ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 03 | March - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARE THE EFFECT OF OROPHARYNGEAL EXERCISES VERSUS DEEP BREATHING EXERCISES TRAINING ON SNORING INTENSITY, FREQUENCY AND SLEEP QUALITY IN SNORING ADULTS

Physiotherapy

Dr. M. Praveen Kumar* (MPT in cardio-thoracic), College of Physiotherapy, SVIMS. *Corresponding Author
Dr. K. Madhavi MPT (CT), Ph.D., Professor & Principal, College of Physiotherapy, SVIMS.
Dr. M. Suresh Kumar MPT (CT), Faculty, College of Physiotherapy, SVIMS.
Dr. N. Kavitha MPT (CT), Faculty, College of Physiotherapy, SVIMS.

ABSTRACT

Background: Snoring is a breathing sound (or noise) that occurs during sleep and can be nocturnal or daytime. Loud upper respiratory breathing without apnea or hypoventilation due to pharyngeal tissue vibration. The aim of study was comparing the effect of oropharyngeal exercises vs deep breathing exercises training on snoring adults. **Objectives:** This study evaluates the compare oropharyngeal and deep breathing exercise on snoring intensity, frequency and sleep quality in snoring adults **Methodology:** A comparative study of 30 young male adults were randomized for 6week of treatment with nasal dilator strips plus deep breathing exercises in one group and daily oropharyngeal exercises in group. Patients evaluated by study entry and end by Berlin questionnaire and Pittsburgh sleep quality index. **Outcome Measures:** Snoring intensity and frequency is measured using Berlin questionnaire and sleep quality evaluated using Pittsburgh sleep quality index. **Result:** Statistically significant improvements have been observed in the oropharyngeal group BQ snore intensity and frequency improves in sleep quality . No significant changes in deep breathing group. **Conclusion:** Oropharyngeal exercises are effective in reducing subjectively measured snore intensity, frequency and improves in sleep quality.

KEYWORDS

Snoring, Oropharyngeal Exercises, Deep Breathing Exercises.

INTRODUCTION

Snoring is a breathing sound (or noise) that occurs during sleep and can therefore be nocturnal or daytime[1] The American Sleep Disorders Association (ASDA)[2] defined snoring as; loud upper respiratory breathing without apnea or hypoventilation due to pharyngeal tissue vibration. It can be classified as mild, moderate and severe depending on the effect, body position and other people (spouse).

The definition of snoring should also refer to the way sound and noise signals are measured[3] More specifically, snoring is characterized by gentle vibrations of the palate, pharyngeal walls, larynx and tongue[4]. In general, the pathological importance of snoring was related to its intensity (dB), maximum and average intensity of snoring, time (continuous or intermittent) and during sleep (snoring index: number of snoring per hour of sleep). frequency: number of snoring times snoring time per minute.

Prevalence And Incidence Of Snoring

Epidemiologically ,snoring is a very common condition. In an early population-based investigation extending to 5713 people, the prevalence of habitual snoring was found to be 19%, corresponding to 24.1% of the male and 13.8% of the female population[5]. In India, A study done in Delhi has the prevalence of Obstructive sleep apnea 13.7%[6].

Pathological Aspects Of Snoring

The passage of the upper airway is regulated by the action of several muscles that act as dilators or constrictors. The decrease in the transparency oforopharyngeal segment depends on the activity of three muscle groups. The pharynx, which extends from posterior nasal cavities and mouth to the larynx and oesophagus, has a muscular wall. There are five pharyngeal muscles, three of which are contractile and two are levatormuscles[3].

Under **pathophysiological** conditions, different sites of anatomical or functional narrowing from the nose to the throat are thus represented in all three segments. The segment that is usually folded is the second, i.e. the oropharynx. The following simultaneous **factors** are necessary to cause snoring: 1) sleep; 2) flow restriction 3) oscillatory structure represented by the soft palate and other soft parts of the oropharynx 4) decrease in UA CSA 5) thoracic bellows, which act on inspiratory pressure through suction [3].

The root **causes** of snoring is upper airway obstruction : 1) general causes (metabolism, obesity, hormonal causes and aging); Local causes (congenital and acquired)[3]

Upper airway resistance decrease with increasing lung volume and breathing rate[8,9] They increase when bending the head, blocking mucous membranes and especially during sleep[10] . Contraction of the UA dilator muscles during inspiration assumes a tendency to close the collapsible segment of the UA [11,12]. During sleep, the reduced activity of these muscles makes the two segments of the UA less stable and increased resistance.

Oropharyngeal Exercises:

Oropharyngeal exercises are a new, non-invasive and cost-effective treatment method that increases the strength of pharyngeal muscles. It corrects the posture, sensitivity and proprioception, as well as the tone and mobility of the orofacial and pharyngeal muscles. Oral exercises strengthen oropharyngeal muscles and increase their surface area, which widens the UA during sleep[13]

Deep Breathing Exercises:

Deep breathing exercises are non-invasive, cost-effective treatment. The purpose of respiratory muscle therapy is to improve the coordination of the muscles of the upper and lower airways and to increase the patency of the airways during sleep.[14].

Need Of The Study

Oropharyngeal exercises and deep breathing exercises helps to improve the sleep quality, airway muscle tone and reduce the disease severity. But few studies were done on the effectiveness of oropharyngeal exercises and Deep breathing exercises in reducing snoring severity and improving sleep quality.Hence the present study will be conducted to compare the effect of oropharyngeal exercises Vs Deep breathing exercises on snoring intensity, frequency and sleep quality in snoring adults.

Aim Of The Study

The aim of the studyis compare the effect of oropharyngeal exercises vs deep breathing exercises training on snoring intensity, frequency and sleep quality in snoring adults.

Objectives Of The Study

To evaluate the pre test and post test values of snoring intensity , frequency and sleep quality after oropharyngeal exercises training in snoring adults.

MATERIALS & METHODOLOGY

MATERIALS: Questionnaires, Weighing machine, Stadiometer , Inch tape.

METHODOLOGY:

Study design: Randomized clinical study (comparative study)

Study duration: 6 weeks

Sample collection& study setting: College of physiotherapy, Sri Venkateswara Institute of Medical Sciences (SVIMS).

Sampling method: Simple random sampling.

Sample size: 30samples.

Ethical approval: The present was approved by Institution ethics committee (IEC) of SVIMS wide reference number 1550/2023 Tirupati .

Inclusion Criteria

- Age – 20-60 years
- Males only
- BMI < 40 kg/m²
- Persons with snoring, fragmented sleep, witnessed apnea, daytime sleepiness.

Exclusion Criteria

- Subjects with CPAP therapy
- Age below 20 and above 60 years
- Obesity and BMI >40 kg/m²
- Neurological disease
- Severe obstructive sleep apnea, Abnormal large tonsils
- COPD
- Regular intake of alcohol, drugs and smoking
- Hypothyroidism, heart diseases
- Individuals who are not willing to participate are excluded from this study.

Outcome Measures

- BERLIN QUESTIONNAIRE is used to measure snoring frequency and intensity.
- Sleep quality evaluated by using PITT'S BURG SLEEP QUALITY INDEX

Study Methodology

Participants were randomly assigned into two groups GROUP – A and GROUP – B by lottery method. GROUP –A (15 subjects) – oropharyngeal exercise GROUP – B (15 subjects) – deep breathing exercise for 42 sessions over a period of 6 weeks. At the start of pretreatment and at the end of 6th week oropharyngeal 30 minutes of exercise duration per day for 6weeks in oropharyngeal exercises group(GROUP-A), and 8 minutes duration 3 times in a day for 6 weeks in deep breathing exercise group (GROUP B).

PROTOCOL

Oropharyngeal exercises training program (GROUP-A)

Soft palate :

- Pronounce an oral vowel intermittently (Isotonic contraction) for daily 3 min and Pronounce an oral vowel continuously (Isometric contraction) Daily for 3 min

Tongue:

- Scrubbing the tongue, right and left (15 repetitions)
- Place the tongue behind the front teeth and slide the tip back (3 mins)
- Sticking all the tongue to the palate and keeping the tongue in the same position (3 mins)
- Stick whole tongue on the palate and suck backwards (3 mins)

Facial muscles:

- Lips tightly closed (Isometric) for 30 sec
- Lips tightly closed with pressure to open (Isotonic) - 30 repetitions
- Sucking cheeks with lips closed (Isometric) for 3 mins
- Sucking cheeks with lips closed without isotonic exercises - 30 repetitions
- Single sided mouth corner elevation (Isotonic) Repeating 3x10 separately right and left
- Unilateral mouth corner elevation (Isometric) 3 x 30 sec
- Single sided jaw scrolls for left and right - 3 x 30 sec
- Hook the index finger in the form of a hook on the cheek against the index finger to the teeth (Isotonic) - 3 x 30 sec

Stomatognathic function:

- The patient was instructed to use forced nasal inhalation and oral expiration with vowel phonation. She was also instructed to open her lips and chin as much as possible in order to produce the longest possible 'A' sound. - 5 times
- Ballon inflation and oral inspiration followed by forced expiration. He was instructed to grasp the balloon with both hands while taking it in his mouth. He was asked to breathe deeply through his nose and inflate the balloon without inflating his cheeks - 5 times

Swallowing and chewing:

Bilateral chewing and swallowing using the palate, tongue, teeth closed around the mouth without contraction of bread, chewing bread and then swallowing.

Deep breathing exercises (GROUP-B)

Deep breathing through the nose while sitting. The patients were instructed to perform the same procedure at home three times a day (8min). Plus, nasal lavage with application of 10ml of saline in each nostril three times a day. When consuming meals they advised to chew on both sides.

Statistical Analysis & Results

Statistical analysis has been carried out to analyze the significant impact of snoring intensity, frequency and sleep quality using SPSS (version 29.0) for windows. Microsoft excel was used to generate graphs and tables. All the 30 Participate data were analyzed by intention to treat. All continuous data were assessed for normality. Continuous data was describe using mean (SD) if normally distributed median. Difference in the outcomes were compared within and between the groups of P-value of <0.05 will be considered statically.

Demographic data

TABLE 1: Shows the categorization of the subjects according to Demographic Data- Descriptive statistics in both the groups

Column1	N	Minimum	Maximum	Mean	Column2	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Age	30	19	39	24.90	.823	4.506
BMI	30	16.00	31.00	23.1667	.54895	3.00670

Table 2 : Comparison of pretest and post test values of outcome measures of Group A and Group B

s.no	Out come measures	GROUP A			GROUP B		
		$\chi 2$	difference	P - value	$\chi 2$	difference	P -value
1	Neck circumference	168.750	156	0.23	127.500	120	0.303
2	Abdominal circumference	168.750	144	0.08	120.000	80	0.003
3	Snoring intensity	21.43	6	0.002	11.88	4	0.02
4	Snoring frequency	35.580	16	0.003	35.580	16	0.003
5	Sleep quality	126.667	81	0.001	93.750	80	0.140

The above table shows mean and standard deviation values of neck and abdominal circumference, snoring intensity and frequency, sleep quality before and after the treatment in both the groups.

DISCUSSION

This randomized controlled study is done to compare the effect of oropharyngeal exercises and deep breathing exercises in snoring adults.Statistically analysis reveals that 30 subjects were randomly divided into Group-A (oropharyngeal exercises) and Group-B (deep breathing exercises). snoring intensity, frequency and sleep quality is evaluated using Berlin questionnaire and Pittsburgh sleep quality index.

The mean neck circumference decreased after 6 weeks of

oropharyngeal exercises therapy but not was found Statistically non-significant (p value 0.23). Guimaraes et al. also reported a same result. Mean snoring intensity and frequency was also decreased after 6 week of oropharyngeal exercises therapy which was found to be Statistically. Mean sleep quality was improved after 6 weeks of oropharyngeal therapy which was found to be Statistically.

In their studies about snoring in OSAS , Ieto et al.Guimaraes et al. and sleep quality applied oropharyngeal exercises for 3 months and nasal dilator bar given to the control group. During the evaluation snoring level was measured with berlin questionnaire, sleep with ESS, and quality of sleep with PSQI. At the end of the treatment, the snoring had reduced and quality of sleep had improved. The neck circumference of patients randomly assigned to oropharyngeal treatment was significantly lower.

Tongue muscle training during the daytime for 20 minutes twice a day for 8 weeks reduced snoring, but did not change AHI significantly in a randomized controlled study. A recent trial found that in patients with moderate OSAS 4 months of training of the upper airways by didgeridoo playing reduced daytime sleepiness, snoring, and AHI. Patients with OSAS typically had elongated and floppy soft palate and uvula, enlarged tongue, and inferior displacement of the hyoid bone. Independent of the possible health problems aggravated by snoring, most patients with mild forms of OSA had some degree of social burden generated by snoring.

The prevalence and significance of snoring in the general population varies widely in epidemiological studies (from 15 to 54%). To estimate the percentage of young Indian adults having risk of developing OSA in future. According to a questionnaire-based study conducted by Pattanaik et al., the overall prevalence of OSA in the 18–70 age range was 13.7%, while the prevalence was 12% in the 18–29 age group..Additionally, it was reported that men were two to three times more likely than women to have OSA, and this has been connected to differences in sex hormones and patterns of fat distribution.

Moreover, it has been reported that males are genetically more prone for snoring as suggested by a study which says self-reported symptoms of snoring and daytime sleepiness in older men have a genetic basis .3 months of oropharyngeal exercises significantly reduced both the frequency of snoring by 36% and the total power of snoring by 59%.

Limitations

- Small sample size
- Short duration study

CONCLUSION

The present study concluded that oropharyngeal exercises had significant effect on snoring intensity, frequency and on quality of sleepin snoring individuals than the deep breathing alone. The results suggest that the set of oropharyngeal exercises is alternative method for the treatment of snoring.

Recommendations

- Long duration follow up may be require to find out the further effect of oropharyngeal exercises.
- More combination of other methods with the present study can be done.
- Study can be conducted on large group of population.

REFERENCES:

1) Dalmasso, F., Benedetto, G., Righini, G., & Spagnolo, R. (1989). Snoring sound analysis and acoustic tube model of upper airway. In Proceedings of the 14th International Conference on Lung Sounds, Winnipeg.
2) Thorpy, M. J. (1990). Classification of sleep disorders. Journal of Clinical Neurophysiology, 7(1), 67-82.
3) Dalmasso, F., &Prota, R. (1996). Snoring: analysis, measurement, clinical implications and applications. European Respiratory Journal, 9(1), 146-159.
4) Lugaresi, E., Cirignotta, F., & Montagna, P. (1988). Pathogenic aspects of snoring and obstructive apnea syndrome. PubMed, 118(38), 1333–1337.
5) Lugaresi, E., Coccagna, G., & Piana, C. (1980). Some epidemiological data on snoring and cardiocirculatorydisturbances. SLEEP, 3(3–4), 221–224.
6) Sharma, S. K., Kumpawat, S.(2006). Prevalence and risk factors of obstructive sleep apnea syndrome in a population of Delhi, India. Chest, 130(1), 149–156
7) Hyatt, R. E., & Wilcox, R. E. (1961). Extrathoracic airway resistance in man. Journal ofApplied Physiology, 16(2), 326–330.
8) Spann, R. W., & Hyatt, R. E. (1971). Factors affecting upper airway resistance in conscious man. Journal of Applied Physiology, 31(5), 708-712.
9) Ferris Jr, B. G., Mead, J., & Opie, L. H. (1964). Partitioning of respiratory flow resistance in man. Journal of Applied Physiology, 19(4), 653-658.
10) Strohl, K. P., Hensley, et al (1980) Activation of upper airway muscles before onset of inspiration in normal humans. Journal of Applied Physiology, 49(4), 638–642.
11) Sauerland, E. K., Orr, W. C., & Hairston, L. E. (1981). DMG patterns of oropharyngeal muscles during respiration in wakefulness and sleep. Electromyography and clinical neurophysiology, 21(2-3), 307-316..
12) Friedman, M., Schalch, et al (2008, February). Palatal implants for the treatment of snoring and obstructive sleep apnea/hypopnea syndrome. Otolaryngology–Head and Neck Surgery, 138(2), 209–216.
13) Brien Hsu, Emperumal, C. P., Grbach, V. X., Padilla, M., & Enciso, R. (2020, May 15). Effects of respiratory muscle therapy on obstructive sleep apnea: a systematic review and meta-analysis. Journal of Clinical Sleep Medicine, 16(5), 785–801.