

## **VHI vs. VRQOL in Trained and Untrained Choir Singers**

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**Abstract**

A singer's quality of life and overall comfort are profoundly affected by the way the voice functions. Conversely, the way a person sings profoundly disturbs their quality of life. As singers known to be an at risk population for voice disorders and related problems, it is noted that comparative studies of VHI and VRQOL are relatively rare particularly in Indian population. The present study aimed to study the VHI scores in trained and untrained choir singers, VRQOL scores in trained and untrained choir singers, compare VHI in singers and nonsingers, and compare VRQOL in singers and nonsingers and to compare the VHI and VRQOL in trained and untrained choir singers. The results of the following study show that there is a significant difference in VHI between trained and untrained choir singers. There is a significant difference in VRQOL between trained and untrained choir singers. There is a significant difference in VHI between singers and non-singers choir singers. There is a significant difference in VRQOL between singers and non-singers choir singers. Thus, VHI can be considered as a better and a more appropriate tool for the evaluation of the professional voice users especially for the singers.

**Key words:** choir singers, trained/untrained, VHI, VRQL, assessment of voice, risks

### **Introduction**

Speech is defined as the audible manifestation of language (Van riper & Erickson, 1990). Man has used speech to transfer his ideas, thoughts throughout human history. Speech has three parameters that are voice, fluency and articulation. Voice acts as a carrier wave of speech communication. Individuals use their voice effectively to influence their environment and also to protect their thoughts and personalities.

Professional voice users have more vocal demands compared to nonprofessional voice users. "Professional voice users are those individuals who are directly dependant on communication for their livelihood" (Stemple, 1993). Professional voice users include not

only singers and actors, but also attorneys, politicians, clergy, educators and telephone receptionists (Sataloff, 1991).

Professional voice user is at risk than the normal speaker for disorders produced by abuse or by inefficient use of the speech production system.

Assessment of voice includes perceptual, objective, acoustic, Aerodynamic and self-evaluation by the patient questionnaires. Most of the self-evaluation by the patient questionnaire are in English. They include: Voice related quality of life instrument (VRQOL), the Voice handicap index (VHI) & Voice symptom scale (VoiSS).

Rosen and Murry (2000) determined the degree of handicap expressed by professional and recreational presenters with a voice complaint. Results of the VHI for singers show that singers score significantly lower (less severe) on the VHI matched to nonsingers.

Portone, Hapner, McGregor, Otto and Johns (2007) investigated the correlation between the Voice Handicap Index (VHI) and the Voice-Related Quality of Life Measure (V-RQOL), and to test conversion of scores between the two instruments. There was no significant difference between the mean measured and mean calculated VHI scores and recommended that the two instruments are not substitutable for individuals.

Kazi, De Cordova, Singh, Venkitaraman, Nutting, Clarke, Rhys-Evans and Harrington (2007) examined effect of the voice impairment across the physical, emotional, and functional domains in patients using valved speech following total laryngectomy with the help of two symptom specific scales. They found a strong correlation (Spearman rho,  $P < 0.001$ ) between the V-RQOL and VHI questionnaires. They concluded that both the symptom scales had good correlation between them.

Cohen, Noordzij, Garrett and Ossoff (2008) determined the factors that influence the self-perceived handicap associated with singing voice problems. Duration of symptoms, being an amateur singer or singing teacher, benign vocal fold lesions, and neurologic voice disorders were associated with increased SVHI scores. Singers experience significant handicap as a consequence of their singing problems with certain issues associated with greater impairment.

Murry, Zschommler and Prokop (2009) determined the dissimilarities in responses to the Voice Handicap Index (VHI-10) between singers and non-singers. Result showed Singers

with voice problems do not rate their voices to be more handicapped than non-singers unless statements related specifically to singing are included. Shankar and Rao (2009) studied VHI vs VRQOL in bhajan trained and untrained singers and result shown that trained had more voice handicap than untrained group.

Avila, Oliveira and Behlau (2010) verified whether the presence of vocal complaints in erudite singers produces quality of life handicap in the use of singing voice. They concluded that singers with vocal complaints and/or symptoms had higher handicap index in singing, expressed in subscales Impairment and Disability, without relationship with vocal classification.

### **Need for the Present Study**

As singers are known to be an at risk population for voice disorders and related problems, studies estimating voice quality are found in literature. It is noted that comparative studies of VHI and VRQOL are relatively rare particularly in Indian population. Further studies comparing these measures in trained and untrained population are not found. This study addresses to answer these questions. The understanding of the results is expected to throw more light in understanding voice problems of singers in Indian context.

### **Aim of the Study**

The present study aimed to study the VHI scores in trained and untrained choir singers, VRQOL scores in trained and untrained choir singers, compare VHI in singers and nonsingers, and compare VRQOL in singers and nonsingers and to compare the VHI and VRQOL in trained and untrained choir singers.

### **Methodology**

#### **Subjects**

45 choir singers in the age of 20- 25 years were included in the study. The groups were divided according to the selected variable such as singing experience: Trained: 15 singers with more than two year of experience, Untrained: 15 singers with little experience (less than 2 years) and Non singers: 15 non singers with no singing experience. Singers answered questions posed to them from two protocols (VHI, and VRQOL), the protocols

were administered without the investigator's support, with questions posed in a random order and without consulting previously answered questionnaires.

### **Procedure**

All subjects were asked to fill the Voice Handicap Index. It is a patient-based self-assessment tool that consists of 30 items distributed over three domains: functional, physical, and emotional. The functional subscale describes the “impact of voice disorders on daily activities,” the physical subscale describes patients’ self-perceptions of laryngeal discomfort or the voice output characteristics, and the emotional subscale illustrates patients, “affective response to voice disorders”. . Each item is answered using a 5-point Likert-type scale: 0=never, 1=hardly ever, 2=sometimes, 3=almost always, and 4=always. The VHI total score ranges between 0 and 120 a high number indicates greater severity of voice problem.

VRQOL is a quality of life measure which includes 10 questions. It is a measure which determines the severity and frequency of the problem by answering each question. Each question is answered using 5 - point Likert-type scale: 1=none, 2 = a small amount, 3 = a moderate amount, 4 = frequently and 5 = problem is as “bad as it can be”. There is a scale from 0 to 100, with 100 being the best. This is a different number scale by adding up answers on the questionnaire. If the score is low, there is more problem. If there is high score, there is less problem.

VHI tried to get the information concerning the frequency of the voice problem, while VRQOL focused on the frequency and severity of a voice problem. The answers of the questionnaires were charted and the comparison of the groups for which the variable studied was done using the ANOVA test.

### **Results and Discussion**

The present study aimed to study the VHI scores in trained and untrained choir singers, VRQOL scores in trained and untrained choir singers, compare VHI in singers and non-singers, compare VRQOL in singers and non-singers and to compare the VHI and VRQOL in trained and untrained choir singers. The obtained data was statistically analysed and results were discussed below.

	N	Mean	Std. Deviation	95% Confidence Interval for Mean		ANOVA F	p		
				Lower Bound	Upper Bound				
VHI - F	US	15	2.40	1.30	1.68	3.12	209.609	HS	.000
	TS	15	7.67	.90	7.17	8.16			
	NS	15	.60	.63	.25	.95			
	Total	45	3.56	3.18	2.60	4.51			
VHI- P	US	15	4.13	1.13	3.51	4.76	448.576	HS	.000
	TS	15	12.27	1.28	11.56	12.98			
	NS	15	.60	.83	.14	1.06			
	Total	45	5.67	5.05	4.15	7.19			
VHI - E	US	15	2.33	1.76	1.36	3.31	101.493	HS	.000
	TS	15	6.27	1.16	5.62	6.91			
	NS	15	.00	.00	.00	.00			
	Total	45	2.87	2.87	2.00	3.73			
TOTAL	US	15	8.93	3.10	7.21	10.65	543.968	HS	.000
	TS	15	26.20	1.74	25.24	27.16			
	NS	15	1.20	.94	.68	1.72			
	Total	45	12.11	10.77	8.88	15.35			

**Table 1 showing VHI domain scores for untrained, trained and non singers.**

As is evident from the table 1, lower scores (2.40 and 2.33) were obtained for the functional and emotional domains for untrained choir singers while comparatively higher scores (4.13) were obtained for the functional domains. Results were found to be highly significant (0.00). Similar results were also obtained for trained group, Lower scores (7.67 and 6.27) were obtained for the functional and emotional domains while comparatively higher scores (12.27) were obtained for the functional domains. Results were found to be highly significant (0.00). And also similar results found for nonsingers group, Lower scores (0.00) were obtained for the emotional domain while comparatively higher scores (0.60 and 0.60) were obtained for the functional and physical domains. Results were found to be highly significant (0.00).

	Trained	Untrained
Mean	26.20	8.93
Standard deviation	1.74	3.10
P value	0.00 ( highly significant)	

**Table 2 showing the comparison between VHI scores in trained and untrained choir singers.**

Above table shows mean, standard deviation and p values for both trained and untrained choir singers. The mean score for the VHI in the trained group was 26.20, whereas for the untrained group mean was 8.93. Results were found to be highly significant (0.00).

**Below table showing comparison between VHI scores in singers and non-singers**

	Singers	Non singers
Mean	26.20	1.20
Standard deviation	1.74	0.94
P value	0.00 ( highly significant)	

Above table shows mean, standard deviation and p values for both singers and nonsingers. The mean score for the VHI in the singer group was 26.20, whereas for the nonsingers group mean score was 1.20. Results were found to be highly significant (0.00).

	N	Mean	Standard deviation	Mean		ANOVA F	p
				lower bound	upper bound		
<b>VRQOL US</b>	15	11.33	1.29	10.62	12.06	10.946	.000
<b>TS</b>	15	13.33	2.64	11.87	14.79		
<b>NS</b>	15	10.47	.52	10.18	10.75		
<b>Total</b>	45	11.71	2.07	11.09	12.33		

**Table 4: showing the VRQOL domain scores for untrained, trained and non-singers.**

From the above table it is evident that mean score for the VRQOL in the trained group was 13.33, whereas for the untrained group mean was 11.33. Results were found to be highly significant (0.00).

	Trained	Untrained
Mean	13.33	11.33
Standard deviation	2.64	1.29
P value	0.00 ( highly significant)	

**Table 5 showing Comparison between VRQOL in the trained and untrained choir singers.**

Above table shows mean, standard deviation and p values for both trained and untrained singers. The mean score for the VRQOL in the trained group was 13.33, whereas for the untrained group mean was 11.33. Results were found to be highly significant (0.00).

	Singers	Non singers
Mean	13.33	10.47
Standard deviation	2.64	0.52
P value	0.00 ( highly significant)	

**Table 6 showing comparison between VRQOL in the singers and non singers.**

Above table shows mean, standard deviation and p values for both singers and non singers. The mean score for the VRQOL in the singer group was 13.33, whereas for the nonsingers group mean score was 10.47. Results were found to be highly significant (0.00).

**Discussion**

The gold standard for self-assessment of voice is the VHI, a 30- item questionnaire examining functional, physical and emotional aspects of voice disorders. An alternative is the VRQOL questionnaire which gives almost identical results. The latter is recommended for clinical application as it only comprises 10 items, while the VHI consists of 30 questions, and it is considered more practicable.

Both professional and avocational singers report a greater prevalence of disability and are more likely to seek medical attention than non- singers. Shankar and Rao (2009) noted that experienced, trained singers are more voice handicapped than untrained singers.

The results of our study revealed that there is no significant difference in the mean score of VHI in trained, untrained and nonsingers groups. Our results are in accordance with those of Shankar and Rao (2009).

**Summary and Conclusion**

A variety of adverse consequences happens when the voice is comprised. These consequences differ according to how dependant an individual is, professionally and

personally, on consistent vocal behaviours. Irrespective of training or use, the range of adversity differs in impact from person to person. A singer's quality of life and overall comfort are profoundly affected by the way the voice functions. Conversely, the way a person sings profoundly disturbs their quality of life.

Relatively less research have been done on singer's self-evaluation of voice and limited studies have been done on type of singer and self-evaluation of voice. The present study aimed to find the VHI & VRQOL scores in trained and untrained choir singers and to compare VHI in singers and non-singers and VRQOL in singers and non singers.

The VHI and VRQOL are self-administered questionnaire that quantifies the degree of handicap related to voice disorders. It's a measure of functional disability and also provides data valuable to pre and post treatment evaluation. VHI and VRQOL rating scale were administered to the subject groups by administering the questionnaire of both the rating scales to identify the presence of a voice problem.

The results of the following study show that: There is a significant difference in VHI between trained and untrained choir singers. There is a significant difference in VRQOL between trained and untrained choir singers. There is a significant difference in VHI between singers and non-singers choir singers. There is a significant difference in VRQOL between singers and non-singers choir singers.

VHI and VRQOL rating scale administered on the above mentioned population show a mild handicap and an excellent score respectively. VHI scores revealed that the functional domains of the score were impaired compared to the physical and emotional domains. The different results obtained for VHI and VRQOL may be because of the restricted number of questions in VRQOL about the functional elements of voice which is found to be the most impaired in trained and untrained choir singers. Thus, VHI can be considered as a better and a more appropriate tool for the evaluation of the professional voice users especially for the singers.

### **Clinical Implications**

This data will be useful for speech language pathologists to understand emotional, physical and emotional domains of voice in trained, untrained and nonsingers.

### **Limitations and Future Directions**

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The study was carried out in a small population. Study was only focused on choir singers, future studies can be focused on other singing groups. Variables such as frequency, duration of singing session could be added in future studies.

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