

## Obesity Treatments and Obstructive Sleep Apnea (OSA): Cross-Sectional Study

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### Abstract

Obesity incidence has increased globally, and there is a need to conduct an assessment of the prevalence of the condition and treatment of the condition. The aim of this study is on exploring the possibilities of the OSA treatment through the obesity medication on the people with obesity. In conducting this study, primary quantitative method and online survey is used in collecting the data. The findings of this study indicate that the treatment process of people with obesity can be effective in managing comorbidities, and this can be critical in achieving success in the dynamic industry. Some of the proposed treatment plans include CPAP medication, physical activity, and surgical procedures.

**Keywords:** *Obstructive Sleep Apnoea (OSA); Obesity; OSA Treatment*

### Abbreviation

OSA: Obstructive Sleep Apnea; CPAP: Continuous Positive Airway Pressure; BMI: Body Mass Index

### Introduction

It has been seen that the Obstructive Sleep Apnea (OSA) is caused due to the intolerance to glucose and insulin resistance. However, it is also associated with the overweight and airway obstruction. Overweight or obese people tend to have fat deposition in their neck which is termed as the pharyngeal fat. Hence, it is likely to state that the obese people have likelihood to the OSA issues [1]. Thus, the consideration of the obesity reduction medication for the reduction of the OSA issues of people can be considered with priority. In the following proposal, the detailed overview of the research on the topic of obesity medicine impact on OSA will be provided.

### Rationale of the study

OSA is one of the common issues among people which can develop trauma and lead to death as well if untreated. Hence, the consideration of the possible treatments of the issues should be considered with higher priority. Hence, this study focused on the possibilities of the treatment of people with obesity reduction medications [2]. Considering this factor, it can be highlighted that it can provide a practical knowledge and idea regarding this very aspect. Thus, this study is very much significant.

### Research aim

The purpose of the study is to identify the possibilities of the OSA treatment through the obesity medication on the people with higher BMI or obesity.

### Research objectives

- To identify the impacts of the obesity medication on the treatment of OSA among the obese people.
- To determine the feasibility of the treatment of OSA with obesity reduction medication.
- To recommend the most feasible and effective process of treatment for the obese people with OSA.

### Brief literature review

The most prevalent severe sleep condition in the world is obstructive sleep apnea (OSA) and the prevalence in the general population is between nine and 38 per cent [3]. OSA is characterized by bouts of repetitious hypoxemia and intermittent respiratory interruption, which cause oxygen de-saturation, sleep arousal and excessive day-time sleep [4]. OSA is characterized by a deep sleep obstruct [3]. OSA people generally do not know their status. Long-term OSA may lead to hypertension, cardiovascular illness, stroke, diabetes, metabolism of aberrant glucose and sudden death [5]. In both children and adults, links between increasing weight and OSA are well documented [4]. Obesity and morbid obesity in children enhance the severity of OSA in obese children and adolescents with a prevalence of OSA between 46 and 60% [5]. Since the levels of obesity have risen to pandemics, together with the OSA, the health system has a burden on both overweight and obese individuals [6]. While numerous research have been undertaken to study the prevalence and risk factors of OSA in various demographic groups such as children with OSA, the link between overweight and obesity has not been properly established [7]. Moreover, improvements and breakthroughs in respiratory measurement and categorization have been made throughout time, making it difficult to compare across research findings.

Several investigations have shown OSA to be involved with diabetes and metabolic disorders, stroke and cardiovascular illnesses and cancer [8]. Recurring airway obstruction, resulting in intermittent hypoxia, intrathoracic pressure changes and sleep fragmentation, might be a potential mechanism that leads to sympathetic activation, oxidative stress, inflammation and endothelial dysfunction [4]. A relationship between OSA and dental arch size has also been found in youngsters [8]. Previous trials have shown that OSA's common risk variables are obesity, age higher, male sex and hereditary factors [4]. The OSA-obesity link is mostly two-way: one is more obese in OSA patients and the other is high obesity prevalence in OSA patients [9]. The significant incidence of OSA obesity implies that OSA preventive and management intervention programs can play a role [4]. Continuous positive airway (CPAP), oral appliances and surgical procedures involve dietary modifications and lifestyles for OSA patients [9].

### Methodology overview

The current research aimed to investigate the link between obesity medicine and OSA (obstructive sleep apnea). In order to meet the research aim, the researcher proposed that primary study would be the right choice, as it would help to gather and analyze data from the real time resources that would improve credibility of the study. The researcher would thus conduct a cross-sectional study design for conducting the study. The research would be supported by "positivism philosophy and deductive approach", as both of these philosophical methods support primary empirical study, and helps the researcher to logically deduce objective and factual data and analyze those towards specificity in a scientific context [10]. The researcher would use "primary quantitative method" for collection and analysis of data

collected from resources. The researcher would use survey tool in this regards for gathering data from participants. The researcher would involve participants, who have long term condition of obesity, with high BMI index and takes regular medicines for controlling their condition. The researcher would use an online survey questionnaire and distribute it over online platform to gain feedbacks. The researcher would provide participant information sheet and consent form to every participant, for ensuring that they are aware of the purpose of their participants and no one is being manipulated or forced to participate. The data gathered from participants, would be analyzed using statistical analysis tool [11]. The researcher would use MS Excel tool for analyzing and estimating frequencies of participants’ response, so that the link between obesity medicine and OSA could be found. The researcher would represent those findings in tabular and graphical form. All the data collected from the participants, would be kept confidential and safe through the research process. For ensuring the same, the researcher would follow the “Data Protection Act 1998”. The research would be completed within 10 month.

**Results**

**Baseline and demographic characteristics**

From the demographic findings indicated in the above figure, it is evident that majority of the respondents were female (67.7%), but the researcher ensured that there was inclusivity in the overall findings and selection of subjects. Majority of the respondents were aged 45 years and above (40.6%), and it showed that the study would be credible as they understood the concept of diabetes and the medical treatment of such condition. In measuring the BMI status of the respondents, it was important to ensure that some of the respondents had a high BMI value. As such, there were 33.3% of the respondents with the BMI status being more than 32.

		Frequency	Percent	Valid Percent	Cumulative Percent
<b>Gender</b>	• Female	65	67.7	67.7	67.7
	• Male	31	32.3	32.3	100.0
	Total	96	100.0	100.0	
<b>Age</b>	• 18 to 25 years	19	19.8	19.8	19.8
	• 26 to 36 years	22	22.9	22.9	42.7
	• 36 to 45 years	16	16.7	16.7	59.4
	• 45 years and above	39	40.6	40.6	100.0
	Total	96	100.0	100.0	
<b>BMI status</b>	25 to 27	29	30.2	30.2	30.2
	28 to 30	21	21.9	21.9	52.1
	31 to 32	14	14.6	14.6	66.7
	More than 32	32	33.3	33.3	100.0
	Total	96	100.0	100.0	

**Table 1**

**Sleep apnea**

The study assessed the respondent’s sleep apnea, and this meant that they had experienced on the challenges of OSA. The findings indicated that most of the respondents (77.08%) did not have sleep apnea, with majority being women at 50 respondents. It was interest-

ing to understand their perception on the suffering of apnea condition, and the respondents claimed that they did not suffer regularly at 92.71%. This affected the credibility of the findings as it linked it to the issues affecting the population. Having this in place ensured that the researcher understood the challenges that affected the effectiveness of the findings of this study.

	Gender	No	Yes	Total
Do you have sleep apnea?	• Female	50	15	65
	• Male	24	7	31
	Percent	77.08%	22.92%	100%
Do you suffer from sleep apnea regularly?	• Female	60	5	65
	• Male	29	2	31
	Percent	92.71%	7.29%	100%

Table 2

		10-15 seconds	15-20 seconds	5 seconds	5-10 seconds	Total
How long does Sleep Apnea last?	• Female	3	2	53	7	65
	• Male	1	0	26	4	31
	Percent	4.17%	2.08%	82.29%	11.46%	100%
			1-5 times per hour	10 times and more	5-10 times per hour	Total
How often does Sleep Apnea happen?	• Female		53	10	2	65
	• Male		30	1	0	31
	Percent		86.46%	11.46%	2.08%	100%

Table 3

In the table provided above, the researcher aimed at determining the length in which sleep apnea will last, and this was critical in assessing the treatment plan for the obesity. From the findings, it is evident that majority of the respondents claimed that sleep apnea lasted for only 5 seconds (82.29%) with a small proportion of respondents (2.06%) stating that the sleep apnea lasted for between 15 and 20 seconds. In determining the frequency in which sleep apnea occurred, the findings indicate that majority of the respondents (86.46%) claimed that sleep apnea was experienced in 1 to 5 hours per more. Most of the respondents who supported this frequency of occurrence were female at 53 respondents.

**Diagnosis and treatment**

From the diagnosis of the diabetes, it is evident that majority of the respondents were not diagnosed (88.54%). Although they were not diagnosed with the condition, they understood the challenges that affect the individuals and influencing credibility of the findings. Interestingly, the findings indicated that the obesity reduction medication is not considered to be effective in the process of reducing sleep apnea (57.29%). However, 42.71% of the respondents claimed that obesity reduction medication is effective for the patients with sleep apnea.

	Gender	No	Yes	Total
Have you ever been diagnosed by a doctor because of Sleep Apnea?	• Female	57	8	65
	• Male	28	3	31
	Percent	88.54%	11.46%	100%
Do you think that the obesity reduction medication is effective in the process of sleep apnea reduction?	• Female	40	25	65
	• Male	15	16	31
	Percent	57.29%	42.71%	100%
Did you experience any betterment through the use of obesity reduction medication in your sleep apnea issues?	• Female	46	19	65
	• Male	24	7	31
	Percent	72.92%	27.08%	100%
Will you recommend obesity medication use for the sleep apnea issue reduction?	• Female	37	28	65
	• Male	15	16	31
	Percent	54.17%	45.83%	100%

Table 4

Further assessment aimed at revealing whether the obesity reduction medication improved the conditions of the patients and reduce the challenges sleep apnea. From the findings, it indicated that 72.92% had issues with the obesity reduction medication in which the treatment did not fully treat the patients with sleep apnea. Also, the table above indicated that 54.17% of the patients will not recommend obesity medication use for the sleep apnea issue reduction.

How much will you rate your issue of sleep apnea issue? (The scale is from 1 to 5 and 1 being less harmful and 5 is the worst case scenario)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	61	63.5	63.5	63.5
	2	7	7.3	7.3	70.8
	3	13	13.5	13.5	84.4
	4	6	6.3	6.3	90.6
	5	9	9.4	9.4	100.0
	Total	96	100.0	100.0	

Table 5

From the table above, it was interested to understand the individual’s perspectives and their rating on the sleep apnea issue. Majority of the respondents (63.5%) claimed that sleep apnea was less harmful, and this showed that people were less worried on the effects of sleep apnea as compared to other conditions.

**Discussion**

**Impacts of obesity medication on the treatment of OSA**

Obesity medication treatment has always been used to treating OSA patients. From the findings of this study, it indicates that majority of the respondents had not experienced sleep apnea with only 22.92% of the respondents having experienced this condition. As such,

it indicates that these study findings will be largely supported by the previous literature reviews as a way of increasing credibility and reliability of the findings. As noted in Dong, Xu, Wang, Cartledge, Maddison and Islam, being obese is characterized by problems in sleep disorders due to the weight characterizing such individuals [3]. As such, with the treatment of the weight of the patient, there is the possibility that the OSA will be addressed. However, this will only be achieved where the patient has intermittent sleep disorders and one is overweight. In some cases where OSA is not characterized by increased weight, the efficacy of the obesity medication in treating OSA will be questionable.

From the findings, it indicates that most people appreciate the role of the obesity medication in the treatment of OSA with 42.71% claiming that the condition can be best treated with the obesity medication. This has an implication on the overall treatment process and influences the reliability of the medication in addressing the current overweight problem. Galerneau, *et al.* indicates the symptoms characterizing the condition including positive pressure on the airways. This has an impact on the breathing of the patient, and it influences the overall impact of the treatment process among the individuals [1]. The narrowing of the upper airway is attributed to the accumulation of fat, and this can result to OSA. As such, when reducing the weight of the individual, it will directly affect the OSA and improve the conditions of the patient. This is necessary when assessing the outcome of the treatment plan undertaken by the individuals.

However, it is always necessary for the doctor to diagnose the condition and determine the correct treatment plan that should be given to the patients. Considering that the findings indicated that 88.54% of the respondents had not been diagnosed by the doctor, the response on the treatment given to the patient and the effect of the medication on the condition needs to be assessed further. Obesity medication cannot impact an individual where there is no diagnosing and treatment given to such patients and this creates a notion in which there is a need to integrate the views of the current respondents in making informed decision on the effects of obesity reduction medication on the treatment of OSA.

### Feasibility of the treatment of OSA with obesity reduction medication

Based on the findings and the information presented above on reliability of the study findings, it is necessary to rely on the information collected in determining the feasibility of the treatment of OSA using obesity reduction medication. From Perger, *et al.* diagnostic approach, understanding the issues affecting the treatment of OSA requires an assessment of the conditions that impacts the treatment of plan of OSA [4]. In most cases, Perger, *et al.* indicates that the treatment plan for OSA includes diet control, physical activity, and weight loss. Obesity is known to be characterized by low levels of activity, and this is the main impediment for the severity of the OSA [4]. As most of the symptoms of obesity are linked to OSA, it shows that the medication and treatment of obesity can be effective in decreasing the OSA condition. From the findings, it indicates that the respondents support the effectiveness of the treatment of OSA, and this helps in addressing the key symptoms that can affect an individual.

In support of the current findings, Becerra, Needleman, Noria and Bradley indicates that the conventional treatment of obesity is linked to the treatment of OSA using the continuous positive airway pressure (CPAP) [5]. This indicates that where the treatment of obesity is effective, there is the possibility that OSA will be effectively treated. Using the CPAP machine ensures that there is constant airflow being delivered to the airway of the patient through oral device, facial, and nasal. With the CPAP treatment, Noria and Bradley claims that the airway patency is improved even when the patient is sleeping. In improving functional status, OSA symptoms can be eradicated where the patient is continuously involved in the treatment using the obesity medication treatment [5]. The current findings support the views of the Noria and Bradley in indicating the significance of using the CPAP treatment method in increasing the efficiency and effectiveness of the treatment for the condition [5]. However, interesting findings indicate that the respondents ranked the issue of sleep apnea as less harmful in the society, and this demonstrated that people were interested in treating diabetes rather than apnea.

### Recommendations

From the literature reviewed and the findings of the current study, it is evident that there are effective processes that should be observed when treating obese people with OSA. One of the treatment strategies to be utilized is CPAP in which the machine that is utilized aims at delivering constant airflow to the patient's airway. According to AbdelMassih, *et al.* the symptoms of OSA can be relieved with the use of this treatment plan, and it improves the functional status of female and male patients. For the women having psychological changes especially during menopause or pregnancy, they can experience difference in sleep patterns that can result to OSA clinical manifestation [7]. Thus, patient should follow the recommended treatment regimen provided by the clinicians in reducing the possibility of the condition affecting the individuals negatively. The changing trends in the views and perceptions of the individuals regarding the treatment of the conditions should be incorporated in the current findings as this will influence the negative effect of such conditions on the individuals. Physicians' diagnosis can impact the overall health of the individuals, and this should be prioritized when dealing with different facets that impact the health of the individuals.

Another recommended and feasible process of treatment is the diet control, physical activity, and weight loss and this is associated with OSA. With the use of exercise, it ensures that the weight of the individual can decrease, fatigue level decreased, and anxiety can be managed. Sivanesan and Bhatti study indicates that neurocognitive capacities can be managed where the patient is involved in physical exercising, and this is critical for the OSA patients [9]. As OSA is comorbidity for obesity, exercising will be critical in reducing the weight of the patient, and this will lessen the obstruction in the airways. As such, it is always necessary to encourage the patients to be involved in physical exercising as a way of reducing the weight and fat content in the body and airways. Sivanesan and Bhatti indicate that addressing the eating disorder among the individuals can be critical in overcoming obesity and some of its comorbidities, and this is critical in improving the health of the patients [9].

Surgical procedures can be recommended for the patients with obese as this reduces weight of the individuals. As evident in the current study, BMI of the patients determine the diagnosis of patients with diabetes and OSA condition. As noted in Vaishali, *et al.*, where coping strategies involves weight loss, it is considered to be an effective OSA treatment and this is realized through exercising, diet changes, and medications of the conditions [6]. Surgical procedures ensure that the medical procedures utilized can be integral in addressing obesity comorbidities and improving the weight loss when treating the condition. Where dieting and exercising do not improve the condition, the alternative should be on surgical procedures in reducing weight. As such, it will be essential in treating patients with diabetes and its comorbidities.

### Conclusion

This study was aimed at identifying the possibilities of OSA treatment through the obesity medication on the people with higher BMI. The study indicated that the comorbidity of obesity is OSA, and this should be treated using effective treatment plan that can improve the health conditions of the patients. The literature review conducted indicates that obesity treatment can realize the treatment of OSA, and this is essential when addressing the current issues and challenges impacting the success of the operations. As such, the current study indicated that there are treatment plans in which the obesity reduction medication can improve OSA. These are essential in improving the conditions of OSA and enhancing the health situation of the individuals. The recommended treatment plan for the obese people with OSA includes CPAP medication, physical activity, and surgical procedures. All these are essential in addressing the treatment plan and effectiveness of the process. As such, following the treatment for obesity and articulating to the recommended strategies of OSA treatment, it will be essential in meeting the emerging needs of the individuals in the society.

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