

# The Prevalence of Anxiety and Depression Symptoms in Obstructive Sleep Apnea

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## ABSTRACT

**Study Design:** Cross sectional

**Background:** Obstructive sleep apnea (OSA) is the most frequent type of sleep-disordered breathing, and it's linked to higher mortality and morbidity, as well as a lower quality of life. It is characterized by nocturnal hypoxemia, hypercapnia, and sleep fragmentation caused by recurring episodes of upper airway obstruction during sleep. Obstructive sleep apnea (OSA) is associated with mood problems, albeit the relationships are not well understood

**Methods:** Patients who visited the KKU ENT clinic between December 2020 and October 2021, were given the Hospital Anxiety and Depression Scale (HADS) to complete. The presence of obstructive sleep apnea on a diagnostic or split-night sleep study, completion of the HADS questionnaire, and age >18 years were all required for inclusion. All records that met the inclusion criteria were chosen for review; records were excluded if the patient did not complete the HADS or the PSG.

**Results:** This study contained 126 records, 55 of which were females and 71 of which were males. There were 55 people who tested positive for anxiety and 49 people who tested positive for depression. The demographics and features of persons with and without anxiety symptoms. The AHI was lower in patients who reported anxiety symptoms. The anxiety group had a greater peripheral oxygen saturation (SpO<sub>2</sub>) than the non-anxiety group. In addition, the anxiety group spent less time with SpO<sub>2</sub> 90% compared to the control group.

**Conclusion:** The inverse association between anxiety and OSA severity, in particular, is intriguing and deserves additional research. Understanding these connections could provide crucial information for bettering patient care and identifying patients with underlying psychiatric illness.

**Keywords:** Anxiety, Depression, Symptoms, Obstructive, Sleep Apnea

## INTRODUCTION

Obstructive sleep apnea (OSA) is the most frequent type of sleep-disordered breathing, and it's linked to higher mortality and morbidity, as well as a lower quality of life. It is characterized by nocturnal hypoxemia, hypercapnia, and sleep fragmentation caused by recurring episodes of upper airway obstruction during sleep. Obstructive sleep apnea (OSA) is associated with mood problems, albeit the relationships are not well understood.<sup>1-2</sup>

The presence of anxiety was found to have an inverse association with the severity of OSA in patients with obstructive sleep apnea (OSA), whereas symptoms of depression did not have a comparable relationship.<sup>3</sup>

Anxiety was found to have an inverse association with the severity of obstructive sleep apnea (OSA) in patients, although depressive symptoms did not have a similar link.<sup>4</sup>

Despite the fact that mental disorders are frequently linked to OSA, the researchers point out that these connections are little understood.<sup>5</sup>

Obstructive sleep apnea has been linked to serious mental problems. These could be linked to both the neurobehavioral consequences of intermittent hypoxia and the sleep fragmentation effects. The link between anxiety and sadness and obstructive sleep apnea isn't fully recognized. Patients with OSA experienced greater depressed symptoms than those without OSA, according to some research, however depressive symptoms were linked to poor sleep quality rather than OSA severity. Many people, however, go undetected with OSA. As a result, recognizing people with psychiatric disorder and OSA could assist avert long-term health consequences.<sup>6-7</sup>

Researchers expected that people with more severe OSA would have more severe anxiety and depression symptoms, in order to better understand the link between anxiety and depression and OSA.<sup>8-9</sup>

These could be linked to both intermittent hypoxia's neurobehavioral impacts and sleep fragmentation's effects. The link between anxiety and sadness and obstructive sleep apnea isn't fully recognized. Patients with OSA experienced greater depressed symptoms than those without OSA, according to certain studies, however depressive symptoms were linked to poor sleep quality rather than OSA severity. Many people,

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however, go undetected with OSA. As a result, recognizing people with psychiatric disorder and OSA could assist avert long-term health consequences.

### METHODS

Patients who visited the KKU ENT clinic between December 2020 and October 2021, were given the Hospital Anxiety and Depression Scale (HADS) to complete. The presence of obstructive sleep apnea on a diagnostic or split-night sleep study, completion of the HADS questionnaire, and age >18 years were all required for inclusion. All records that met the inclusion criteria were chosen for review; records were excluded if the patient did not complete the HADS or the PSG.

Each patient was given a questionnaire to fill out at the time of PSG testing, which included demographic questions. The HADS questionnaire is a validated 14-item anxiety and/or depression test; each item is responded with a number 0-3 based on the frequency with which a sensation occurred in the previous week. The questionnaire is divided into two sections, a seven-item anxiety screen (HADS-A) and a seven-item depression screen (HADS-D); the total score for each section yields a normal (0-7), borderline (8-10), or abnormal 11-21 anxiety/depression screen. As previously stated, the sensitivity and specificity of HADS-A and HADS-D are both around 78 percent.

### RESULT

This study contained 126 records, 55 of which were females and 71 of which were males. (See Table 1) There were 55 people who tested positive for anxiety and 49 people who tested positive for depression. Table 2 compares the demographics and features of persons with and without anxiety symptoms. The AHI was lower in patients who reported anxiety symptoms. The anxiety group had a greater peripheral oxygen saturation (SpO2) than the non-anxiety group. In addition, the anxiety group spent less time with SpO2 <90% compared to the control group.

**Table 1.** Demographic and clinical characteristics of the participants

Number	126
Age (years), median (IQR)	41 (39 – 54)
Male, n	55
Female n	76
BMI (kg/m <sup>2</sup> ), median (IQR)	47.5 (35.9 – 49.0)
ESS score, median (IQR)	14 (6 – 16)
AHI (events/hour), median (IQR)	26.5 (19.5 – 63.4)
SpO2 nadir (%), median (IQR)	71(62.5 – 82.5)%
Minutes with SpO2 <90%, median (IQR)	14.0 (12 – 32.5)

Abbreviations, IQR = interquartile ratio; BMI = body mass index; ESS = Epworth Sleepiness Scale; AHI = apnea-hypopnea index; SpO2 = peripheral oxygen saturation

**Table 2.** Demographics and features of persons with and without anxiety symptoms

	No Anxiety (HADS-A <8)	Anxiety (HADS-A ≥8)	P-value
<b>Number</b>	<b>65</b>	<b>61</b>	
Age (years), median (IQR)	42 (34 – 55)	41 (32 – 48)	0.55
ESS score, median (IQR)	13 (6 – 15)	11(6– 14)	0.65

AHI (events/hour), median (IQR)	49.2 (25.2 – 96.3)	22.4 (9.5 – 42.3)	0.0074*
SpO2 nadir (%), median (IQR)	62 (55 – 72)	79 (72– 84)	0.0065*
Minutes with SpO2 <90%, median (IQR)	34 (12 – 55)	10 (6 – 13)	0.0001*

As per table 3, The features of participants with and without depression symptoms are compared. Individuals with and without depression symptoms had an AHI of AHI that was similar in median (IQR). In the depression group, the SpO2 nadir was greater than in the control group. When compared to the non-depression group, the time spent with SpO2 90% was shorter in the depression group.

**Table 3.** Participants with and without depression symptoms

	No Depression (HADS-D <8)	Depression (HADS-D ≥8)	P-value
<b>Number</b>	<b>76</b>	<b>50</b>	
Age (years), median (IQR)	45 (42 – 52)	42 (41 – 54)	0.65
BMI (kg/m <sup>2</sup> ), median (IQR)	43.2 (37.2 – 44.2)	43.2 (37.5 – 51.8)	0.62
ESS score, median (IQR)	12 (9 – 15)	14 (6 – 18)	0.46
AHI (events/hour), median (IQR)	23.4 (7.5 – 65.4)	26.2(21.2 – 63.2)	0.49
SpO2 nadir (%), median (IQR)	72 (54 – 85)	76 (64– 81)	0.24
Minutes with SpO2 <90%, median (IQR)	11 (9 – 42)	10 (8 – 42)	0.91

### DISCUSSION

Co-morbid anxiety and sadness were shown to be common in OSA patients in this study. The age, gender, race, BMI, and ESS score of those with and without anxiety were not statistically different. When compared to those who did not have anxiety symptoms, the group with anxiety symptoms showed a statistically significant lower AHI. In the group with anxiety symptoms, the SpO2 nadir was statistically higher. Finally, there was a significant difference in the amount of time spent with SpO2 90% between the groups with and without anxiety symptoms, with the anxiety group spending less time with SpO2 90%. These results show that patients who scored high on the HADS-A had less severe OSA symptoms. As the level of anxiety grows, the AHI with HADS-A score indicates a tendency.

Study stated a large sample of 3770 patients in Norway to assess the severity of OSA and its relationship to anxiety and sadness. The HADS-A (HAD-A 8) was also used to assess anxiety in this study.<sup>8-10</sup> As the severity of OSA rose, it was discovered that fewer people suffered from anxiety. In Korea,<sup>11</sup> State-Trait Anxiety Inventory to look at apnea severity and anxiety severity, and discovered that the prevalence of anxiety was highest in patients with moderate OSA and lowest in those with severe OSA. It's unclear why there's an inverse association between anxiety and OSA severity. Intermittent hypoxia has been shown in animal models to lessen anxiety responses.<sup>12</sup>

A study discovered that depression (as measured by the HADS-D) was unrelated to OSA severity.<sup>13-15</sup> employed the Beck Depression Inventory and the State and Trait Anxiety Inventory to assess depression severity in patients, and discovered that patients with mild OSA had

more depressed symptoms than those with severe OSA . looked at the relationship between anxiety and depression <sup>16</sup> and the severity of OSA in a systematic evaluation of literature that comprised 73 publications. <sup>17</sup> Although there was a small number of papers that included the data of interest, the majority of the literature does not indicate the existence of a link between OSA severity and the presence of depressive symptoms or anxiety <sup>18-19</sup>

## CONCLUSION

**This study emphasizes the importance of continuing to investigate the links between depression and anxiety and obstructive sleep apnea. The inverse association between anxiety and OSA severity, in particular, is intriguing and deserves additional research. Understanding these connections could provide crucial information for bettering patient care and identifying patients with underlying psychiatric illness.**

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**Competing Interest:** None

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