

Review
by
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on a dissertation for the award of a
educational and scientific degree “Doctor“

Author: Dr. Lyudmil Hristov Matev

Topic: „Improving the quality of life in patients with snoring and obstructive sleep apnea through intraoral apparatus“

The thesis presented to me for review contains 165 standard typewritten pages with a bibliography consisting of 332 authors, of which 7 in Cyrillic script and 325 in Latin script, and 3 appendices. It is illustrated with 81 figures and 6 tables. The dissertation is well structured, which facilitated the review preparation.

The **Introduction** emphasizes the fact that **Sleep apnea** is a common and potentially dangerous sleep disorder, characterized by alternating periods of cessation and resumption of breathing, as well as increased resistance of the upper respiratory tract. Among the main symptoms of the disease are severe snoring and periods of complete lack of breathing during sleep,

Snoring, as a symptom of sleep apnea, is described as a loud noise when breathing during sleep, the result of vibration of structures in the pharynx and oropharynx.

The high prevalence of sleep apnea, the many unexplored questions and data published by various authors on its impact on the overall physical and mental health of patients and their quality of life determines the **topicality** of the dissertation. The above facts give grounds for the candidate to formulate:

The aim of the dissertation is to study the effectiveness of diagnostic and therapeutic approaches to improve the quality of life in patients with snoring and OSA and pathological dental status.

In order to meet the set aim, **5 tasks** have been formulated and completed.

1. To identify patients with symptoms of snoring and OSA, suitable for dental treatment.
2. To diagnose with modern methods the main clinical characteristics of these patients (oral status and polysomnographic examination).
3. To analyze the dynamics of the functional indicators of respiration of patients with snoring and OSA before and after treatment with splints and CPAP.
4. To study the individual quality of life of patients with respiratory disorders during sleep before and after treatment with intraoral devices and CPAP.
5. To develop a diagnostic and therapeutic algorithm in adult patients with snoring and OSA and pathological dental status.

The materials and methods of the study are correctly and adequately selected, the use of a sufficient number of modern **statistical methods** for processing the obtained data ensures that reliable and objective **results** are attained.

Material and methods

Task one

Subject of the study - a study of the symptoms of snoring and OSA in 120 patients who sought help in connection with respiratory disorders and snoring with an ENT specialist at UMDC Varna. Patients were provided with a sleep apnea screening card containing 10 questions.

Task two examined two groups of patients:

1. Study of rhinopharyngeal status

The subject of the study were **120 patients from task 1**, who were examined for endoscopic rhinopharyngeal status by an ENT specialist. Soft palate and uvula, size and position of the tongue, epiglottis, pharynx, nose and nasal passages were examined.

Diagnosis of snoring and OSA was performed with a **Weinmann SOMNOcheck micro device**.

Patient selection criteria:

a) Criteria for inclusion of persons

- ❖ Persons over 18 years of age
- ❖ With symptoms of OSA
- ❖ With normal or pathological dental status
- ❖ Completed informed consent
- ❖ No concomitant systemic diseases

b) Exclusion criteria

- ❖ Persons under 18 years of age
- ❖ No symptoms of OSA
- ❖ With normal dental status
- ❖ Without completed informed consent
- ❖ With concomitant systemic diseases

2. Assessment of oral status and use of an intraoral device for the treatment of snoring and OSA Silensor-sl of Erkodent.

The 120 patients examined underwent a clinical intraoral examination by a dental specialist. A probe and mirror kit was used to assess oral status. The types of occlusion (I, II or III Engle class), height of occlusion (deep, normal, open), condition of teeth and periodontal status, condition of soft tissues and tongue, path of movement of the lower jaw when closing and opening were studied. and assessment of the state of TMJ.

After the clinical oral examination of 30 patients, an intraoral device for the treatment of snoring was placed.

Patient selection - Criteria for inclusion:

1. Patients with snoring, mild or moderate obstructive sleep apnea.
Apnea / Hypopnea Index – AHI < 10
2. Patients with at least one tooth from the group of premolars and molars
3. No symptoms of TMJ
4. Healthy periodontitis, initial or stages of moderate periodontitis

Tasks three and four

Compared the functional indicators of respiration and quality of life in 120 patients before and after the use of intraoral apparatus and CPAP for the treatment of snoring and OSA, and the patients were divided into the following

groups:

- ❖ Conducted treatment with intraoral apparatus - 30 patients
- ❖ Conducted treatment with CPAP - 71 patients
- ❖ Without treatment - 19 patients

Statistical methods

- ❖ Dispersion analysis (ANOVA)
- ❖ Variation analysis
- ❖ Correlation analysis
- ❖ Regression analysis
- ❖ Comparative analysis (evaluation of hypotheses)
- ❖ Graphic and tabular method of displaying the obtained results

The results obtained give the doctor a reason to draw the following **conclusions:**

Snoring and obstructive sleep apnea (OSA) are common sleep disorders due to recurrent narrowing and collapse of the upper respiratory tract.

Untreated OSA has been associated with a number of adverse health effects, including systemic hyper-stress, coronary artery disease, stroke, atrial fibrillation, increased motor vehicle accidents, congestive heart failure, daytime sleepiness, reduced quality of life, and increased mortality.

Snoring is also an important social problem and contributes to a reduced quality of life of partners in bed through disturbed sleep. Snoring itself can have a negative impact on health, such as an increased risk of cardiovascular disease.

In recent years, **intraoral devices** have become an increasingly common treatment for OSA and snoring.

Although **positive airway pressure (CPAP)** remains the most common and effective treatment for sleep apnea, **intraoral devices** offer effective therapy for many patients with OSA. These devices offer advantages over CPAP, as they do not require a source of electricity and are less cumbersome, especially when traveling. Intraoral devices are well tolerated in most patients and adherence to a therapeutic regimen may be better than CPAP.

The results of the research give the doctor reason to draw the following important **implications**:

1. Patients with symptoms of snoring and OSA are men over 45 years of age, overweight and obese.
2. Snoring correlates with male sex, age over 50 years and BMI over 30 kg / m².
3. Feeling tired after sleep is associated with sleep apnea, snoring frequency and BMI.
4. The study of the dynamics of the functional indicators of respiration of patients with snoring and OSA showed that the cardiovascular risk in half of the persons is low 52.2%.
5. Cardiovascular risk correlates with snoring, female, age over 50, BMI > 30 kg / m²
6. AHI has a significant difference according to gender and correlates with age, BMI, strength and frequency of snoring and the presence of hypertension.
7. AI is associated with male gender, age, BMI, strength and frequency of snoring, the presence of hypertension.
8. The individual elements of the quality of life differ significantly between men and women, with women having a better life expectancy.
9. Daily functioning correlates negatively with BMI, strength and frequency of snoring.
10. Social interactions and emotional functioning are negatively correlated with age, BMI, strength and frequency of snoring.
11. The main difficulties experienced by the studied patients are that they fall asleep while resting, wake up tired in the morning, have restless sleep, find it difficult to stay awake while reading and have low energy.
12. OSA affects important areas of QoL that remain unexplored in the sleep laboratory.
13. Patients with class II dentition, deep bite and reduced height have a significantly higher risk of OSA compared to those with class I dentition and normal bite.

The more important **contributions** of the dissertation can be grouped as:

Contributions of scientific and applied nature

1. For the first time in Bulgaria the frequency, risk factors, diagnosis, treatment and quality of life of patients with obstructive sleep apnea and dental pathology are assessed.
2. For the first time in Bulgaria the use of intraoral devices for the treatment of obstructive sleep apnea has been subjected to critical analysis.
3. Special attention is paid to the participation of the dentist in the multidisciplinary team for the treatment of obstructive sleep apnea and snoring.
4. The risk profile of patients with OSA among the Bulgarian population - male, overweight and obesity, the strength and frequency of snoring.
5. A diagnostic-therapeutic algorithm has been developed in adult patients with snoring and OSA and pathological dental status.
6. A critical analysis of polygraphy in patients with dental pathology has been developed.

Contributions with an original character for the country

1. The quality of life of OSA patients treated with intraoral devices was studied for the first time.
2. The risk factors for snoring and OSA in patients with pathological dental status were studied for the first time.
3. Diagnosis of patients with suspected sleep apnea with a polygraph is performed for the first time.
4. The importance of the otorhinolaryngologist-dentist relationship in the diagnosis and treatment of patients with obstructive sleep apnea and snoring has been proven.
5. The requirements for reducing the side effects in the treatment of snoring with intraoral devices both in patients and in relation to the intraoral device have been established.

Contributions of a confirmatory nature

1. The role of the multidisciplinary team for early differentiation of the patient's path to different specialties is confirmed.
2. The use of intraoral devices in the treatment of mild forms of obstructive sleep apnea and snoring is confirmed (AHI <5).
3. It is confirmed that individually made devices are a better healing solution than factory-made.
4. The polygraph test is absolutely sufficient to diagnose patients with mild obstructive sleep apnea.

Assessment of publication activity

In connection with the dissertation, Dr. Matev presents 3 publications. This fact proves that the topic developed in the dissertation is his personal work.

The author's summary objectively reflects the dissertation. It is drawn up in accordance to the requirements of the law for the development of the academic staff.

I have no critical remarks on the reviewed thesis.

Conclusion:

The thesis of Dr. Lyudmil Hristov Matev is an depth study about "Improving the quality of life in patients with snoring and obstructive sleep apnea through intraoral apparatus"

The obtained results are valuable for clinical practice and can serve as a basis for future research.

I am confidently giving my positive vote for the award of the educational and scientific degree "Doctor" to Dr. Lyudmil Hristov Matev.

Plovdiv
24.01.2022


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(Prof. Yavor Kalachev, DMD, PhD)