

Research**The depression level effect on the QOL of patients with obstructive sleep apnea syndrome****Vicky Eko Nurcahyo Hariyadi, Donny Hendriyanto**Department of Otorhinolaryngology - Head and Neck Surgery
Faculty of Medicine Sebelas Maret University/Dr. Moewardi Regional Hospital,
Surakarta**ABSTRACT**

Background: Obstructive sleep apnea syndrome is one of the obstructive sleep disorders, which has a high prevalence. The neuropsychological impact will affect daily life activities, social life, and reduce the quality of life in patients with obstructive sleep apnea syndrome. **Purpose:** To find out the effect of depression level against the quality of life (QOL) on patients with obstructive sleep apnea syndrome. **Method:** Analytical observational study with cross sectional approach. The study sample was 30 patients with high risk of obstructive sleep apnea syndrome who came to Otorhinolaryngology Head and Neck Surgery Department of Dr. Moewardi Hospital, from February to April 2019. The samples were determined using the Modified Berlin Questionnaire, and had fulfilled the inclusion and exclusion criteria. The variables studied were measured using questionnaires, including the level of depression (Beck's Depression Inventory-II) and quality of life (Sleep Apnea Quality of Life Index). **Result:** From 30 samples, there were 20 patients (66.7%) with moderate depression and 10 patients (33.3%) with severe depression. The mean QOL of patients with obstructive sleep apnea syndrome with moderate depression was 4.085 ± 0.369 , while with severe depression was 3.040 ± 0.241 . The Independent Samples t-test showed a statistically and clinically significant correlation between the level of depression and QOL patients with obstructive sleep apnea syndrome (95% CI=0.78-1.31; $p=0.000$; $t=8.097$). **Conclusion:** There was a significant effect of depression level on the quality of life of patients with obstructive sleep apnea syndrome.

Keywords: level of depression, quality of life, obstructive sleep apnea syndrome

ABSTRAK

Latar belakang: Obstructive sleep apnea syndrome merupakan salah satu gangguan bernapas saat tidur tipe obstruktif, yang memiliki prevalensi cukup tinggi. Gangguan neuropsikologis yang ditimbulkannya dapat mempengaruhi aktivitas kehidupan sehari-hari, kehidupan sosial, dan akan menurunkan kualitas hidup pada pasien obstructive sleep apnea syndrome. **Tujuan:** Mengetahui pengaruh tingkat depresi terhadap kualitas hidup pasien dengan obstructive sleep apnea syndrome. **Metode:** Penelitian observasional analitik dengan pendekatan potong lintang, yang dilaksanakan pada 30 pasien dengan risiko tinggi obstructive sleep apnea syndrome di Bagian Telinga Hidung Tenggorok Bedah Kepala dan Leher RSUD dr. Moewardi Surakarta. Subjek penelitian diambil berdasarkan Modified Berlin Questionnaire, dan memenuhi kriteria inklusi dan eksklusi. Variabel yang diteliti diukur menggunakan kuesioner, meliputi tingkat depresi (Beck's Depression Inventory-II) dan kualitas hidup (Sleep Apnea Quality of Life Index). Analisis data dilakukan uji normalitas dengan uji Saphiro-Wilk. Jika data terdistribusi normal, uji hipotesis yang digunakan adalah Independent Samples t-test. Apabila data tidak terdistribusi normal maka dilakukan uji Mann Whitney. Nilai $p < 0,05$ menunjukkan hasil yang signifikan. **Hasil:** Dari 30 sampel didapatkan 20 pasien (66,7%) dengan depresi sedang dan 10 pasien (33,3%) dengan depresi berat. Nilai rerata kualitas hidup pasien obstructive sleep apnea syndrome dengan depresi sedang didapatkan $4,085 \pm 0,369$, sedangkan dengan depresi berat $3,040 \pm 0,241$. Uji Independent Samples t-test menunjukkan adanya hubungan yang signifikan antara

tingkat depresi dengan kualitas hidup pasien obstructive sleep apnea syndrome ($IK\ 95\%=0,78-1,31$; $p=0,000$; $t=8,097$). **Kesimpulan:** Terdapat pengaruh tingkat depresi terhadap kualitas hidup pasien obstructive sleep apnea syndrome.

Kata kunci: tingkat depresi, kualitas hidup, obstructive sleep apnea syndrome

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INTRODUCTION

Obstructive sleep apnea (OSA) is a common sleep disorder, highly prevalent, characterized by repeated episodes of upper airway collapse that results in brief periods of breathing cessation (apnea) or a marked reduction in airflow (hypopnea) during sleep. Many studies stated that OSA is underdiagnosed and undertreated disorder.¹

The limited data available suggested that the prevalence and severity of OSA is higher in men than in women, with a ratio of male to female 3:1, with age range of 30-60 years.^{2,3}

OSA clinical symptoms are snoring, apnea, choked, insomnia, excessive sleepiness during day time, fatigue, difficult to concentrate, personality/cognitive changes, nausea, headache and depression.^{4,5}

The neuropsychological disturbances affect daily life activities, resulting in OSA patients' decreased quality of life compared to normal people. Considering the extent of its negative effect, early detection of OSA syndrome is crucial to be executed by doctors.^{6,7}

Several risk factors affecting OSA syndrome are male, high Body Mass Index (BMI), low social economic status, age and menopause. The most influencing risk factors for OSA are age, gender and obesity.⁷

Polysomnography (PSG) as the gold standard diagnosis of OSA has limitations because of expensive cost and time consuming.

Several experts propose to use questionnaires for OSA detection.¹

The questionnaires are simple and practical screening tools to detect OSA, such as Epworth Sleepiness Scale (ESS), Modified Berlin Questionnaire (MBQ) and STOP Questionnaire (STOP).⁸ Modified Berlin Questionnaire (MBQ) has the highest validity compared to ESS and STOP. Besides its validity, this questionnaire is more sensitive and reliable to detect OSA syndrome, proven by the value of 92.86% sensitivity and 95% specificity. The high sensitivity of MBQ could minimize the risk of undetected or missed OSA samples, while the high specificity could lessen the risk of misidentifying non-OSA samples.^{1,6,8}

Disturbed sleeping pattern would affect human body stress system causing the body more prone towards depression.^{9,10} A study had proven that severe depression had a high prevalence among OSA patients in the community and OSA clinical population from 7% to 63%.^{6,11} Symptoms such as fatigue, lack of concentration, memory loss, depression, and decreased libido were the characteristic of OSA that may impair QOL.^{6,7,9}

Furthermore, some researches showed that OSA patients with high depression level, possessed low QOL and heavily suffered from sleepiness and fatigues during day time.¹²

Several epidemiologic studies and clinical tests had used various tools to measure the QOL of OSA syndrome patients.

The most common instrument to measure QOL is Medical Outcomes Study Short-Form Health Survey SF-36.¹³

Recently, a questionnaire had been developed to measure specifically the QOL of OSA patients, namely Sleep Apnea Quality of Life Index (SAQLI). SAQLI had a strong content and had built validity, also responsive towards quality of life's changes, but it had to be mastered by the interviewer.^{12,14}

This research was conducted to find out the effect of depression level against the quality of life (QOL) on patients with obstructive sleep apnea syndrome.

METHOD

This was an analytical observational study with cross sectional approach on 30 patients with high risk OSA syndrome, executed from February to April 2019 at the Polyclinic of Otorhinolaryngology-Head and Neck Surgery, Dr. Moewardi Regional Hospital, Surakarta.

This study began with identifying the high risk OSA patients, determined by using MBQ, and the samples were chosen based on inclusion and exclusion criteria. The inclusion criteria were high risk patients with OSA syndrome determined by MBQ, age 18-59 years old, and willing to join the research by signing the informed consent. The exclusion criteria were BMI>40, prior history of sleeping deprivation, psychiatric disorder, neurologic disturbances such as stroke, respiration difficulty, or kidney and liver diseases.

Using binomial proportion formula, the total sample of the research was decided as many as 30. All samples were asked to fill in Beck's Depression Inventory - II and Sleep Apnea Quality of Life Index (SAQLI).

The obtained data were then evaluated with Saphiro-Wilk test to find out the distribution. Should the distribution was

normal, the hypothetical test used was Independent Samples t-test and ANCOVA test. But, should the distribution was not normal, the test used would be Mann Whitney test, where $p < 0.05$ showed a statistical significant result.

This study had been approved by the Research Ethical Commission of the Faculty of Medicine Sebelas Maret University/Dr. Moewardi Regional Hospital, Surakarta by issuing ethical clearance document.

RESULT

This study was performed on 30 high risk OSA syndrome patients, who had fulfilled the inclusion and exclusion criteria.

The observed variables were age, gender, Body Mass Index (BMI), depression level and the quality of life. All variables were measured using the questionnaires.

Table 1 showed respondent's distribution based on age, gender, BMI and the level of depression.

Age distribution showed that the highest OSA syndrome patient's age range was 30-39 years as many as 10 patients (33.3%) where the majority was male (63.3%).

Based on BMI distribution, the highest number was respondents with fat category found in 12 persons (40%). The distribution of depression in OSA syndrome patients, the majority was in moderate depression as many as 20 patients (66.7%).

Statistical analysis using ANCOVA revealed non-significant correlation result of age, gender and BMI towards the quality of life of OSA syndrome patients, with $p > 0.05$.

Table 2 showed the effect of depression level towards the quality of life of OSA syndrome patients.

The mean value of quality of life of OSA syndrome patients with moderate depression

was 4.085 ± 0.369 , while the quality of life of OSA syndrome patients with severe depression was 3.040 ± 0.241 .

Saphiro-Wilk test was used to calculate the data distribution, it gave normal distribution ($p > 0.05$).

Statistical analysis used Independent Samples t-test with result $p = 0.000$. In

significance level (α) 5%, it gave $p < 0.05$ which concluded that there was a significant correlation between the level of depression and the quality of life of OSA syndrome patients.

The t value 8.097 showed that OSA syndrome patients with moderate depression had a better QOL than OSA syndrome patients with severe depression.

Table 1. Respondent's distribution based on age, gender, BMI and level of depression

Variable	Frequency (n = 138)	Percentage (%)	p
Age			
< 30 years	8	26.7	0.698 ^a
30–39 years	10	33.3	
40–49 years	5	16.7	
≥50 years	7	23.3	
Gender			
Male	19	63.3	0.917 ^a
Female	11	36.7	
BMI*			
Thin (<18,5 kg/m ²)	2	6.7	0.279 ^a
Normal (18,5-24,9 kg/m ²)	10	33.3	
Fat (25-29,9 kg/m ²)	12	40	
Obesity (≥30 kg/m ²)	6	20	
Depression level			
Moderate depression	20	66.7	0.000 ^b
Severe depression	10	33.3	

* According to WHO 2014

^a ANCOVA test (*Analysis of Covariance*)

Table 2. Depression level effect on the QOL of OSAS patients

Depression Level	Quality of Life		p	t
	Mean	SD		
Moderate depression	4.085	0.369	0.000 ^b	8.097
Severe depression	3.040	0.241		

^b *Independent samples t-test* (IK 95% = 0.78-1.31)

DISCUSSION

This study was conducted to find out the effect of depression level upon the quality of life (QOL) on patients with obstructive sleep apnea syndrome.

Obstructive sleep apnea (OSA) syndrome is a common obstructive type sleep disorder which is highly prevalent.¹ The prevalence and severity of OSAS is higher in men than in women, with a ratio of male to female 3:1, with age range of 30-60 years.^{2,3}

OSA syndrome has traditionally been considered as a male disease, and there were many evidence showed significant gender-related differences in OSA syndrome.²

OSA syndrome is also related to obesity, where the increase of BMI would worsen the severity of OSA.^{2,3}

This condition is compliant with Table 1 which showed that majority of OSAS patients were male, age range 30-39 years, and BMI category fat.

The delayed diagnosed of OSAS is probably due to common view, because most people do not pay much attention to snoring and nocturnal apnea.

Therefore, a better comprehension of OSAS clinical symptoms and complication is required in order to perform a complete approach with better outcomes.^{4,7} Modified Berlin Questionnaire (MBQ) is a very sensitive questionnaire which is valid and reliable to detect OSA syndrome.^{1,6,8}

A study by Rezaeitab in 2014, concluded that the frequency of depression occurred higher in patients with OSA syndrome compared to other chronic diseases.^{11,15}

This was in accordance with the result of this study, where OSA patients who came to the hospital for consultation had suffered moderate and severe depression.

SAQLI questionnaire was developed as an instrument for evaluating the quality of life of OSA patients. A higher SAQLI score represents a better quality of life.¹³

Yosunkaya,⁹ reported in his research performed in the year 2016 that depression disrupts general health and quality of life.

This condition was in accordance with Table 2, stating a higher depression level would decrease the QOL of OSA syndrome patients.

Our research concluded that the level of depression affected the QOL of OSA

syndrome patients. Early detection and good depression management on OSA patients were needed to give a better quality of life.

Further research using polysomnography as the gold standard of OSA diagnosis should be conducted.

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