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Exploring impact of Obstructive Sleep Apnea Syndrome (OSAS) with and without comorbidities on Quality of Life (QoL)

Dr. Leena A. Deshpande

leenadeshpande23@gmail.com

Government Medical College, Nagpur, Maharashtra

Dr. Amitabh K. Dwivedi

akdwivedi123@yahoo.com

Jaipur Occupational Therapy College, Jaipur, Rajasthan

ABSTRACT

OSAS has become a significant public health problem with the increasing demands of modern society. It is often associated with serious and adverse consequences as it is most of the time associated with comorbid conditions. Objectives of this paper are: To assess the impact of OSAS with and without comorbidities on Quality of life in either gender of different age. The sample of 205 patients diagnosed as having OSAS was divided into two groups depending on the presence and absence of comorbid conditions. OSAS patients with comorbidities were 179 and 26 patients were without comorbidities. The patients were administered with the specific evaluation scale SAQLI. In Group with Comorbidities- Quality of life (SAQLI) of patients was strongly affected by the degree of apnea severity and age. Gender comparison revealed more affection in females in domains daily functioning, Social interactions, and emotional function. In Group without Comorbidities- Quality of life (SAQLI) of patients was strongly affected by the degree of apnea severity however, no correlation was observed gender and age wise in patients without comorbidities. Conclusion of this paper is that the impact of OSAS in patients without comorbidities was significantly less than in patients with comorbidities.

Keywords— OSAS, SAQLI, Quality of Life, Comorbidities

1. INTRODUCTION

Obstructive Sleep Apnea (OSA) is the most common type of sleep apnea and is caused by complete or partial obstructions of the upper airway. It is characterized by repetitive episodes of shallow or paused breathing during sleep, despite the effort to breathe, and is usually associated with a reduction in blood oxygen saturation. These episodes of decreased breathing, called "apneas" (literally, "without breath"), typically last 20 to 40 seconds.

Apnea-Hypopnea Index (AHI): The number of apneas and hypopneas per hour of sleep, is confirmed by Electroencephalogram (EEG).

Severity criteria: The criteria of the severity of OSAS are a combination of the severity of daytime sleepiness and the value of the Apnea-Hypopnea Index (AHI).

1. Mild: 5-15 events per hour.
2. Moderate: 15-30 events per hour.
3. Severe: more than 30 events per hour.

In India, the prevalence of OSA is high in Western India. Statistics reveal that OSA in Indian males varied from 4.4% to 19.7% while among females it ranged from 2.5% to 7.4%. (Public Health; 2017)

The comorbid conditions associated with OSAS are: Essential hypertension, obesity and type 2 diabetes mellitus were found to be most frequently associated with OSA. Other conditions include ischemic heart diseases, hypercholesterolemia, congestive heart failure, Diseases of the respiratory system, hypertrophy of tonsils etc.

"Quality of life in clinical medicine represents the functional effect of an illness and its consequent therapy upon a patient, as perceived by the patient". There are 4 main domains for measuring QOL: physical and occupational function, psychological function, social interaction and somatic sensation. (Schipper et al.)

Occupational therapy is founded on the health-promoting benefits of occupational engagement. Sleep was recognized as necessary for ensuring the health and balanced life of human being.

Occupational therapy can serve a major role by evaluating problem areas and suggesting interventions that facilitate habits, roles, and routines that utilize meaningful occupations to promote desirable sleep behaviours and compliance with the patients of OSAS who are living compromised life and can add to the advanced research in the area of sleep. (American Occupational Therapy Association, 2008).

2. AIMS

To assess the impact of OSAS with and without co morbidities on Quality of Life (QOL) in either gender of different age groups.

3. OBJECTIVES

To assess the impact of OSAS with and without comorbidities on Quality of Life (QOL) using Calgary Sleep Apnea Quality Of Life Index (SAQLI).

4. MATERIAL AND METHODS

4.1 Study Design

Prospective Cross-sectional observational study.

4.2 Setting

The study was carried out in Occupational Therapy Centre, GMCH, Nagpur.

4.3 Duration of Study

Was a period of 3 years and 6 months.

Patients referred by Pulmonologists, Otorhinolaryngologists diagnosed as OSAS by Polysomnography of either gender were selected for the study according to the eligibility criteria.

4.4 Inclusion criteria

- Patients of OSAS of either gender aged between 18-75 yrs. willing to give written informed consent.
- Patients diagnosed as OSAS by Polysomnography and having symptoms for 6 months or more.
- OSAS graded as Mild (5-15), Moderate (15-30), Severe (>30) on AHI (Apnea Hypopnea Index).
- Patients with or without co morbidities like Obesity, Diabetes, Hypertension, Hypothyroidism, Bronchial Asthma, Chronic Alcoholism.

4.5 Exclusion criteria

- Patients having any Neurological, Psychiatric ailment, Upper airway tumours or Nasal polyps and Cardiac disease excluding Hypertension.
- Patients received or receiving any treatment for OSAS in the form of Medical/Surgical/Lifestyle modification.

Each participant underwent a single evaluation session, lasting roughly one hour. This included general OT evaluation i.e., demographics, history of illness, present and past history, comorbidity history, Polysomnography and other reports and current medication.

Non-probability convenient sampling technique was used. Out of total 267 patients who were diagnosed as having OSAS on Polysomnography and who were enrolled during the study period, the final analysis was conducted on data gathered from SAQLI scale on 205 patients due to dropouts.

The sample of 205 patients was divided into two groups depending on the presence and absence of comorbid conditions.

- Group A – {OSAS patients with comorbidities} -179 subjects
- Group B- {OSAS patients without comorbidities} -26 subjects

4.6 Calgary Sleep Apnea Quality of Life Index (SAQLI)

The Calgary Sleep Apnea Quality of Life Index (SAQLI)¹ was developed by Flemons WW, Reimer MA., in 1998 to record key elements of the disease-specific health-related quality of life for sleep apnea that are important to patients.

In this study, the patients were assessed on four domains – Daily functioning, Social interactions, Emotional functioning and symptoms. The fifth domain, Treatment-related symptoms was not used as the study did not include any therapeutic intervention.

5. OBSERVATION AND RESULTS

5.1 Statistical Analysis

Statistical software STATA version 14.0 was used for data analysis. Wilcoxon rank sum test, one-way ANOVA, Independent t-test, chi²-test and Pearson correlation coefficient was used for appropriate analysis.

6. RESULTS

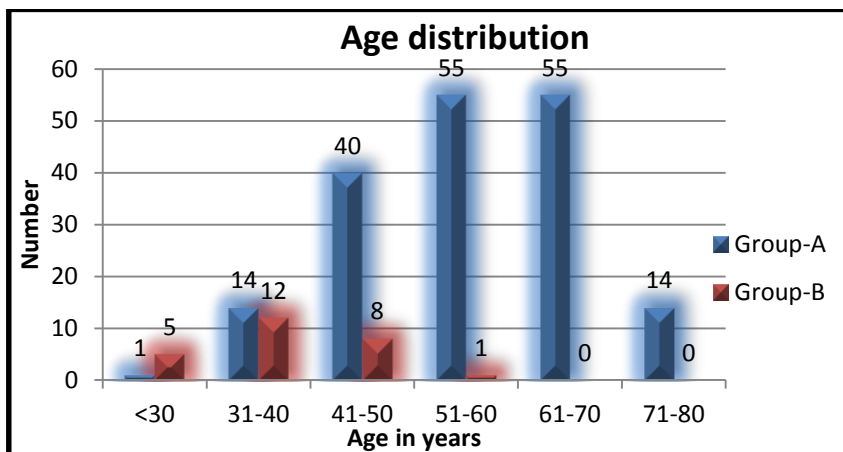


Fig. 1: Age Distribution

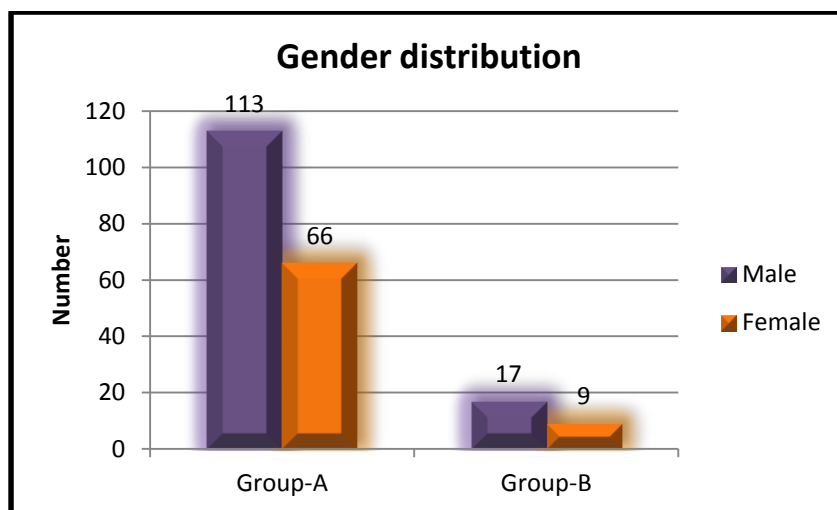


Fig. 2: Gender Distribution

6.1 Analysis of OSAS with co-Morbidities on SAQLI

Table 1: Mean Scores of Different SAQLI Domains in (Group-A)

SAQLI Domain	Mean Score	SD
Daily functioning	4.18	0.80
Social interaction	4.35	0.92
Emotional functional	4.20	0.88
Symptoms	4.02	0.89

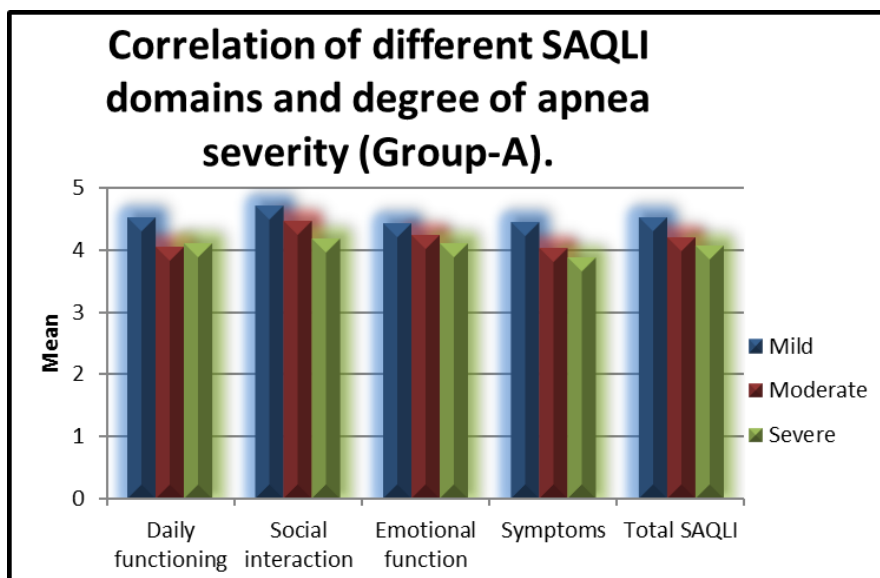


Fig. 3: SAQLI Domains and Degree of Apnea Severity Correlation (Group-A)

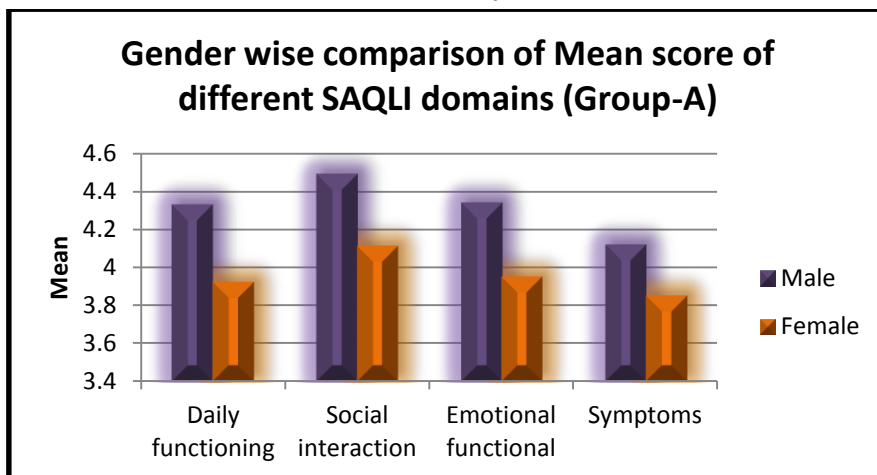


Fig. 4: Mean Score of SAQLI Domains Gender Wise Comparison (Group-A)

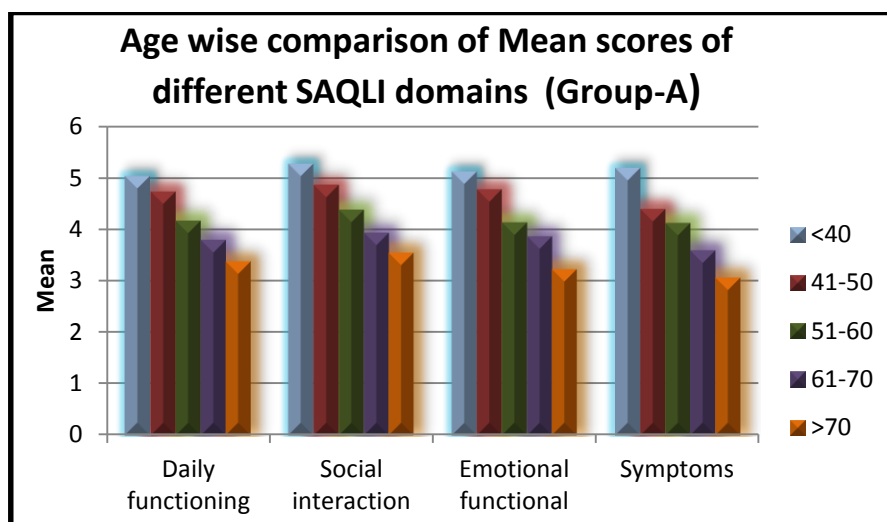


Fig. 5: Mean Score of SAQLI Domains Age Wise Comparison (Group-A)

6.2 Analysis of OSAS without co-Morbidities on SAQLI

Table 2: Mean Scores of Different SAQLI Domains (Group-B)

SAQLI Domain	Mean Score	SD
Daily functioning	4.85	0.56
Social interaction	4.89	0.88
Emotional function	4.85	0.60
Symptoms	4.79	0.72

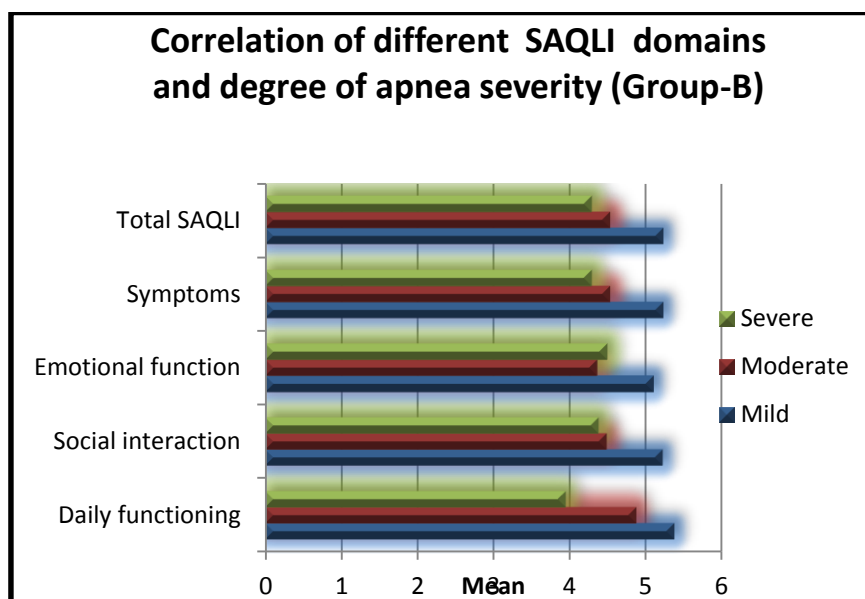


Fig. 6: SAQLI Domains and Degree of Apnea Severity Correlation (Group-B)

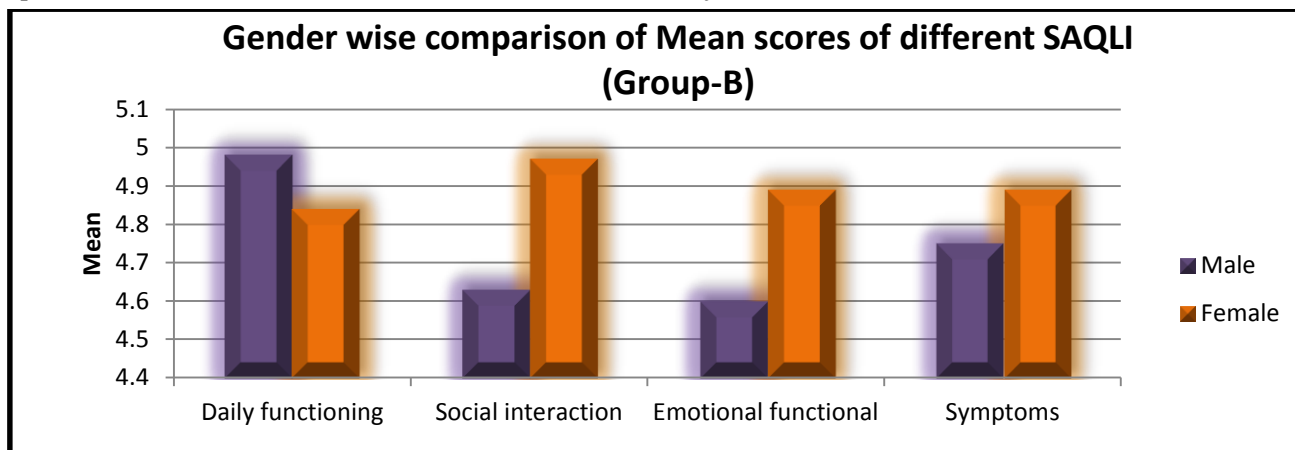


Fig. 7: SAQLI Mean Scores Gender Wise Comparison (Group-B)

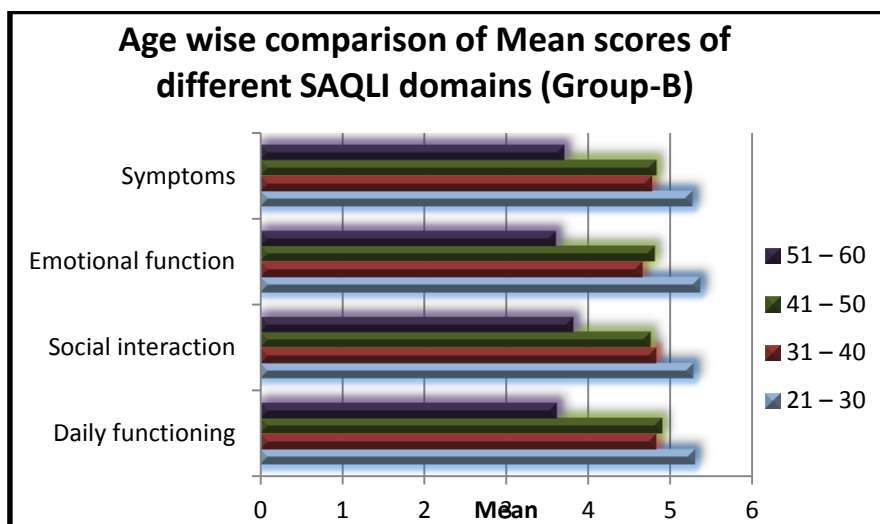


Fig. 8: SAQLI Mean Scores Age Wise Comparison (Group-B)

Table 3: Correlation of AHI with SAQLI in Group-A and Group-B

Variable	Group-A		Group-B	
	r-value	p-value	r-value	p-value
SAQLI	-0.2198	0.0031,HS**	-0.6010	0.0012,HS**

7. DISCUSSION

- QoL represents the human desire to live a happy, productive, and meaningful and disease free life. When QoL is considered in relation to a disease, it represents desire not just to be free of symptoms of the disease but is free of any impact of disease or its treatment on happiness, productivity and meaningful life. It has become a frequently used tool to evaluate the burden of disease and to evaluate medical treatment.
- Correlation of different SAQLI domains and degree of severity of apnea in Group-A patients revealed, high significance in Social interactions (0.0096), Symptoms (0.0048), and weak to moderate significance in Daily functioning (0.0192). Emotional function (0.0170) showed no significance. The p-value of total SAQLI score was 0.0098 showing high significance. This indicated a decrease in quality of life with an increase in apnea severity.
- In Group-B, Daily functioning (0.0004), Social interactions (0.0006) and symptoms (0.0003) domain showed a high correlation with the degree of apnea severity.
- Some patients with mild OSA showed QOL impairment same or even more than what was observed in patients with severe OSA. Conversely, some patients with severe OSA were found having only minimal impairment of QOL.
- A study by Naveen Dutt, Ashok Kumar Janmeja et.al in 2013, revealed that OSA caused significant impairment of QOL, but the severity of impairment was not directly proportional to the severity of OSA.²
- Gender wise comparison of mean scores of different SAQLI domains in patients of Group-A, showed high significance in Daily functioning (0.0009), Social interactions (0.0076), Emotional function (0.0042) indicating more affection of quality of life in females as compared to males.
- These results are similar to study done in 2016, by Graciela E Silva, James L Goodwin, et.al. They concluded that the impact of OSA on QoL differs between genders with a larger effect on females and is largely explained by the presence of daytime sleepiness.³
- Gender wise comparison of Mean scores of different SAQLI domains in patients of Group-B revealed non-significant p values.
- OSA is associated with a number of neurocognitive and behavioural outcomes. Sleepiness can impair social function and can have a major impact on the ability to carry on daily life activities. All of these may contribute to a lower QOL that are reversible with treatment.⁴

- Age wise comparison of mean scores of different SAQLI domains in Group-A patients showed high significance with p values of all domains <0.0001. With the increase in age, the quality of life affection increased in OSAS patients.
- Results in Group-B showed no significant difference in the quality of life scores.

7.1 Correlation of AHI with SAQLI in two groups

- In Group-A, total SAQLI score (p-value-0.0031) and In Group-B (p-value-0.0012) showed negative correlation and high significance i.e. with an increase in AHI value, quality of life decreased significantly.
- These results are in accordance with most of the studies which have suggested that there is significant impairment of QoL in OSA patients but present study got the QoL impairment directly proportional with the severity of OSA as determined by AHI. This result is not in accordance with the studies done by Yang EH, et. al., 2000, Naveen Dutt, Kirti Chaudhry,2016. Naveen Dutt, Prasanta Mohapatra, 2013.

8. CONCLUSION

From the present study and in the light of existing literature, it can be concluded that:

- Quality of life of patients was strongly affected by the degree of apnea severity. A strong correlation was observed in Social interactions, Symptoms and weak to moderate correlation in Daily functioning. Emotional function showed no significance in patients with comorbidities while Daily functioning, Social interactions and symptoms domain showed a high correlation in patients without comorbidities.
- Quality of life affection increased with age. Gender comparison revealed more affection in females in domains Daily functioning, Social interactions, Emotional function in patients with comorbidities; while, no correlation was observed gender and age wise in patients without comorbidities.
- With the increase in AHI value, Quality of life decreased significantly in patients with and without comorbidities.

9. REFERENCES

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