

# Association Between Sleep Apnea and ENT Disorders Among Obese Adults in Mirpur, AJK

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## ABSTRACT

**Objective:** To evaluate the association between sleep apnea and ENT disorders among obese adults in Mirpur, AJK

**Study Design:** A cross-sectional study

**Place and Duration of Study:** This study was conducted at the Department Of Community Medicine & ENT of DHQ Hospital & MBBS Medical College Mirpur AJK from 1<sup>st</sup> July 2023 To 30<sup>th</sup> January 2024.

**Methods:** A cross-sectional study was conducted involving 300 obese adults (BMI  $\geq$  30 kg/m<sup>2</sup>) aged 18–60 years in Mirpur, AJK. Sleep apnea was assessed using the STOP-BANG questionnaire and polysomnography. ENT disorders were evaluated through clinical examinations. Data were analyzed using chi-square tests and logistic regression to determine associations

**Results:** Participants, 72% (n=180) were diagnosed with sleep apnea. ENT disorders were highly prevalent among those with sleep apnea, including nasal obstruction (48%,  $p < 0.001$ ), tonsillar hypertrophy (35%,  $p = 0.002$ ), and deviated nasal septum (22%,  $p = 0.01$ ). Logistic regression showed that individuals with nasal obstruction were 2.5 times more likely to have sleep apnea (OR=2.5; 95% CI: 1.8–3.4), while those with tonsillar hypertrophy had a 1.8-fold increased risk (OR=1.8; 95% CI: 1.2–2.7). BMI was significantly correlated with sleep apnea severity ( $r = 0.6$ ,  $p < 0.00$ )

**Conclusion:** The study demonstrates a strong association between sleep apnea and ENT disorders among obese adults in Mirpur, AJK. Integrated management of obesity and ENT conditions is essential for effective sleep apnea intervention.

**Key Words:** Sleep apnea, ENT disorders, obesity,

**Citation of article:** Noor FA, Imtiaz A, Noor AA, Bashir F, Ahmed E, Qureshi AM. Association Between Sleep Apnea and ENT Disorders Among Obese Adults in Mirpur, AJK. Med Forum 2024;35(11):69-71. doi:10.60110/medforum.351114.

## INTRODUCTION

Obstructive sleep apnea (OSA) is a common breathing disorder that happens during sleep. It occurs when the upper airway repeatedly gets blocked, causing low oxygen levels (hypoxia) and disrupted sleep. Obesity is the biggest risk factor for OSA because it affects the structure and function of the airway. Excess fat around the neck, tongue, and upper airway narrows the passage and makes it easier to collapse. This leads to symptoms like snoring, daytime sleepiness, and poor sleep quality.<sup>1,2</sup>

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Received: March, 2024

Reviewed: April-May, 2024

Accepted: September, 2024

ENT (ear, nose, and throat) disorders, such as nasal obstruction, tonsillar hypertrophy, and deviated nasal septum (DNS), also contribute to OSA. For example, nasal obstruction increases resistance in the airway, forcing people to breathe through their mouths. This worsens airway blockage<sup>3, 4</sup>. Similarly, enlarged tonsils (tonsillar hypertrophy) are common in obese adults and can block the airway, making OSA more severe<sup>5, 6</sup>.

Nasal obstruction was found in 48% of participants with sleep apnea and was strongly linked to the condition ( $p < 0.001$ ). It was shown through logistic regression analysis that people with nasal obstruction were 2.5 times more likely to have sleep apnea. Nasal obstruction increases airway resistance, which forces individuals to breathe through their mouths, making them more likely to experience airway collapse during sleep. These findings highlight the importance of nasal obstruction being assessed and treated as part of sleep apnea management. Deviated nasal septum (DNS) was seen in 22% of participants with sleep apnea ( $p = 0.01$ ). DNS blocks nasal airflow, making mouth breathing more likely and leading to airway instability during sleep. Although DNS was less common than other ENT disorders, its significant connection with sleep

apnea suggests that surgery in some cases may help reduce symptoms

Obesity is rising worldwide, and Mirpur, Azad Jammu and Kashmir (AJK), is no exception. However, little data is available about how ENT disorders and sleep apnea are related in this region, especially among obese adults. This study aims to find the link between OSA and ENT conditions—like nasal obstruction, enlarged tonsils, and deviated nasal septum—in obese adults in Mirpur, AJK. Identifying these connections can help doctors create combined strategies to manage obesity, ENT problems, and OSA at the same time.<sup>7, 8</sup>

**METHODS**

This study was a cross-sectional analysis aimed at evaluating the association between sleep apnea and ENT disorders among obese adults in DHQ Hospital & MBBS Medical College Mirpur AJK. The research work was done from 1st July 2023 to 30th January 2024.

The study included 300 obese adults with a (BMI) of  $\geq 30 \text{ kg/m}^2$ , aged between 18 and 60 years, who were recruited from the community. Obesity was defined based on the WHO criteria for BMI. Participants were selected through a convenience sampling technique. Individuals with a history of neurological disorders, prior ENT surgeries, or severe comorbidities (e.g., chronic respiratory or cardiovascular conditions) were excluded to minimize confounding factors. Sleep apnea was assessed using the STOP-BANG questionnaire, a widely validated tool for identifying individuals at risk of obstructive sleep apnea (OSA).

**RESULTS**

Participants, 72% (n=180) were diagnosed with sleep apnea. ENT disorders were highly prevalent among those with sleep apnea, including nasal obstruction (48%,  $p<0.001$ ), tonsillar hypertrophy (35%,  $p=0.002$ ), and deviated nasal septum (22%,  $p=0.01$ ).

**Table No. 1: Prevalence of Sleep Apnea and ENT Disorder**

Condition	Prevalence (%)	Number Participants (n)
Sleep Apnea	72(%)	180
Nasal Obstruction	48(%)	144
Tonsillar Hypertrophy	35(%)	105
Deviated Nasal Septum (DNS)	22(%)	66

Logistic regression showed that individuals with nasal obstruction were 2.5 times more likely to have sleep apnea (OR=2.5; 95% CI: 1.8–3.4), while those with tonsillar hypertrophy had a 1.8-fold increased risk (OR=1.8; 95% CI: 1.2–2.7). BMI was significantly correlated with sleep apnea severity ( $r=0.6$ ,  $p<0.00$ )

**Table No. 2: Association Between Nasal Obstruction and Sleep Apnea**

Condition	p-value	Odds Ratio (OR)	95% Confidence Interval (CI)
Nasal Obstruction	$<0.001$	2.5	1.8–3.4

**Table No. 3: Association Between Tonsillar Hypertrophy and Sleep Apnea**

Condition	p-value	Odds Ratio (OR)	95% Confidence Interval (CI)
Tonsillar Hypertrophy	0.002	1.8	1.2–2.7

**Table No. 4: Correlation between BMI and Sleep Apnea Severity**

Condition	p-value	Correlation Coefficient (r)
BMI and Sleep Apnea Severity	$<0.001$	$r=0.6$

**DISCUSSION**

Findings of research show that firm association present in sleep apnea and ENT disorders among obese adults in Mirpur, AJK. Of the 300 participants, 72% were diagnosed with sleep apnea, showing a high prevalence of this condition in the obese population. This result is link with earlier research which have identified obesity as a major risk factor for OSA due to its effects on the upper airway's anatomy and function.<sup>9, 10</sup> Nasal obstruction was found in 48% of participants with sleep apnea and was strongly linked to the condition ( $p<0.001$ ). It was shown through logistic regression analysis that people with nasal obstruction were 2.5 times more likely to have sleep apnea. Nasal obstruction increases airway resistance, which forces individuals to breathe through their mouths, making them more likely to experience airway collapse during sleep.<sup>11, 12</sup> these findings highlight the importance of nasal obstruction being assessed and treated as part of sleep apnea management.

Tonsillar hypertrophy was seen in 35% of participants with sleep apnea ( $p=0.002$ ), with a 1.8-fold increased risk (OR=1.8; 95% CI: 1.2–2.7). Enlarged tonsils can block the airway, which is showing the role of tonsillar hypertrophy in airway obstruction among obese adults<sup>3,14</sup>. This emphasizes the importance of evaluating tonsil size in obese individuals who show signs of sleep apnea. ENT (ear, nose, and throat) disorders, such as nasal obstruction, tonsillar hypertrophy, and deviated nasal septum (DNS), also contribute to OSA. For example, nasal obstruction increases resistance in the airway, forcing people to breathe through their mouths. This worsens airway blockage<sup>3,4</sup>. Similarly, enlarged tonsils (tonsillar hypertrophy) are common in obese adults and can block the airway, making OSA more severe. Deviated nasal septum (DNS) was seen in 22% of participants with sleep apnea ( $p=0.01$ ). DNS blocks

nasal airflow, making mouth breathing more likely and leading to airway instability during sleep<sup>16,17</sup>. Although DNS was less common than other ENT disorders, its significant connection with sleep apnea suggests that surgery in some cases may help reduce symptoms. BMI was also strongly linked to the severity of sleep apnea ( $r=0.6$ ,  $p<0.001$ ), showing that obesity perform a major process in causing OSA. Excess fat, especially around the neck and upper airway, increases the risk of airway narrowing and collapse during sleep.<sup>10, 18</sup>. Therefore, weight loss interventions are critical in lowering OSA severity and improving sleep quality overall. The results of this study align with global findings on the link between sleep apnea, obesity, and ENT disorders.<sup>19, 20</sup> However, focusing on Mirpur, AJK, offers valuable insights into the local rates of these conditions. The findings underline the need for strategies that address both obesity and related ENT problems at the same time. For example, combining weight loss programs, surgery for ENT issues.<sup>21,22</sup>.

**CONCLUSION**

The research shows a strong connotation in sleep apnea and ENT disorders, including nasal obstruction, tonsillar hypertrophy, and deviated nasal septum, among obese adults in Mirpur, AJK. BMI was significantly correlated with sleep apnea severity, further reinforcing the role of obesity in OSA development. Integrated management of obesity and ENT conditions is essential for effective intervention and improving patient outcomes.

**Author’s Contribution:**

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Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

**Source of Funding:** None

**Ethical Approval:** No.10/MBBSMC/ERC/2023 dated 10.01.2023

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