



# Are Anxiety and Stress the Main Cause of Vocal Cord Nodules in Women?

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## Abstract

**Aim:** Although it is reported that the abuse of the voice is effective in the development of vocal cord nodules in women, it is thought that psychological factors also contribute to the occurrence of these lesions.

**Material and Method:** The relation between anxiety, stress, and women with vocal cord nodules (WVN) was investigated using Beck Anxiety Inventory (BAI) and Perceived Stress Scale (PSS) tests.

**Results:** BAI test to WVN and healthy women (HW), normal values were detected in 69% of HW, while this rate was found to be 22% in WVN. As a result of PSS test, it was found that, 74% WVN were under stress, while this rate was found to be 26% in HW. The relation between, WVN and stress, anxiety was found to be statistically significant ( $p < 0.05$ ).

**Conclusion:** Physicians and speech therapists dealing with voice disorders should also evaluate psychological factors in WVN

**Keywords:** Vocal nodules; women; anxiety; stress

## Introduction

Vocal cord nodules are mostly seen in women and the etiology is based on vocal mucosal trauma due to bad, misuse and excessive use of voice [1,2]. Personality traits and voice usage characteristics related to emotional state are also factors that contribute to the development of vocal cord nodules [3,4]. Dysphonia caused by vocal cord nodules can cause emotional and mental tension in people's lives and also disrupt social communication. Voice is a highly sensitive instrument that is quickly affected by emotional changes. The stress and anxiety that occur when individuals cope with problems leads to a high level of tension in the laryngeal muscles. This use of the voice also causes vocal nodules [5]. Symptoms of psychological disorders such as stress and anxiety are also common in patients with vocal cord nodules [6,7]. There are two commonly used simple tests to measure stress and anxiety. The Perceived Stress Scale (PSS) is the most widely used psychological instrument for measuring the perception of stress. It is a measure of the degree to which situations in one's life are appraised as stressful. The test consists of 14 questions and the scores from the test range from 0 to 56. High scores indicate that the person has excessive perception of stress, and he is not able to deal with stress effectively. The 0-35 score range indicates normal stress level. The 35-56 score range indicates that the individual is under stress and

cannot cope with stress effectively [8]. The Beck Anxiety Inventory (BAI) is a well-accepted self-report measure of anxiety in adults and adolescents for use in both clinical and research settings. The high scores detected in the scale indicate the severity of the anxiety experienced by the individual. The scores obtained from the scale indicate minimum / normal level of anxiety between 0-7 points, mild anxiety between 8-15 points, moderate anxiety between 16-25 points, and severe anxiety between 26-63 points [9]. In this study, the relation between stress, anxiety and female patients with vocal cord nodules was investigated using both BAI and PSS tests.

## Material and Method

In our study, 62 female patients between the ages of 23-54 who were admitted to the Otorhinolaryngology Clinic with hoarseness and voice changes and diagnosed with vocal cord nodules and 35 healthy women as the control group were included. Beck anxiety scale and perceived stress scale were administered to patients and healthy women by the clinical psychology department of the hospital. Anxiety and stress symptoms were investigated in women with vocal cord nodules. The statistical evaluation of the research results was made in the SPSS program.

## Results

As a result of the Beck anxiety scale applied to women patients with vocal nodules and healthy women included in our study, normal values were detected in 69% of healthy women, while this rate was found to be 22% in women with vocal cord nodules. Mild and moderate anxiety symptoms were detected in 73% of women with vocal nodules while this rate was 31% in healthy women

(Table1). According to this result, the relation between women with vocal nodules and anxiety was statistically significant ( $p < 0.05$ ). As a result of the applied PSS test, it was found that, 66% of the women with vocal nodules were under stress, while this rate was found to be 26% in healthy women (Table 2). The relation between women with vocal nodules and stress was found to be statistically significant ( $p < 0.05$ ).

**Table 1:** Distribution of BAI scores on women with vocal cord nodules and healthy women.

BAI Scores	Women with Vocal Nodules (n=62)	Healthy Women (n=35)
Normal (0-7)	14 (22%)	24 (69%)
Mild (8-15)	29 (46%)	8 (23%)
Moderate (18-25)	17 (27%)	3 (8%)
Severe (26-63)	2 (3%)	0

**Table 2:** Distribution of PSS scores on women with vocal cord nodules and healthy women.

PSS Scores	Women with Vocal Nodules (n=62)	Healthy Women (n=35)
Normal (0-35)	27 (44%)	26 (74%)
Under Stress (35-56)	35 (56%)	9 (26%)

## Discussion

While only the abuse of voice is thought to be effective in the development of vocal cord nodules, psychological factors also contribute to the occurrence of these lesions [10]. Studies have suggested that personality traits, emotions, and psychological problems may be the main cause of vocal disorders, and voice problems may also consequence of psychological problems [11,12]. In our study, the relation of stress and anxiety in women with vocal cord nodules was investigated. As a result of the perceived Stress Scale and Beck anxiety inventory applied to the patients, stress and anxiety scores were found to be higher in women with vocal nodules compared to the control group. It is known that there is a close relationship between vocal disorders and mental health, changes in emotions affect the tension of the muscles used in phonation and articulation and cause lesions in the vocal cords at the end of voice production [13,14]. Many studies show that changing voice quality is often accompanied by symptoms of psychological disorders. Stress and anxiety that occur in response to psychological response are assumed to be factors leading to the development of voice disorders [15]. Goldman et al. reported in their study on women patients with vocal nodules that stress, anxiety, and physical complaints were higher than the control group [16]. Aronson reports that the factor responsible for the vocal nodule is not only the abuse of the voice, but also that these patients' lives are at a time when they are under emotional stress. According to Aronson, vocal nodules are more common in women who are talkative, social aggressive, tense, aggressive, anxious, angry, or depressed [17]. Studies have shown that women are more vulnerable to vocal disorders. Female vocal cords anatomically have a weaker tissue mass to absorb vocal trauma. Hyaluronic acid,

which is found in excessive shock absorbing places in the body and plays a major role in wound repair, has been found to be less in the vocal cord lamina propria of women [18,19]. The voices of women with vocal cord nodules are usually hoarse, coarse, and bifurcated [20]. Voice disorders due to vocal cord nodules negatively affect both the social and work life of individuals, thus causing functional, physical, psychological, and economic impairments in the quality of life [21]. According to Vandoudut, voice problems affect not only professional life but also social, physical, and communicative life [22]. Voice disorders, apart from professional limitations, lead to the deterioration of social relationships and may also cause psychological problems [23,24].

## Conclusion

In studies, investigating the relationship between voice disorders and psychological diseases, it is still controversial whether one is the cause or the consequence of the other. If treatment methods are sought without considering the psychological, emotional, social conditions and lifestyles of women with vocal nodules, recovery will be difficult. Therefore, multidisciplinary studies are required for physicians and speech therapists dealing with voice disorders to understand the psychological factors in female patients with voice disorders and to evaluate these patients well. In the treatment of these patients, it may be necessary to start psychotherapy in addition to voice therapy.

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