# Prevalence of Depression, Anxiety, and Stress among Obstructive Sleep Apnea Patients in Saudi Arabia

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## ABSTRACT

*Background:* Obstructive sleep apnea is a common disease that may be associated with psychiatric illnesses. Furthermore, treatment of obstructive sleep apnea may improve mood disorders.

*Objective:* To evaluate the frequency of depression, anxiety and stress in Saudi Arabia with obstructive sleep apnea and its link with obstructive sleep apnea severity.

*Methods:* In this cross-sectional study, all patients at risk of obstructive sleep apnea visiting the sleep clinic at a university hospital from January 2015 till February 2016 were enrolled. Those who were already confirmed with obstructive sleep apnea and were receiving continuous positive airway pressure were also studied. Patients with a history of psychiatric illnesses or use of antipsychotic medication in the last six months were excluded. Depression, anxiety and stress were assessed using self-administered validated questionnaires: The Depression Anxiety Stress Scale.

*Results:* Seventy-five patients with obstructive sleep apnea were included. Males accounted for 65.30% of the study population. Mean age was 47.49 years and mean body mass index was 36.5 kg/m$^2$. Fifty percent had depression, 54.60% had anxiety and 65.30% had stress. In addition, the prevalence of depression and anxiety but not stress appears to be higher in patients with severe obstructive sleep apnea. Moreover, treatment with continuous positive airway pressure seems to decrease the prevalence of mood disorders among sleep apnea patients.

*Conclusion:* Mood disorders are very common among patients with obstructive sleep apnea and their prevalence tends to increase with the severity of obstructive sleep apnea and decrease among those receiving continuous positive airway pressure.

## Keywords

Obstructive sleep apnea; Depression; Anxiety; Stress; Continuous positive airway pressure.

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## INTRODUCTION

Obstructive sleep apnea (OSA) is defined as repetitive episodes of upper airway obstruction that occur during sleep, usually associated with a reduction in oxygen saturation[1]. The prevalence of OSA is found to be 4% in men and 2% in women, (male to female ration is 2:1)[1]. The severity of OSA is measured by apnea and hypopnea index (AHI), which is represented by the number of apnea and hypopnea events per hour of sleep. The gold standard treatment option for obstructive sleep apnea is continuous positive airway pressure (CPAP)[2].

Psychiatric conditions were found to be more prevalent in individuals with OSA than those without the disease[3]. Life time prevalence of generalized anxiety disorder in general population is 5.7%[4]. In contrast, 18.5% of patients with sleep disordered breathing had anxiety in one study[5]. In a study conducted by Sharafkhaneh et al.,[3] the prevalence of anxiety among patients with OSA was reported to be 16.67% and depression was 21.75%[3]. More recently Mysliwiec et al.,[6] reported a very high prevalence of anxiety in OSA patients reaching 47.5% (excluding post-traumatic stress disorder)[6]. They also reported that the prevalence of depression in OSA patients was as high as 41.4%. Recently, in a community based study, the prevalence of OSA in patients with anxiety was found to be alarmingly as high as 57.1%[7].

Although psychiatric problems were found to be more common among patients with OSA, their relationship to the severity of sleep apnea was inconsistent. There was a weak but significant association between apnea hypopnea index (AHI) and the presence of anxiety and depression[5]. On the other hand, severity of OSA which is represented by AHI did not show a significant correlation with anxiety[8]. Interestingly, CPAP therapy for OSA showed significant improvement of depression symptoms at short-term and long-term follow up periods[9]. Moreover, a systematic review demonstrated a moderate effect of positive airway pressure on depression and anxiety symptoms in patients with OSA[10]. Nevertheless, the prevalence of psychiatric problems among Saudis has not been studied before. In this study, we tried to address the prevalence of psychiatric problems such as depression, anxiety and stress among those with OSA and their relation to the severity of AHI. We also examined the prevalence of these conditions among patients on CPAP therapy.

## MATERIAL AND METHODS

### Study Design and Participants

All consecutive patients at risk of obstructive sleep apnea referred to the sleep clinic at King Abdulaziz University Hospital (KAUH), Jeddah, Kingdom of Saudi Arabia from January 2015 till February 2016 were recruited for this cross-sectional study. Those who already have confirmed OSA were included. History of psychotic illnesses or use of antipsychotic medication in the last six months are the excluding criteria. The questionnaire was administered in the Arabic language. One English speaking patient used the original English version of the questionnaire.

### Questionnaire Administration

The questionnaire was self-administered. Those with sight problems were interviewed by one of the investigators. Participants were informed about the confidentiality of the study. Ethical approval was granted by the Research Ethics Committee at Faculty of Medicine, KAU.

### Variables

Depression Anxiety Stress Scale (DASS) was used for data collection. It is a 42-item self-reported instrument designed to measure the severity of depression, anxiety and stress. It is a valid and reliable questionnaire for depression and anxiety assessment[11,12]. A validated Arabic form was printed from this website: http://www2.psy.unsw.edu.au/dass/. A score of 0-9 from depression scale is considered normal, 10-13 is mild, 14-20 is moderate, 21-27 is severe and 28 or more is a very severe depression. For anxiety, a score of 0-7 is normal, 8-9 is mild, 10-14 is moderate, 15-19 is severe and 20 or above is a very severe anxiety. Regarding stress, a score of 0-14 is normal, 15-18 is mild, 19-25 is moderate, 26-33 is severe, 34 or more is considered very severe stress.

### Statistical Analysis

The Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 20, IBM Corp., Armonk, NY USA) was used. Data were presented as mean ± standard deviation or number (%) as appropriate. Comparison of the measured parametric parameters between groups was made using one-way analysis of variance (ANOVA) (LSD) test for normal distributed data. Mann-Whitney test was used for abnormal distributed data. Between non-parametric parameters, chi-square test was used. A probability ($P$) < 0.05 was considered significant.

## RESULTS

Seventy-five patients with different severity of obstructive sleep apnea were recruited (Table 1). Table 1 shows that there was insignificant difference in age and Epworth sleepiness scale (ESS) between patients with different severity of OSA. Males participating in this study were insignificantly higher than females (65.3% versus 34.7%, P = 0.33). However, in severe OSA, males were significantly higher than females (74.2% versus 25.8%, P = 0.007). Meanwhile, there was insignificant difference between the number of males and females in patients with mild (55.6% versus 44.4%, P = 0.567) and moderate OSA (64.7% versus 35.3%, P = 0.225). The BMI was significantly higher in patients with severe versus moderate OSA (P = 0.015).

Table 2 demonstrates the prevalence of depression, anxiety and stress (50%, 54.1% and 64%, respectively). This is very high if compared with the reported prevalence of depression (35.7%)[13] and anxiety (13.8%-17.4%)[14] in

**TABLE 1.**
Demographic characteristics of the study population.

| The Disorder | All Patients (n = 75) | Mild OSA (AHI 5-15) (n = 27) | Moderate OSA (AHI 15-30) (n = 17) | Severe OSA (AHI > 30) (n = 31) |
|---|---|---|---|---|
| **Age** (years) | 47.49 ± 15.02 | 43.19 ± 15.84 | 50.59 ± 15.52 | 49.55 ± 13.59 |
| **P value** | | | [1]P = 0.112 | [1]P = 0.108; [2]P = 0.817 |
| **Gender** | | | | |
| Male | 49 (65.30%) | 15 (55.60%) | 11 (64.70%) | 23 (74.20%) |
| Female | 26 (34.70%) | 12 (44.40%) | 6 (35.30%) | 8 (25.80%) |
| Significance | P = 0.330 | P = 0.564 | P = 0.225 | P = **0.007** |
| **BMI** (kg/m$^2$) | 36.50 ± 8.42 | 35.35 ± 9.30 | 33.17 ± 7.22 | 39.30 ± 7.55 |
| **P value** | | | [1]P = 0.395 | [1]P = 0.072; [2]P = **0.015** |
| **ESS** | 13.12 ± 6.12 | 12.22 ± 6.59 | 12.47 ± 7.28 | 14.26 ± 4.92 |
| **P value** | | | [1]P = 0.896 | [1]P = 0.211; [2]P = 0.337 |

Abbr.: OSA: Obstructive sleep apnea; AHI: Apnea and hypopnea index; BMI: Body mass index; ESS: Epworth sleepiness scale

Data were expressed as mean ± Standard deviation or number (%) as appropriate. [1]P: Significance versus mild OSA; [2]P: Significance versus moderate OSA using ANOVA test. P: Significance between male and female of the same group using chi-square test.

**TABLE 2.**
Prevalence of depression, anxiety and stress among the study sample.

| The Disorder and Severity | Mild OSA (AHI 5-15) (n = 27, 36.00%) | Moderate OSA (AHI 15-30) (n = 17, 22.67%) | Severe OSA (AHI > 30) (n = 31, 41.33%) | All Patients (n = 75, 100%) |
|---|---|---|---|---|
| **Depression** | | | | |
| Normal | 16 (59.30%) | 8 (47.10%) | 14 (45.20%) | 38 (50.70%) |
| Abnormal | 11 (40.70%) | 9 (52.90%) | 17 (54.80%) | 37 (49.30%) |
| *Mild* | 4 (14.80%) | 2 (11.80%) | 5 (14.90%) | 11 (14.70%) |
| *Moderate* | 4 (14.80%) | 3 (17.60%) | 4 (12.90%) | 11 (14.70%) |
| *Severe + Very Severe* | 3 (11.10%) | 4 (23.50%) | 8 (25.80%) | 15 (20.00%) |
| Significance | **0.001** | 0.181 | **0.049** | 0.908 |
| **Anxiety** | | | | |
| Normal | 13 (48.10%) | 10 (58.80%) | 11 (35.50%) | 34 (45.30%) |
| Abnormal | 17 (51.90%) | 7 (41.20%) | 20 (64.50%) | 41 (54.60%) |
| *Mild* | 5 (18.50%) | 2 (11.80%) | 8 (25.80%) | 15 (20.00%) |
| *Moderate* | 3 (11.10%) | 2 (11.80%) | 8 (25.80%) | 13 (17.30%) |
| *Severe + Very Severe* | 6 (22.20%) | 3 (17.60%) | 4 (12.90%) | 13 (17.30%) |
| Significance | **0.038** | **0.015** | 0.363 | 0.419 |
| **Stress** | | | | |
| Normal | 10 (37.00%) | 4 (23.50%) | 12 (38.70%) | 26 (34.70%) |
| Abnormal | 17 (63.00%) | 13 (76.50%) | 19 (61.30%) | 49 (65.30%) |
| *Mild* | 3 (11.10%) | 3 (17.60%) | 2 (6.50%) | 8 (10.80%) |
| *Moderate* | 6 (22.20%) | 3 (17.60%) | 7 (22.60%) | 16 (21.30%) |
| *Severe + Very Severe* | 8 (29.60%) | 7 (41.20%) | 10 (32.30%) | 25 (33.30%) |
| Significance | 0.265 | 0.470 | 0.062 | **0.008** |

Abbr.: OSA: Obstructive sleep apnea; AHI: Apnea and hypopnea index

Data were expressed as number (%). Significance was made using chi-square test between the normal versus the mild, moderate and severe in the same group.

Saudi Arabia. However, there is no population study in Saudi Arabia evaluating stress. In addition, the prevalence of depression and anxiety appears to be higher in patients with severe OSA (54.8%, P = 0.049 and 64.5%, P = 0.363, respectively) compared to those with moderate (52.9%, P = 0.181 and 41.2%, P = 0.015, respectively) and mild OSA (40.7%, P = 0.001 and 51.9%, P = 0.038, respectively). However, the prevalence of stress appeared to be the same among severe, moderate and mild OSA.

The study included 20 patients on CPAP and 55 patients off CPAP. Treatment duration, hours of CPAP use at night and compliance were not investigated in our study. Table 3 reveals that there is a significant difference in the prevalence of depression, anxiety and stress in patients receiving CPAP treatment and those off treatment. The prevalence of depression in those on CPAP is 40%, while it is 52.7% in those off CPAP (P = 0.001). Moreover, those patients with anxiety and stress on CPAP accounted for

**TABLE 3.**
Prevalence of depression, anxiety and stress in patients based on CPAP device usage.

| The Disorder | On CPAP (n = 20, 26.67%) | Off CPAP (n = 55, 73.43%) | P value |
|---|---|---|---|
| **Depression** | | | |
| Normal (n = 37) | 12 (60.0%) | 26 (47.30%) | **0.023** |
| Abnormal (n = 37) | 8 (40.0%) | 29 (52.70%) | **0.001** |
| *Mild (n = 11)* | 2 (10.0%) | 9 (16.40%) | **0.035** |
| *Moderate (n = 11)* | 1 (5.0%) | 10 (18.20%) | **0.035** |
| *Severe + Very Severe (n = 15)* | 5 (25.0%) | 10 (18.20%) | 0.197 |
| **Anxiety** | | | |
| Normal (n = 34) | 9 (45.0%) | 25 (45.50%) | **0.006** |
| Abnormal (n = 40) | 11 (55.0%) | 30 (54.50%) | **0.003** |
| *Mild (n = 14)* | 5 (25.0%) | 10 (18.20%) | 0.197 |
| *Moderate (n = 13)* | 2 (10.0%) | 11 (20.0%) | **0.013** |
| *Severe + Very Severe (n = 13)* | 4 (20.0%) | 9 (16.40%) | 0.166 |
| **Stress** | | | |
| Normal (n = 26) | 7 (35.0%) | 19 (34.50%) | **0.019** |
| Abnormal (n = 48) | 13 (65.0%) | 36 (65.50%) | **0.001** |
| *Mild (n = 8)* | 3 (15.0%) | 5 (9.10%) | 0.480 |
| *Moderate (n = 15)* | 6 (30.0%) | 10 (18.20%) | 0.317 |
| *Severe + Very Severe (n = 25)* | 4 (20.0%) | 21 (38.20%) | **0.001** |

*Abbr.: CPAP: Continuous positive airway pressure*

*Data were expressed as number (%). Significance between on and off of the same group was made using chi-square test.*

**TABLE 4.**
The number of patients with one or more mood disturbances coexisting in relation to severity of OSA.

| No. of Disorders | Mild OSA | Moderate OSA | Severe OSA | Significance |
|---|---|---|---|---|
| **One Disorder** (n = 9, 12.0%) | 2 (22.20%) | 3 (33.30%) | 4 (44.40%) | 0.717 |
| **Any 2 Disorders** (n = 14, 18.67%) | 8 (57.10%) | 4 (28.60%) | 2 (14.30%) | 0.135 |
| **All 3 Disorders** (n = 30, 40.0%) | 8 (26.70%) | 6 (20.00%) | 16 (53.30%) | 0.061 |
| **No Disorder** (n = 22, 29.33%) | 9 (40.90%) | 4 (18.20%) | 9 (40.90%) | 0.321 |

*Abbr.: OSA: Obstructive sleep apnea*

*The number of patients with one or more mood disturbances coexisting in relation to severity of OSA.*

55% (n = 11) and 65% (n = 13) compared to untreated patients 54.5% (n = 30) and 65.5% (n = 36) (P = 0.003 and P = 0.001, respectively).

There was a tendency towards having more patients with 3 disorders among patients with severe OSA compared with mild or moderate OSA (Table 4). Table 5 shows that the prevalence of two or three disorders was significantly lower in the CPAP treated group than those off CPAP, (P = 0.008 and P = 0.011, respectively). Moreover, the prevalence of having no disorder (*i.e.,* no depression, anxiety, or stress) was higher among patients on CPAP (P = 0.033). There was no significant difference between the two groups in regard to one disorder (P = 0.739).

Analysis of the polysomnography (PSG) revealed that there was no significant difference in the percentage of rapid eye movement sleep (REM) (P = 0.965), stage 1 (P = 0.564), stage 2 (P = 0.492) and stage 3 (P = 0.468) between patients with and without depression. Similar results were obtained in regard to anxiety and stress (Table 6).

## DISCUSSION

Fifty percent of our patients with OSA had depression (Table 2). The prevalence was higher among patients with severe OSA. In contrast, the prevalence of depression among the general population was reported in other studies to be much less. The life time prevalence of depression in the general population was found ranging between 8-12%[15]. On the other hand, studies from Saudi Arabia revealed that the prevalence of depression among the Saudi population was found to be 35.7%[13], which is much less than the prevalence among OSA seen in this present study. However, other studies that evaluated the prevalence of depression in OSA patients showed variable results. The prevalence ranged between 5 to 63%[16]. Those studies used different tools to diagnose depression, none of them used DASS. In a veteran's study that reviewed a database of more than 118,105 patients with OSA, they used the International Classification of Diseases (ICD) coding system as a tool for data collection. They found that 21.8% had depression[3]. Another study evaluated 284 patients with newly diagnosed

**TABLE 5.**

The number of patients with one or more mood disturbances coexisting in relation to CPAP.

| No. of Disorders | On CPAP | Off CPAP | Significance |
|---|---|---|---|
| **One Disorder** (n = 9, 12.0%) | 4 (20.0%) | 5 (9.10%) | 0.739 |
| **Any 2 Disorders** (n = 14, 18.67%) | 2 (10.0%) | 12 (21.80%) | **0.008** |
| **All 3 Disorders** (n = 30, 40.0%) | 8 (40.0%) | 22 (40.0%) | **0.011** |
| **No Disorder** (n = 22, 29.33%) | 6 (30.0%) | 16 (29.10%) | **0.033** |

*Abbr.: CPAP: Continuous positive airway pressure*

*Data expressed as number (%). Significance between on CPAP and off CPAP of the same group was made using chi-square test.*

**TABLE 6.**

Polysomnography characteristics in patients with depression, anxiety and stress.

| Sleep Stages | Depression | Anxiety | Stress | All Patients |
|---|---|---|---|---|
| **REM (%)** | | | | |
| Yes | 11.51 ± 10.72 | 10.30 ± 10.14 | 10.85 ± 9.97 | 10.67 ± 9.79 |
| No | 11.61 ± 8.27 | 13.07 ± 8.54 | 12.89 ± 8.55 | 13.69 ± 8.58 |
| P value | 0.965 | 0.210 | 0.379 | 0.213 |
| **Stage 1 (%)** | | | | |
| Yes | 20.85 ± 29.68 | 21.51 ± 29.63 | 21.37 ± 30.36 | 21.00 ± 29.29 |
| No | 17.36 ± 22.02 | 16.15 ± 20.75 | 14.75 ± 13.99 | 14.45 ± 14.78 |
| P value | 0.564 | 0.377 | 0.296 | 0.323 |
| **Stage 2 (%)** | | | | |
| Yes | 38.21 ± 20.36 | 35.53 ± 20.39 | 36.35 ± 21.10 | 36.40 ± 20.34 |
| No | 35.26 ± 16.64 | 38.15 ± 16.12 | 37.40 ± 12.54 | 37.46 ± 13.45 |
| P value | 0.492 | 0.545 | 0.817 | 0.823 |
| **Stage 3 (%)** | | | | |
| Yes | 21.97 ± 18.64 | 20.98 ± 18.10 | 21.3 ± 18.29 | 21.34 ± 18.05 |
| No | 18.89 ± 17.68 | 19.65 ± 18.34 | 18.57 ± 17.94 | 18.13 ± 18.41 |
| P value | 0.468 | 0.757 | 0.529 | 0.488 |

*Abbr.: REM: Rapid eye movement*

*Data were expressed as mean ± Standard deviation. Significance was made between Yes and No using Mann-Whitney test.*

OSA. Mini International Neuropsychiatric Interview (MINI) administered by a trained psychologist was used in the evaluation. Depression prevalence in this study was 6%[17]. A study evaluated a smaller sample size (55 patients) using Zung Self-Rating Depression Scale (SDS). They found that 45% of OSA patients had depression[18]. A Chinese study published in 2016 evaluated 1327 patients with OSA[19]. Using Self-Rating Depression Scale (SDS) revealed that 47.4% had depression. The variation in the prevalence of depression reported by different studies can be attributed to the different sample sizes, study population, age groups and the psychiatric assessment tools used. Nevertheless, it seems that the more recent studies with more objective evaluation of depression have a higher prevalence of depression among OSA. In addition, we found that depression correlated with severity of OSA. It was found to be more prevalent in severe OSA patients.

Similarly, anxiety and stress prevalence in our study population was found to be 56.6% and 65.3%, respectively (Table 2). The previously mentioned veteran's study evaluated the prevalence of anxiety as well. They found that the prevalence of anxiety in OSA patients was 16.7%[3]. A cross-sectional study evaluated 178 patients with OSA using Beck anxiety inventory (BAI) scoring. They found

that the prevalence of anxiety was 46.1%[20]. Although they found that the severity of OSA correlated with anxiety and depression, a larger study included 658 recently diagnosed OSA patients found that there is no association between severity of OSA and depression or anxiety[21]. This discrepancy could be explained by difference in study design and size. Moreover, our study showed no correlation between the prevalence of anxiety and stress and the severity of OSA.

Povitz *et al.*,[22] published a meta-analysis in 2014 about the effect of CPAP on depression symptoms in OSA patients. They found that CPAP improved depression with significant heterogenicity. Table 3 presents the difference in prevalence of depression, anxiety and stress in patients on CPAP and those who have never been treated. It shows that the prevalence of depression, anxiety and stress was significantly lower in those who are on CPAP. In addition, the prevalence of severe and very severe depression and anxiety was non-significant between the two groups while severe and very severe stress prevalence was lower among CPAP group. A small study evaluated patients with OSA after six months on CPAP. They found that anxiety scores were significantly decreased with treatment[23]. Moreover, CPAP therapy was found to have a positive effect on job

productivity and occupational well-being in patients with severe OSA. However, it did not decrease job stress or job dissatisfaction[24]. Therefore, patients with psychiatric disorders who have features of sleep apnea should be screened first for OSA, since instituting CPAP might be a reasonable treatment option in dealing with psychiatric disorders associated with OSA.

Polysomnography evaluation of patients with depression showed an increase in sleep latency, frequent awakening, decrease in slow wave sleep (Stage III) and increase in REM percentage[25]. Sleep architecture in our study did not show any significant difference between OSA patients with or without depression, anxiety or stress (Table 6). It was found that 45% of depressed patients may show PSG changes in outpatient settings, and 80% in inpatient settings[26]. Evaluation of sleep architecture was not consistent in our study. It was evaluated from a full night sleep study in some patients. However, some patients were evaluated using their split night study or a titration study. Moreover, our findings were not adjusted for age and sex. In addition, studies that showed a significant difference between OSA patients with depression and those without any psychiatric illness had a relatively larger sample size[27].

Our study suffers from some last level limitations, including the small size and the cohort of the patients used. In addition, OSA symptoms may overlap with depression and anxiety symptoms, which makes the evaluation of these psychiatric disorders in OSA difficult. A recently published study evaluated the use of DASS-21 scale, which is a shorter version than we used in our study, in untreated OSA[28]. It found that despite overlap symptoms between OSA, depression and anxiety, which can increase the score, DASS-21 can be considered as a suitable tool to assess depression and anxiety in OSA. Another limitation of our study is the lack of objective assessment of CPAP therapy *i.e.,* compliance and duration of treatment. This may affect our observation regarding the effects of CPAP on psychiatric disorders in patients with OSA.

In summary, our study revealed that mood disorders are very common among patients with OSA and their prevalence tends to increase with the severity of obstructive sleep apnea and decrease among those receiving continuous positive airway pressure. Hence, physicians should consider comorbidities such as OSA when evaluating a patient with mood disorders.

## Conflict of Interest

The authors have no conflict of interest.

## Disclosure

None of the authors received any type of commercial support either in forms of compensation or financial for this study. They have no financial interest in any of the products or devices, or drugs mentioned in this article.

## Ethical Approval

Obtained.

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# دراسة مدى انتشار الاكتئاب والقلق والإجهاد بين مرضى متلازمة انقطاع النفس الإنسدادي أثناء النوم في المملكة العربية السعودية

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## المستخلص.

**الخلفية:** يعتبر انقطاع النفس أثناء النوم مرضا شائعا وقد تصاحبه بعض الأمراض النفسية التي قد تتحسن بعلاجه

**الهدف:** تقييم مدى انتشار وشدة الاكتئاب والقلق والإجهاد عند مرضى انقطاع النفس أثناء النوم في المملكة العربية السعودية.

**طريقة الدراسة:** تمت هذه الدراسة المقطعية في عيادة أمراض النوم التابعة لمستشفى جامعة الملك عبد العزيز بجدة في الفترة من يناير ٢٠١٥ حتى فبراير ٢٠١٦، و تم اختيار جميع مرضى انقطاع النفس الإنسدادي أثناء النوم الذين زارو العيادة في نفس الفترة بما فيهم المرضى الذين يتلقون العلاج بجهاز ضغط الهواء الإيجابي المستمر، وقد استبعد المرضى الذين لديهم أمراض نفسية أو يستخدمون أدوية نفسية خلال الستة أشهر الماضية، و جرى تقييم الاكتئاب والقلق والاجهاد من خلال استبيان مقنن مدار ذاتيا

**النتائج:** ضمت الدراسة ٧٥ مريضا نسبة الذكور ٦٥,٣٪ من هذه الدراسة، ومتوسط الأعمار كان ٤٩,٤٧ سنة، وبلغ معدل كتلة الجسم ٣٦,٥ كجم/م²، كما أن خمسين في المئة من المرضى يعانون من الاكتئاب، و ٥٤,٧٪ من القلق و٦٥,٣٪ من الاجهاد. أوضحت الدراسة أن معدل الاكتئاب والقلق كان أعلى في المرضى الذين يشكون من انقطاع النفس الإنسدادي قوي الشدة، كما أظهرت الدراسة أن العلاج بجهاز ضغط الهواء الإيجابي المستمر قد قلل من اضطراب المزاج بين هؤلاء المرضى.

**المحصلة:** اضطرابات المزاج شائعة جدا بين مرضى اختناق النوم الانسدادي، والتي تزيد بزيادة شدة المرض. ويبدو انها تتحسن مع العلاج بجهاز ضغط الهواء الإيجابي المستمر.