



KNOWLEDGE ON PHYSIOTHERAPY MANAGEMENT OF SLEEP APNOEA IN PHYSIOTHERAPY STUDENTS

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ABSTRACT

Background: Obstructive sleep apnoea (OSA) is a sleep disorder characterized by repetitive episodes of upper airway occlusion. Obesity is one of the major risk factor for the development of OSA. This is a serious problem because undiagnosed and untreated OSA is associated with increased cardiovascular and cerebrovascular mortality and morbidity. Physiotherapy plays an important role in management of sleep apnoea by improving muscle tone and reducing weight.

Aim: To asses the knowledge on Physiotherapy management of sleep apnoea in Physiotherapy students.

Methodology: The study population consist of final year students, interns, and postgraduate students at Krishna Collage of Physiotherapy, Karad, Maharashtra. This is a survey based study on awareness of Physiotherapy management of obstructive sleep apnoea. A conventional sampling method was used to collect data from students about knowledge on Physiotherapy management of obstructive sleep apnoea. A specially designed questionnaire was used for data collection. Data of 161 students were collected and analysed. Different questions were asked to collect the data to conclude the awareness rate in Physiotherapy students. Questions were asked on knowledge, risk factor, complications and Physiotherapy management of obstructive sleep apnoea.

Result: Out of 161 participants 11(6.8%) had good knowledge and 150 (93%) had poor knowledge on sleep apnoea and its Physiotherapy management. And the total knowledge mean score is 2.702 ± 2.210 . The P value of overall knowledge regarding sleep apnoea and its Physiotherapy management is < 0.0001 .

Conclusion: This study concludes that the Physiotherapy students had poor knowledge regarding sleep apnoea and its Physiotherapy management. Therefore the knowledge of sleep apnoea in students is not enough to deal with a cases of OSA and in future the scenario should be changed , their level of knowledge on OSA should be improved to treat effectively. Lack of knowledge regarding sleep apnoea in Physiotherapy students indicate the need to update the

syllabus of sleep medicine and management, improve good clinical exposure which helps them in future to provide the patients with appropriate Physiotherapy management.

Keywords: Knowledge, Sleep apnoea, Physiotherapy management, Physiotherapy students

INTRODUCTION:

Obstructive sleep apnoea (OSA) is a sleep disorder characterized by repetitive episodes of upper airway occlusion during sleep. Reduction in the activity of genioglossus muscles at the onset of sleep, the tongue falls backward and people with mechanical properties of upper airway are prone to upper airway obstruction. The prevalence of OSA was found higher in males than in females. Globally, prevalence of moderate to severe OSA is found 20%.¹ According to survey conducted in an Indian population in 2018, found that the prevalence of OSA is 13.7%. In males, it is found higher(14.8%) than in females(12.9%).²

Obesity is the major risk factor for development of obstructive sleep apnoea.³ Fat deposition around the upper airway leads to pharyngeal airway collapse. The neck girth is the strongest factor of OSA and the mechanism associating obesity to OSA are complex. Neck girth of >17 inches in males and >16 inches in females leads to OSA. The neck girth is interrelated with the increased size of the parapharyngeal fat pads.⁴ Fat deposits inside of the upper airway and reduced lung volume, resulting in loss of caudal traction on the upper airway. Also deposition of fat around the abdomen result in reduced functional residual capacity, which leads to reduction in lung volume which cause tethering effect on the upper airway.⁵

The larger upper airway soft tissue of males be one of the factor contributing to the higher incidence of OSA in men as compared to women. Eventhough obesity is the major risk factor for OSA, 20% to 40% of sleep apnoea patients are not overweight.^{6,7} Enlarged or low placed soft palate and enlarged lymphoid tissue, low arousal threshold, and fluid around the upper airway also a risk factor for OSA. Episodes of apnoea increases with aging. Anatomical vulnerability to OSA will worsen with aging and appears fat deposition around the pharynx with aging. With aging, genioglossus negative pressure reflex appears to deteriorate. These anatomical and physiological changes results in increased upper airway collapsibility with aging.⁷

Some studies had clearly shows genetics is also a key risk factor for the development of OSA.^{8,9} Craniofacial abnormality, size of upper airway soft tissue, abnormalities in ventilator control, respiratory responses resistive loading at onset of sleep have a familial basis. Certain social factors like cigarette smoking, alcohol consumption are also a possible risk factor for development of OSA.¹⁰ These can alter the pharyngeal airway properties and increase the pharyngeal airway collapsibility of upper airway during the onset of sleep.¹¹

Sleep apnoea is a severe issue because under-diagnosed and under-treated OSA is related with increased cardiovascular and cerebrovascular mortality and morbidity.¹² OSA is an independent risk factor for atrial fibrillation in the absence of other underlying cardiac disorders. Acute apneic incidence results to hypoxia and hypercapnia, variation in thoracic pressure, increased sympathetic tone, and autonomic dysregulation. Chronic recurrence and abrupt alteration in

intrathoracic pressure lead to structural and functional atrial remodeling and cause atrial fibrosis. Several episodes of hypoxia and hypoxemia cause sudden death due to cardiac arrhythmias. Sleep apnoea episodes persuade a state of increased oxygen demand as well as a state of low oxygenation reserve due to insufficient of ventilation. This results to a state that nocturnal angina can be provoked by apnoea in coronary artery disease(CAD) patients.¹³

Hypertension is a major clinical problem in sleep apnoea patients. Study shown that prevalence of hypertension was found 67% in newly diagnosed OSA patients.¹⁴ Most of the sleep apnoea patients shows increased systolic and diastolic blood pressure and also increased blood pressure changes at onset of sleep and reduced baroreflex sensitivity. In general, high blood pressure changes and reduced effectiveness of cardiovascular control mechanisms may all leads to the increased cardiovascular risk in OSA.^{15,16}

In OSA patients, atrial fibrillation is one of the major risk factor stroke, mainly thromboembolic stroke.¹⁷ The severity of OSA and atrial fibrillation were directly proportional to stroke. Repetitive oxidative stress and vascular endothelial damage in sleep apnoea patients can cause CVD and stroke.¹⁸ Oxidative stress and inflammatory damage to blood vessel is not only caused by apneic-hypoxemic episodes but also due to stimulation of sympathetic system. The blood pressure is increased which results in platelet aggregation and further leads to damage of vascular endothelium which results in CVD and stroke.

Nasally applied continuous positive airway pressure (CPAP) is the medical choice of treatment for OSA. Researches shown that between 29% to 83% of sleep apnoea patients, who are receiving CPAP are non-adherent with therapy. Nevertheless, the acceptance rate of CPAP is 60% to 70%.¹⁹ Low adherence to CPAP lower the benefits obtained by patients receiving this treatment. Adherence is important to reduce cardiovascular morbidity. Another treatments including pharyngoplasty and mandibular advanced devices aims to correct the anatomical perturbations that leading to this collapse. These anatomical perturbations are caused by physiological dysfunction such as muscle hypotonia.

Physiotherapy plays an important role in management of sleep apnoea. Physical exercise is an important therapeutic program for weight reduction, which is very important to consider because obesity is one of the most crucial cause of OSA. Oropharyngeal exercises helps to improve the tone of muscles which keeps the upper airway open. Physiotherapy managements such as physical or oropharyngeal exercises improve the AHI and quality of life in patients with sleep apnoea, not only who use CPAP but also in the patients with low adherence to therapy. Respiratory muscle training increases the tone of pharyngeal dilator muscle which reduces the collapse of upper airway at the onset of sleep.²⁰

Physiotherapy students should be aware of the sleep apnoea and benefits of its management, by that in future they can incorporate them into their therapeutic strategies. The knowledge of physiotherapy students regarding sleep apnoea may give insight into their future ability to identify people with sleep apnoea and can also explain student education on this condition. This study is to asses awareness and knowledge of physiotherapy students regarding sleep apnoea and

its physiotherapy management and also by this we can give information to physiotherapy students regarding this condition.

METHODOLOGY:

This is a survey based study on awareness of Physiotherapy management of obstructive sleep apnoea. The study population consist of final years, interns and postgraduate Physiotherapy students of Krishna College of Physiotherapy, Karad, Maharashtra. An ethical clearance certificate was obtained by Ethical Committee of Krishna Institute of Medical Sciences, "Deemed To Be University", Karad, Maharashtra. Subjects in this study were chosen according to inclusion and exclusion criteria. The inclusion criteria were both males and females, students with age group of 21-25, final year Physiotherapy students, interns, postgraduate students and those who are willing to participate. Exclusion criteria were students with age above 25 , first year students, second year students, third year students and those who are not willing to participate. One hundred and sixty one Physiotherapy students were participated in this study. A conventional sampling method was used to collect data from students. A specially designed questionnaire was used for data collection. A Google form was created and circulated among groups via social media platform. Participants were asked to fill out the form and submit their responses.

Different questions were asked to collect the data to conclude the awareness rate in Physiotherapy students. The questionnaire contained demographic data such as name, age and gender. Questions were asked on knowledge, risk factor, complications and Physiotherapy management of obstructive sleep apnoea. Total fifteen questions were asked and each questions consisted of three options which was true, false and don't know. After collection of data, software Instat was used to analyse the data. Results were obtained and study aim was achieved.

RESULTS:

Analysis of data was done by calculating the mean and standard deviation. The participants' age range was 21 to 25 years. A total of 161 participants completed the questionnaire. Table 1 shown that out of a total 161 participants, 141 (87.57%) were female and only 20 (12.42%) were male. Tables 2 shown that majority of the participants were between the age group 20-21 (45.34%). Out of 161 participants, very few, 11(6.8%) had good knowledge and 150 (93%) had poor knowledge on sleep apnoea and its Physiotherapy management. And the total knowledge mean score is 2.702 ± 2.210 . The P value of overall knowledge regarding sleep apnoea and its Physiotherapy management is < 0.0001 , which was extremely significant.

TABLE 1: FREQUENCY AND PERCENTAGE OF GENDER DISTRIBUTION

Gender	N	Percentage
Female	141	87.57%
Male	20	12.42%

TABLE 2: FREQUENCY AND PERCENTAGE OF AGE DISTRIBUTION

Age	N	Percentage
20-21	73	45.34%
22-23	47	29.19
24-25	41	25.46%

Table 3 shown about the knowledge on sleep apnoea and its Physiotherapy management. Out of a total 161 students ,34 (21.11%) had knowledge about the term obstructive sleep apnoea and 33(20.49%) responded that reduction in tone of respiratory muscle cause OSA. Only 18(11.18%) students knew that obesity is one of the risk factor for the development of OSA. 45 (27.95%) students had responded that hypertension is a complication of OSA and 58(36.02%) students had responded that patient with OSA have increased risk of type 2 diabetes mellitus. 32 (19.87%) students had responded that OSA can lead to cardiac complications such as atrial fibrillation and cardiac arrhythmias.

28(17.39%) students had responded that people with OSA have increased risk of motor vehicle accidents. 33 (20.49%) had responded that it is important to educate the patient about his condition and exercises. Very few, 19(11.80%) students had responded that CPAP is the first line treatment of OSA. About 25(15.52%) students had responded that exercise tolerance test is necessary before treatment. Very few students, 8 (4.96%) knew that patients of OSA should be advised for weight reduction if they are obese. In addition, only 18 (11.18%) students were aware that physical exercise improve sleep efficiency and daytime sleepiness and 27(16.77%) responded that sleep hygiene in OSA patient can help to reduce their symptoms. Only 28 (17.39%) students had knowledge regarding oropharyngeal exercises , which improve the function of muscles that keeps the upper airway open and 29(18.01%) students responded that inspiratory muscle training is used as a supportive therapy with CPAP to provide better compliance rate.

TABLE 3: KNOWLEDGE ON PHYSIOTHERAPY MANAGEMENT OF SLEEP APNOEA

Questions	True (n)	Percentage (%)	False (n)	Percentage (%)	Don't know(n)	Percentage (%)	P value
Obstructive sleep apnoea (OSA) is a sleep disorder characterized by repetitive episodes of upper airway occlusion during sleep.	34	21.11%	122	75.77%	5	3.10%	<0.0001

Reduction in tone of respiratory muscles can cause OSA.	33	20.49%	113	70.18%	15	9.31%	<0.0001
Obesity is one of the major risk factor for the development of OSA.	18	11.18%	18	11.18%	125	77.63%	<0.0001
Hypertension is not a complication of OSA.	37	22.98%	45	27.95%	79	49.06%	<0.0001
Patients with OAS have increased risk of type 2 diabetes mellitus.	58	36.02%	78	48.44%	25	15.52%	<0.0001
OSA can lead to cardiac complications such as atrial fibrillation and cardiac arrhythmias.	32	19.87%	15	9.31%	114	70.80%	<0.0001
People with OSA have increased risk of motor vehicle accidents.	28	17.39%	89	55.27%	44	27.32%	<0.0001
Educating the patient about his condition and exercise is not so important.	8	4.96%	33	20.49%	120	74.53%	<0.0001
Continuous positive airway pressure(CPAP) is the first line treatment for OSA.	82	50.93%	19	11.80%	60	37.26%	<0.0001
Exercise tolerance testing is necessary before starting treatment in OSA patient.	25	15.52%	11	6.83%	125	77.63%	<0.0001
Patient of OSA should be advised for weight reduction.	8	4.96%	138	85.71%	15	9.31%	<0.0001
Physical exercise has nothing to do with sleep efficiency and daytime sleepiness.	40	24.84%	18	11.18%	103	63.97%	<0.0001
Sleep hygiene in OSA patient can help to reduce their symptoms.	27	16.77%	13	8.07%	121	75.15%	<0.0001

Oropharyngeal exercises improve the function of muscles that keeps the upper airway open.	28	17.39%	18	11.18%	115	71.42%	<0.0001
Inspiratory muscle training is used as a supportive therapy with CPAP to provide a better compliance rate.	29	18.01%	124	77.01%	8	4.96%	<0.0001

In table 4, knowledge is compared between both male and female, the mean score is 2.8 ± 2.067 and 2.687 ± 2.236 respectively ($p=0.8327$, which is not significant) and also compared among different age group students ($p=0.4029$, which is not significant).

TABLE 4: Statistical analysis

Demography	Knowledge		Unpaired t test/Anova value	p value
	Mean	Standard deviation		
Gender				
Male	2.8	2.067	0.2115	0.8327
Female	2.687	2.236		
Age				
20-21	10.273	2.501	0.9143	0.4029
22-23	9.574	3.091		
24-25	9.829	3.146		

DISCUSSION:

This study assessed the level of knowledge on sleep apnoea and its Physiotherapy management among Physiotherapy students. As a Physiotherapy student it is very important to know about sleep apnoea and its Physiotherapy management, as it is a fairly common disorder which leads to cardiovascular and cerebrovascular mortality, morbidity and quality of life . A proper knowledge on sleep apnoea, can reduce mortality and morbidity rate. The questionnaire was forwarded to final years, interns and postgraduate students in the Physiotherapy Institute. The duration of the study was 20 days. On the tenth and fifteenth day a reminder was sent to non respondents . The response rate was 90% . Out of 161 participants, 141(87.57%) were females and 20(12.42%) were males ($p=0.8327$). The number of participants in the age group 20-21 were 73(45.34%),

while in age group 22-23 were 47(29.19%), and age group 24-25 were 41 (25.46%) and the p value is 0.4029.

In the results of the present study, students had poor knowledge about sleep apnoea and its physiotherapy management ($p < 0.0001$). Out of 161 participants, only 6.8% had good knowledge and 93% had poor knowledge on OSA. Avi Choudhary et al. (2018), concluded that Physiotherapy students had negligible knowledge regarding obstructive sleep apnoea.²² Only 20% of the students know about the term sleep apnoea and only 1% of the student who knows about risk factors of sleep apnoea. No student had knowledge about treatment of sleep apnoea. In the present study, 21.11% of the students know about the term obstructive sleep apnoea and 11.18% students students knows about the risk factor of OSA. Very few students was aware that oropharyngeal exercise(17.39%) and physical exercises can reduce the symptoms of sleep apnoea(11.18%). This lack of knowledge is due to inadequate exposure in their undergraduate clinical curriculum, and never posted in sleep medicine department. Insufficient information in Physiotherapy curriculum regarding sleep disorders contribute to low level of knowledge, awareness, and confidence in physiotherapy students. The basic knowledge of OSA is considered essential to identify these patients for appropriate referral and treatment.

In this present study, only 27.95% of the students responded that hypertension is a complication of OSA. Study conducted by Reem. A. Alansari et al. (2020) among Dental interns shown that only 29% of the students known that hypertension is related to OSA.²³ Another study conducted by Obianuju B. Ozoh, shown that the level of knowledge regarding OSA among medical students at Nigerian University was optimal and only 44.8% students had known that hypertension is associated with OSA²⁴. This poor knowledge is due to limited education of sleep medicine topics in undergraduate curriculum. The undergraduate education did not prepare the students well on knowledge of OSA.

Awareness of sleep apnoea among Physiotherapy students is less than expected. Patients seeks medical attention for cardiovascular disease caused by sleep apnoea, but not for treatment of sleep apnoea. So students are not directly exposed to sleep apnoea and give management. Also sleep apnoea is not included in the curriculum, if included in the curriculum, then students will gain knowledge, patients will be diagnosed and treated early and delay the progression of sleep apnoea into cardiovascular conditions. Proper knowledge helps in management, reduction in progression of sleep apnoea to cardiovascular related conditions. This results of the study stresses that it is mandatory to include sleep apnoea in Physiotherapy curriculum.

CONCLUSION:

This study concludes that the physiotherapy students had poor knowledge regarding sleep apnoea and its physiotherapy management. Therefore the knowledge of sleep apnoea in students is not enough to deal with a cases of OSA and in future the scenario should be changed, their level of knowledge on OSA should be improved to treat effectively. Lack of knowledge regarding sleep apnoea in Physiotherapy students indicate the need to update the syllabus of sleep medicine and

management, improve good clinical exposure which helps them in future to provide the patients with appropriate physiotherapy management.

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