

A Study to Analyse the Effect of Oropharyngeal Exercise Along With Position and Lifestyle Modification for Snoring

T. BHARANEEDHARAN¹, S. KOUSHALYAA²

¹Professor in Physiotherapy, Sri Venkateshwaraa college of Physiotherapy, Puducherry,

²BPT Intern, Sri Venkateshwaraa college of Physiotherapy, Puducherry
Affiliated to Pondicherry University

ABSTRACT

Background: The effect of oropharyngeal exercise testing as an intervention on reducing the snoring intensity.

Methodology: Adults of age group between 30-55 years, 10 subjects were taken and assessed with stop-bang questionnaire to analyse their risk level of snoring. Intervention used were oropharyngeal exercise training using flute with a resistance, the study duration was 2 months, 5 sessions/week for 15-20 minutes of duration with an Outcome measure of STOP-BANG questionnaire and Berlin questionnaire.

Results: : The paired 't' test data between pre and post intervention within the group is STOP-BANG QUESTIONNAIRE (10.77598; $p > 0.0001$) and Berlin questionnaire (6.12794; $p > 0.0001$)

Conclusion: This study concluded that the oropharyngeal exercise programme shows very significant effect on reducing the intensity of snoring.

Key Word: Oropharyngeal exercise, berlin questionnaire, Obstructive sleep apnea.

Date of Submission: 07-06-2022

Date of Acceptance: 23-06-2022

I. Introduction

Snoring is a rough rattling noise made on inspiration during sleep by vibration of soft palate and uvula caused by collapse of upper airway. Snoring has received increased attention in recent years. Given its high prevalence and impact on quality of life.¹ Patients may have normal lungs and daytime respiratory function but during sleep they may have abnormality of ventilatory drive or upper airway obstruction.¹¹ Snoring is suspected sleep apnea and most frequent causes were reported on sleep study, that loud snoring occurs only in supine position.

Recurrent airway obstruction during sleep sufficient to cause sleep fragmentation that affects 2% of women and 4 % of men of aged 30 to 60 in Caucasian population.¹¹ A survey had addressed the issue of whether snore is associated with hypertension. Cross sectionally snore is associated with obesity, age, physical inactivity⁸ Epidemiologically the worldwide prevalence of snoring in adults ranges from 2 to 86% with high prevalence of age group between 45-54 where that includes 62% male and 45% female¹, it is said to be that 67.9% male and 32.1% of females are prone to snoring as per the Indian population.¹¹ Incomplete obstruction causes turbulent flow result in snore in 44% of men and 28% of women under age group of 30 -60 years.¹² It is said to be that during sleep muscle tone declines, impairs the ability of those muscles to maintain pharyngeal patency.¹² Predisposing factors to hyponoea syndrome include male gender which doubles the risk and obesity which is found about 50% because the parapharyngeal fat deposit tends to narrow the pharynx. Alcohol and sedative lifestyle predispose to snore and apnea by relaxing the upper airway dilating muscles.¹² Universally excessive day time sleep is the principal symptom of snore.

The general management of snore is by administering CPAP delivered by nasal mask every night to splint the upper airway open, meantime Mandibular advancement devices that fit over the teeth to hold the mandible forward thus opening the pharynx¹³ It is said that the surgical procedure like Somnoplasty, Tonsillectomy are the minimally invasive procedure done by reducing the soft tissue in upper airway, removal of tonsils to prevent snoring .It is said to be the patients who had undergone myofunctional therapy had reduced in snoring intensity⁴ whereas playing didgeridoo had decreased snore and hyponoea index in patients with upper airway obstruction.

II. Material And Methods

This prospective comparative study was carried out on patients of Department of Physiotherapy at Sri Venkateshwaraa medical college hospital and research centre, Puducherry. A total 10 adult subjects (both male and females) of aged 35 -55, years were for in this study.

Study Design: A Pilot study

Study Location: Department of physiotherapy, SVMCH&RC Ariyur, Puducherry.

Study Duration: 6 months

Sample size: 10 patients.

Inclusion criteria:

- Ages between 35 -55 years.
- Both males and females were included.
- STOP-BANG Score: 4 & above.
- Berlin questionnaire is positive in 2 categories.

Exclusion criteria:

1. Individuals with narrowed lateral airway.
2. Nasal problems
3. Individuals with Upper respiratory tract or Lower respiratory tract infection.
4. Any recent neck surgery
5. Presenting with any ENT disorders.

Procedure methodology:

Subject who had fulfilled the inclusion criteria were included in this study. The benefit of the study and treatment were explained to the subject and written consent was taken. The subject is assessed by STOP-BANG questionnaire and Berlin questionnaire. Here the oropharyngeal exercises were given along with position modification by assessing their position during sleep by a supportive Bed partner questionnaire. After the assessment subject is explained and self-demonstrated the techniques to be done by the investigator.



Fig.1 Initial Assessment



Fig.2 Neck circumference assessment using inch tape

After the assessment subject is explain

As a warm up session, the subject is comfortably seated and follows the series of procedure:

- a. Subject inhales a gulp of air as per their capacity and exhales it in an open mouth.
- b. After that, the subject is instructed to take a deep breath and blow a balloon while exhalation as much as they can at a single stretch.
- c. Then the subject is instructed to inhale through left nostril and exhale through the right.



Fig 3. Represents the warm up Oropharyngeal exercise.
MODIFIED WIND INSTRUMENT FOR OROPHARYNGEAL EXERCISE TRAINING

After the warm up session the subject is instructed to blow the hole draped flute along with a balloon is given as resistance at the otherend of the flute, and he/she is asked to practice circular breathing.



Fig 4 - Day 1 Oropharyngeal Training



Fig 5 - 2nd Week Oropharyngeal Training



Fig 6 - 4th Week Oropharyngeal training



Fig 7 - Position Modification

FREQUENCY	20minutes/day 5days/week for 4 weeks
INTENSITY	As patient tolerance level
TIME	20 minutes a day
TYPE	Active

Table 1: FITT principle on Oropharyngeal exercise training.

Statistical analysis:

In this study, pre and post interventional differences within the group were analyzed using paired t test. Statistical significance was set at $p < 0.05$. Statistical analysis was verified using the SPSS software window version 08.

III. Result

The Mean and Standard deviation of Pre-test and Post-test values of STOP-BANG and Berlin Questionnaire were listed here;

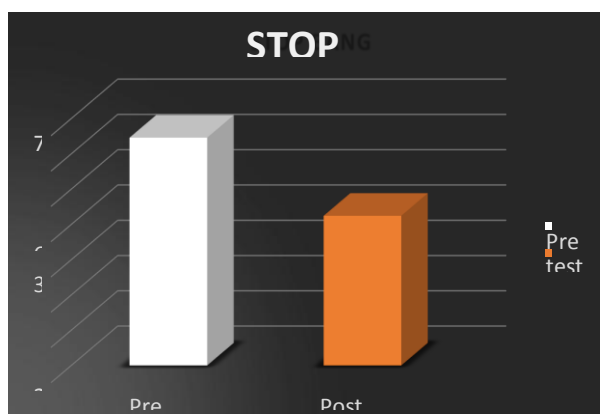
STOP-BANG QUESTIONNAIRE: The Mean and SD of STOP-BANG questionnaire for Pre-test and Post-test values are 5.3 ± 1.15950 and 3 ± 1.24721 and the 't' value is 10.77598. The statistical analysis is done with paired 't' test within the group shows the significance of ($p < 0.0001$).

BERLIN QUESTIONNAIRE: The Mean and SD of Berlin questionnaire for Pre-test and Post-test values are 2.3 ± 0.67498 and 1.2 ± 0.42763 and the 't' value is 6.12794. The statistical analysis is done with paired 't' test within the group shows the significance of ($p < 0.0001$). After the statistical analysis, it shows that there is reduction in the intensity and the events of snoring, hence it has been concluded that the oropharyngeal exercise along with position and lifestyle modification shows very significant improvement in reduction of intensity and events of snoring hence this shows the significance to the alternative hypothesis.

WITHIN THE GROUP ANALYSIS OF STOP- BANG QUESTIONNAIRE:

Table 2: Showing the pre and post -test values:

GROUP	Mean	SD	't' value	'p' value
Pre test	5.3	1.159	10.77598	< 0.0001
Post test	3	1.247		

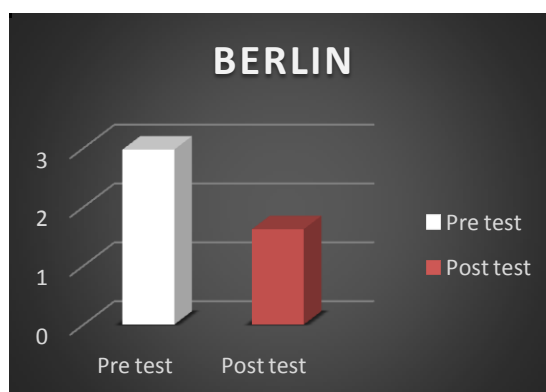


Graph -1 showing the pre- test and post- test values of STOP-BANG questionnaire

WITHIN THE GROUP ANALYSIS OF BERLIN QUESTIONNAIRE

Table 3: Showing the pre and post- test values:

GROUP	Mean	SD	't' value	'p' value
Pre test	2.3	0.6749	6.12794	p< 0.0001
Post test	1.2	0.4276		



Graph -2: Showing the pre- test and post- test values of BERLIN questionnaire:

IV. Discussion

The present study is the pilot study conducted to find out the “Effect of oropharyngeal exercise along with position and lifestyle modification for snoring” among snorers. According to *Boris. A. Stuck, al*; This study was selected for the purpose to reduce the snore intensity. We selected adults as our target population because it is already established that 72% of subjects with snore were the adults. The subjects were selected on the basis of inclusion criteria and they were assessed using the outcome measure such as STOP-BANG questionnaire and Berlin questionnaire used by *Ahmed. S. Bahammam in 2015* and by *Surapon Suksakorn in 2014*. The outcome measures have shown the significant improvement in the relief of snore intensity when compared to Pre-test values. None of the participants reported aggravation of symptoms or discomforts during the treatment session.

In this study 10 subjects were taken in a single group and done with oropharyngeal exercise and position modification along with some lifestyle changes shows the reduction in the snore intensity. As we discussed earlier in the Introduction that the snore intensity is higher in subjects who always use supine lying ie;

the avoidance of supine position is one of the beneficial behavioral therapy for subjects, hence this can be modified by adopting a slight elevated upright position (15°) to reduce the events of snoring according to **Arie Oksenberg** in 2005. The modified flute is used in this instead of Didgeridoo instrument, as a trail, here the subjects feel better during the 2nd week itself, that they can able to blow the balloon attached to the flute. This study was conducted to find out the “Effect of oropharyngeal exercise along with position and lifestyle modification for snoring”. A standard measurement tools were utilized to evaluate the effectiveness of the treatment. The values of STOP-BANG questionnaire and Berlin questionnaire scores showed a significant improvement in reducing the intensity of snore. Hence, the Null Hypothesis is rejected and the Alternative hypothesis is proved to be effective in snoring population.

V. Conclusion

From this study it was concluded that, the oropharyngeal exercises training, along with position and lifestyle modification is effective in reducing the intensity of snoring.

References

- [1]. **Boris.A.Stuck, Alfred Drecher, Clemens Heiser, Michael Herzog** et al.: Diagnosis and treatment of snoring in adults-S2k guideline of the German society of Otorhinolaryngology, Head and Neck surgery: *Sleep breath* 2015; 19(1):135-148. DOI 10.1007/s11325-014-0979-8 13 April 2014.
- [2]. **Milo A Puhon, Alex Suarez, Alfred Zahn, Otto Braendii, Markus Heitz, Christian Lo Cascio**: Didgeridoo playing as alternative treatment for obstructive sleep apnoea syndrome: Randomized controlled trail. *BMJ*.2006;332(7536):266-270. doi 10.1136/bmj 38705.470590.5 23 December 2005.
- [3]. **Arie Oksenberg, Natan Gadoth.**: Continuous and Loud Snoring only in Supine Posture. *Journal of clinical sleep medicine Vol 11, No 12, 2005.*
- [4]. **Macario Camacho, Chirstian Guilleminault, Justin. M. Wei, Sungjin. A. Song** et al: Oropharyngeal and tongue exercises (myofunctional therapy) for snoring: a systemic review and meta-analysis. *European Archieves of Oto-Rhino-Laryngology* 2018;275(4):849-855.doi10.1007/s00405-017-4848-5 23 December 2005.
- [5]. **Richard. E.Gliklich, Pa-Chun Wang.** Validation of snore outcomes survey for patients with sleep disordered breathing. *Arch otolaryngol head and neck surgey* 2002;128(7):819-824.doi10.1001/archotol.128.7.819
- [6]. **Ahmed.S.BaHammam, Alaa.M, Al-Aqeel, Alanoud.A, Ghaida.I** et al. The Validity and Reliability of an Arabic Version of the STOP-bang Questionnaire for identifying Obstructive Sleep Apnea. *The Open Respiratory Medicine Journal*, 2015, 9,22-29.
- [7]. **Surapon Suksakorn , Pimon Rattanaumpawn, Wish Banhiran, Nitipatana Cherakul** et al.: Reliability and Validity of a Thai Version of a Thai Version of the Berlin Questionnaire in patients with Sleep Disordered Breathing. *J Medical Assoc Thai* 2014;97 Vol.97 Suppl. 3: S46-S56.
- [8]. **E. Lindberg, C. Janson, T. Gislason, K. Svardsudd, J. Hetta, G. Boman.**: Snoring and Hypertension: 10year follow up. *European Respiratory Journal* 1998; 11 (4): 884-889.doi 10.1183/09031936.98.1104088
- [9]. **Catherine. L. Davis, Joseph Tkacz, Mathew Gregoski, Colleen.A. Boyle and Gordana Lovrekovic.** Aerobic Exercises and Snoring in Overweight Children: A Randomized Controlled Trail. *Obesity Vol.14, No 11 November 2006.***A.Elmasry ,**
- [10]. **C.Janson, E.Lindberg, T. Gislason, M.A Tageldin and G.boman.**The role of habitual snoring and obesity in the development of diabetes: a 10- year follow up study in a male population. *Journal of internal medicine* 2000:248(1):13-20.doi10.1046/j.1365-2000.00683.x
- [11]. **Abhijeet Singh et al.,** A study to estimate prevalence and risk factors of obstructive sleep apnoea syndrome in a semi urban Indian population. *Monaldi Arch Chest Dis.* 2017;87(1):773.Published May 18 2017

T. BHARANEEDHARAN, et. al. “A Study to Analyse the Effect of Oropharyngeal Exercise Along With Position and Lifestyle Modification for Snoring”. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*, 11(03), 2022, pp. 17-21.