



Exploration of Patients' Perceptions About Obstructive Sleep Apnea (OSA) and Their Efforts to Reduce the Risk: A Qualitative Study

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ABSTRACT

Obstructive sleep apnea (OSA) is a health problem that can cause various negative impacts on health, but society considers OSA to be normal. This research aims to determine how the patient's perception and efforts reduce OSA risk. A qualitative study with a phenomenological approach was conducted. Inclusion criteria were experiencing OSA symptoms such as snoring, sleepiness during the day, and often waking up at night. Purposive and snowball sampling techniques took seven participants who met these criteria. Data were collected through interviews, Epworth Sleepiness Scale (ESS), and the STOP-BANG questionnaire (SBQ). The method and time triangulation were used in this study. Data were analyzed using thematic analysis from the Colaizzi approach. Based on the SBQ, all participants have a high risk of OSA but perceived it as a normal complaint. Three themes were found in this study: participants perceive OSA as a usual complaint, perceive that OSA does not endanger health, and do not take action to reduce OSA. It is hoped that this study's results can increase nurses' awareness to provide education about sleep problems to the community because sleep problems have not received much attention in Indonesia

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ABSTRAK

Obstructive sleep apnea (OSA) merupakan masalah kesehatan yang dapat menimbulkan berbagai dampak negatif bagi kesehatan, namun masyarakat menganggap OSA sebagai hal yang wajar. Penelitian ini bertujuan untuk mengetahui bagaimana persepsi dan upaya masyarakat dalam menurunkan risiko OSA. Desain penelitian adalah kualitatif dengan pendekatan fenomenologis. Kriteria inklusi dalam penelitian ini adalah : partisipan mengalami gejala OSA seperti mendengkur, mengantuk di siang hari, dan sering terbangun di malam hari. Tujuh partisipan yang memenuhi kriteria tersebut diambil dengan teknik sampling purposive dan snowball. Data dikumpulkan melalui wawancara, serta kuisioner Epworth Sleepiness Scale (ESS), dan STOP-BANG (SBQ) untuk mengetahui risiko terjadinya OSA. Teknik triangulasi metode dan waktu digunakan dalam penelitian ini. Data dianalisis menggunakan analisis tematik dengan pendekatan Colaizzi. Berdasarkan kuisioner SBQ, partisipan memiliki risiko OSA yang tinggi, namun mereka menganggap OSA sebagai keluhan yang normal atau wajar. Serta didapatkan tiga tema dalam penelitian ini yaitu: partisipan mempersepsikan OSA sebagai keluhan yang biasa atau wajar, memiliki persepsi bahwa OSA tidak membahayakan kesehatan, dan tidak melakukan tindakan untuk menurunkan risiko OSA. Diharapkan hasil penelitian ini dapat meningkatkan kesadaran perawat untuk memberikan edukasi tentang masalah tidur kepada masyarakat karena masalah tidur belum banyak mendapat perhatian di Indonesia

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INTRODUCTION

Obstructive sleep apnea (OSA) is one of the most prevalent sleep disorders affecting up to 17% of middle-aged men and 9% of women, and the prevalence is rising and affects all countries (Dudley and Patel, 2016; Lyons et al., 2020). The increasing prevalence is driven by the global increase in obesity as the major risk factor for OSA. A study in 16 countries using the American Academy of Sleep Medicine (AASM) diagnostic criteria and apnea-hypopnea index (AHI) threshold values estimated that 936 million adults aged 30–69 years (men and women) have mild to severe OSA (AASM, 2012). Also, globally, 425 million (399–450) adults aged 30–69 years have moderate to severe obstructive sleep apnea (Benjafield et al., 2019). Evidence suggests that obstructive sleep apnea is an essential contributor to poor health outcomes. The prevalence of OSA is increasing in developing countries due to the increasing prevalence of obesity. Moreover, there is generally little awareness of obstructive sleep apnea in developing countries, and diagnostic and treatment options are often unavailable (Jehan et al., 2018; Benjafield et al., 2019).

The prevalence of OSA in Indonesia is unknown, this is due to the limited sleep laboratory that performs polysomnography (PSG) examinations as the gold standard for OSA examination. Several studies revealed that 49.5% of 202 subjects examined with the Stop-Bang questionnaire in five areas of Jakarta had a high risk of OSA, examination of the traffic police in East Jakarta with the Berlin questionnaire showed 17.2% of 93 subjects had a high risk of OSA. The results of the PSG examination on 60 patients at Dr. Mintohardjo hospital showed that 75% experienced OSA with moderate and severe categories (Susanto *et al.*, 2016; Bahari, Bustamam and Thadeus, 2021)

Obstructive sleep apnea is a sleep disorder characterized by repeated episodes of partial and complete airway obstruction with recurrent apnea resulting in intermittent hypoxia and fragmented sleep (Osman *et al.*, 2018; Rundo, 2019; Abdissa, 2020). Obstructive sleep apnea is part of the most common sleep-disordered breathing (SDB) or sleep-related breathing disorder (SRBD). According to the International classification of sleep disorders-3 (ICSD-3), other types of SDB are central sleep apnea (CSA), sleep-related hypoventilation disorders, and sleep-related hypoxemia disorder (Sateia, 2014; Foldvary-Schaefer and Waters, 2017; Li et al., 2018).

Obstructive sleep apnea is characterized by periodic narrowing, and obstruction of the pharyngeal airway during sleep, and manifestations include snoring, witnessed apneas, choking or gasping episodes, excessive daytime sleepiness, non-restorative sleep, breathing interruptions, dry mouth on awakening, morning headaches, unrefreshing sleep regardless of sleep duration and nocturia (Franklin and Lindberg, 2015; Foldvary-Schaefer and Waters, 2017; Veasey and Rosen, 2019). Obstructive sleep apnea is diagnosed by PSG examination and OSA is defined when the AHI < 15 events/hour or > 5 events/hour when accompanied by at least one symptom above one symptom or a comorbid condition including hypertension, mood disorder, cognitive dysfunction, coronary artery disease, or diabetes mellitus (Sateia, 2014; Franklin and Lindberg, 2015).

Obstructive sleep apnea causes various negative impacts on body health and is associated with many cardiovascular and metabolic disorders. Apnea-hypopnea index of more than 30 events per hour is also at increased risk for sleep-related dysrhythmias (e.g., sinus bradycardia and atrioventricular block) and non-sustained ventricular

tachycardia. In addition, OSA is associated with an increased risk of diabetes and glucose dysregulation, obesity, total cholesterol levels, low-density lipoprotein cholesterol, triglycerides, and decreased levels of high-density lipoprotein cholesterol. Episodes of apnea or hypoxemia in OSA initiate inflammation and damage the endothelial lining of the blood vessels, and there is an increased aggregation of platelets, leading to further oxidative stress and vascular endothelial damage. Moreover, several studies have shown a decrease in cognitive function in OSA patients (Dudley and Patel, 2016; Jehan et al., 2018; Veasey and Rosen, 2019).

The previous study revealed that the prevalence of OSA in Asia ranged from 3.7% to 97.3% with the most risk factors being male gender, older age, a higher BMI and waist-to-hip ratio, greater neck circumference, and smoking (Mirrakhimov, Sooronbaev and Mirrakhimov, 2013). It is estimated that 80% to 90% of the general population has low awareness of OSA (Chang, Chen and Du, 2020). Although the number of OSA patients in Indonesia is quite large, however, research on OSA was rare and limited data because of a lack of knowledge and understanding of OSA, and difficulties in diagnosing OSA (Sulistyaningrum and Syafii, 2021). Polysomnography is the gold standard for diagnosing OSA, but it is rarely done in Indonesia because limited availability of tools, requiring special expertise, and expensive prices (Sulistyaningrum and Syafii, 2021). From previous studies, we can find the gap that public awareness and understanding of OSA is still lacking, and to my knowledge, no research discusses the patient's perception of OSA in Indonesia. Furthermore, few hospitals have sleep centers or sleep laboratories, so sleep problems, especially OSA, do not receive proper treatment and are difficult to diagnose. Therefore, we performed current research to explore how patients perceive OSA and their efforts to overcome their complaints using a qualitative study approach.

METHODS

Research design

A qualitative study with a phenomenological approach was conducted; this is a method of choice to study what an experience means to a particular group of people (Grossoehme, 2014). Through this method, researchers want to obtain patients' perceptions of OSA and their efforts to reduce the risk of OSA and attempt to capture the main themes and the individual's interpretation. Whereas in-depth information is collected regarding this phenomenon, an opportunity is also provided for patients to express feelings about their perception related to OSA freely. Moreover, the researchers conduct a triangulation method and time in data collection. Triangulation has been viewed as a qualitative research strategy to test validity through the convergence of information from different sources (Carter et al., 2014).

Settings and samples

A purposive and snowball sampling strategy was used to recruit participants. This method is commonly used in qualitative research to find and select information-rich cases for the most effective use of limited resources (Palinkas *et al.*, 2015). Purposive sampling was done by directly contacting participants who had OSA and met the inclusion criteria. Initial information about these participants was obtained by

researchers from the community. A five-person as the initial participant (key informant) was obtained through this technique. Furthermore, two additional samples were obtained using snowball sampling, where information about these participants was obtained from key informants. So, in total, we get seven participants. The inclusion criteria of participants were (1) experiencing OSA symptoms such as snoring, daytime sleepiness, and frequent awakening at night, (2) adults ≥ 18 years. The research was conducted in one of the villages in the Lumajang Regency in February–October 2021.

Data collection

Data were collected using in-depth semi-structured personal interviews, following an interview guide of open questions about patients' perceptions of OSA. These interview guides were used to explore participants' experiences and perceptions, developed based on OSA theory and perceptions. Moreover, the guideline is developed to gather similar data types from all participants and create a sense of order. The interview can be flexible, with open-ended questions and opportunities to explore themes that arise unexpectedly. The researcher is free to vary the order and wording of the questions depending on the direction of the interview and ask additional questions (Doody and Noonan, 2013). The interview guide includes: what do you think about snoring (OSA)? Since when have you experienced OSA? what are the symptoms that appear during OSA? What actions do you take to reduce snoring while you sleep?

During the interview, the researcher sometimes replaced the word OSA with the word snoring because this is a usual term that is familiar known to the participants. The interview for each participant was conducted two times with a duration of 15–60 minutes. At the interview, the researchers came to the participant's houses. Interviews were conducted in the living room, only between researchers and participants (without being accompanied by their families) and the environmental conditions were conducive at the time of the interview. The interview was done in the morning or evening according to the time agreed by the participants, and was recorded with an audio recorder and directly transcribed verbatim.

Moreover, data collection was carried out using Epworth Sleepiness Scale (ESS) and STOP-BANG questionnaire (SBQ) to determine the OSA experienced by participants. SBQ is a more accurate tool with a higher sensitivity than the Berlin questionnaire. STOP-BANG questionnaire is a simple instrument that is useful for assessing the OSA risk level. This instrument was validated as the screening tool for identifying OSA risk level score > 3 indicates high risk and < 3 low risk (Harahap and Indrayana, 2018; Abdissa, 2020). In contrast, the ESS questionnaire measures daytime sleepiness, which is one of the OSA symptoms. The Indonesian version of the ESS was valid and reliable ($r \geq 0.4$), and a total ESS score of > 10 was considered to have excessive daytime sleepiness (Marta *et al.*, 2020). The gold standard for OSA diagnosis should use the PSG examination, but due to the unavailability of this examination, data were collected using the two questionnaires above.

Data analysis

After the interview, each audio-recorded was transcribed verbatim within 24 hours to avoid recall biases and begin the initial data analysis process, which used thematic analysis

from the Colaizzi approach. The researcher handled all data processes and analysis manually using guidelines from Creswell & Poth (2016). According to Creswell & Poth (2016), the following steps were involved: (1) Reading and copying all interview descriptions disclosed by participants, (2) Extracting significant statements (directly attributed to the phenomenon under investigation), (3) Summarizing the meaning, (4) Created groups of codes according to their similar meaning, (5) Developing a complete theme description, (6) Identifying the structural basis of the phenomenon, and (7) Finally, returning the findings to the participants for validation. At the final validation, the team discussed the data verification for validation and sharing—the findings with the participants to ensure that these findings reflected the participants' actual meaning. For publication, the transcripts were translated into English from the original Indonesian.

Rigor and trustworthiness

Trustworthiness is regarded as a more relevant criterion for evaluating qualitative studies. There are four criteria to ensure the process is trustworthy: credibility, dependability, confirmability, and transferability (Ghafouri and Ofoghi, 2016; Maher *et al.*, 2018). Participants were requested to provide comments, and all of them agreed with the transcripts. It was also done to validate the findings, as this is the most important strategy for establishing credibility and allowing participants to reflect on their experiences. Moreover, to meet these criteria, the researcher triangulates and member checks. The triangulation technique used in this research is method and time triangulation. Triangulation was carried out using more than one data collection technique. The researcher used two questionnaires (ESS and SBQ) to check the diagnosis of OSA and crosschecked the participants' families.

Meanwhile, time triangulation in this study was conducted by interviewing the participants twice at different times. The dependability in this study was fulfilled by maintaining the consistency of data collection techniques, using concepts, and making interpretations of phenomena. Confirmability was achieved by debriefing the study results with all research teams to ensure that no bias was present in the analysis and development of the themes. All researchers agreed upon all findings. Finally, the researchers examined transferability by summarizing the outcomes of the study and then offering a narrative explanation of the interview results. It was done to help readers clearly understand the results of the research.

Ethical considerations

The data collection process commenced after obtaining ethical clearance from the Health Research Ethics Commission with a reference number of E.5.a/017/KEPK-UMM/II/2021. Participants who meet the criteria will be contacted by the researcher and given information about the research objectives, methods, discomfort, risks, benefits, and expectations; participants will also be asked to sign an informed permission form. The transcribed data were maintained in a password-protected file, and anonymity ensured no participants were linked to their recounted experiences. Only the researchers have access to the study's data.

RESULTS

Characteristics of the participants

The participant's characteristics are described in (Table 1) and (Table 2). The total participants were seven people, and all of them were male, mean age was 38.42, mean BMI was 29.98, mean neck size was 15.83, and 100% were at high risk of OSA based on the SBQ questionnaire.

Perceptions of OSA

Analysis of the data regarding the perception of OSA obtained three themes, namely:

Perceiving OSA as a usual or normal complaint

All participants perceived that OSA is a natural thing that happens when a person experiences fatigue. Obstructive sleep apnea can occur in everyone, both obese and thin, as observed by the following statements:

"I think it's a natural thing, it can be experienced by everyone, especially I usually snore when I'm tired after work" (P1).

"Oh yes, madam, if I think it is normal for everyone to snore, Ms. and most people also snore a lot because I have seen it too or seen from the condition of many people. I see that I'm fat (holding my chest and laughing), but there are skinny people, and they also snore, but that doesn't mean anything...(P2)

"In my opinion, snoring is normal, mostly because of fatigue or tiredness, which causes snoring in a deep sleep, and it's not something that can cause disease in my opinion" (P4).

"In my opinion, it's a natural thing and I'm not used to snoring, I've only recently experienced snoring" (P5).

Table 1. Characteristics of participants

Characteristics of participants	Mean (SD)	n (%)
Age		
mean age	38.42 (10.59)	
Range age	31- 60	
Age category		
Early adulthood (26-35 years)		3 (42.86%)
Late adulthood (35-45 years)		0
Early elderly (46-55 years)		1 (14.28%)
Late elderly (56-65 years)		
Gender		
Male		7 (100%)
female		0
BMI		
Mean BMI	29.98 (4.00)	
Obesity I		4 (57.14%)
Obesity II		3 (42.86%)
Neck size	15.83 (0.98)	

Table 2. Risk factors for OSA and OSA assessment

Participants	Body weight (kg)	Height (cm)	BMI	Neck circumference (inch)	ESS		Stop Bang	
					score	category	score	category
P1	85	155	35.37	16.5	14	EDS	7	High risk
P2	73	164	27.14	17	16	EDS	5	High risk
P3	92	170	31.83	17	13	EDS	5	High risk
P4	100	170	34.60	16	7	Normal	6	High risk
P5	72	157	29.21	15	13	EDS	4	High risk
P6	70	165	25.71	15	10	EDS	4	High risk
P7	77	172	26.02	15	18	EDS	4	High risk

EDS: excessive daytime sleepiness, ESS: Epworth Sleepiness Scale

The process of preparing the themes obtained can be seen in the image below (Figure 1).

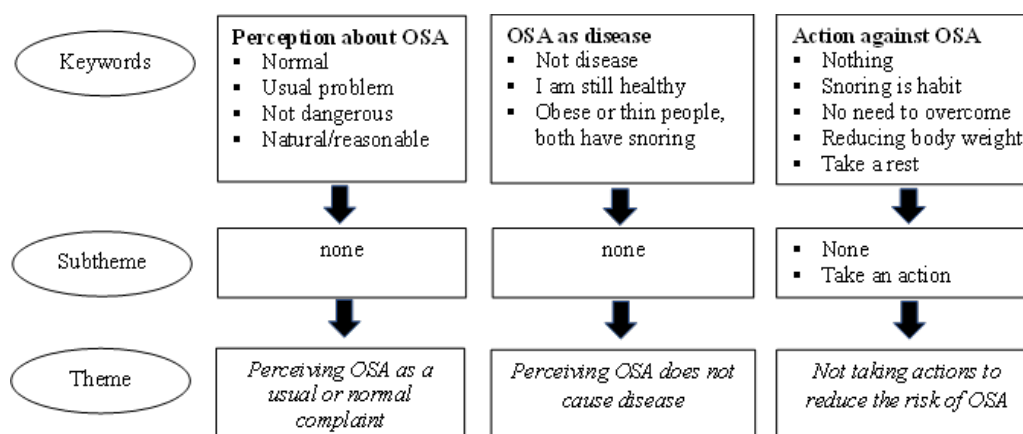


Figure 1. Process of getting the theme

Perceiving OSA does not cause disease

Participants perceive that OSA is not harmful to health, as observed by the following statements:

.....I see that I'm fat (holding my chest and laughing), but some people are thin, and they are also snoring, but that doesn't mean anything, erm, I don't think it's a disease either because judging from a person's physique, they are also healthy" (P2).

"It's normal or something normal for everyone, and in my opinion, it can't cause disease" (P3).

"It's just a normal thing, sis, and it's natural, it's not something that can cause a disease, in my opinion, the proof is that I'm healthy, sis" (P6).

"In my opinion, snoring is normal. It's just a different sensation (while laughing) and I think it's a natural symptom and not a disease" (P7).

Not taking actions to reduce the risk of OSA

Participants assume that OSA is a common thing, so they usually never take any action to reduce their OSA and let it go, as observed by the following statements:

"I've never done anything, Miss. So, I've never done anything like that, sis" (P1).

"...The sport that I usually do is playing volleyball or running, sis. I exercise every afternoon, 2-3 times a week. I do exercise to keep my body healthy, sis, not specifically to reduce snoring"....(P2)

When it comes to snoring myself, I never do anything, sis, because I think it's a habit, so it's impossible to get rid of it, sis, and I don't know what to give" (P3).

However, two participants exercise to reduce weight so that OSA is reduced, based on the following statements:

"Yes, reducing weight is the same as avoiding being tired, because if I lose weight, my breath will be relieved, sis, because the fat is reduced, and if I'm tired, I will snore even louder, my mother said, so I avoid being tired so that the snoring will decrease " (P4).

"I exercise so that my body is healthy, and my body weight can be reduced, Sis. Maybe if my body weight reduces, my snoring will disappear, sis" (P5).

DISCUSSION

In this research, we found three themes: participants perceive OSA as a usual complaint, have a perception that OSA does not endanger health, and do not take action to reduce OSA. Most participants stated that they considered OSA to be a reasonable complaint, so they did not take action to reduce OSA. The researchers use questionnaires to support or validate OSA complaints experienced by participants. Based on the questionnaire results, participants have a high risk of OSA, but they do not know the negative impact of OSA. The high risk of OSA in participants is also evidenced by the high body mass index (BMI) value. It is included in the categories of overweight (25-30 kg/m²) and obesity (25-30 kg/m²) (Yusuf and Ibrahim, 2019).

Some previous studies corroborated the result of this research. In the study from Kaffah and Susanto (2015), participants consider OSA as a natural thing to happen in society. The general population's awareness and knowledge of OSA were low; only one in 10 people knew about OSA (Sia et al., 2017). Although the prevalence of OSA in Indonesia is

high, there are limited studies in Indonesia that examine OSA. Thus, people still think OSA is a usual complaint and not a serious health problem. According to Sulistyningrum and Syafii (2021), research on OSA was rare and limited data because of a lack of knowledge and understanding of OSA, and the gold standard for diagnosing OSA is using polysomnography. There are a limited number of hospitals that have these tools and expensive prices for examination (Sulistyningrum and Syafii, 2021).

Participants considered OSA to be harmless and could not cause disease. Whereas if untreated, sleep apnea can have a detrimental impact on your health and well-being (AASM, 2012). Obstructive sleep apnea can cause hypertension, stroke, heart disease, brain damage, depression, diabetes, and mortality. Moreover, OSA is common in the general population and presents a significant risk of increased morbidity and mortality when they coexist in the same patient. Thus, clinicians should carefully evaluate the clinical outcomes and the high risk of OSA complications (Bonsignore et al., 2019; Gharib, 2020). This research is in line with research (Sia et al., 2017) that the general population's awareness and knowledge of OSA were low. Only very few recognized that OSA could be associated with cardiovascular and metabolic diseases such as diabetes. Perception is the result of the brain's work in understanding or assessing something happening around them, which is related to a person's perspective on a particular object using the senses they have and then trying to interpret it. Several factors affect a person's perception, including age, gender, level of education, type of work, socioeconomic, culture, environment, personality, and life experience of the patient (Franklin & Lindberg, 2015).

Five participants do not take action to overcome OSA, **however, two participants did an exercise to lose their body weight**, because according to the participants, they experienced snoring after gaining weight. Lack of knowledge about OSA causes low public awareness to prevent or reduce OSA risk factors. The previous study revealed that the general population's awareness and knowledge of OSA are currently poor (Sia et al., 2017). Obstructive sleep apnea therapy can be done medically, such as through surgery and continuous positive airway pressure installation. Continuous positive airway pressure (CPAP) is the gold standard treatment for OSA (Cao, Sternbach and Guillemainault, 2017). Moreover, lifestyle modification including diet, exercise training, sleep hygiene, and tobacco or alcohol cessation is recommended in the management of OSA (Carneiro-Barrera et al., 2019) The prevalence of OSA is correlated with body mass index (BMI), and increasing rates of OSA have been attributed to the increasing rates of obesity. By losing weight, OSA patients with obesity can increase the volume and function of the upper airway. It is estimated that a 10% increase in body weight can worsen the respiratory arrest index by up to 30%. Still, a 10% decrease in body weight can reduce the respiratory arrest index by up to 20%. Therefore, a healthy lifestyle and diet that promotes weight loss are necessary to reduce OSA symptoms (Hanafiah & Dorinda, 2010; Calik, 2016)

According to screening results using a questionnaire, participants have a high risk of OSA. The risk factor of OSA consists of modifiable factors including obesity, medications that cause muscle relaxation and airway narrowing (opiates, benzodiazepines, alcohol), endocrine disorders (hypothyroidism, polycystic ovarian syndrome), smoking, and nasal congestion or obstruction. Meanwhile, unmodifiable risk factors include male sex, age, and race (Franklin and Lindberg, 2015; Rundo, 2019). Obstructive

sleep apnea is a dangerous sleep disorder, however, this problem is often underdiagnosed. If OSA is untreated, patients will experience health problems such as myocardial infarction, arrhythmias, pulmonary hypertension (Rachmawati *et al.*, 2018), stroke, heart disease, brain damage, depression, diabetes, and mortality (Bonsignore *et al.*, 2019; Gharib, 2020). Therefore, health education campaigns are needed to increase awareness about the risk of OSA so that they will change their lifestyle.

Implications and limitations

This research has important implications for nursing to provide a health education campaign to the community regarding OSA. With sufficient knowledge, this will change people's negative perceptions and reduce the risk of OSA. This study has limitations. First, OSA complaints are only based on the patient's subjective complaints, due to limited resources to carry out PSG (Polysomnography) examinations. The researchers validated OSA using the ESS and Stop Bang questionnaires to overcome this obstacle. Second, researchers' incomplete demographic data (such as education level, comorbidities, etc.) can influence perceptions. Further research can increase the number of samples and dig deeper into the topic of OSA because OSA in society is still considered normal.

CONCLUSION

The current research showed that participants have a negative perception of OSA. They perceive OSA as a usual or normal complaint and perceive that OSA is not harmful to health. Even based on the screening results with the ESS and Stop Bang questionnaire, all participants are at high risk of OSA. Because of this negative perception, participants not taking action to reduce OSA. Therefore, it is hoped that the results of this study can increase the awareness of health workers, especially nurses, to provide education about sleep problems to patients and the community because sleep problems have not received much attention in Indonesia, especially in the community.

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Conflict of interest

The authors declare no potential conflict of interest concerning this research, authorship, or publication of this article.

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