

Effect of Oropharyngeal Exercises on Snorers

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Abstract: *This study investigates the efficacy of oropharyngeal exercises in mitigating snoring intensity, frequency, daytime sleepiness scale, and sleep quality scale. Sixty participants were divided into two groups, one incorporating oropharyngeal exercises alongside lifestyle adjustments, while the other solely focused on lifestyle modifications. Significant enhancements were observed in daytime sleepiness, sleep quality, and snoring frequency and intensity for the Experimental Group only. Neck Circumference showed no improvement in either of the two groups. These findings underscore the effectiveness of oropharyngeal exercises and lifestyle modifications in ameliorating snoring and associated issues.*

Keywords: Oropharyngeal Exercises; Snoring; Daytime sleepiness; Sleep quality; Lifestyle modifications; Efficacy; Mitigating; Frequency; Intensity; Neck circumference

1. Introduction

The prevalence of snoring, attributed to obstructed airflow, has surged alongside sedentary urban lifestyles, precipitating a host of health concerns. Despite its pervasive nature, snoring often evades proper recognition as a medical issue, despite its association with risk factors such as obesity, alcohol use, smoking, and anatomical predispositions, predominantly among males. Left unchecked, snoring can progress to sleep apnea, exerting profound effects on daily functionality, work efficiency, and interpersonal dynamics. Treatment typically entails lifestyle adjustments and muscle - strengthening exercises aimed at maintaining upper airway integrity. With India witnessing a rise in snoring risk factors, there is mounting apprehension regarding a potential upsurge in sleep apnea cases and ensuing societal repercussions. Exploring the therapeutic potential of physiotherapy, notably oropharyngeal exercises, emerges as a promising avenue in tackling sleep disorders, warranting further scrutiny and investigation.

Oropharyngeal Exercises: Exploring Therapeutic Interventions

In a randomized controlled trial conducted by Guimaraes et al, obstructive sleep apnea patients were subjected to oropharyngeal exercises over 3 months, resulting in notable reductions in snoring frequency and an improvement in overall sleep quality. Similarly, Milo et al's investigation into the effects of didgeridoo playing among snoring and sleep apnea patients revealed significant enhancements in daytime alertness and quality of life.

Furthermore, Winfried et al's trial focusing on tongue training showcased promising outcomes, with participants experiencing decreased snoring levels amidst obstructive sleep apnea. Bailey et al introduced an innovative upper airway exercise regimen incorporating sucking, swallowing, chewing, breathing, and speech exercises, aiming to bolster upper airway patency and mitigate snoring.

Additionally, Guimaraes et al delved into the therapeutic benefits of phonoaudiology in augmenting upper airway

muscle tone, providing further insights into potential interventions for snoring and related sleep disorders. These studies collectively highlight the diverse array of oropharyngeal exercises and their potential efficacy in addressing snoring and sleep apnea, underscoring the significance of exploring novel therapeutic avenues in this domain.

Aim of the study

This study aims to investigate the effect of oropharyngeal exercises on individuals who snore.

Objectives of the study

- To assess the impact of oropharyngeal exercises on daytime sleepiness.
- To evaluate the effect of oropharyngeal exercises on sleep quality.
- To analyze the influence of oropharyngeal exercises on snoring frequency and intensity.
- To examine the effect of oropharyngeal exercises on neck circumference.

Research Hypothesis

There is significant improvement in oropharyngeal exercises in daytime sleepiness, sleep quality, snoring frequency and intensity, and neck circumference in people who snore.

Research Design:

Experimental study design with pre and post - test.

Sample Technique:

A convenient sampling technique was used.

Sample Size:

In total, 60 patients were taken in this study. Divided into two groups - experimental and control group.

- The control group consists of 30 subjects.
- The experimental group consists of 30 subjects.

Sample Setting:

Patient's home setting.

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Variables:

a) Independent variables -

- Oropharyngeal Exercises

b) Dependent variables -

- Daytime sleepiness scale
- Sleep quality scale
- Snoring frequency
- Snoring intensity
- Neck circumference

Selection Criteria

a) Inclusion Criteria:

- Age range: 35 - 55 years
- Gender: both men and women
- Snoring Frequency: Berlin Questionnaire rating between 1 and 4

b) Exclusion Criteria:

- Absence of craniofacial abnormalities
- Infrequent use of hypnotic medications
- Absence of neuromuscular disorders
- No recent nasal infections

2. Procedure

Subjects meeting the inclusion criteria are enrolled and provided informed consent. They are then randomly assigned to either the experimental or control group. Subjects receive explanations about the condition and undergo pre - test assessments. Group B receives lifestyle modification suggestions, while Group A undergoes oropharyngeal exercises demonstrated directly and through audio - visual aids, along with lifestyle modifications. Subjects are provided with handouts and CDs for home exercise guidance. Regular encouragement and motivation are provided through weekly check - ins. Post - test assessments are conducted after 6 weeks.

Intervention Protocol

In every session, participants engage in oropharyngeal exercises involving tongue, facial, and functional movements, along with lifestyle modifications and a brief recap of the previous session.

Intervention For Control Group

Patients are recommended to make lifestyle changes for a brief period, which has been noted to impact snoring in individuals.

Intervention For Experimental Group

Involves oropharyngeal exercises encompassing lingual, facial, and functional movements.

3. Data Analysis & Interpretation

- a) Statistical analysis of Pre - test and post - test in Control Group
 - Wilcoxon signed - rank test was performed to find the difference between Pre - test and Post - test scores. 5% significance level was observed.
 - Tabular form -

b) Daytime Sleepiness Scale

	Mean	S. D	N	p Value
Control Pre - Test	13.433	2.5554	30	P > 0.001 (not significant)
Control Post Test	13.433	2.5554	30	

c) Sleep Quality

	Mean	S. D	N	p Value
Control Pre - Test	11.833	1.9134	30	P > 0.001 (not significant)
Control Post Test	11.833	1.9134	30	

d) Snoring Frequency (SF)

	Mean	S. D	N	p Value
Control Pre - Test	3.400	1.1017	30	P > 0.001 (not significant)
Control Post Test	3.400	1.1017	30	

e) Snoring Intensity (SI)

	Mean	S. D	N	p Value
Control Pre - Test	2.967	0.764	30	P > 0.001 (not significant)
Control Post Test	2.967	0.764	30	

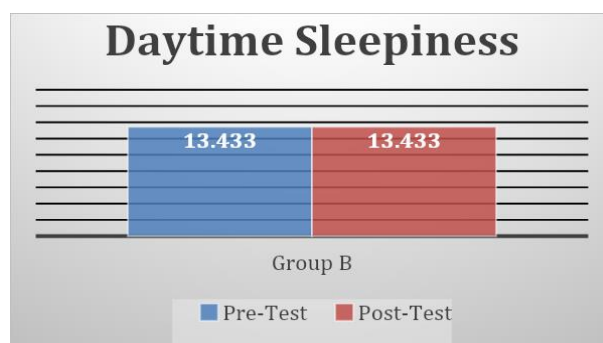
f) Neck Circumference

	Mean	S. D	N	p Value
Control Pre - Test	33.323	1.9388	30	P > 0.001 (not significant)
Control Post Test	33.323	1.9388	30	

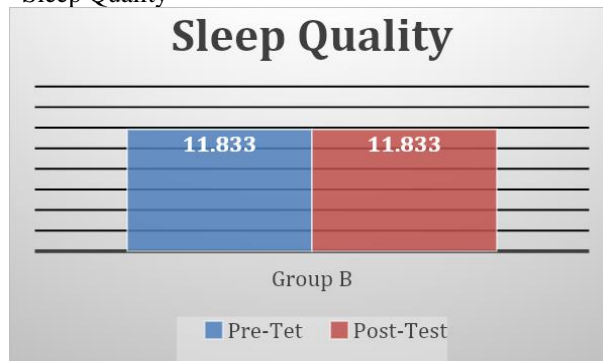
- Since the p value of 0.001 is greater than 0.05 alternate hypothesis is rejected. Therefore there is no significant differences between pre - test and post - test scores in the Control Group of snorers. This suggests that the intervention received by the control group did not have significant improvement.

g) Graph form - Draw

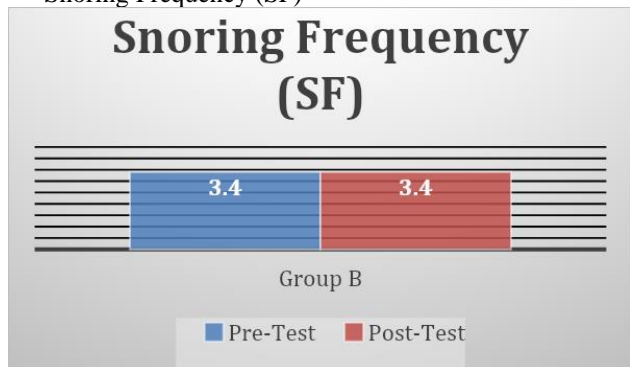
- Daytime Sleepiness Scale



- Sleep Quality



• Snoring Frequency (SF)



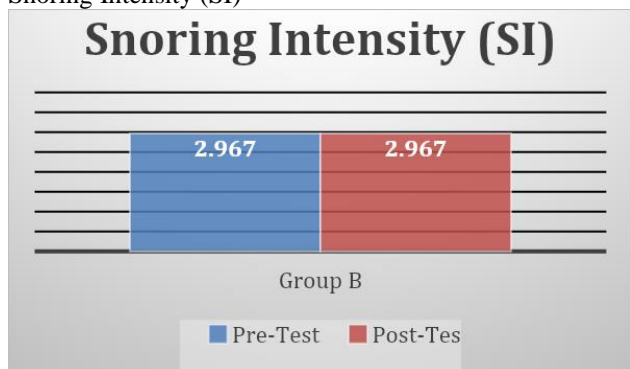
Snoring Frequency (SF)

	Mean	S. D	N	p Value
Experimental Pre - Test	3.258	1.0318	30	P > 0.001 (not significant)
Experimental Post Test	1.935	0.9639	30	P < 0.001 (significant)

Snoring Intensity (SI)

	Mean	S. D	N	p Value
Experimental Pre - Test	2.935	0.7273	30	P > 0.001 (not significant)
Experimental Post Test	1.613	0.7154	30	P < 0.001 (significant)

Snoring Intensity (SI)



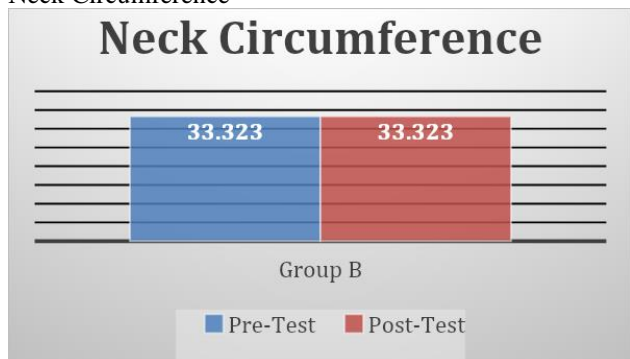
Neck Circumference

	Mean	S. D	N	p Value
Experimental Pre - Test	33.323	1.9388	30	P > 0.001 (not significant)
Experimental Post Test	33.323	1.9388	30	

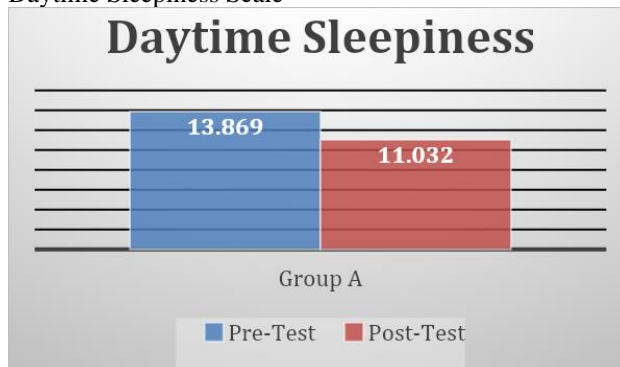
In the experimental group, an alternate hypothesis is accepted because a p - value of 0.001 is lesser than 0.05. Hence there is a significant difference in pre - test and post - test scores in Snorers. This suggests that the intervention received by this group had significant improvement.

Graph form – Draw

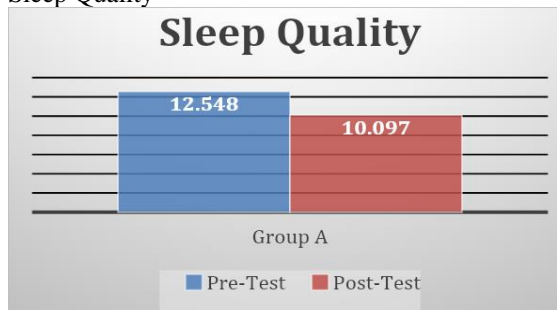
Neck Circumference



Daytime Sleepiness Scale



Sleep Quality



2]Statistical analysis of pre - test and post - test in Experimental Group

Tabular form – Draw

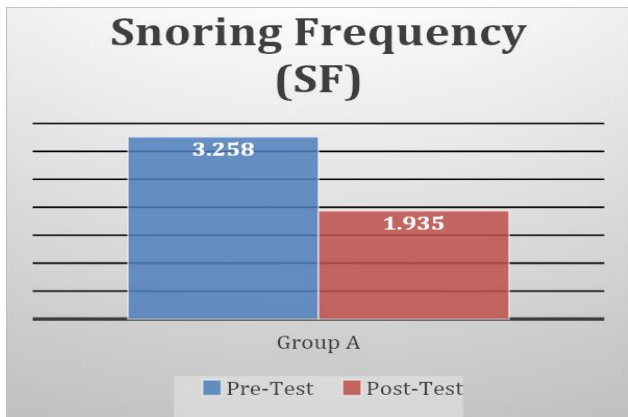
Daytime Sleepiness Scale

	Mean	S. D	N	p Value
Experimental Pre - Test	13.839	1.8275	30	P > 0.001 (not significant)
Experimental Post Test	11.032	1.7978	30	P < 0.001 (significant)

Snoring Frequency (SF)

Sleep Quality3

	Mean	S. D	N	p Value
Experimental Pre - Test	12.548	1.6297	30	P > 0.001 (not significant)
Experimental Post Test	10.097	1.8139	30	P < 0.001 (significant)

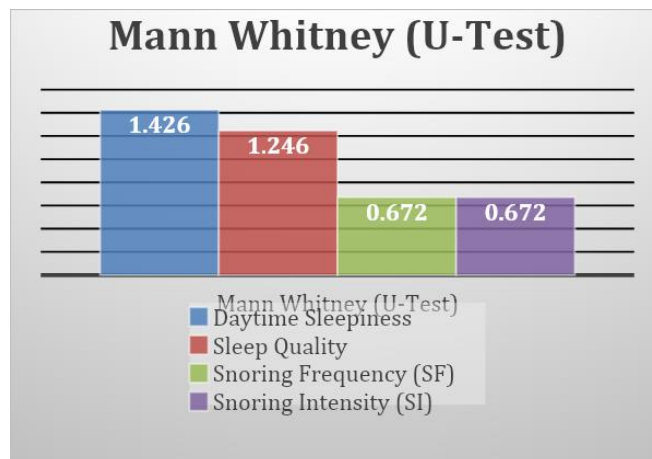
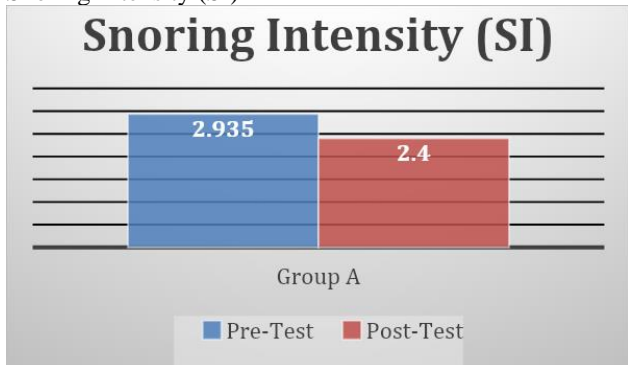


Snoring Intensity (SI)

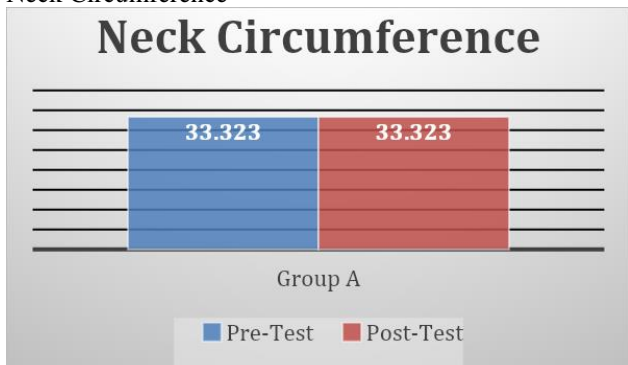
MEAN	0.672
SD	0.7466
p - value	p>0.001 (not significant) p<0.001 (significant)

- Since the p - value of 0.00 is lesser than 0.05, an alternate hypothesis is accepted.
- Therefore there are statistically significant differences between the post - test scores of the Control and Experimental group of Snorers.
- Then a suggests that intervention received by the experimental group had significant improvement when compared to control group.
- Graph form – Draw

Snoring Intensity (SI)



Neck Circumference



4. Discussion

This research aimed to investigate the effectiveness of oropharyngeal exercises in reducing daytime drowsiness, sleep quality, snoring frequency and intensity, and neck size in individuals who snore. The study lasted for 6 weeks, involving a total of 60 participants randomly divided into an experimental and control group after initial assessments. The experimental group received oropharyngeal exercises, while the control group did not undergo any specific intervention. Post - assessment was conducted for both groups to analyze the results after the intervention.

- Table 1 and Graph 1 show the statistical analysis between the pre - test and post - test of the control group. The mean Value of the pre - test is _ and the mean value of the post - test is _ and the p - value is 0.001 and which indicates that there is a statistically significant difference 1between pre - test and post - test scores in the control group. This indicates that there was a statistical improvement in the control group after lifestyle modifications.
- Table 2 and Graph 2 show the statistical analysis of the pre - test and post - test of the experimental group. The mean The value of the pre - test is _ the mean value of the post - test is _ and the p - value is 0.001 which indicates that there is a significant improvement between the pre - test and post - test in the experimental Group.
- Table 3 and Graph 3 show the statistical analysis of the post - test between the control group and the

Statistical analysis of post - test scores between control and experimental group

Tabular form - Draw

Daytime Sleepiness Scale

MEAN	1.426
SD	1.5754
p - value	p>0.001 (not significant) p<0.001 (significant)

Sleep Quality

MEAN	1.246
SD	1.3374
p - value	p>0.001 (not significant) p<0.001 (significant)

Snoring Frequency (SF)

MEAN	0.672
SD	0.7466
p - value	p>0.001 (not significant) p<0.001 (significant)

experimental Group. The mean value of the control group is _ and the mean value of the experimental group is _ and the p - value is 0.000* and this indicates that there is a significant improvement in the Experimental when compared to the control group. This shows that Oropharyngeal Exercises show significant Improvement in the experimental compared to the other lifestyle modifications.

5. Conclusion

The research spanned 6 weeks, involving a total of 60 participants split evenly between a Control and an Experimental group. Pre and post - tests were administered using various measures like daytime sleepiness, sleep quality, snoring frequency and intensity, and neck circumference. The Experimental group practiced Oropharyngeal Exercises, while the Control group focused on lifestyle changes. Results indicated a significant improvement in the Experimental Group's post - Oropharyngeal Exercises, demonstrating the efficacy of this therapy in reducing snoring among individuals who snore.

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