FACTORS THAT RELATED WITH SLEEP DISTURBANCE AMONG OLDER NURSING HOME RESIDENTS WITH DEMENTIA

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This study aimed to identify factors that related with sleep disturbance among older people with dementia in nursing homes. This cross-sectional study included 140 participants aged 60 years old and over, who were diagnosed with dementia (according to DSM 5 criteria) from November 2022 through January 2023 in 3 nursing homes in Hanoi, Vietnam. Sleep quality was assessed by the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The mean (SD) age among participants was 78.23 (8.73) and the female/male ratio was 1.5. The prevalence of poor sleep was 76.4% (n = 107). The poor sleep was significantly associated with depression (p = 0.007). The prevalence of poor sleep quality among the older people in nursing homes is relatively high. Depression is related to poor sleep quality among participants. Therefore, evaluating sleep quality among nursing homes should be performed as a basic clinical practice.

Keywords: Sleep disturbance, related factors, dementia, nursing homes, older adult.

I. INTRODUCTION

According to WHO, there is more than 55 million people with dementia worldwide.[1] with 60% of people with dementia live in low and middle income countries. In Vietnam, the prevalence of cognitive symptoms of dementia in adults aged 60 years and above is relatively high (14.4–46.4%).[2] Dementia has significant social and economic implications in terms of direct medical and social care costs.

Sleep disturbances are especially common among people with dementia. Indeed, 60 to 70% of persons with early stage of dementia experience sleep disturbance, which have been associated to a worse disease prognosis.[3] Sleep disorders in people with dementia also cause serious consequences such as impacting to quality of life and aggravating dementia, depression, physical functioning and self-care According to the previous finding, sleep disturbances are associated with age, gender, depression, pain and lack of physical activity among older people with dementia.[4]

In Vietnam, there is very limited available research on sleep disturbance. Understanding the relationship between sleep disturbance and related factors among older people with dementia is very important in providing timely intervention to prevent, treat and reduce the severity of sleep disturbance. Thus, we conducted this study to investigate factors related to sleep disturbances in dementia people in nursing homes.

II. METHODS

1. Study design

A descriptive cross-sectional study.

2. Setting

Location

In Hanoi, there are presently 20 private nursing homes. The nursing homes included in this study were selected using cluster sampling based on their size: (Small cluster): facility with less than 100 residents; (Medium cluster): facility with 100 to 200 residents; and (Large cluster): facility with more than 200 residents. We then used random sampling to select institutions in each cluster. Target population: older adults with dementia living in nursing homes in Hanoi, Vietnam.

The final study sample consisted of one large cluster (Dien Hong Nursing Center), one medium cluster (Nhan Ai Aged Care Center), and one small cluster nursing home (OriHome Aged Care Center).

Time

The research was conducted from November 2022 through January 2023.

3. Study subject, sampling and sample size

Study subject

Older adults with dementia living in nursing homes

Inclusion criteria

Participants aged 60 years old and over, living in nursing homes, who have a diagnosis of dementia (according to DSM 5 criteria[5]).

Exclusion criteria

- Malignant and acute diseases (e.g., advanced cancers, end-stage chronic diseases, acute myocardial infarction, stroke)

- Alcoholism or substance dependence (according to DSM-5 criteria[5]), currently, or within the past 2 years

- Participant or family unwilling to participate in the study

- Severe loss of vision, hearing or communicative ability (according to the interRAI Community Health Assessment)

Sample size

$$n = \frac{Z^2_{(1-\alpha/2)}}{d^2} \times p(1-p)$$

n: the smallest sample to study have significance

$Z_{(1-\alpha/2)}$ = 1.96 with 95% confidence intervals

p: the estimated population mean of sleep disturbance selected as 20% according to the result of Lucy Webster (2019).[6]

d: relative precision, selected as 0.07

Thus the minimum research sample size was calculated as n = 126. In this study, we have conducted on 140 participants.

Data Collection

After initial screening, participants and their families and nursing home care staff received a complete explanation of the purpose, procedures, and risks of the study.

Data were obtained through in-person interviews with study participants; interviews with the nursing home care staff; and review of nursing home records.

4. Tools and data collection method

Variable

General characteristics: gender: was categorized into male and female, age: was divided into 3 groups: from 60 to 69, from 70 to 79, 80 and over, number of comorbidities: defined as the co-occurrence of more than one disease) (review of nursing home records).

Sleeping quality was assessed based on The Pittsburgh Sleep Quality Index (PSQI) questionnaire.[7]PSQI is a questionnaire that evaluates sleep quality and disturbance during a one-month period. There are seven "component" scores generated by 19 individual items: subjective sleep quality, sleep latency,

sleep duration, habitual sleep efficiency, sleep disruptions, usage of sleeping medication, and daytime dysfunction. The PSQI score is established by adding the scores for these seven components.[5]

Evaluation: PSQI score is calculated by sum of 7 components score. A total PSQI score of <5 indicates good sleep quality, whereas a total score of ≥ 5 indicates poor sleep quality.

Factors related with sleeping quality

Functional ability was assessed using activities of daily living (ADLs) Barthel index (BI)[8] and the Lawton Instrumental Activities of Daily Living (IADL) Scale.[9] Barthel index measures the extent to which somebody can function independently and has mobility in their ADLs with independent: independent: 100 points, dependency: 21-99 points, total dependency: 0-20 points). IADL assesses a person's ability to perform tasks such as using a telephone, doing laundry, and handling finances. Measuring eight domains, the final total score ranges from 0 (low function, dependent) to 8 (high function, independent) for women, and 0 through 5 for men.

Depressive symptoms based on PHQ-9 questionnaire:[10] The PHQ-9 is the 9-item depression module. The PHQ-9 score as a severity measure can range from 0 to 27, because each of the 9 items can be graded from 0 (not at all) to 3 (almost every day). For the majority of analyses, the PHQ-9 score was classified into the following categories of increasing severity: 0 - 4: Normal, 5 - 19: Depression

5. Data processing and data analysis

The data coding and entry were completed using Redcap software. The data was then analyzed using the Statistical Package for Social Science (SPSS) software (version 21). Descriptive statistics were adopted to examine characteristic data: frequency, percentage and mean, SD.

Descriptive statistics were adopted to examine characteristic data: frequency, percentage and mean, SD. Inferential statistics were done to perform a correlation between groups such as the independence sample T-test. Statistical significance was accepted at the 95% confidence level ($p < 0.05$)

6. Ethical considerations

Study subjects and their families were explained clearly about the purpose of the study. The questionnaires were only distributed with the participants' permission. The right to withdraw at any moment was properly explained to the participants.

III. RESULTS

A total of 140 participants were included in the study

1. Demographic characteristics among participants

Table 1. Demographic characteristics among participants (n = 140)

Characteristics	Results	
Gender, n (%)		
Male	50	35.7
Female	90	64.3

Characteristics	Results	
Age, n (%)		
60 - 69	24	17.1
70 - 79	43	30.7
≥ 80	73	52.1
Mean age = 78.23 ± 8.73		
Poor sleep quality	107	76.4
Good sleep quality	33	23.6

The participants' age ranged from 60 to 100 years old. Participants were divided into three age groups: 60-69 years (n = 24, 17.1%), 70-79 years (n=43, 30.7%), and 80 years or older (n = 73, 52.1%). The percentage of females (n = 90, 64.3%) was higher than males (n = 50, 35.7%).

Approximate two-fifths of participants (n = 55, 39.3%) were married. In this study, the majority of participants (107 people, 76.4%) reported poor sleep quality, whereas only 33 people (23.6%) reported good sleep quality.

Table 2. Association between sleep quality and general characteristics (n = 140)

Characteristics		Sleep quality		p-value
		Poor sleep	**Good sleep**	
Age group, n(%)	60 - 69	15 (10,7%)	8 (5,7%)	0.29
	70 - 79	33 (23,6%)	11 (7,9%)	
	≥ 80	59 (42,1%)	14 (10%)	
Gender, n(%)	Male	10 (7.1%)	40 (28.6%)	0.46
	Female	23 (16.4%)	67 (47.9%)	
Comorbidities, n(%)	Yes	97 (69.3%)	27 (19.3%)	0.16
	No	10 (7.1%)	6 (4.3%)	

There was no statically significant difference between age groups, gender and sleep quality (p=0.29 and p=0.46, respectively). In 124 participants with comorbidities disease, there were 97 poor sleepers (69.3%) and 27 good sleepers (19.3%). There was no statistic significant difference between comorbidities group and sleep quality (p=0.16 > 0.05).

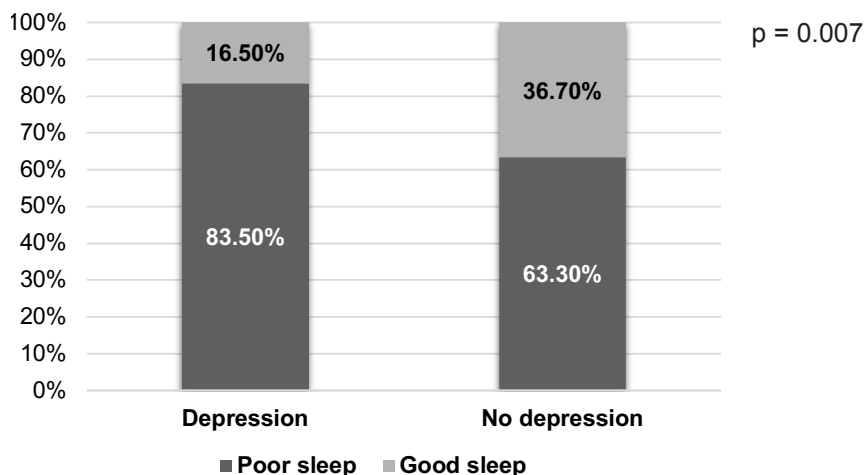***Association between sleep quality and depression***

Firgue 1. The relationship between sleep quality and depression in participants (n = 140)

76 (83.5%) participants suffering from depression had poor sleep, higher than those who were good sleepers (n=15, 16.5%). There was statistic significant association between sleep disturbance and depression (p=0.007).

Table 3. Association between physical activities, instrument activities of daily living, activities of daily living and sleep quality (n = 140)

Characteristics		Sleep quality		p-value
Functional ability		Poor sleep	Good sleep	
Instrument activities of daily living, n(%)	Dependence	100 (71.4%)	30 (21.4%)	0.62
	Indendependence	7 (5.0%)	3 (2.1%)	
Activities of daily living Bathel Index, n(%)	Total dependence	15 (10,7%)	7 (5.0%)	0.32
	Dendepence	92 (65.7%)	26 (18,6%)	
	Independence	0	0	

There was no statistic significant association between sleep quality and instrument activities of daily living (p = 0.62), physical activities of daily living (p = 0.32).

IV. DISCUSSION

This study showed that almost the participant had poor sleep (n=104; 76.4%). The prevalence of poor sleep quality in this study is higher than found in the finding of Xidi Zhu et al (2020).[11] According to another research, our result was higher than the finding of Than Ha Ngoc The (55.9%). This inconsistency can be explained by the mean age of The's finding was 71.2 (SD=7.7), which was lower than our study (78.23, SD=8.73).

This study did not find a relationship between age and sleep quality. In the study by Li et al (2020) a significant correlation was found between age and the score in the PSQI.

A statistic significant difference between sleep quality and depression was found. It was

the same with finding in previous study which show that poor sleep quality was positively associated with depression (p < 0.001). Another study in Norway, the finding of Kjersti Marie Blytt et al (2021) was similar to our result, the p-value was <0.001.[12] Depression is also a known cause for disrupted sleep. Depression is commonly comorbid with dementia especially in the early stages of the dementia. It is common for depressed patients to complain of insomnia and other sleep difficulties. As with medical illness, the concurrent treatment of the psychiatric illness and the sleep disturbance should be considered. The mechanism underlying the relationship between poor sleep quality and depression symptoms is not understood. Some studies have suggested that poor sleep quality and depression symptoms can reinforce each other and this relationship might be bidirectional. Although we are unable to determine the association between sleep quality and depression symptoms in this study as a result of the study design, poor sleep quality was viewed as a prodromal state or even a main symptom of depression symptoms in the older adults.

There was no correlation between sleep quality and physical activity (p = 0.92 > 0.05). This result similar with previous study in China, which show no significant association between sleep quality and physical activity (p = 0.485 > 0.05).

This study is one of the few studies in Vietnam to evaluate the sleep disturbance among older people with dementia in nursing care centers. We acknowledge several limitations to this work. First, our study was a cross-sectional research so we cannot explain the causality of the relationship between sleep quality and related factors and sleep quality among nursing home centers. Second, the study was conducted in nursing care centers in

Hanoi, so the result might not be representative of nursing home centers in Vietnam.

V. CONCLUSION

The prevalence of poor sleep quality among the older people in nursing homes is relatively high. Depression related to poor sleep quality among participants. Therefore, evaluating sleep quality among nursing homes should be performed as a basic clinical practice.

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