2. Association between social participation, health status, behavior, environment factors and sleep quality among elderly (n=208)

Participation	Total	Sleep quality				*p*-value
		Good		Poor		
	N	N	%	N	%	
Social participation						0.040 [a]
Always	32	17	53.1	15	49.6	
Sometimes	132	40	30.3	92	69.7	
Rare/ Never	44	13	29.5	31	70.5	
Traditional and cultural participation						0.016 [a]
Always	65	27	41.5	38	58.5	
Sometimes	117	30	25.6	87	74.4	
Rare/ Never	26	13	50.0	13	50.0	
Praying before sleep						0.037 [a]
Always	52	15	28.8	37	71.2	
Sometimes	101	30	29.7	71	70.3	
Rare/ Never	55	25	45.5	30	54.5	
Musculoskeletal problem						0.000 [a]
No	94	46	48.9	48	51.1	
Yes	114	24	21.1	90	78.9	
Bladder problem						0.012 [a]
No	146	57	39.0	89	61.0	
Yes	62	13	21.0	49	79.0	
Depression						0.005 [a]
No	150	59	39.3	91	60.7	
Yes	58	11	19.0	47	81.0	
Smoking						0.020 [a]
Never	161	59	36.6	102	63.4	
Former	19	8	42.1	11	57.9	
Current	28	3	10.7	25	89.3	
Light Disturbance						0.006 [a]
No	176	66	37.5	110	62.5	
Yes	32	4	12.5	28	87.5	
Noise Disturbance						0.032 [a]
No	167	62	37.1	105	62.9	
Yes	41	8	19.5	33	80.5	

Note: [a] Chi-square test; *p*-value < 0.05

Social participation and sleep quality

Of 132 participants sometimes participated social activities, the most of participants 92 elders (69.7%) sometimes social participation and assessed to poor sleep quality. In addition, social participation significantly associated to sleep quality at p-value < 0.05. Likewise, traditional and cultural participation significantly associated to sleep quality at p-value < 0.05. Most of participants 87 poor sleep quality elders (74.4%) sometimes participated traditional and cultural participation. Considering on praying before sleep, there were 71 elderly poor sleep quality (70.3%) sometimes prays before sleep. The significantly association between praying before sleep and sleep quality was found in the current study as shown Table 2.

Health status and sleep quality

Health status and sleep quality of the present sample were listed in Table 2. The current study found that musculoskeletal problem, bladder problem, and depression were significantly associated to sleep quality at *p*-value < 0.05. The most of participants 90 elders (78.9%) had musculoskeletal and sleep quality problems. Whilst 89 elders (61%) were poor sleep quality but without bladder problem. Considering on psychological problem, most of participants 91 elders (60.7%) were poor sleep quality but without depression.

Table 3. Odds ratio (OR) and 95% Confidence Intervals (CI) of sleep quality in elderly

Characteristics	Odd ratio Adjusted	95% Confident Interval		*p*-value
		Lower	Upper	
Gender				
Male	1.00 (ref)			
Female	0.634	0.273	1.473	0.289
Age	1.006	0.964	1.049	0.790
BMI	0.975	0.884	1.075	0.609
Social participation				
Yes	1.00 (ref)			
No	5.962	1.459	24.361	0.013
Traditional and cultural participation				
Yes	1.00 (ref)			
No	0.574	0.284	1.160	0.122
Praying before sleep				
Yes	1.00 (ref)			
No	1.478	0.273	0.838	0.010
Musculoskeletal problem				
No	1.00 (ref)			
Yes	2.288	1.249	4.192	0.007
Bladder problem				
No	1.00 (ref)			
Yes	2.618	1.084	6.327	0.032
Depression				
No	1.00 (ref)			
Yes	3.275	1.179	9.095	0.023
Smoking				
Non-Smoker	1.00 (ref)			
Smoker	2.147	1.062	4.340	0.033
Light Disturbance				
No	1.00 (ref)			
Yes	2.919	0.416	20.481	0.281
Noise Disturbance				
No	1.00 (ref)			
Yes	1.162	0.255	5.285	0.846

Note: *Adjusted age, gender, BMI

Behavior and sleep quality

There was significantly association between smoking and sleep quality among elderly at *p*-value < 0.05. Most of participants 102 non-smokers (63.4%) were poor sleep quality. Furthermore, there was no association between caffeine drinking, secondhand smoked and physical activity to sleep quality among the present sample.

Table 3 presented the adjusted Odd Ratio (AOR) for gender, age, and BMI. In multivariable adjusted model, elders who never participated social activities was increased 5.962-fold odds of poor sleep quality (AOR = 5.962; 95% CI 1.459 – 24.361). Furthermore, no praying before sleep was increased 1.478-fold odds of poor sleep quality. (AOR = 1.478; 95% CI 0.273 – 0.838). Considering on health status, elders who had musculoskeletal problem increased 2.288-fold odds of poor sleep quality (AOR = 2.288; 95% CI 1.249 – 4.192). Whilst elders who had bladder problem increased 2.618-fold odds of poor sleep quality (AOR = 2.618; 95% CI 1.084 – 6.327). Additionally, elders with depressive symptoms increased 3.275-fold odds of poor sleep quality (AOR = 3.275; 95% CI 1.179 - 9.095). Lastly, Smokers increased 2.147-fold odds of poor sleep quality (AOR = 2.147; 95%CI 1.062 – 4.340).

Discussion

The participants of this study were 208 elderly people aged 60 – 97 years old among community-dwelling elderly in Chanthaburi province, Thailand (76 males and 132 females). In this study, most of participants 66.3% had PSQI sleep quality score ≥ 5 indicating poor sleep quality which had more than those of community-dwelling elders in Taipei study. The prevalence presented that 49% with poor sleep quality but a half of them had short sleep onset (<15 minutes) [17]. There were twenty-two percent of elders use psychoactive medication sleep but the current study excluded the people who used sleep medication and psychological drug. Poor sleep quality rate from this study was higher than study in Thailand such a study conducted in elderly nursing home in Chonburi reported that there were 57.1% of elders had poor sleep quality [18]. But the prevalence in this study was lower than study in Turkey. The study conducted in elderly people who lived in service area of a family health center. The finding shown that 73.3% elders had poor sleep quality [19].

However, elderly never participated the social activities was increased 5.96-fold odds of poor sleep quality. Similarity to previous study conducted in being 65 years or more. The result found that there was significantly associated between sleep disorder and perception of social support [12]. Similarity with case-control study represented high social support was associated with awaken after onset sleep both non-clinical and clinical groups. Furthermore the social interaction was associated with short period of sleep latency in clinical group [20]. Social activities should be provided such as elderly club to engage that do some activities together and improve their mental health. The current study found that elders did not pray before sleep was likely to increase 1.48 time to poor sleep quality. Praying before sleep is the vibrational therapy or vibration medicine. It is using of radio to treat the illness. Praying is the principle of sound waves to stimulate the body heals. The mechanism begins at the ear, send the signals to primary auditory cortex in temporal lobe and to brainstem. Professional from Nursing Care Program, Public Health Major, Mahidol University reported when the brain is stimulated regularly 15 minutes by slowly sound waves, the pineal gland releases the hormone called serotonin. An essential connection is controlled by the hypothalamus-pituitary-adrenal axis (HPA). Serotonin is changed to melatonin. It engages neuron cell, body cell and improves sleep. It related to traditional and cultural participation among older people such as Visakhabucha day, Makhabucha day and Asarnlahabucha day.

Elders who had musculoskeletal problems perception was likely to poor sleep quality about 2.29 times when compared those without musculoskeletal problems. For example muscle pain, joint pain, and low back pain, those are consistent with elderly Thai study that reported health problem about muscle twitching were positively correlated to poor sleep quality [18] and systemic review study investigated three mains factors to insomnia included predisposing factors, precipitating factors, and perpetuating factors. The finding concluded diseases and physical disorder influenced to sleeping [21]. Elderly people who had bladder problems perception was likely to poor sleep quality about 2.62 times when compared to elders without bladder problem. This founding was likely consistency to observational study at urology department, presented urinary incontinence, storage symptoms, and nocturia were suspected of contribution a poor sleep quality [22].

There were 47 people (81%) was assessed to depression and poor sleep quality. Elderly people who were assessed as depression by PHQ-9 was likely to poor sleep quality about 3.28 times when compared to those of them without depression. Depression was common abnormal psychology in elderly. Consistent to previously study [23] presented poor sleep quality was associated with higher depressive symptom. Additionally, cross-sectional studies showed a strong relationship between symptoms of depression and insomnia which resulting of poor sleep quality [24]. National Sleep Foundation reported people with depression were found to be five times more likely to suffer from sleep-disordered breathing [25].

The current study found that physical activity was not associated to sleep quality. They were most likely the light physical activity rather than the moderate physical activity. Inconsistency with study in multiple sclerosis report light, moderate, and moderate to vigorous physical activity level correlated to sleep onset and effects to poor sleep quality [10]. Quasi-experimental study was conducted in general population that revealed once compared with general health education. In 12 months, moderate-intensity exercise program improved sleep disturbance score. The intervention group had sleep quality better than control group [12]. Elderly people who smoked was likely to poor sleep quality about 2.15 times when compared with non-smoker. Consistency to insufficient rest and poor sleep quality for those who were both current smokers and current smokeless tobacco. Previously study examined secondhand smoked and poor sleep quality presented where it was the one causal for poor sleep quality. Whilst the secondhand smoked was not associated to sleep quality in this study. The mechanism of active smoking related to sleep disorder. The active component of cigarette smoked knows as nicotine. It stimulates the neurotransmitter triggers including dopamine and serotonin [9].

Conclusion

The study found that 66.3 percent of Wang-sapparos community-dwelling elderly had reported poor sleep quality with PSQI score ≥ 5. Poor sleep quality was associated with social participation, praying before sleep, musculoskeletal problem perception, bladder problem perception, depression, and smoking. Therefore, public health strategic development by promoting for health activities to prevent chronic diseases and engagement social participation to prevent depression among elderly are essential.

The strength of this study could be noted. This study used multistage sampling therefore the participant distributed in all age (min. 60 years – max. 97 years). BMI variable, measurement of weight and height were measured by weighing scales and height measuring scales. Therefore the value of BMI was accurately. Several limitations of this study. Firstly, Obstructive sleep apnea was not assessed by the effective tool or medical professional. However elder was diagnosed to sleep

obstructive apnea will be excluded from the study. Secondly, this study was cross-sectional study design which limits the confirmation of result temporality. Lastly, self-reported data from collection assistants in this study were obtained from the questionnaires and therefore may be biased. It is also possible that improving their sleep quality and realize the influencing factors. Therefore therapeutic intervention and qualitative study involving a large number of cases are needed to further study.

Acknowledgements

The author is grateful to the elderly people who agreed to participate and the administration assisted the data collection in Wang-sapparos community, Chanthaburi province, Thailand. Moreover, thank you very much for Prof. Sathirakorn Pongpanich, Assist. Prof. Nutta Taneepanichskul, Ph.D. of College of Public Health Sciences, Chulalongkorn University.

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