

PREVENTION OF OCCUPATIONAL DYSPHONIA: RISK AWARENESS OF VOCAL EFFORT IN PROFESSIONAL SINGERS

PREVENZIONE DELLE DISFONIE PROFESSIONALI: CONSAPEVOLEZZA DEL RISCHIO DI SFORZO VOCALE IN CANTANTI PROFESSIONISTI

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Citation: Longo L, De Vita R, Chiatti E, et al. Prevention of occupational dysphonia: risk awareness of vocal effort in professional singers. *Prevent Res* 2012; 2 (3): 288-296

Key words: singers voice, occupational dysphonia, prevention



Parole chiave: voce del cantante, disfonia occupazionale, prevenzione

Abstract

Background: Professional singers must become aware of their vocal behavior so that they can prevent the occurrence of problems that interfere negatively with their profession.

Objectives: The aim of our study is the prevention of occupational dysphonia.

Methods: The sample was subjected to phoniatic visit, fiber optic laryngoscopy, MSHI (Modern Singer Handicap Index) and CSHI (Classical Singer Handicap Index) questionnaires, MDVP (Multidimensional Voice Program).

Results: The analysis of the data obtained makes it possible to quantify the awareness of the singer on the risk associated with the vocal effort required by his profession.

Discussion and Conclusion: Integration of phoniatician, speech pathologist and voice teacher skills cooperate toward a common objective for the prevention of disorders related to professional singing.

Abstract

Introduzione: Il cantante professionista deve rendersi consapevole del proprio comportamento vocale affinché possa scongiurare la comparsa di problematiche che interferiscano negativamente con la sua professione.

Obiettivi: L'obiettivo del nostro studio è la prevenzione delle disfonie professionali.

Metodi: Il campione è stato sottoposto a visita foniATRica, fibrolaringoscopia, questionari MSHI (Modern Singer Handicap Index) e CSHI (Classical Singer Handicap Index), MDVP (Multidimensional Voice Program).

Risultati: L'analisi dei dati ottenuti rende possibile quantificare la consapevolezza del cantante sul rischio associato allo sforzo vocale richiesto dalla sua professione.

Discussione e Conclusioni: La prospettiva auspicabile è l'integrazione tra le competenze di foniatri, logopedisti e maestri di canto che si pongano come obiettivo comune la prevenzione dei disturbi associati al canto professionale.

Background

Professional singers, during the management of their professional activities, not always become aware that accompanies the medical profession. Therefore not always put attention to risk factors for vocal effort that can often be responsible for diseases that affect voice vocal performance.

Objectives

The aim of our study is the prevention and treatment of occupational dysphonia. The survey aimed to sensitize the professional on the importance to undergo periodic inspection by the physician and speech pathologist for integration of medical counseling and progress of singing exercises.

Materials and Methods

The study has been developed at the Complex Operative Unit of Phoniatics of the Policlinico Umberto I University Hospital in Roma.

Firstly an informative questionnaire was elaborated and distributed to 84 professional singers.

The questionnaire is divided into 4 principal areas containing specific questions respect:

- ❖ General data on the performer;
- ❖ Information on his health;
- ❖ Information on the vocal behaviour;
- ❖ Extra-professional activities.

The questionnaire was sent by email to Conservatories, Music Academies and singing teachers.

We enrolled 84 singers, of which 30 males and 54 females; 43 singers was under 35 years, 41 was over.

Genres found are (Table 1) (1):

Table 1 - Vocal classification of the sample.

VOCAL CLASSIFICATION	RESULT	RATE
SOPRANO	24	28,5%
MEZZO-SOPRANO	13	15,5%
CONTRALTO	17	20%
TENORE	16	19%
BARITONO	9	11%
BASSO	5	6%

- ❖ Lyrical;
- ❖ Classical/polyphonic;
- ❖ Jazz, Soul, Gospel;
- ❖ Pop;
- ❖ Rock.

We have administered also *Classical Singer Handicap Index (CSHI)* and *Modern Singer Handicap Index (MSHI)* (2), to value self-perception by singers.

68 singers compiled these questionnaires, 16 failed to the compilation.

We proposed phoniatic control, fibrolaryngoscopy and spectroscopic analysis of the voice with MDVP (Multi-Dimensional Voice Program) (3, 4) to all singers that compiled the questionnaires.

Results

Of the enrolled 84 professional singers, 50 undergone phoniatic visit.

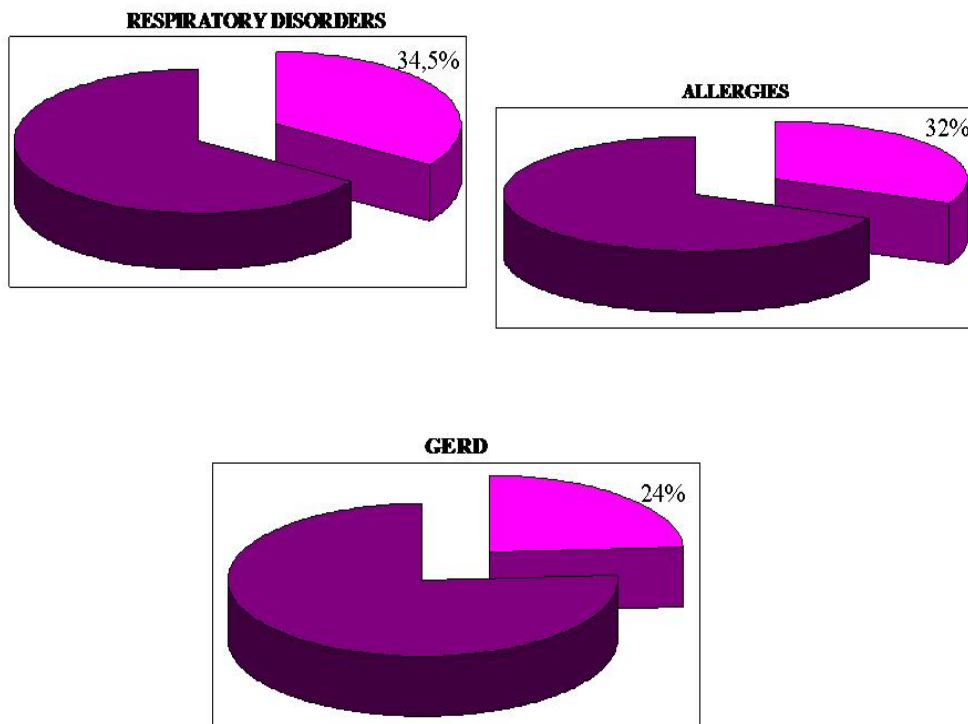
We consider as risk factors respiratory diseases, allergies and GERD and we observed that (graphic 1):

- ❖ 29 singers are affected by respiratory disorders;
- ❖ 27 singers are affected by allergies;
- ❖ 20 presented GERD (GastroEsophageal Reflux Disease).

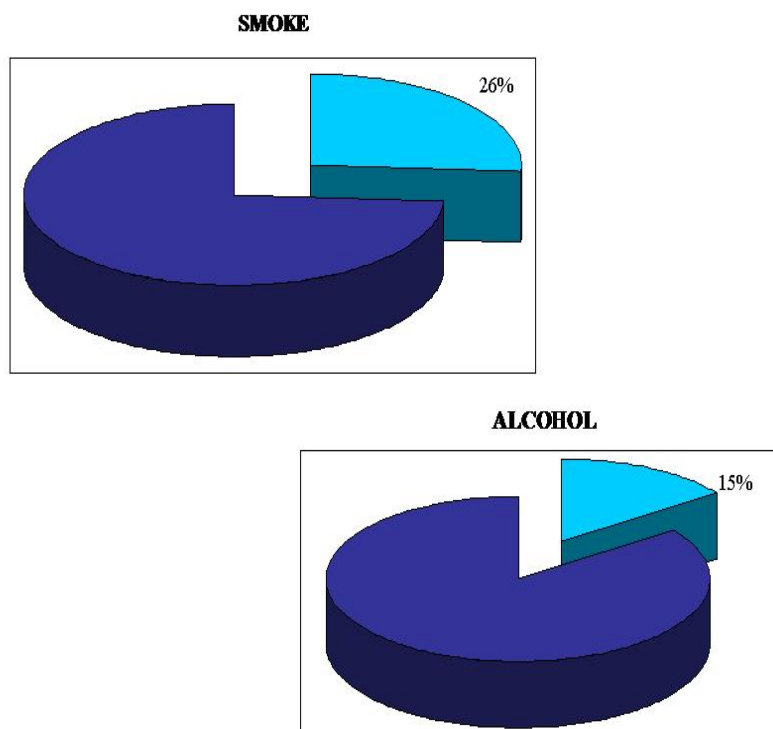
Singer's life style is also important (5) and other risk factors considered are smoke and alcohol (graphic 2):

- ❖ 22 singers smoke regularly;
- ❖ 13 drinking alcohol.

Graphic 1 - Respiratory disorders, allergies and GERD in the sample



Graphic 2 - Smoking and alcohol used in the sample.



Regarding the vocal training 79 singers attended regularly to singing lessons, 5 call themselves self-taught. 33 singers referred to undergo sessions of vocal efforts shorter than 1 hour; 37 referred vocal efforts longer than 1 hour; 14 can't quantify the duration of their exercises (graphic 3) 73 subjects used to habituate gradually to vocal efforts before the vocal training sessions. Only 9 singers performing cool-down after the exercises. 47 singers perceived a vocal change after their vocal exercise, qualifying in positive and negative effects.

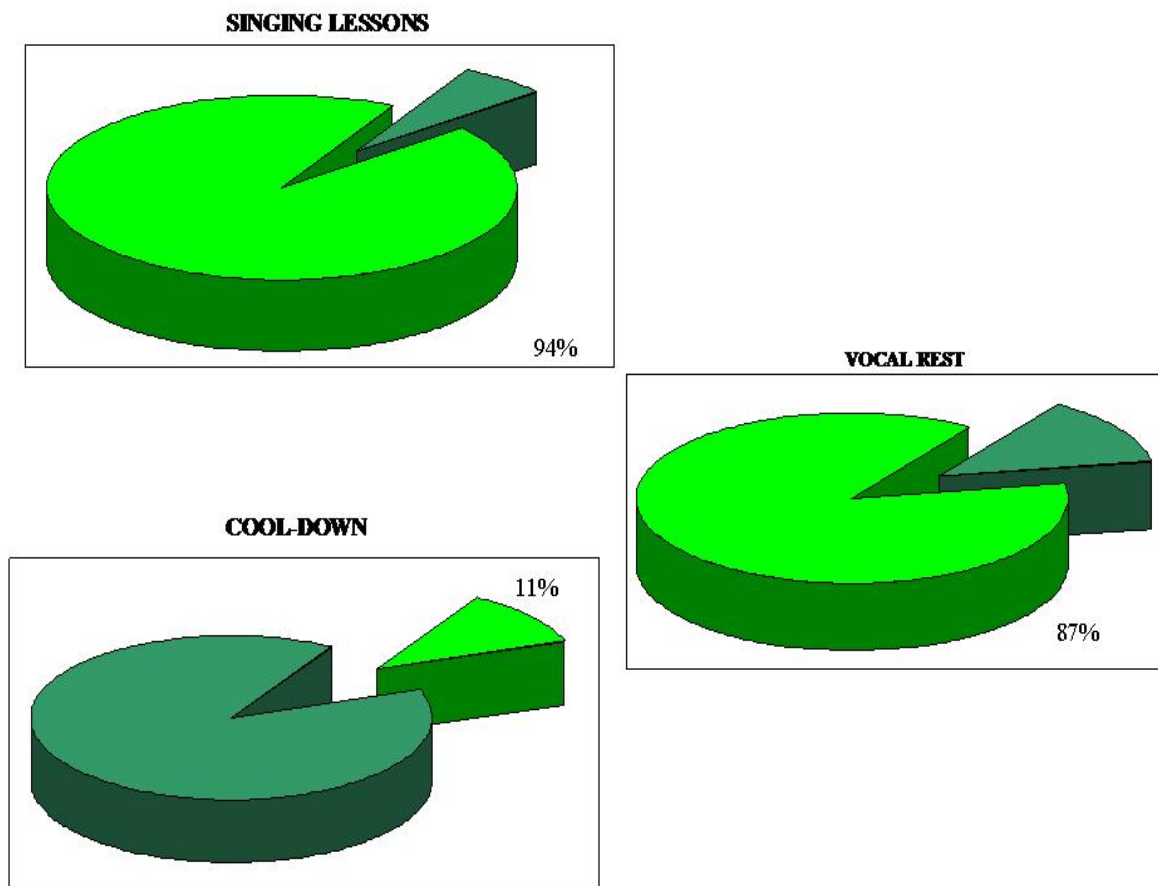
Positive effects are:

- ❖ Voice full and clear;
- ❖ Voice more stamped;
- ❖ Voice with more harmonics;
- ❖ Greater ability to diversify the dynamics of the song;
- ❖ Enhanced voice.

Negative effects are:

- ❖ Decreased voice;
- ❖ Hoarse voice;
- ❖ Muffled voice;
- ❖ Falling tones;
- ❖ Falsetto.

Graphic 3 - *Singing lessons, vocal rest and cool-down exercises in the sample.*



33 subjects perceived shortened breath and needed to refuel often inspired air; 51 perceived breathing enhanced enough to carry on long sentences.

50 patients referred hoarse and muffled voice after the performance.

Among singers, 44 believed to be accustomed to speak at high vocal volume and 45 affirmed to be constricted to talk in noisy and large environments.

Results refers that 15 singers were subjected at least to one phoniatic visit and 12 of these required a speech therapy.

Regarding results of the MSHI and CSHI, subdivided into 3 areas (functional, emotional and physical) we can report the findings (Table 2-3).

16 singers haven't compiled these questionnaires.

Table 2 - Number of singers, divided according to the scores obtained for each partial area MSHI and CSHI.

SUBSCORES	FUNCTIONAL AREA	EMOTIONAL AREA	PHYSIC AREA
0	22	25	19
1-5	36	31	27
6-10	7	8	10
11-15	3	2	5
16-20	0	1	2
21-25	0	1	2
≥ 26	0	0	3

Table 3 - Number of singers divided by the total score MSHI and CSHI.

TOTAL SCORE	SINGERS
0	10
1-5	18
6-10	17
11-15	10
16-20	4
21-25	3
≥ 26	6

Discussion

Analysis of the questionnaire data makes it possible to establish a vision of how a singer becomes aware of his occupational risk and of the effort associated with it that involves speech.

It should be emphasized that almost all of the subjects in the sample play another work to have a certain monetary gain, besides the gain resulting from artistic profession.

Risk factors, such as respiratory disorders were present in 34.5% of the sample, allergies in 32%, GERD in 24%, smoking in 26% and use of beverages with alcohol content in 15%, are often associated and simultaneously present in some subjects, exacerbating the framework of risk.

Almost the entire sample, (94% of subjects), continues to attend singing lessons, ensuring continued didactic support to the profession. Only 6% self-described as an autodidact and deals the profession without an adapted preparation. The daily time devoted to the study of vocal technique, for 39% of the sample had a duration of less than 1 hour, 44% have a duration equal to or greater than 1 hour. For the remaining 17% the time length of their exercise varied without the possibility to precise it.

It was still difficult to quantify an average daily exposure to the use of the voice including performances and study, as the variation of the commitments or salary, of course, also the duration of vocal use changes.

The vocal training, in 87% of the sample, is preceded by specific warm-up exercises, which include important for:

- ❖ improve the phonation;
- ❖ increase the elasticity of the vocal fold mucosa;
- ❖ reduce the effort and the vocal tract constriction;
- ❖ contribute to a broader resonance.

Only 11% of the sample, start the exercise of voice training without any warm-up, important to promote a faster recovery after an overdrive.

Considering that dysphonia can depend also from the daily speech, it was reputed important to pay attention to how the sample responded about their habit in daily talk. 52% reported of using a high volume of voice during speech for reasons related to the type of work or for personal habit which would exclude underlying causes. 53.5% daily attends large and/or noisy environments that induces to this attitude. Habit of turning up the voice volume, is an attitude characterized by a vocal effort which, added to the vocal stress due to their profession, exposes the subject to a greater risk than the vocal pathologies.

Another fact which highlights the importance for vocal professionals to be sensitized to the prevention, is the observation that only 18% of the sample was subjected at least once to a phoniatic visit and 14% of these was followed by a Speech Therapist.

This study confirms that MSHI and CSHI questionnaires are appropriate for assessing self-perception and provide a significant contribution to the diagnosis. MSHI and CSHI questionnaires have not been compiled by the whole sample. Singers who completed the compilation of these surveys were 68, 81%. This is important since it allows us to deduce that a percentage of the sample showed no ability to quantify self-perception of their voice in the artistic context.

Analysis of the scores obtained by completing MSHI and CSHI questionnaires, reports that the prevalent score is between 1 and 5 points. This fact does not show any particular tendency to think that their voice would be compromised. This score was obtained from 18 singers (26%). The partial scores are included between 1 and 5 points in every area of the questionnaires. The emotional area has the lower score (ie equal to 0), that shows how the condition of singer's voice is experienced without any emotional / psychological tension. This data is present in 25 subjects (37%). On the contrary, the score that showed a significant impairment, equal to or greater than 26 points, is present in the physic area in 3 subjects, equal to 4.4% of the sample.

The scarcity of the scores, however, is explained by considering that these questionnaires assume a problematic voice, absent in singers observed.

About the phoniatic visits, we did not observe any pathological finding. It should be underlined, however, that during the examination in fibro-laryngoscopy, in almost all singers, and mostly in those of younger age, it was demonstrated a neglect of the vocal apparatus, and the need for request information and clarification.

Let us now consider the information emerged from vocaligrams, taking into account those parameters considered indicative.

The parameter most affected appears to be the Shimmer. It was altered in 23.8% of vocaligrams. The found average value was 4.569%, compared to the threshold value of 3.810%. Value of the parameter vF° was found to be altered

in 4.7% of the total vocaligrams carried out, with an average value of 1.426%, compared to the threshold value of 1.1%.

The value of the ShbD is found to be altered in 19% of vocaligrams, with an average value of 0.413 dB, compared to the threshold value of 0.350 dB.

Either values of the parameter Jitter, than value of the parameter NHR, were found to be perfectly within the limits of the threshold values.

Conclusions

It's required a combination of medical knowledge and teaching skills for protection of health. Professional singers must necessarily become aware of their vocal behavior so that they can prevent the occurrence of problems that interfere negatively with their profession, and the risk of vocal effort is certainly among the most important.

It's therefore essential that the support given to professional singers from the medical speech pathologist and the speech therapist is not experienced as an interference in the singing teaching process, but as a support that would allow the reliability of voice as an instrument of personal gratification and as a tool of professionalism.

It is essential that the medical intervention should be considered important not only in the treatment of any disease, but in preventing the occurrence of the same, in the management of the singer's voice and driving towards a more conscious management that allows the enhancement of individual skills.

It's therefore necessary that the knowledge of teaching and medicine are united each other, so singers will always be able to adapt their voice in different situations. It's indispensable to explode the conflict between the singing pedagogy and medicine; conflict that is based on the concept of intrusion into different fields, to reach necessary and indispensable cooperation. The intervention of the physician and speech pathologist, will be aimed for guiding the professional singer to:

- a use of a mode as economical as possible relatively to the commitment required;
- a respect for rules of vocal hygiene towards a protection from abuse;
- a vocal attitude that minimizes the risks of overwork;
- a self-awareness of voice control;
- a self-perception of effort/vocal abuse and self-protection.

The desirable prospect is an interaction between voice teachers, speech therapists and phoniaticians, to join working which has as its purpose the interest and attention to the singer that makes of his voice the only instrument of expression.

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