DOI: https://doi.org/10.54393/pjhs.v7i7.4039

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 7, Issue 07 (July 2026)

Original Article

OPEN ACCESS

Diagnostic Accuracy of the Oxygen Desaturation Index for Screening Severe Obstructive Sleep Apnea

Muhammad Uzair Ijaz Malik[1*], Muhammad Imran[1], Karamat Ali[1], Mehar Rehman[2], Sarfaraz Ahmed[1] and Muhammad Umair Ijaz Malik[3]

[1]Department of Pulmonology, Pak Emirates Military Hospital, Rawalpindi, Pakistan
[2]Department of Medicine, Pak Emirates Military Hospital, Rawalpindi, Pakistan
[3]Department of General Medicine, Pak Emirates Military Hospital, Rawalpindi, Pakistan

ARTICLE INFO

Keywords:
Obstructive Sleep Apnea, Oxygen Desaturation Index, Apnea Hypopnea Index, Screening

How to Cite:
Malik, M. U. I., Imran, M., Ali, K., Rehman, M., Ahmed, S., & Malik, M. U. I. (2026). Diagnostic Accuracy of the Oxygen Desaturation Index for Screening Severe Obstructive Sleep Apnea: Oxygen Desaturation Index for Screening Severe Obstructive Sleep Apnea. Pakistan Journal of Health Sciences, 7(7), 150-156. https://doi.org/10.54393/pjhs.v7i7.4039

***Corresponding Author:**
Muhammad Uzair Ijaz Malik
Department of Pulmonology, Pak Emirates Military Hospital, Rawalpindi, Pakistan
usayuzair@gmail.com

Received Date: 26th February, 2026
1st Revision Received: 16th April, 2026
2nd Revision Received: 7th May, 2026
Acceptance Date: 13th May, 2026
Published Date: 31st July, 2026

ABSTRACT

Obstructive sleep apnea (OSA) is a common disorder with significant cardiovascular and metabolic effects. Although polysomnography-derived Aponea-Hypopnea Index (AHI) is the diagnostic gold standard, limited access has increased interest in simpler alternatives like Oxygen Desaturation Index (ODI). **Objective:** To determine the diagnostic accuracy of the ODI in identifying severe OSA compared with the AHI. **Methods:** This cross-sectional study was conducted at the Pulmonology department, Pak Emirates Military Hospital, from 01-03-2025 to 30-11-2025, including 126 patients with a STOP-BANG score>5. Overnight monitoring was performed for 4-8 hours using polysomnography with integrated pulse oximetry. ODI was calculated as a ≥3% drop in oxygen saturation lasting at least 10 seconds. All participants underwent polysomnography for AHI assessment. SPSS version 27.0 was used for analysis. Pearson correlation, linear weighted kappa measure, and ROC curve analysis were performed. **Results:** The patients' mean age was 54.6 ± 11.9 years, and BMI was 34.1 ± 5.5 kg/m^2, predominantly male. Many patients had severe OSA. AHI and ODI showed a strong positive correlation with significant predictive value, and substantial agreement was observed between their severity classifications (κ=0.676, p<0.001). ROC analysis showed good diagnostic performance of ODI for identifying severe OSA (AUC=0.961, 95% CI: 0.932–0.990, p<0.001), with a sensitivity (94.3%) and specificity (79.5%) at an ODI cutoff ≥35. **Conclusion:** ODI shows a strong association with AHI and good accuracy for detecting severe OSA. It may be used as a non-invasive screening tool in resource-limited settings, but it cannot replace polysomnography.

INTRODUCTION

Obstructive sleep apnea (OSA) is a common sleep-related breathing disorder where periodic hypoxemia, arousal, and disjointed sleep are prevalent. OSA is a severe worldwide health problem, and the level of prevalence varies among adults, including all the severities of the disease [1]. OSA has been linked with the high risk of cardiovascular diseases, including hypertension, heart failure, stroke, cardiac arrhythmias, myocardial infarction, and pulmonary arterial hypertension. It is also associated with metabolic dysregulation, such as insulin resistance and lipid abnormalities, which are risk factors for cardiovascular disease. Neuro-cognitive and psychiatric ailments are also associated with it [2]. According to a recent meta-analysis, the prevalence of OSA in Pakistan was estimated at 35; yet, this figure represents mainly those who have been screened or suspected to have OSA, rather than the definitive diagnosis of polysomnography, which is why there is a pressing need to perform targeted screening and early intervention, to perform early diagnosis, and to effectively manage OSA [3]. Some predisposing factors for the development of OSA include structural (Anatomical variations, Micrognathia, retrognathia, adenotonsillar

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

hypertrophy, palatal deformities, etc.) and non-structural risk factors (Male gender, Obesity, advanced age, smoking/alcoholism, and medical conditions such as hypothyroidism, acromegaly, PCOS, and chronic cardiopulmonary disorders). OSA causes fragmented sleep, which causes daytime sleepiness, lack of concentration, mood swings, and cognitive impairments. This eventually impacts the quality of life, such as family life and work performance. Diagnosis of OSA can be made by calculating the Apnea-Hypopnea Index (AHI), which is done using overnight in-laboratory Polysomnography (PSG), by recording airflow, respiratory effort, oxygen saturation, heart rate, and brain activity [4]. Although the gold standard of diagnosis of OSA should be AHI calculation by PSG, it is an arduous procedure, which requires proper sleep labs and trained staff. It is not readily available, expensive, and technically sophisticated, which is a barrier to its extensive use in developing countries such as Pakistan [5]. Over the years, pulmonologists and sleep study experts have proposed different, simpler, and more cost-effective methods of diagnosing OSA. Among them is the measurement of Oxygen Desaturation Index (ODI), a relatively practical and readily available method as an alternative to PSG for OSA diagnosis [6, 7]. It is done by applying a finger pulse oximeter to sleeping patients and observing them overnight for pre-defined oxygen desaturation episodes without the need for a sleep lab. This data is then compared to the standard values available for diagnosing OSA and interpreted for the presence of OSA or otherwise [8, 9]. In addition to desaturation episodes, lowest oxygen saturation (LSpO2) and cumulative time below 92% oxygen saturation (TBSpO2) can also be calculated using ODI protocols and used to increase diagnostic accuracy [10]. Despite being an attractive option for OSA diagnosis, there have been question marks on the sensitivity, specificity, positive and negative predictive values of ODI as compared to AHI [11].

Limited availability and cost of polysomnography necessitate simpler screening tools for OSA. However, the diagnostic accuracy of ODI for detecting severe OSA remains insufficiently validated in the local population of Pakistan. Therefore, this study aimed to evaluate the diagnostic accuracy of the ODI in detecting severe OSA, using AHI as the reference standard.

METHODS

This cross-sectional study was conducted from 1st March 2025 to 30th November 2025 at the Department of Pulmonology, Pak Emirates Military Hospital (PEMH), Rawalpindi. Sample size for this study was 126, calculated through 'diagnostic study sample size calculator (web)', keeping the sensitivity of ODI as 96.6% and the specificity of 69.6% in diagnosing severe OSA, [8] the prevalence of OSA in the Pakistani population as 35% [3], confidence level of 95%, and 80% power of test. After approval from the Ethical Committee (Ref# A28/ERC/156/2025; dated 1st March 2025), 126 patients were selected from the Pulmonology Outpatient department using a non-probability consecutive sampling technique during the study period. The inclusion criteria were patients of either gender, aged 18-75 years, with suspected OSA with a STOP-BANG Score > 5. The exclusion criteria include individuals diagnosed with central sleep apnea, patients with chronic lung diseases such as COPD or interstitial lung disease, and patients who use supplemental oxygen or sedative drugs that can modify sleep architecture or patterns of oxygen saturation, or are unwilling to participate. A standardized questionnaire was used to collect demographic and clinical data, including age, sex, body mass index (BMI), neck circumference, and related comorbidities, such as hypertension and diabetes. All patients were then observed overnight, 4-8 hours after the onset of sleep, in the polysomnography suite, where sleep assessment was done using the Philips Alice Night One device. In the study, various parameters were measured simultaneously, such as the ODI, which is defined as the number of oxygen desaturation events per hour of sleep, and each event was characterized by a decrease in oxygen saturation of over 3 per cent of the baseline, which lasts longer than 10 seconds. The Lowest Oxygen Saturation (LSpO 2) or the lowest oxygen saturation level recorded during the whole night was also recorded. In addition, AHI was measured and analyzed.

IBM SPSS version 27 was used to analyze the data. Mean with standard deviation was used to express quantitative variables like age, BMI, AHI, and ODI, whereas frequencies and percentages were used to express qualitative variables. Pearson correlation analysis and simple linear regression analysis were used to determine the relationship between ODI and AHI. The agreement between the OSA severity classification based on AHI and that based on ODI was assessed using linear weighted kappa statistics. This was done by receiver operating characteristic (ROC) curve analysis to determine the diagnostic performance of ODI in identifying severe OSA (AHI ≥30 events/hour). The sensitivity, specificity, and area under the curve (AUC) were calculated. Several ODI cutoff points (≥15, ≥20, ≥25, ≥30, ≥35, and ≥40) were considered to identify the diagnostic performance over a clinically relevant range. The best cutoff value was determined using the Youden index (sensitivity + specificity -1). A p-value ≤0.05 was considered statistically significant.

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

RESULTS

This study included 126 patients, predominantly middle-aged males (70.6%). The mean age of the patients was 54.6±11.9, and the mean BMI was 34.1 ± 5.5 kg/m^2. About 38.1% of patients had no comorbidities; the rest commonly had ischemic heart disease, hypertension, diabetes, or multiple comorbidities. Sleep study results showed a mean AHI of 46.2 ± 24.2 and ODI of 56.3 ± 31.9, with average and lowest SpO_2 of 90.8 ± 3.5% and 73.2 ± 10.8%, respectively. Most participants had moderate-to-severe OSA, with 81.7% classified as severe by ODI and 69.0% by AHI (Table 1).

Table 1: Baseline Information (n=126)

Variables	Mean ± SD / n (%)
Age (Years)	54.56 ± 11.913
BMI (kg/m^2)	34.096 ± 5.5224
Gender	
Male	89 (70.6%)
Female	37 (29.4%)
Comorbidities	
No Comorbidities	48 (38.1%)
IHD	27 (21.4%)
HTN	25 (19.8%)
DM	18 (14.3%)
Multiple Comorbidities	8 (6.3%)
AHI	46.177 ± 24.1906
ODI	56.319 ± 31.9027
Average SpO_2 during sleep (%)	90.79 ± 3.516
Lowest SpO_2 during sleep (%)	73.20 ± 10.804
Monitoring Time (minutes)	274.89 ± 31.472
Severity of OSA (ODI-based)	
Mild	3 (2.4%)
Moderate	20 (15.9%)
Severe	103 (81.7%)
Severity of OSA (AHI-based)	
Mild	5 (4.0%)
Moderate	34 (27.0%)
Severe	87 (69.0%)

The severity of OSA as classified by AHI fell parallel to ODI with all participants having severe OSA as categorized by AHI which also corresponded to severe as categorized by ODI. Overall agreement was measured using linear weighted kappa (κ=0.676, 95% CI: 0.5330.818, p<0.001), which shows that there is a great deal of agreement between the two classification methods beyond chance. This helps to support the reliability of ODI as a surrogate tool to classify the severity of OSA. The positive correlation between ODI and AHI was very strong (r=0.921), which shows that ODI closely follows changes in AHI and is a good indicator of the severity of the disease. Also, ODI was moderately positively correlated with BMI (r=0.359), indicating that higher BMI is positively correlated with more oxygen desaturation events during sleep (Table 2).

Table 2: Agreement between AHI- and ODI-based OSA severity classification using linear weighted kappa (n=126)

AHI-based OSA	ODI-based OSA			Linear Weighted Kappa	CI	p-value
	Mild	Moderate	Severe			
Mild	3 (60.0%)	1 (20.0%)	1 (20.0%)	0.676	0.533-0.818	<0.001
Moderate	0 (0.0%)	19 (55.9%)	15 (44.1%)			
Severe	0 (0.0%)	0 (0.0%)	87 (100.0%)			

Linear regression analysis revealed a strong positive relationship between ODI and the Apnea-Hypopnea Index (AHI). The ODI strongly predicted AHI (β=0.698, p<0.001). The model explained 84.8% of the variance in AHI (R^2=0.848), demonstrating that ODI is responsible for a significant fraction of the variability. The regression model showed significant results (F (1,124) =691.866, p<0.001). For every one-unit rise in ODI, AHI increased by about 0.7 occurrences per hour (Table 3).

Table 3: Correlation analysis of study variables

Variables	Pearson Correlation (r)	p-value
ODI vs AHI	0.921	<0.001
ODI vs BMI	0.359	0.057

The scatterplot demonstrates a strong, positive linear correlation between the Apnea-Hypopnea Index (AHI) and the ODI. This tight clustering validates the use of ODI cutoffs as reliable predictive surrogates for AHI-defined OSA severity in clinical diagnostics (Figure 1).

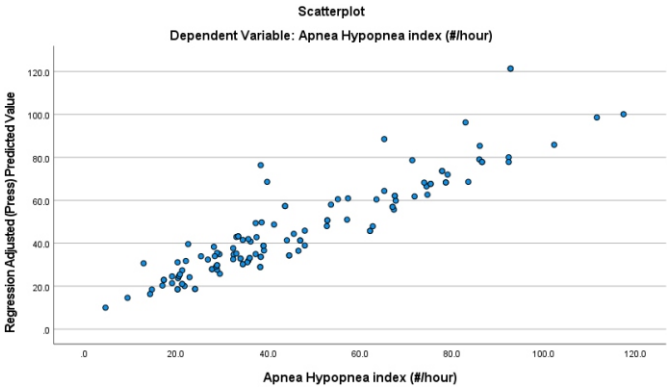

Figure 1: Scatterplot illustrating the relation of AHI and ODI values

The blue line in the ROC graph represents the diagnostic performance of the ODI. The curve rises sharply toward the upper left corner of the graph, indicating high diagnostic accuracy in identifying severe OSA. Furthermore, since the blue line lies well above the diagonal reference line, it demonstrates that ODI performs significantly better than chance in predicting severe OSA (Figure 2).

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

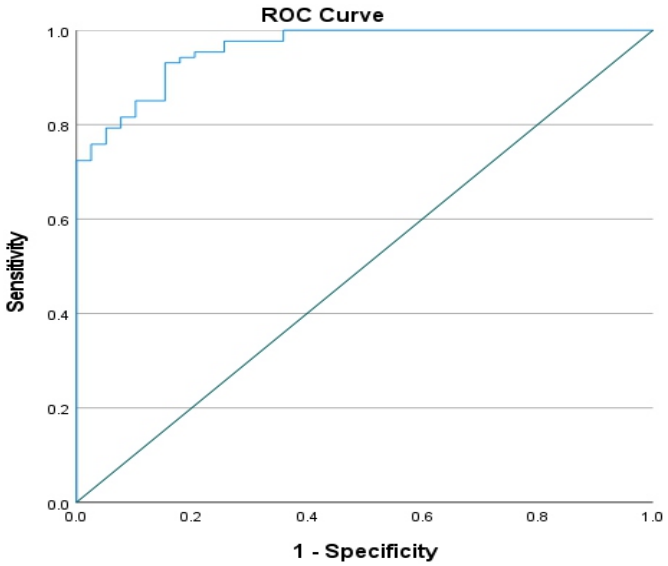

Figure 2: ROC Analysis Demonstrated that ODI Sensitivity

The ROC analysis shows that the ODI has very good diagnostic accuracy for detecting severe OSA (AHI ≥30/hour), with an area under the curve (AUC) of 0.961 (95% CI: 0.932–0.990, p<0.001) (Table 4).

Table 4: Area under the curve for ODI based on ROC

Area Under Curve	95% C. I	p-value
0.961	0.932-0.990	<0.001*

Lower ODI cutoffs (≥15 to ≥30) demonstrate 100% sensitivity but low specificity (7.7%–59%), indicating a high false-positive rate. As the cutoff increases to ≥35, sensitivity slightly decreases to 94.3% while specificity improves to 79.5%, suggesting a more balanced diagnostic performance. At ≥40, specificity further increases to 89.7%, although sensitivity declines to 81.6% (Table 5).

Table 5: Sensitivity and Specificity of ODI Cutoffs for Severe OSA

AHI ≥ 30 /hr	Sensitivity	Specificity
ODI ≥ 15	100%	7.7%
ODI ≥ 20	100%	30.8%
ODI ≥ 25	100%	43.6%
ODI ≥ 30	100%	59%
ODI ≥ 35	94.3%	79.5%
ODI ≥ 40	81.6%	89.7%

DISCUSSION

The findings of this study indicate that there is a strong positive relationship between the ODI and AHI, i.e., higher values of the ODI are associated with increased severity of OSA. These results agree with the use of ODI as a practical screening and triage instrument for severe OSA. ODI in resource-limited settings: ODI can be used as a primary screening modality; nevertheless, it cannot be utilized to definitively diagnose the issue. The American Academy of Sleep Medicine (AASM) supports the use of limited-channel and home-based testing strategies, such as oximetry, when access is limited, and the clinical pretest probability is high. Substantial prospective studies have also demonstrated that ODI is strongly correlated with AHI and can be successfully used to stratify patients to refer to definitive sleep testing. This assists in specific early detection and early therapeutic response. The variability in hypopnea scoring criteria (3 vs. 4 desaturation thresholds), oximeter technology, altitude, baseline lung function, and population case mix are likely to explain the variability in reported diagnostic efficacy across studies. Based on the clinical applicability perspective, ODI has a number of advantages. Pulse oximetry is cheap, non-invasive and commonplace (pocket pulse oximeters, smart watches, etc.). This facilitates easy screening within outpatient and resource-limited facilities. In high-risk populations, an elevated ODI may support prioritization for Polysomnography and facilitate earlier initiation of treatment, such as continuous positive airway pressure. Chen et al also tested the validity of ODI as compared to AHI / REI and concluded that ODI was strongly correlated with apnea-hypopnea index (AHI) (rs=0.941) [12]. These results were not only consistent with our study's findings, but their study's findings were further supported by a bigger sample size (n=440). Additionally, Undrajavarapu *et al.* found a strong association (r=0.734, p=0.001) between ODI and AHI. When it came to identifying OSA (ODI>5), home oximetry had sensitivity, specificity, and diagnostic accuracy of 69%, 100%, and 71%, respectively [13]. However, instead of inpatient overnight monitoring, they opted for home monitoring by a trained staff member, as opposed to our study. However, the higher proportion of severe OSA identified by ODI compared to AHI in our study suggests a tendency of ODI to overestimate disease severity. This may be attributed to the fact that ODI captures all oxygen desaturation events, including those not meeting strict hypopnea criteria in AHI scoring. Additionally, ODI is influenced by baseline oxygen saturation and may reflect non-obstructive desaturation events, thereby increasing the likelihood of misclassification. Despite this, its high sensitivity makes it a useful screening and triage tool, particularly in high-risk populations. Sinthia *et al.* also tested ODI to predict OSA and concluded that it indeed was able to diagnose OSA as accurately as AHI [14]. Sinthia et al used an automated monitor, whereas our study used observer-based monitoring. Karhu *et al.* compared different desaturation event quantification parameters and concluded that ODI was superior in determining the OSA presence and severity as compared to the lowest saturation or total time below cut-off saturation [15]. This contrasts with the findings of our study, in which LSpO2 did correlate with a higher number of desaturation events, but we did not compare the two indices head-to-head.

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

Additionally, Fabius *et al.* confirmed the association between ODI and AHI and found that, when assessed concurrently with the same oximeter during PSG, an ODI <5 predicted an AHI <5 with excellent sensitivity (97%) and specificity (97%) [16]. They, however, documented that at higher AHI and ODI scores, this correlation wasn't as strong. Levendowski *et al.* also compared ODI and AHI for OSA diagnosis, as well as studying the effect of posture on the two. They found that the overall correlation between AHI and ODI was 0.97, with supine recording times being 0.94 and non-supine recording times being 0.96 (all p<0.001). The AHI and ODI differences for the majority of patients were negligible; 14% of the records had an AHI-ODI difference greater than 5 events per hour, and 6% had a difference greater than 10 events per hour [17]. The ROC analysis in the present study demonstrated excellent diagnostic accuracy of ODI for detecting severe OSA (AHI ≥30/hour), with an AUC of 0.961 (95% CI: 0.932–0.990). This is comparable to previously reported AUC values ranging from 0.98 to 0.997 in similar populations, indicating consistently high discriminative ability of ODI. In our study, an ODI cutoff ≥35 yielded a sensitivity of 94.3% and specificity of 79.5%, which aligns with prior studies reporting sensitivity ranging from 32% to 98.5% and specificity from 47.7% to 98%. These findings reinforce that ODI demonstrates high sensitivity with moderate-to-high specificity, making it a reliable screening tool, although variability across studies may be influenced by differences in study design, population characteristics, and desaturation thresholds [18, 19]. In the present study, BMI showed a weak positive correlation with ODI; however, this association was not statistically significant (p>0.05), limiting its clinical interpretability. The same association was studied by Leppänen *et al.* According to their research, all OSA categories showed statistically significant increases in AHI, ODI, and hypopnea index values with increasing BMI (β=0.10, P=0.002), except the moderate OSA category, where increases in AHI and ODI did not reach the threshold of statistical significance (β=0.047, P=0.20) [20]. Similarly, Novkovic *et al.* were also not able to conclusively correlate higher BMI with a higher ODI score in patients with OSA but did validate ODI for the diagnosis of OSA independent of obesity [21]. Finally, Azakli *et al.* also documented the predictive value of ODI in OSA with respect to long-term mortality and demonstrated that it could be used as a prognostic tool in addition to being a diagnostic tool. ODI was the only polysomnography metric found to be an independent predictor of OSA patients' mortality in a research sample of 3541 individuals [22]. However, such a prospective analysis was not done in our study, so similar conclusions or otherwise cannot be drawn.

There are several limitations to be taken into account. ODI can be influenced by baseline oxygen saturation and comorbid cardiopulmonary conditions, which may lead to overestimation of OSA severity, and these confounders were not adjusted. Technical measurement bias (e.g., motion artifacts, probe problems) can also affect the results. Moreover, the relatively low monitoring period (mean 4.6 hours) as compared to full-night polysomnography may have an impact on event detection; nevertheless, it is still similar to the studies conducted in resource-limited environments. Validation should be done by more multi-center full-night monitoring.

CONCLUSIONS

This study indicates that there is a strong positive correlation between the ODI and AHI, and that it has a good diagnostic sensitivity to detect severe OSA. ODI could be regarded as a practical, non-invasive screening and triage instrument, especially in the context of resource-limited settings, but it should not be considered as a substitute of polysomnography, which is still considered the gold standard in diagnosis. These findings need to be viewed in the light of some limitations, such as the single-center design, the application of non-probability consecutive sampling, the relatively short period of monitoring, and the absence of correction of such potential confounding factors. Also, the fact that the relationship between ODI and demographic variables (age, gender, and BMI) was not statistically significant should be viewed with reservations. Substantial, multi-center, large-scale research is required to confirm these results.

Authors' Contribution

Conceptualization: MUIM
Methodology: MUIM
Formal analysis: MI, KA, MR, SA
Writing and Drafting: MUIM, KA, MUIM
Review and Editing: MUIM, MI, KA, MR, SA, MUIM

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

REFERENCES

[1] Lyons MM, Bhatt NY, Pack AI, Magalang UJ. Global Burden of Sleep-Disordered Breathing and Its Implications. Respirology. 2020 Jul; 25(7): 690-702. doi: 10.1111/resp.13838.

[2] Szewczyk K, Szewczyk B, Krzesłowska WJ, Pytel P, Wiśniewski S, Hołownia W. Health Consequences of Obstructive Sleep Apnoea Syndrome. Journal of

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

Education, Health and Sport. 2024 Jun; 74: 1-19. doi: 10.12775/JEHS.2024.74.52568.

[3] Gheshlagh RG, Aghahosseini SS, Ebrahimi H. Prevalence of Obstructive Sleep Apnea in Pakistan: A Systematic Review and Meta-Analysis of Observational Studies. Sleep and Breathing. 2025 Dec; 29(6): 1-2. doi: 10.1007/s11325-025-03529-3.

[4] Kirby T. Patient with Decades of Sleep Apnoea History Successfully Treated with Continuous Positive Airway Pressure Therapy. The Lancet Respiratory Medicine. 2024 Feb; 12(2): 103-4. doi: 10.1016/S2213-2600(23)00487-3.

[5] Goyal A, Pakhare A, Pavirala ST, Lahiri A, Shrivastava N, Bohra A *et al.* Prevalence and Association Analysis of Obstructive Sleep Apnea in India: Results from the BLESS cohort. Sleep medicine. 2025 Jan; 125: 128-35. doi: 10.1016/j.sleep.2024.11.029.

[6] Wali SO, Abaalkhail B, AlQassas I, Alhejaili F, Spence DW, Pandi-Perumal SR. The Correlation Between Oxygen Saturation Indices and the Standard Obstructive Sleep Apnea Severity. Annals of Thoracic Medicine. 2020 Apr; 15(2): 70-75. doi: 10.4103/atm.ATM_215_19.

[7] Suen C, Ryan CM, Mubashir T, Ayas NT, Abrahamyan L, Wong J et al. Sleep Study and Oximetry Parameters for Predicting Postoperative Complications in Patients with OSA. Chest. 2019 Apr; 155(4): 855-867. doi: 10.1016/j.chest.2018.09.030.

[8] Varghese L, Rebekah G, Oliver A, Kurien R. Oxygen Desaturation Index as an Alternative Parameter in Screening Patients with Severe Obstructive Sleep Apnea. Sleep science. 2022 Mar; 15(1): 224-228. doi: 10.5935/1984-0063.20200119.

[9] Temirbekov D, Güneş S, Yazıcı ZM, Sayın İ. The Ignored Parameter in the Diagnosis of Obstructive Sleep Apnea Syndrome: The Oxygen Desaturation Index. Turkish Archives of Otorhinolaryngology. 2018 Mar; 56(1): 1. doi: 10.5152/tao.2018.3025.

[10] Kong D, Hu C, Zhu H. Oxygen Desaturation Index, Lowest Arterial Oxygen Saturation, and Time Spent Below 90% Oxygen Saturation as Diagnostic Markers for Obstructive Sleep Apnea. American Journal of Translational Research. 2023 May; 15(5): 3597.

[11] Veugen CC, Teunissen EM, den Otter LA, Kos MP, Stokroos RJ, Copper MP. Prediction of Obstructive Sleep Apnea: Comparative Performance of Three Screening Instruments on the Apnea-Hypopnea Index and the Oxygen Desaturation Index. Sleep and Breathing. 2021 Sep; 25(3): 1267-1275. doi: 10.1007/s11325-020-02219-6.

[12] Chen L, Tang W, Wang C, Chen D, Gao Y, Ma W *et al.* Diagnostic Accuracy of Oxygen Desaturation Index for Sleep-Disordered Breathing in Patients with Diabetes. Frontiers in Endocrinology. 2021 Mar; 12: 598470. doi: 10.3389/fendo.2021.598470.

[13] Undrajavarapu A, Prasath A, Varghese M, George P, Kisku KH, Varughese PG. Correlation Between Oxygen Desaturation Index Measured by Overnight Oximetry and Apnea-Hypopnea Index Measured by Polysomnography in Patients Diagnosed with Obstructive Sleep Apnea. Cureus. 2024 Oct; 16(10). 1-11. doi: 10.7759/cureus.71895.

[14] Sinthia P, Malathi M, Sri BS, Sankar K, Nalini M. Early diagnosis and monitoring of sleep apnea using desaturation index and respiration percentage. In AIP Conference Proceedings. 2022 Apr; 2405 (1): 20015. doi: 10.1063/5.0072690.

[15] Karhu T, Leppänen T, Korkalainen H, Myllymaa S, Duce B, Töyräs J *et al.* Desaturation Event Scoring Criteria Affect the Perceived Severity of Nocturnal Hypoxic Load. Sleep Medicine. 2022 Dec; 100: 479-486. doi: 10.1016/j.sleep.2022.09.024.

[16] Fabius TM, Benistant JR, Bekkedam L, van der Palen J, de Jongh FH, Eijsvogel MM. Validation of the Oxygen Desaturation Index in the Diagnostic Workup of Obstructive Sleep Apnea. Sleep and Breathing. 2019 Mar; 23(1): 57-63. doi: 10.1007/s11325-018-1654-2.

[17] Levendowski DJ, Hamilton GS, St. Louis EK, Penzel T, Dawson D, Westbrook PR. A Comparison Between Auto-Scored Apnea-Hypopnea Index and Oxygen Desaturation Index in the Characterization of Positional Obstructive Sleep Apnea. Nature and Science of Sleep. 2019 Jul: 69-78. doi: 10.2147/NSS.S204830.

[18] Borsini E and Nigro CA. Proposal of a Diagnostic Algorithm Based on the Use of Pulse Oximetry in Obstructive Sleep Apnea. Sleep and Breathing. 2023 Oct; 27(5): 1677-1686. doi: 10.1007/s11325-022-02757-1.

[19] Rashid NH, Zaghi S, Scapuccin M, Camacho M, Certal V, Capasso R. The Value of Oxygen Desaturation Index for Diagnosing Obstructive Sleep Apnea: A Systematic Review. The Laryngoscope. 2021 Feb; 131(2): 440-447. doi: 10.1002/lary.28663.

[20] Leppänen T, Kulkas A, Mervaala E, Töyräs J. Increase in Body Mass Index Decreases Duration of Apneas and Hypopneas in Obstructive Sleep Apnea. Respiratory care. 2019 Jan; 64(1): 77-84. doi: 10.4187/respcare.06297.

[21] Novković D, Popović N, Novković N, Lukić J, Kuprešanin VB, Popević M. The Relationship Between the Apnea-Hypopnea Index, Oxygen Desaturation Index, Average Oxygen Saturation, and Body Mass

DOI: https://doi.org/10.54393/pjhs.v7i7.4039

Index in Patients with Obstructive Sleep Apnea. Vojnosanitetski Pregled. 2025 May; 82(5): 1-6. doi: 10.2298/VSP240323024N.

[22] Azakli D, Satici C, Sokucu SN, Aydin S, Atasever F, Ozdemir C. Long-Term Mortality Risk in Obstructive Sleep Apnea: The Critical Role of Oxygen Desaturation Index. Sleep and Breathing. 2024 Dec; 28(6): 2367-78. doi: 10.1007/s11325-024-03137-7.