

Mapping of Vocal Risk in Amateur Choir

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Summary: Objectives. The study aimed to investigate and map the existence of vocal risk in amateur singers, analyzing the contribution of general voice signs and symptoms, specific singing handicap, and generalized anxiety.

Study Design. This is a cross-sectional study.

Methods. The sample comprised 526 volunteer amateur choristers—186 male and 340 female—(mean age of 42.07 years) from different choirs in the region of São Paulo. Three questionnaires were used: the Voice Symptom Scale (VoiSS), the Modern Singing Handicap Index (MSHI), and the Generalized Anxiety Disorder 7-item (GAD-7) scale.

Results. The mean total score obtained on the VoiSS was 17.57, which is almost two points higher than the protocol's passing score (16). The choristers who scored higher or equal to 16 points (51.5%, $n = 271$)—considered at vocal risk—and the group who scored less than 16 points (48.5%, $n = 255$)—healthy group—were analyzed separately. The risk group presented a mean total score of 26.34 on the VoiSS and 20.97 on the MSHI, with higher deviation on the impairment subscale, followed by the disability and handicap subscales, along with mild anxiety. The healthy group presented a mean total score of 8.27 on the VoiSS and 6.11 on the MSHI, also with higher deviation in the impairment subscale, followed by disability and handicap, and a minimum level of anxiety.

Conclusion. Even in leisure activities, vocal care is necessary for the correct use of the singing voice, which demands individual adaptations. The use of protocols for voice symptoms and singing handicap has revealed the possibility of amateur choristers to present vocal risk.

Key Words: voice–dysphonia–singing–quality of life–self-assessment.

INTRODUCTION

There are many amateur choirs that are affiliated to schools, religious groups, communities, or other organizations that develop this activity for self-gratification.¹ The choir singing practice is used as a tool for motivation and social integration,² contributing for personal development, increasing self-esteem, and preserving emotional balance.³ Some authors⁴ have mentioned that this activity therapeutically relieves tension and sadness of daily life. They also report the importance of music for the elderly.⁵

Developing a healthy vocal singing technique in the choir is essential for singing.¹ Vocal misuse and abuse may cause some voice disorders.⁶ In amateur choirs, the singers are not technically trained musicians; thus, they do not have the necessary skills to consistently and reliably produce the sounds requested by the conductors while avoiding vocal injuries.¹ In these choirs, the conductor is usually the only member with musical training. Many choristers make rehearsals their only source of knowledge on vocal techniques.¹

The socialization provided by singing in a choir has broadened the objectives of learning how to sing to a point where today there are actually more lay than professional choirs. This brings the layperson closer to musical achievement, but on the other hand one should take vocal care into consideration in order to avoid risks.⁷ Risk may be defined as the likelihood of a disease

in a population or group for a period of time, that is, the possibility of acquiring a voice disorder, in our case related to singing activities and/or other situations of vocal use.⁸

Teachers and singers are professionals who present higher frequency of voice disorders than the general population,⁹ and functional dysphonia is the most frequent diagnosis¹⁰ among voice professionals. It is even less frequent among amateur choristers, who sing in choirs as a hobby. These choristers are rarely submitted to vocal screening. They may not receive education on proper voice use for speaking or for singing.¹¹ Because of a lack of specific preparation, amateur choristers may present symptoms that may lead to a vocal handicap. Less experienced singers may be at a greater risk than professional singers.¹² In other words, the greater the singer's experience, the lower the potential of a vocal handicap.¹³

In a Swedish¹⁴ and an American¹⁵ study, the subjects with higher vocal risk are singers, followed by consultants, teachers, lawyers, pastors, telemarketing operators, salesmen, and health professionals. Singers present high prevalence of abnormal findings on videolaryngostroboscopy examinations, ranging from reflux to lesions caused by vocal abuse and tension on the vocal folds.¹⁶ It is known that voice professionals have higher occurrence of vocal problems.¹⁵ When it comes to amateurs, the mean number of problems reported in this population can be considerably high,¹⁷ and may be related to the lack of orientation regarding vocal well-being or lack of singing-specific vocal techniques.

It is also known that, usually, not even voice professionals, who depend on specific vocal training¹⁸ oriented to their needs, undergo vocal screening. Speech language may contribute to the early identification of vocal problems, preventing phonotrauma and ensuring good vocal function for a better professional performance.¹⁹ They may present symptoms related to vocal health,⁷ such as throat clearing, secretion, hoarseness and dry cough,²⁰ or even neck pain or sore throat after long conversations, along with hoarseness or aphonia.²¹ On the other hand, there are other aspects related to vocal behavior that can have

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an influence on vocal risk, such as technical difficulties, lack of knowledge on voice production, wrong vocal classification, incorrect use of voice, and lack of vocal training on warm-up and cool-down techniques.^{22,23}

The symptoms might lead to a handicap on their choir activities, which are more easily observed in less experienced singers than professional singers.¹² In other words, the longer the singer's experience, the lower is his or her vocal handicap.¹³ Modern singers with vocal complaints present higher self-reported handicap compared with individuals without vocal complaints and with subjects who do not sing.²⁴ Similarly, for church amateur singers, the handicap is higher in individuals with voice alterations, and similar between men and women, regardless of age, voice type, and associated use of professional speaking voice.²⁵ Other studies have reported that women present more voice disorders than men, and that the most frequent complaints are related to the lack of vocal technique.¹⁷ The vocal self-image or self-assessment is also directly related to the vocal experience level, being most commonly positive in experienced singers and negative in less experienced singers.²⁶

The presence of three or more vocal symptoms²⁷ should be seen as indicative of a possible voice disorder, presenting a vocal handicap in their choir activities, possibly evolving into dysphonia and affecting their quality of life.²⁸ However, these symptoms may be linked to emotional factors, such as mood disorders associated with concerns and constant stress regarding their vocal health²⁹ and degree of trait anxiety.³⁰

If, on one hand, choir singing has positive influences on choristers' emotional state, providing relaxation and well-being,³¹ on the other hand anxiety may hinder their performance.³² Some factors tend to increase anxiety, such as difficulty with music, physical health, and characteristics and behavior of the conductor, among others.³² Studies with amateur singers have shown that anxiety is common among children and young choristers, suggesting that anxiety could occasionally distract them from or interfere with their performance.³² Researchers interested in investigating anxiety in musicians have been usually studying professional singers; relatively few studies have focused on the experience of amateur choirs.

The following were the aims of this study:

- (1) to investigate the existence of vocal risk in amateur singers; and
- (2) to map the vocal risk and analyze the contribution of general voice signs and symptoms, specific singing handicap, and generalized anxiety.

METHODS

A cross-sectional questionnaire study was carried out after approval was given by the Research Ethics Committee of the Universidade Federal de São Paulo (CEP-UNIFESP n° 842.117). The participants who were selected signed a free and informed consent form. The invitation for participation in the study was carried out through amateur choir conductors by phone or in person.

Initially, 38 amateur choirs from the city of São Paulo, Brazil, were invited, which was equivalent to 926 choristers. The conductors were provided with information about the purpose, design,

content, and length of the study. After this initial contact, the researcher scheduled an appointment with each choir conductor on when to answer the questionnaires. Because of problems in schedules, only 35 choirs were included in the study. The initial data included 786 questionnaires filled in by choristers.

The data collection procedure included answering the personal identification and characterization form, the Voice Symptom Scale (VoiSS),³³ the Modern Singing Handicap Index (MSHI),²⁴ and the Generalized Anxiety Disorder 7-item (GAD-7) scale.³⁴ The choristers answered the questionnaires at their residences or at the choir rehearsal site after the researcher provided a verbal explanation about the aims of the study. The questionnaires were then returned to the conductor, and then to the researcher. The data were collected between September 2013 and January 2014.

Subjects were selected using the following criteria: older than 18 years, to be a member of the choir for over 6 months, and to correctly fill in all of the questionnaires. These data were obtained from each questionnaire. Subjects who were excluded were those who presented with hearing impairments, as well as neurologic, psychiatric, or psychological conditions, which could prevent them from appropriately answering the questionnaires. The data regarding the inclusion and exclusion criteria were obtained from the answers of the participants.

After the inclusion and exclusion criteria were applied, the final sample comprised 526 individuals from 35 choirs, 340 females and 186 males, with ages between 18 and 89 years (mean age of 42.02 years). [Figure 1](#) presents the flowchart of the choristers included in the research.

The choirs selected for the study are maintained by universities, schools, churches, companies, hospitals, foundations, institutions, or private funding. Their repertoire is eclectic, from folkloric songs to sacred music, and playing *a cappella* or accompanied by a piano or other musical instruments.

Self-assessment questionnaires are convenient tools to screen singers who might be at risk for vocal injury. The questionnaires are inexpensive and easy to administer. These protocols are very subjective. They characterize the impact of a disease or disorder on an individual's quality of life.³⁵ They have been developed as a means of quantifying the impact of dysphonia. In addition, they have been proven useful in helping conductors map the vocal risk of amateur choral singers for the purpose of referral to otorhinolaryngologists and speech language pathologists. Even in leisure activities, vocal care is necessary to prevent vocal alterations.

The identification form was composed of closed and open questions on four aspects: identification data, chorister's profile, general health, and vocal self-assessment ([Table 1](#)).

On the term "profession," participants were classified in seven categories, according to the vocal demand and the style of voice and speech expected for each profession. This classification was based on the categorization adapted from Shewell.³⁶ An extra category ("others") was developed by the authors to comprise all the professions in the present study ([Chart 1](#)).

There are several self-assessment questionnaires translated into and are validated for Brazilian Portuguese. In this study, participants answered three questionnaires: the VoiSS,^{33,37} the MSHI,²⁴ and the GAD-7 scale.³⁴

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