High Risk Prevalence of Obstructive Sleep Apnea in Employees and Lecturers of the Faculty of Medicine and Health Sciences at Warmadewa University

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Abstract. Obstructive sleep apnea (OSA) is a respiratory illness with the involvement of sleep disorders that have a characteristic ofrecurrent collapse of pharynx airway during sleep. OSA has a serious physiological and psychological impact if left untreated. OSA complications can be divided into 2, namely neurocognitive dysfunction and cardiovascular disease. This will affect the quality of life of the patients, including low quality of sleep, reduced cognitive function, and decreased productivity. The purpose of this study is to determine the prevalence of high risk of OSA in employees and lecturers at Warmadewa University. This research is using descriptive research method with cross sectional design. The sample in this research is employee and lecturer of Faculty of Medicine and Health Sciences at University of Warmadewa taken at random. The independent variables were snoring, daytime sleepiness, obesity, and high blood pressure. Dependent variable is obstructive sleep apnea. The study used primary data, which the data collected by interviewing and distributing Berlin questionnaire and measuring body mass index of employees and lecturers of Warmadewa University. Data analysis used descriptive analysis with Statistical Package for The Social Science (SPSS) program. There were 12 (15.18%) employees and lecturers at high risk of OSA based on the Berlin questionnaire. It is expected that the puskesmas can optimize its role in carrying out advanced screening to detect OSA in the community
Keyword : Prevalence , Employees, Lecturers.

1 Introduction

Obstructive sleep apnea (OSA) is a respiratory disease with the involvement of a sleep disorder that has the characteristic of recurrent collapse of the pharyngeal airway during sleep. Individuals with OSA show symptoms of loud snoring, stopping breathing during sleep, feeling suffocated during sleep and fatigue during the day. Several studies have shown that OSA occurs in 2% to 14% of the adult population depending on sex and race.

OSA complications can be divided into 2, namely neurocognitive dysfunction and cardiovascular disease, OSA also causes a tendency to fall asleep, decreasing alertness and decreasing psychomotor coordination. This condition will ultimately increase the risk of traffic accidents.

OSA data for university staff and lecturers has not been done much. University employees and lecturers work for a long time in one day, months to years. This work is also related to errors in work and motor vehicle accidents. University employees, for example in administrative staff, carry out many activities that do not involve physical activity, this will increase the risk of overweight and obesity.

The purpose of this study was to determine the prevalence of high risk OSA in employees and lecturers of the Faculty of Medicine and Health Sciences at Warmadewa University.

2 Method

2.1 Data Collection

This study used a descriptive research method with cross sectional design. The target population in this study were employees and lecturers of Warmadewa University. The accessible population of this study were employees and lecturers of the Faculty of Medicine and Health Sciences at Warmadewa University. The sample in this study were employees and lecturers of the Faculty of Medicine and Health Sciences of Warmadewa University who were chosen randomly.

The number of samples studied was calculated based on the assumption of the proportion of OSA prevalence of 25%. The confidence interval of the sample used was 95% ($Z\alpha = 1.96$) and bias (effect size) of 10% (d = 10%) which was then calculated using a cross sectional study sample formula so that 72 samples were obtained. However, to anticipate the drop out in the sample, the number of samples obtained was added 10% to 79 samples. The sample selection technique in this study used a systematic random sampling.

The questionnaire used for OSA screening was the Berlin questionnaire. The Berlin questionnaire consisted of 10 questions about the habit of snoring, daytime sleepiness, history of high blood pressure, and body mass index status.

Questions were divided into 3 categories, where questions 1-5 regarding snoring habits as category 1, questions 6-8 regarding daytime sleepiness as category 2, and questions 9-10 regarding hypertension and body mass index status as category 3. Category 1 is positive if there are 2 or more positive responses, category 2 is positive if there are 2 or more positive responses, and category 3 is positive if there are 1 or more positive responses.

The study used primary data, where data collection was done by interviewing and distributing Berlin questionnaires and body mass index measurements to employees and lecturers of the Faculty of Medicine and Health Sciences at Warmadewa University.

2.2 Statistical Analysis

Data analysis used descriptive analysis with the Statistical Package for The Social Science (SPSS) program. The analysis used was univariate analysis to describe each variable.

2.3 Ethical Consideration

The study, the collection of clinical and epidemiological data submitted for ethical approval to the Research Ethic Committee of Udayana University, Denpasar. Enrollment of the study participants is conditional on appropriate consent.

3 Results And Discussion

Table 1. Baseline characteristics of research subject

Variable	Frequency	Percentage (%)

Age		
21-40	60	75.59%
41-60	19	24.05%
Gender		
Male	54	68.36%
Female	25	31.64%

From the research conducted on 79 employees and lecturers of the Faculty of Medicine and Health Sciences at Warmadewa University, OSA was found to have high risk distribution based on the Berlin questionnaire score. The risk of OSA based on the Berlin questionnaire is categorized as high risk and low risk. There were 12 employees and lecturers (15.18%) who had a high risk of OSA and 67 employees and lecturers (84.82%) had a low risk of OSA.

Snoring habit was categorized as positive and negative. In the sample which included the positive category, 10 samples (55.55%) had a high risk of OSA. In the sample which included the negative category, 2 samples (3.27%) had a high risk of OSA.

Daytime sleepiness was categorized as positive and negative. Reviewing the results of the study, found 26 samples in the positive category and 53 samples in the negative category. From 26 positive category samples, there were 5 (19.23%) samples that had a high risk of OSA and in the negative category, 7 (13.20%) samples had a high risk of OSA.

A total of 7 samples had a Body Mass Index (BMI) of more than 30 kg/m2 and 72 samples had BMI less than 30 kg/m2. Of the total samples at high risk of OSA, 6 (85.71%) who had a BMI of more than 30 kg/m2. Whereas only 1 (14.29%) of the non-high risk OSA samples had BMI of more than 30 kg/m2 and only 6 (8.33%) of 72 people who had BMI less than 30 kg/m2 at high risk of OSA.

A history of suffering from high blood pressure was categorized by positive and negative. There were 4 (36.36%) samples with a history of high blood pressure who had a high risk of OSA and 8 (11.76%) samples who had no history of high blood pressure had the high risk for OSA.

The prevalence rate of high risk for OSA in the employees and lecturers was found in as many as 12 subjects (15.18%). In a study conducted in East Jakarta, the prevalence of OSA reached 17.2%. Thus the results obtained from this study is close to the result of previous study. But the results in this study are still subjective, because only questionnaires that are also subjective were used.

In this study it was found that the likelihood of OSA tends to increase as respondents had snoring habit. Where the prevalence of OSA in respondents who had snoring habit is 55.55% and those who did not have snoring habit is 3.27%. Because OSA is a respiratory disorder that is experienced during sleep, the habit of snoring is very instrumental in the occurrence of OSA. Snoring can cause narrowing or closing of the upper airway so that breathing stops during sleep. Repeated respiratory arrest during sleep is a diagnostic criterion of OSA.

Based on daytime sleepiness, the percentage was 19.23% in the positive score and 13.20% in the negative score. Similar research in Jakarta also received the proportion of OSA in respondents who had a positive score based on daytime sleepiness of 12.5%. This can be explained because most OSA sufferers have manifestations of feeling tired and not refreshed during the day. Daytime sleepiness arises because of the low quality of sleep caused by hypoxia during sleep. OSA is also one of the most common causes of daytime sleepiness.

In this study, 85.71% of employees and lecturers were at high risk of OSA having obesity, while those who did not have obesity were 8.33%. This is in accordance with the results of Agus (2016) study in East Jakarta which resulted in 53% of respondents with the possibility of OSA being obese.

One of the risk factors for OSA is obesity. Obesity is a modifiable risk factor, which can be avoided by changing behaviors such as regular exercise and reducing eating fast food. A 10% increase in body weight was associated with a 6-fold increase in OSA risk. In contrast, a weight loss of 10% reduced Apnea Hypopnea Index (AHI) by 26%.

It was found that employees and lecturers with high-risk for OSA who had a history of high blood pressure was 36.36% and 11.76% did not have history of high blood pressure. The results showed that there were significant differences between the two groups. OSA is one of the risk factors for hypertension. Research shows that when AHI increases, blood pressure will also increase. Severe untreated cases of OSA will also increase the likelihood of fatal cardiovascular disease.

4 Conclusions

From this study, researchers found that OSA high risk prevalence for employees and lecturers of the Faculty of Medicine and Health Sciences of Warmadewa University is 15.18%. The high risk prevalence of OSA in the group with positive score on snoring habits (55.55%) was greater than the group with negative score on snoring habits (3.27%). The high risk prevalence of OSA in the group with positive score on daytime sleepiness (19.23%) was greater than the group with negative score on daytime sleepiness (13.20%). The high risk prevalence of OSA in the group with positive score on obesity (85.71%) was greater than the group with negative score on obesity (8.33%). The high risk prevalence of OSA in the group with positive score on history of high blood pressure (36.36%) was smaller than the group with negative score in the history of high blood pressure (11.76%).

Therefore, in order to optimize OSA screening that reaches the entire community, we suggest to prioritize for groups suffering from a history of high blood pressure, snoring habits, daytime sleepiness, and obesity. A program that aims to reduce OSA risk factors such as promoting regular exercise is also suggested. We also suggest to provide polysomnography tool as a gold standard diagnosis tool for OSA.

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