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Predicting the Outcome of Obstructive Sleep Apnea Syndrome in Iraqi Patients Over 30 Years of Age

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Abstract: Background: An adult sleep disease called obstructive sleep apnea-hypopnea syndrome (OSAHS) can be defined by the partial or total collapse of the upper airway while the patient is asleep. OSAHS is now more common in older individuals than middle-aged men and women globally, with prevalence rates of 2% and 4%, respectively. **Aim**: This paper was predicting the outcome of obstructive sleep apnea syndrome in Iraqi patients over 30 years of age. **Patients and methods**: A cross-sectional study was conducted to predict the outcome of obstructive sleep apnea syndrome in Iraqi patients over the age of thirty. This study was submitted for a period between the 15th of July in the year 2021 to the 24th of April in the year 2022 in different hospitals in Iraq. This study contributed to study accuracy. To comparison of the predicted model and the group to ESS and stop-bang as well as in different types of blood pressure. Our data was designed and built using the SPS program. **Results and discussion**: This paper was focused on prediction the outcome of obstructive sleep apnea syndrome in Iraqi patients over 30 years of age. Our results found that almost targeted patients above 40 years where our results got that almost of the patients' cases were male (67.5%) and more that female (32.5%). Furthermore, this paper was examined the symptoms were found that episodes in which you stop breathing during sleep with (23) and Dry mouth upon awakening (5) patients cases. The study examined the data of blood pressure was found diastolic blood pressure was low with 8 (20%) and high (6) at 15%, which has 17 cases, while systolic blood pressure for apnea patients has 23 cases. Moreover, this study measured the accuracy of prediction model performance at 83.58%, ESS at 55.58% and 46.63%. **Conclusion:** Our study found that apnea had a big impact on males more than females where. Most studies have employed the AHI to assess the severity of obstructive sleep apnea (OSA) as well as the effectiveness of therapy. However, it doesn't appear to be a reliable indicator of illness severity or a tool for selecting a course of therapy in both clinical research and clinical practice. This study was found that sever level got more cases with (26) patients with mild level with 14 cases.

Keywords: Sleep apnea syndrome (OSAHS); ESS degree; STOP-Bang degree; and AHI.

INTRODUCTION

An adult sleep disease called obstructive sleep apnea-hypopnea syndrome (OSAHS) can be defined by the partial or total collapse of the upper airway while the patient is asleep. OSAHS is now more common in older individuals than middle-aged men and women globally, with prevalence rates of 2% and 4%, respectively [Young, T. *et al*., 1993; Neruntarat, C. *et al*., 2011]. Similar to this, the prevalence ranges from 1.9% to 4.8% among middle-aged Thai people. Additionally, estimates for the prevalence of bariatric patients (35–94%) and stroke patients (60–70%) are much greater. [De Raaff, C.A. *et al*., 2017; Johnson, K.G. *et al*., 2010]

Following the respiratory episodes, patients with OSAHS frequently have episodes of hypoxemia, hypercapnia, and microarousal [White, D.P, 2005]. As a result of this cycle, sleep is fragmented, of low quality, and more sympathetically hyperactive. These individuals might exhibit signs of frequent car accidents or workplace issues. It's significant to note that untreated OSAHS is linked to several cardiovascular sides effects, such as systemic and pulmonary high blood pressure, heart failure, arrhythmia, diabetes, and even stroke. [Yaggi, H.K. *et al*., 2005; Kapur, V.K. *et al*., 2017]

Many people with OSAHS are still undiagnosed, nevertheless. Patients with OSAHS may also be at higher risk during surgery [Banhiran, W. *et al*., 2011]. Studies have found that people with OSAHS utilize medical resources more frequently-almost twice as often-including extended hospital stays, doctor fees, and prescribed drugs. Effective therapy for patients with OSAHS progressively lowers related medical expenses while also enhancing the general quality of life. [Suksakorn, S. *et al*., 2014; Chung, F. *et al*., 2008]

The gold standard for diagnosing OSAHS continues to be an attended overnight polysomnography (PSG) [Banhiran, W. *et al*., 2012]. The use of PSG is nonetheless constrained by several factors, such as a lengthy waiting period, dependence on sometimes insufficient resources, and a dearth of skilled sleep specialists [Berry, R.B. *et al*., 2017]. The use of portable sleep studies to diagnose people with simple

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OSAHS has grown in popularity. Nevertheless, the research is also cumbersome, particularly in places with lower socioeconomic levels, and the requirement for suitable abilities to assess sleep continues to be a challenge [International Classification of Sleep Disorders, 2014; Chiu, H.Y. *et al*., 2011]. This paper aims to predict the outcome of obstructive sleep apnea syndrome in Iraqi patients over 30 years of age.

PATIENTS AND METHODS

A cross-sectional study was conducted to predict the outcome of obstructive sleep apnea syndrome in Iraqi patients over the age of thirty. This study was submitted for a period between the 15th of July in the year 2021 to the 24th of April in the year 2022 in different hospitals in Iraq. This study contributed to study accuracy. To comparison of the predicted model and the group to ESS and stop-bang as well as in different types of blood pressure. Our data was designed and built using the SPS program.

This paper started to study all demographic information of patients above 30 years based on all basic parameters for both males and females, and symptoms where contain on Dry mouth upon awakening, Episodes in which you stop breathing during sleep, Insomnia, morning headache, and Snoring loudly as well as complications have Daytime fatigue, heart disturbances, Hypertension, liver problems, and Type 2 diabetes where all these basics information can be seen in Table 1, Table 2, Table 3, and Table 4.

This paper focused on study BMI in different patterns <28 and > 28 apnea patients. Besides that, this paper examined the blood pressure of apnea patients in both types of systolic blood pressure and diastolic blood pressure, where the outcomes of the examination have been seen in Figure 1, Figure 2, and Figure 3.

This paper contributed to assess the demographic data of AHI scores modelling for 40 patients, which characteristic into mild level with a score AHI < 15 and Severe level with AHI ≥ 15 that categories include Age, choking sensation, Heart disturbances, Type 2 diabetes, The ESS degree, The STOP-Bang degree, liver problems, Systolic blood pressure, and Diastolic blood pressure and these categories were clarified in Table 5.

This study was conducting into the assessment of modelling performance in comparison with ESS and Stop-Bang for 40 patients, where these parameters had distributed into Sensitivity, Specificity, Positive predictive value, and Negative predictive value, which these parameters can be seen in Table 6. This paper also Evaluated of accuracy prediction modelling performance for 40 cases into three main modelling, which prediction model in comparing with ESS and Stop-Bang, which all these outcomes assessment ca be seen in Figure 4.

RESULTS

Table 1: Distribution of apnea patients according to age

Statistics		
Age-patients		
N	**Valid**	40
	Missing	0
Mean		49.8725
Std. Error of Mean		1.44305
Median		53.5000
Mode		60.00
Std. Deviation		9.12666
Variance		83.296
Skewness		-.556
Std. Error of Skewness		.374
Range		28.00
Maximum		60.00
Sum		1994.90

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Table 2: Distribution of apnea patients according to sex

Sex					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**female**	13	32.5	32.5	32.5
	male	27	67.5	67.5	100.0
	Total	40	100.0	100.0	

Table 3: Conducting of patients in between symptoms and age

Age * Symptoms Crosstabulation							
Count							
		Symptoms					Total
		Dry mouth upon awakening	**Episodes in which you stop breathing during sleep**	**Insomnia**	**morning headache**	**Snoring loudly**	
Age	32.00	1	0	0	0	0	1
	33.40	1	0	0	0	0	1
	35.00	1	0	0	0	0	1
	36.00	2	0	0	1	1	4
	40.70	0	0	2	1	0	3
	44.70	0	2	0	0	2	4
	47.30	0	1	1	0	0	2
	48.60	0	0	0	1	0	1
	51.20	0	0	1	0	0	1
	53.50	0	5	0	0	1	6
	53.60	0	0	0	1	0	1
	55.60	0	1	0	0	0	1
	57.00	0	1	0	0	0	1
	58.00	0	6	0	0	0	6
	60.00	0	7	0	0	0	7
Total		5	23	4	4	4	40

Table 4: Conducting of patients in between complications and sex

Sex * Complications Crosstabulation							
Count							
		Complications					Total
		Daytime fatigue	**heart disturbances**	**Hypertension**	**liver problems**	**Type 2 diabetes**	
Sex	**female**	2	5	1	3	2	13
	male	4	8	5	4	6	27
Total		6	13	6	7	8	40

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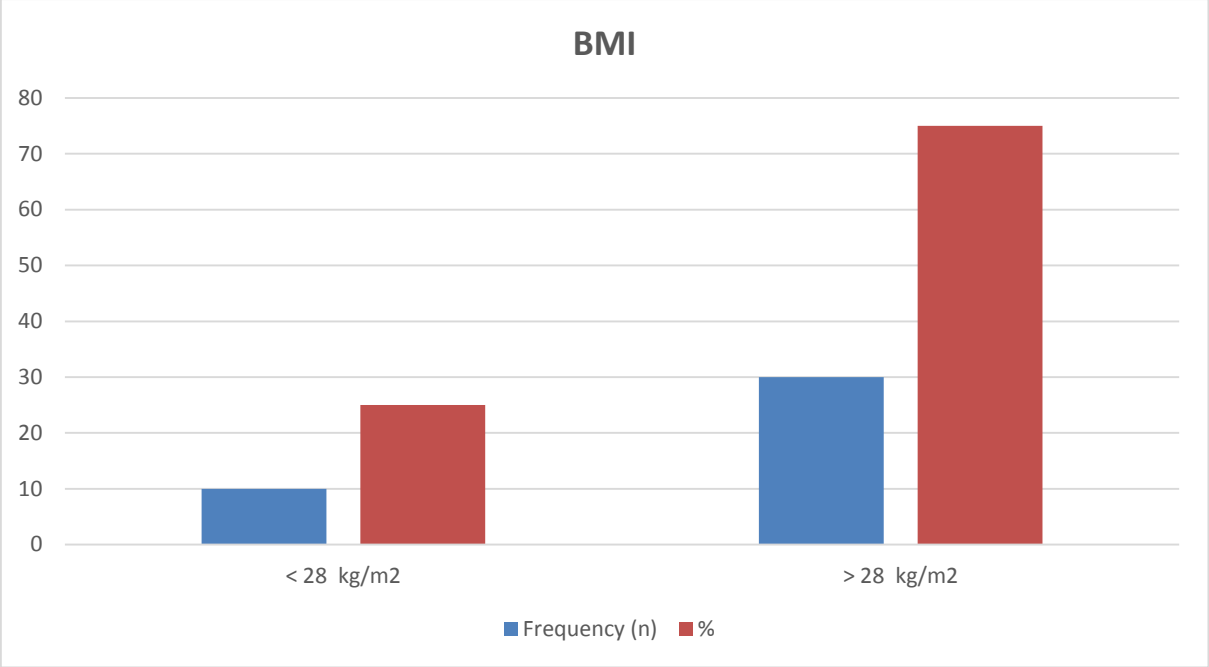

Figure 1: Distributions of apnea patients based on BMI

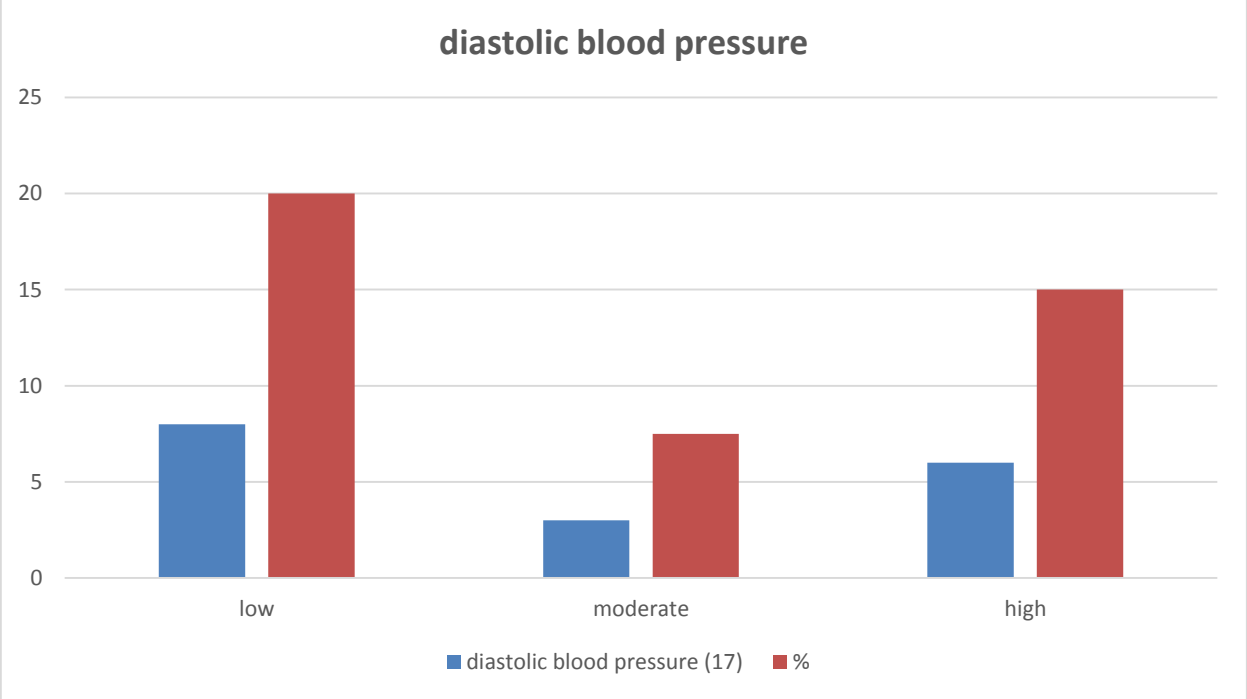

Figure 2: Examination of diastolic blood pressure for apnea patients in 17 cases

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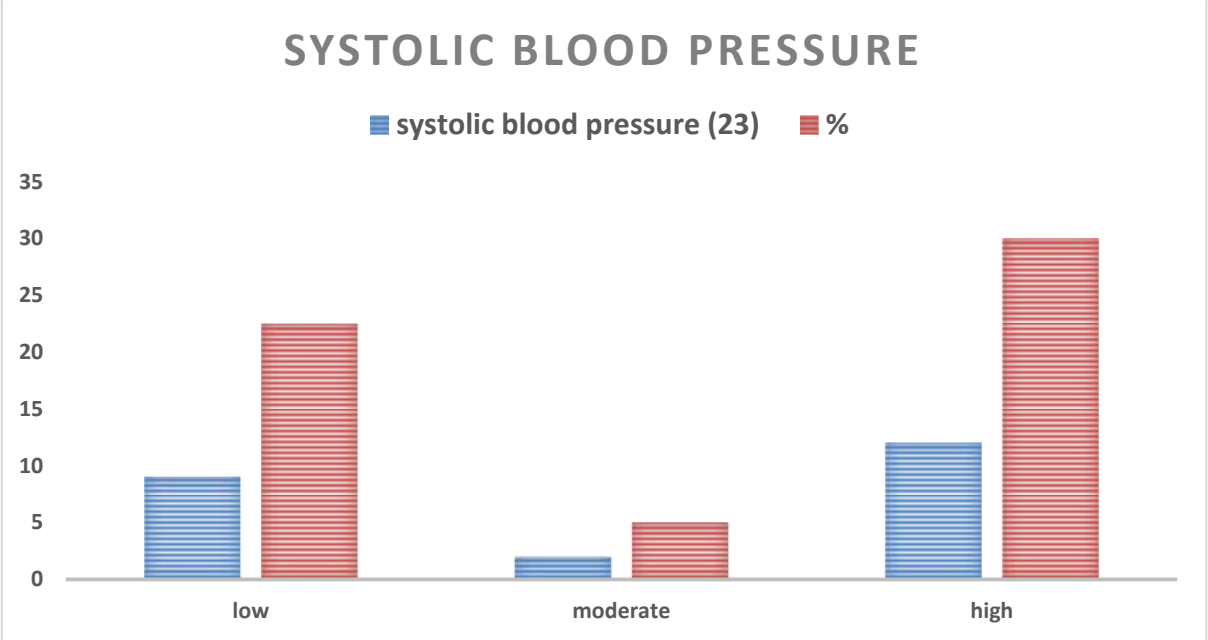

Figure 3: Examination of systolic blood pressure for apnea patients in 23 cases

Table 5: Demographic data of AHI scores modelling for 40 patients.

Categories level	Mild level (14 cases) AHI < 15	Severe level (26) cases AHI ≥ 15	P-value
Age	47.6±13.8	43.4±10.7	0.002
Choking sensation	61±53.6	153±56.23	1.23
Heart disturbances	66.7±12.7	69.2±13.6	0.0474
Type 2 diabetes	45±7.5	48±6.63	0.0477
The ESS degree	8.3	9.52	0.798
The STOP-Bang degree	2.77	2.83	0.599
liver problems	64.23±5.4	67.27±4.6	0.0488
Systolic blood pressure	130.6±14.2	133±16.55	0.980
Diastolic blood pressure	81.62±12.6	83.7±13.58	0.150

Table 6: Assessment of modelling performance in comparison with ESS and Stop-Bang for 40 patients

Parameters	Prediction performance quality	ESS	STOP-Bang
Sensitivity	88.78	65.22	71.4
Specificity	60.46	34.5	20.7
Positive predictive value	87.4	70.6	73.25
Negative predictive value	40.3	35.6	20.84

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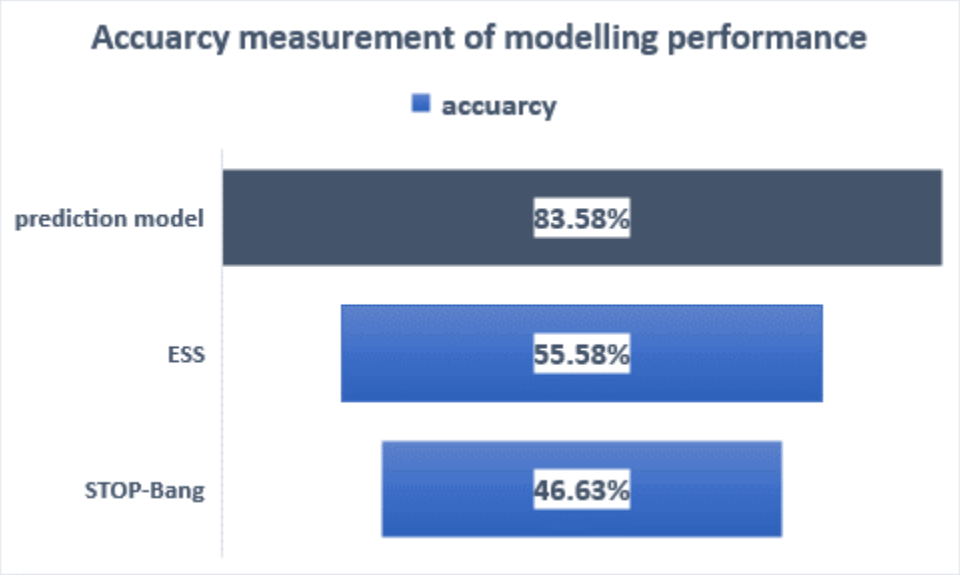

Figure 4: Evaluation of accuracy prediction modelling performance for 40 cases

DISCUSSION

This paper was focused on the prediction of the outcome of obstructive sleep apnea syndrome in Iraqi patients over 30 years of age. Our results found that almost targeted patients above 40 years where our results got that almost of the patients' cases were male (67.5%) and more that female (32.5%).

Furthermore, this paper was examined the symptoms were found that episodes in which you stop breathing during sleep with (23) and Dry mouth upon awakening (5) patients cases. According to heart disturbances, our outcomes have found that almost of complications have heart disturbances got an impact on males with (8) more than females (5) as well as Type 2 diabetes (6) for males more impacting than females (2) ceases.

This paper was studied BMI were found that BMI>28 got 75 patients and BMI <28 have 25 patients' cases. The study examined the data of blood pressure was found diastolic blood pressure low with 8 (20%) and high (6) at 15%, which has 17 cases, while systolic blood pressure for apnea patients has 23 cases. [Sun, L.M. *et al*., 2011; Camacho, M. *et al*., 2015]

The study was shown AHI assessment within AHI <15 and AHI > 15 in both parameters, mild level and Severe level, to study the mean number of apnea and hypopneas per hour of sleep is known as the apnea-hypopnea index (AHI). It is divided into three categories by the American Academy of Sleep Medicine (AASM): mild (5–15 occurrences per hour), moderate (15–30 events per hour), and severe (> 30 events per hour). [Arnardottir, E.S. *et al*., 2016]

Most studies have employed the AHI to assess the severity of obstructive sleep apnea (OSA) as well as the effectiveness of therapy [Kapur, V. *et al*., 2002; Tarasiuk, A. *et al*., 2005]. However, it doesn't appear to be a reliable indicator of illness severity or a tool for selecting a course of therapy in both clinical research and clinical practice. This study was found that sever level got more cases with (26) patients with mild level with 14 cases. Moreover, this study measured the accuracy of prediction model performance at 83.58%, ESS at 55.58% and 46.63%. [Tarasiuk, A. *et al*., 2008]

CONCLUSIONS

Our study found that apnea had a big impact on males more than females, where Most studies have employed the AHI to assess the severity of obstructive sleep apnea (OSA) as well as the effectiveness of therapy. However, it doesn't appear to be a reliable indicator of illness severity or a tool for selecting a course of therapy in both clinical research and clinical practice. This study was found that sever level got more cases with (26) patients with mild level with 14 cases.

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