

Validation of the Polish Version of Voice Disability Coping Questionnaire (PL-VDCQ)

Walidacja polskiej wersji kwestionariusza Voice Disability Coping Questionnaire (VDCQ)

JOANNA MORAWSKA, PIOTR POLITAŃSKI, MARIOLA ŚLIWIŃSKA-KOWALSKA, EWA NIEBUDEK-BOGUSZ

Nofer Institute of Occupational Medicine, Łódź, Poland

Wstęp. We współczesnej medycynie coraz częściej zwraca się uwagę na sposoby radzenia sobie ze stresem wywołanym chorobą. Wykorzystanie narzędzi samooceny jest pomocne dla klinicysty, gdyż umożliwia zidentyfikowanie nieprawidłowych strategii radzenia sobie z niepełnosprawnością oraz skuteczne ich modyfikowanie.

Cel. Walidacja kwestionariusza VDCQ (Vocal Disability Coping Questionnaire), narzędzia do oceny indywidualnych strategii radzenia sobie z niepełnosprawnością głosową.

Materiał i metody. Badaniem objęto 250 osób: 215 osób z zaburzeniami głosu i grupę kontrolną 35 osób z głosem prawidłowym. Metody oceny głosu zawierały samoocenę głosu, analizę akustyczną głosu i badanie aerodynamiczne. W grupie pacjentów z zaburzeniami głosu wykonano laryngowideostroboskopię krtani i wyłoniono 5 podgrup jednostek chorobowych. Oceniono powtarzalność i spójność wewnętrzną testu. Dokonano porównania wyników testu VDCQ w grupie badanej i kontrolnej.

Wyniki. Wysoka wartość Współczynnika Korelacji Klasowej (ICC=0.942) wskazuje na dobrą powtarzalność testu. Dobra spójność wewnątrzna testu została potwierdzona wysokim współczynnikiem alfa Cronbach'a ($\alpha=0,901$). Zaobserwowano znamienne statystycznie różnice pomiędzy wynikiem całkowitym testu VDCQ w grupie badanej i kontrolnej (35,35 punktów vs 8,06 punktów). Znotowano satysfakcjonujące korelacje pomiędzy całkowitym wynikiem VDCQ a całkowitym wynikiem VHI ($r=0,534$; $p<0,001$) oraz VRQOL ($r=-0,562$; $p<0,001$).

Wnioski. Przeprowadzone badania wykazały, że kwestionariusz VDCQ jest rzetelnym narzędziem, które może znaleźć zastosowanie w praktyce klinicznej do oceny strategii radzenia sobie z niepełnosprawnością głosu.

Słowa kluczowe: zaburzenia głosu, niepełnosprawność głosowa, strategie radzenia sobie z niepełnosprawnością, narzędzia samooceny

Introduction. In contemporary medicine coping is a concept referring to the way people deal with the stress of illness and changed health status. Making use of a coping self-assessment tool is of great value for clinicians and therapists as a means of identifying dysfunctional coping strategies and subsequently modifying them.

Aim. Validation of the Polish version of Voice Disability Coping Questionnaire, a tool to assess coping strategies used by individuals with voice disorders.

Material and Methods. Translated version of VDCQ was administered to 250 subjects: study group of 215 dysphonic individuals and 35 healthy controls. Voice assessment methods included self-assessment of voice (Voice Handicap Index, Voice-Related Quality of Life), acoustic analysis and aerodynamic measurement and laryngovideostroboscopy in the study group. The study group was divided into five voice disorder subgroups based on laryngostroboscopic findings. Test-retest reproducibility, internal consistency, discriminant validity and construct validity of PL-VDCQ were investigated.

Results. High value of Interclass Correlation Coefficient (ICC=0.942) obtained for the test-retest indicated a good level of reproductibility of PL-VDCQ. High Cronbach's alpha ($\alpha=0.901$) proved the test's good internal consistency. A significant difference in mean VDCQ scores between patients and controls (35.35 points vs. 8.06 points) showed discriminant validity of PL-VDCQ. Satisfactory correlations were found between all PL-VDCQ subscales. Construct validity was confirmed by satisfactory correlations between VDCQ and VHI scores ($r=0.534$, $p<0.001$) and between VDCQ and VRQOL scores ($r=-0.562$, $p<0.001$).

Conclusion. The study revealed that PL-VDCQ is a valid and a reliable tool which can be implemented in clinical practice.

Key words: voice disorders, voice disability, coping strategies, self-assessment tools

INTRODUCTION

It is estimated that voice disorders (dysphonias) occur in 3-9% of the general population [1] and among voice professionals, the proportion reaches up to 50% [2]. Voice disorders may cause a deterioration of the quality of life of an affected individual and may cause restrictions in the daily life. [3-5]. Individuals with voice disorders often experience social isolation and depression [6, 7]. Given that dysphonia affects communication and social integration, dysphonic patients report psychological and emotional problems as a direct consequence of their voice disorder [8, 9]. The impact of a voice deviation on the quality of life of an individual presents a complex relationship that is not necessarily direct to the degree of voice deviation, because it depends on several factors, including the professional use [10]. Given that in modern society there is an increasing demand for communication in many professions and the service sector continues to grow, society is becoming increasingly dependent on verbal communication [11]. Voice problems experienced by professional voice users may lead to problems for the employee as well as for the employer. The consequences are vocal, professional, and socio-economic. Employees may exhibit reduced productivity, decreased work quality, and restriction of daily activities and social function [3, 12, 13].

Over the last two decades the patient's subjective experience of disease has increased in importance in the analysis of the disease and therapy [14] and it is standard practice to include self-assessment questionnaires in the battery of examinations conducted in diagnosing voice disorders. Therefore, according to European Laryngological Society (ESL) guidelines [15], the essential components of such diagnosis are: perceptual assessment, aerodynamic assessment, laryngovideostroboscopy of the larynx, acoustic analysis of voice and subjective assessment of voice in which, as underlined by World Health Organization [16] the health-related quality of life plays a significant role.

The quality of life (QoL) may be defined as the way an individual deals satisfactory or unsatisfactorily with several aspects of his daily life, considering his wellbeing, beliefs, personal and spiritual satisfactions [17, 18].

What is more, variable course of certain voice disorders, especially those long-lasting ones, requires some adjustments on the part of the patient [19], or in other words, applying particular coping strategies.

Lazarus et al. define coping as a constantly changing effort to deal with external or internal demands that challenge or exceed a person's resources [20]. The function of coping is to promote the adaptation of the individual to the disturbing situation [1]. Given that voice disorders are common problems that affect both patients and therapists in unique way [21], making use of a coping self-assessment tool is therefore of great value for the clinician and the therapist as a means of identifying dysfunctional coping strategies and subsequently modifying them in the course of therapy. It has been established that the way the patient deals with the disease significantly influences the treatment and results [22, 23]. Moreover, in certain cases the way a person deals with a problem can cause a more negative impact than the problem itself [24] so it should be one of the goals of voice therapy to replace the dysfunctional coping strategies by more appropriate ones in order to achieve a better treatment outcome [22].

The subject of coping with voice disorders has been investigated by a number of clinicians and researchers in the last two decades. For instance, Mc Hugh-Munier et al. examined the relationship between coping strategies and personality, and voice in female subjects diagnosed with vocal fold nodules and polyps [25]. In 2014 Baker et al. in an exploratory study assessed the psychosocial factors of emotional expression, alexithymia, illness behaviour and coping strategies in relation to functional voice disorders in women. The authors suggested that the evaluation of coping strategies could be an integral part in the holistic approach to evaluation of voice disorders [26]. The study by Zambon et al. focused on an occupational group of voice users – teachers, and compared coping strategies between those who sought and those who did not seek voice therapy [23].

However, the first in-depth research to investigate the subject of coping with voice disability was carried out by Epstein et al. in 2007 [19] and resulted in creating the Voice Disability Coping Questionnaire (VDCQ) – a proper tool to specifically assess coping strategies applied in case of vocal complaints. Up to date it remains the only questionnaire that evaluates coping strategies in voice disorders and has only been validated into Brazilian by Oliveira et al. in 2016 [27] and into Persian by Faham et al. in 2018 [28].

In Poland there has been a growing interest in voice disorders and there exist a number of tools adapted and validated into the Polish language, for instance commonly used in clinical practice Voice Handicap Index [29, 30] or Voice-Related Quality

of Life [31]. These instruments are, however, insufficient to deal with the subject of coping with voice disorders, as they are mainly focused on the degree of perceived vocal disability (VHI) or the impact the disability has on the overall quality of life of a subject (V-RQOL).

Therefore, the aim of the present study was to validate the Polish version of the VDCQ (PL-VDCQ) for patients with dysphonia with the view of incorporating it into standard clinical practice of diagnosing voice disorders, monitoring the progress of therapy and evaluating voice therapy outcomes.

MATERIALS AND METHODS

Participants

Total number of 250 subjects participated in the study. The study group (1) consisted of 215 patients aged 48.0 ± 10.0 [mean \pm SD] who sought help at the Department of Audiology and Phoniatics of the Nofer Institute of Occupational Medicine in Lodz due to voice problems. Inclusion criteria were: presenting with voice complaint, otolaryngological diagnosis. The control group (0) were 35 volunteers - normophonic subjects aged 43.4 ± 10.0 [mean \pm SD] who reported no vocal complaints, no history of laryngeal disorders and no signs of laryngeal abnormality on indirect laryngoscopy.

Informed consent was sought and confidentiality was ensured by a numerical cross-referencing system. Data collection took place from January 2018 till July 2019.

Approval for this study was granted by the Ethical Committee of the Nofer Institute of Occupational Medicine, Łódź, Poland (decision No. 09/2018).

Procedure

Translation procedure

Consent was granted from the author of the VDCQ questionnaire, Ruth Epstein to translate and validate the tool into the Polish language.

The original version of VDCQ questionnaire [19] was translated into Polish by the first two authors and consulted with a professional English translator. A panel of three experts – a phoniatician, an ENT specialist and a speech-language pathologist reviewed the translation for best possible phrasing. Back translation was performed by a professional English translator who had not participated in the prior stage of the translation. After reviewing the back translation some minor semantic changes and modifications were made.

Self-Assessment of Voice

Voice Disability Coping Questionnaire (VDCQ)

The translated Polish version of VDCQ was used in the study [Appendix 1]. The Voice Disability Coping Questionnaire measures coping strategies in persons with voice disorders and contains 15 items in 4 domains: Social Support (SS), Information Seeking (IS), Passive Coping (PC) and Avoidance (A). Each item is graded on a 6-point Lickert scale (0-5 points), where never (0) means the patients never apply a particular coping strategy and always (5) means they always apply a particular strategy. The minimum total score is 0 points and the maximum total score is 75 points.

Voice Handicap Index (VHI) and Voice-Related Quality of Life (V-RQOL)

VHI and V-RQOL measures were used in this study as reference tools, as they are validated self-assessment tools which have proved reliable in a number of studies on Polish population and have been commonly used in clinical practice.

The participants answered the three questionnaires during one evaluation session. The patients from the study group (1) were asked to complete the questionnaires prior to the phoniatic examination. Assistance with completing the questionnaires was provided when necessary.

Methods of voice evaluation

All patients in the study group (1) underwent otolaryngological and phoniatic examination complemented by laryngovideostroboscopy (LVS) performed by means of XION EndoSTROB DX.

Vocal function and voice quality were also evaluated in the study group (1) and control group (0) by measuring the aerodynamic parameter: MPT (maximum phonation time) and acoustic parameters: Jitter group – Jitter, Relative Average Perturbation (RAP), Pitch Perturbation Quotient (PPQ), Shimmer group – Shimmer, Amplitude Perturbation Quotient (APQ) and noise-to-harmonics ratio (NHR) by means of DiagnoScope software manufactured by Diagnova Technologies, Poland. The recording of voice for the analysis took place in a soundproofed room with the average noise level of 30dB. Short-term acoustic analysis, conducted with the use of multiparametric DiagnoScope module, consisted in analysis of the prolonged sound /a:/ which was uttered twice during one expiration.

The results of the above mentioned examinations were used in order to objectively confirm voice disorders in the study group (1) and the lack thereof in the control group (0).

Statistical Analysis

Statistical analysis was performed by means of IBM SPSS Statistics version 20. The results were considered as statistically significant if the *p* value was less than 0.05 ($p < 0.05$).

Test-retest reliability

To determine test-retest reliability the questionnaire was administered among 25 participants of the study group (1) who completed the questionnaire within a 7 to 10 day interval. This time interval was considered short enough to avoid substantial voice changes and at the same time long enough for the participants to not be able to recall their previous responses. Interclass Correlation Coefficient (ICC) was determined for the reproductability of the test.

Internal consistency

Internal consistency of the test and its subscales was calculated using Cronbach's alpha coefficient. Individual items' contribution to the reliability index was assessed. Values equal to or higher than 0.7 were considered good reliability.

Discriminant validity

The mean values of the VDCQ in study group (1) and control group (0) were compared for discriminant validity using independent *t*-test. Subsequently, VDCQ results were compared among diagnose-based subgroups of patients from the study group by means of two-way ANOVA. Levene Test for Equality of Variances was conducted to determine variance equality between groups. Depending on Levene test result assumptions regarding variance equality were made accordingly.

Construct Validity

In order to deal with the parametric and nonparametric variable of the study, Spearman rank correlation (ρ) was performed to investigate correlation between VDCQ individual subscale scores. Similarly, correlations were determined between: VDCQ scores and the scores of the two commonly used in clinical practice voice self-assessment questionnaires: VHI and V-RQOL, both for the total scores and individual subscales of all tests.

RESULTS

Participants

The study group (1) and control group (0) did not differ significantly in proportions of mean age.

Diagnoses in subjects in the study group were established on the basis of phoniatric examination

including case story review, routine laryngological examination, laryngovideostroboscopy (LVS), assessment of Maximum Phonation Time (MPT) and acoustic parameters of voice. The study group was divided into subgroups of laryngeal pathology based on the LVS findings. The patients suffered from a wide range of dysphonia diagnoses, with the commonest being glottal insufficiency ($n=56$) and hyperfunctional dysphonia ($n=48$). Table I presents videostroboscopic findings in patients from the study group (1).

Table I. Videostroboscopic findings in Participants with Voice Disorders (1)

Larynx pathology	Number (%)
Hyperfunctional dysphonia	48 (23.3)
Glottal insufficiency	56 (26)
BVFM	35 (16,3)
Chronic Laryngitis	51 (23,7)
TVF paralysis	25 (11,6)

Abbreviations: BVFM – benign vocal fold masses, TVF – true vocal fold

The mean values of MPT in the study group were considerably reduced (10,2 seconds) which indicated compromised efficiency of the vocal tract, while in the control group MPT mean values were within the range of the norm (15,5 seconds).

The mean values for fundamental frequency (F0) in the study group (1) were 203 Hz (± 31 SD) for women and 155 Hz (± 55 SD) for men, and in the control group (0) they were 215 Hz (± 21 SD) for women and 126 Hz (± 26 SD) for men. The acoustic analysis of voice showed that the mean values of the acoustic parameters exceeded the threshold of the norm for all the examined parameters (Jitter, RAP, PPQ, Shimmer, APQ, NHR) in the study group and were within the norm range in the control group. The findings of the acoustic analysis of voice and the MPT measurement results in the study group and control group are presented in Table II.

The Interclass Correlation Coefficient (ICC) value obtained for the test-retest was 0.942 (95% confidence interval, lower band 866; upper band 974) for the Polish version of VDCQ, indicating that the instrument has a good level of reproductability. As presented in Table III, ICC coefficient was satisfactory for each VDCQ subscale as well.

Internal Consistency

The measurement of the internal consistency showed a very high Cronbach's alpha coefficient for the total VDCQ score: 0.901 as well as for the particular subscales of the test: PC ($\alpha=0,74$), SS ($\alpha=0.799$), IS ($\alpha=0.845$) and A ($\alpha=0.743$). A detailed

analysis of each item of the test (Table IV) indicates that the Cronbach’s alpha value did not increase after eliminating any item, thus all of the items have comparable influence on the reliability of the whole scale.

Table II. Mean values of Maximum Phonation Time (MPT) and Acoustic Analysis of Voice parameters in study group (1) and control group (0)

Acoustic parameter	Group		p value
	0	1	
MPT [±SD]	15.5 [±5.164]	10.2 [±4.688]	p<0.001
Jitter [±SD]	0.41 [±0.162]	0.85 [±1.336]	p<0.001
RAP [±SD]	0.22 [±0.094]	0.42 [±0.625]	p<0.001
PPQ [±SD]	0.25 [±0.092]	0.49 [±0.827]	p<0.001
Shimmer [±SD]	4.79 [±1.484]	8.27 [±6.450]	p<0.001
APQ [±SD]	3.91 [±1.442]	6.31 [±4.087]	p<0.001
NHR [±SD]	2.73 [±0.974]	4.41 [±3.698]	p<0.001

Abbreviations: MPT – Maximum Phonation Time, RAP – relative average perturbation, PPQ – pitch perturbation quotient, APQ – amplitude perturbation quotient, NHR – noise to harmonic ratio

Table III. Test-Retest Reliability (Interclass Correlation [ICC]) of the PL-VDCQ

VDCQ	ICC
VDCQ – Total	0.942
VDCQ – IS	0.887
VDCQ – SS	0.937
VDCQ – A	0.913
VDCQ – PC	0.861

Abbreviations: VDCQ – Voice Disability Coping Questionnaire, IS – Information Seeking, SS – Social Support, A – Avoidance, PC – Passive Coping

Table IV. Internal Consistency (Cronbach’s alpha) of the PL-VDCQ – Item Analyses Results

Number of the Item	Cronbach’s Alpha
1 VDCQ	0.896
2 VDCQ	0.893
3 VDCQ	0.889
4 VDCQ	0.892
5 VDCQ	0.894
6 VDCQ	0.899
7 VDCQ	0.896
8 VDCQ	0.893
9 VDCQ	0.897
10 VDCQ	0.897
11 VDCQ	0.896
12 VDCQ	0.896
13 VDCQ	0.895
14 VDCQ	0.898
15 VDCQ	0.895

Discriminant validity

The mean VDCQ score in the study group (1) was significantly higher than that in the control group (0) with 35.35 points and 8 points respectively for the study group and control group.

Similar statistically significant differences were observed for all the subscales of the test. Overall, given greater scores obtained by individuals with voice disorders than those without voice disorders the Polish version of VDCQ was shown to discriminate between patients and controls. The differences in mean scores are also observed also in SS, IS, A and PC domains. The results in the study group and control group differ significantly (in t test: p=0.001). The statistical findings are presented in Table V.

Comparing the mean VDCQ scores in diagnose-based subgroups of the study group the highest scores were observed for glottal insufficiency (37.27) and true vocal fold paralysis (35.72), however the between-subgroup differences were not statistically significant. Figure 1 illustrates mean VDCQ scores in each of the voice disorder subgroup. The black lines indicate ±SD ranges.

Table V. Mean Total and Domain VDCQ results for Study Group (1) and Control Group (0)

	Group	Mean	SD	SEM	p-value
VDCQ TOTAL	0	8.06	10.898	1.842	P<0.001
	1	35.35	10.060	0.686	
VDCQ – IS	0	2.51	2.934	0.496	P<0.001
	1	6.31	2.046	0.140	
VDCQ – SS	0	3.43	5.089	0.860	P<0.001
	1	14.25	4.534	0.309	
VDCQ – A	0	0.69	1.530	0.259	P<0.001
	1	5.72	3.072	0.209	
VDCQ – PC	0	1.43	2.581	0.436	P<0.001
	1	9.21	3.618	0.247	

Abbreviations: SD – Standard Deviation, SEM – Standard Error Mean, VDCQ – Voice Disability Coping Questionnaire, IS – Information Seeking, SS – Social Support, A – Avoidance, PC – Passive Coping

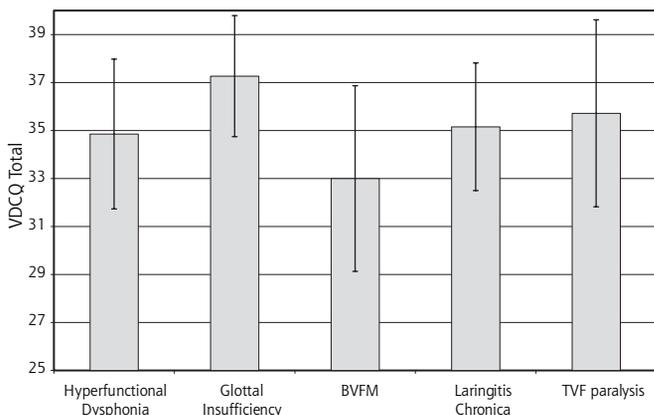


Fig. 1. VDCQ scores in diagnose-based subgroups of the study group (1)

Construct validity

Assessing the correlation between the individual subscales of the VDCQ a satisfactory statistical significance was found for all the subscales of the test (Table VI), with the strongest correlations between VDCQ Information Seeking (IS) subscale and Social Support (SS) subscale($r=0.479$, $p<0.001$) as well as between Passive Coping (PC) subscale and Avoidance(A) subscale ($r=0.576$, $p<0.001$).

Statistically significant correlation for the total score of VDCQ and V-RQOL ($r=-0.652$, $p<0.001$) indicates significant relationship between self-reported voice-related quality of life of the patient and the patient’s need to use coping strategies. The correlation is negative, that is worse reported voice-related quality of life corresponds to higher values obtained in VDCQ test. Similarly, assessing the strength of correlation between VDCQ total score and VHI a statistically significant correlation was observed ($r=0.534$, $p<0.001$) indicating that the higher voice handicap reported by the patient results in employing more strategies to cope with the voice disorder.

Satisfactory correlations were found also between the particular subscales of the VDCQ test

Table VI. VDCQ Subscale Correlations

		VCDQ SS	VDCQ IS	VDCQ A	VDCQ PC
VDCQ SS	rho	1.000	0.479	0.292	0.335
	p		<0.001	<0.001	<0.001
VDCQ IS	rho	0.479	1.000	0.203	0.185
	p	<0.001		0.003	0.007
VDCQ A	rho	0.292	0.203	1.000	0.576
	p	<0.001	0.003		<0.001
VDCQ PC	rho	0.335	0.185	0.576	1.000
	p	<0.001	0.007	<0.001	

Abbreviations: VDCQ – Voice Disability Coping Questionnaire, IS – Information Seeking, SS – Social Support, A – Avoidance, PC – Passive Coping

(SS, IS, PC, A) and the subscales of both VHI (F, SE, P) and VRQOL (SE, PF), however these were not as strong as the correlations between the total scores of the questionnaires (Table VII).

DISCUSSION

The purpose of the present study was to introduce an assessment tool for measuring coping strategies in subjects with voice disorders for the Polish population.

The subjects enrolled in the study were divided into two groups. The first one was a study group of patients who reported to the clinic with vocal complaints which were confirmed in the course of a thorough diagnostic protocol including qualitative, quantitative, instrumental, objective and subjective methods. The voice disorder group of patients was then further divided into subgroups based on the findings on larngovideostroboscopy. The second group were volunteers with no symptoms and no findings of larynx pathology during an ENT examination.

The first step of our research was to assess test-retest reliability of the Polish version of Voice Disability Coping Questionnaire. For this reason, a group of 35 subjects with vocal complaints was asked to complete the questionnaire twice – the first time prior to the phoniatic examination and then within 7 to 10 days from the initial date. However, both took place before the onset of voice therapy if such was recommended for the patient in order to maintain the same conditions of measurement. The determined Interclass Correlation Coefficient was 0.942 for the total score of PL-VDCQ. Similar value was obtained for the Persian version of VDCQ (ICC=0.897) in the study by Faham et al. [28].

It is worth noting at this point that the VDCQ questionnaire was easy for the patients to complete,

Table VII. Correlation of VDCQ Total scores and VDCQ subscales With VRQOL (including subscales) and VHI (including subscales)

		VRQOL Total	VRQOL SE	VRQOL PF	VHI Total	VHI F	VHI SE	VHI P
VDCQ TOTAL	rho	-0.562	-0.529	-0.519	0.534	0.493	0.512	0.350
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VDCQ IS	rho	-0.262	-0.200	-0.292	0.260	0.195	0.244	0.209
	p	<0.001	0.003	<0.001	<0.001	0.004	<0.001	0.002
VDCQ SS	rho	-0.283	-0.260	-0.284	0.322	0.301	0.236	0.320
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VDCQ A	rho	-0.557	-0.559	-0.472	0.552	0.549	0.561	0.316
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VDCQ PC	rho	-0.516	-0.501	-0.443	0.437	0.417	0.433	0.257
	p	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Abbreviations: VDCQ – Voice Disability Coping Questionnaire, V-RQOL – Voice-Related Quality of Life, VHI – Voice Handicap Index, IS – Information Seeking, SS – Social Support, A – Avoidance, PC – Passive Coping, SE - Social-Emotional, PF - Physical Functioning, F – Functional, SE – Social-Emotional, P – Physical

they managed the task within a few minutes and generally required no assistance from staff. However, this was not the case when the questionnaire was being completed by the subjects from the control group. Interestingly, although the subjects were asked to complete three different questionnaires (VHI, V-RQOL, VDCQ) during a single time, VDCQ seemed to be the only one that posed problems. This may result from the fact that unlike VHI which measures the self-perceived degree of voice handicap or V-RQOL which focuses on assessing the patient's self-reported voice-related quality of life, VDCQ asks questions directly linked to an existing problem, that is a voice disorder. The subjects from the control group did not report any vocal complaints and no pathologies of the larynx were found in the routine ENT examination. Therefore, they found it difficult to answer questions which assumed an existing pathology at the start. Seeing that almost every subject from the control group was confused when asked to complete VDCQ and upon completion we often heard that the whole set of questions was "non applicable" we decided not to make the control group any bigger than 35 subjects.

The next step of the research was to determine the internal consistency of the PL-VDCQ by means of Cronbach's alpha. Cronbach's alpha is a measure used to assess the reliability, or internal consistency, of a set of scale or test items [32]. It is computed by correlating the score for each scale item with the total score for each observation (usually individual survey respondents) and then comparing that to the variance for all individual item scores. It is commonly accepted that a minimum alpha coefficient between 0.65 and 0.8 (or higher) is a proof of good internal consistency [33]. We obtained Cronbach's alpha value of 0.901 for the Polish version of the VDCQ questionnaire and $\alpha > 0.742$ for each subscale of the test. These findings are in line with the studies conducted by Epstein et al. [19], Oliveira et al [27] and Faham et al. [28] which are up to date the only studies investigating validity of the VDCQ into different languages.

As expected, there were significant differences in the VDCQ scores between the study group and control group. The mean total VDCQ score in the study group of dysphonic patients was 35.35 points, whereas it was 8 points in the control group of healthy subjects. The results obtained in a study by Faham et al [28], reported similar results, with mean total VDC scores of 42.28 points and 4.5 points for the voice disorder and nonvoice disorder groups accordingly. Similarly, in research by Oliveira et al. [27] individuals with vocal complaints had greater VDC scores than those without vocal complaint.

Encouraged by Epstein's suggestion to investigate coping in relation to specific diagnostic groups [19], we were interested to see if there would be any statistically significant differences in VDCQ results of the patients from different diagnose-based subgroups in our study. In the original study by Epstein et al. two voice disorder subgroups were investigated: muscle tension dysphonia (MTD) and adductor spasmodic dysphonia (ASD) and the results of VDCQ scores differentiated between these two clinical groups [19]. It could be explained by the fact that ASD is a severe dysphonia in which the voice of the patient is strained and strangled, produced with great effort and oftentimes making communication extremely difficult or impossible. Our study comprised 5 different voice disorder subgroups, and the highest scores obtained in VDCQ test were observed in TVF paralysis subgroup (35.72 points) a disease which has a sudden onset, changing the patient's quality of voice instantly, and glottal insufficiency (37.27 points) – a condition resulting from asthenia of the internal larynx muscles. However, at this point of the study we did not notice significantly different results in VDCQ scores among diagnose-based subgroups of dysphonic patients. It would be interesting to further examine each group of patients on a larger population to investigate if any coping strategies are more frequently used than others in relation to a specific voice disorder. The fact that mean VDCQ scores were very similar across the voice disorder groups supports the generalized use of the instrument in dysphonic patients.

In assessing construct validity of the Polish version of VDCQ correlations were determined between the individual items of the scale, that is Social Support, Information Seeking, Avoidance and Passive Coping. The fact that VDCQ Information Seeking subscale correlated significantly with Social Support ($r=0.479$, $p<0.001$) and Avoidance subscale correlated significantly with Passive Coping ($r=0.576$, $p<0.001$) supports the assumption that coping strategies can be generally classified into emotional and cognitive strategies [23]. Our findings support the pioneer findings by Epstein et al. [19] who reported similar correlations between the subscales of VDCQ as well as the findings of the study by Oliveira et al [27]. The correlation between Information Seeking and Social Support implies that individuals with voice disorders cope by having social support and by getting information through discussions with family, friends, health professionals or those experiencing a similar problem. The correlation between Passive Coping and Avoidance, an emotion-focused way of coping, in turn, implies that those who use passive coping are

likely to use avoidance. If the patients are not willing to do anything about their condition and wish the problem would go away, they are likely to avoid the situation where their voice disability would become apparent, for instance by avoiding taking part in social gatherings or by leading an isolated way of life [19].

In order to determine whether coping with voice disability has any relationship with self-perceived severity of voice disorder or voice-related quality of life, we conducted correlation analyses. The total score of VDCQ was found to correlate significantly with the score of VHI – the subjects' self-perceived voice handicap ($r=0.534$, $p<0.001$) and with the score of VRQOL – voice-related quality of life ($r=-0.562$, $p<0.001$). The relationship between coping and self-perceived voice disability was previously reported in literature on the subject. For instance, the study conducted by Van Wijck-Warnaar et al. revealed that among general population, subjects with a relatively high voice handicap scored higher on Utrecht Coping List (UCL) than those with a relatively low voice handicap index [34]. Overall, a strong correlation between the VDCQ and VHI and between VDCQ and V-RQOL as well as significant differences in VDCQ scores in patients and controls (35.35 points vs. 8 points) are findings that

contribute to construct validity of the Polish version of the VDCQ measure.

Coping strategy is considered an important concept in the health area and in the context of quality of life. It is deeply associated with the regulation of emotions [35]. Current approaches in the field of voice emphasize the meaning of an impairment or disability from the patient's unique perspective, so that effective treatment planning and implementation of interventions have the potential to produce the greatest benefit for each patient [36]. Therefore, VDCQ seems a valuable addition to the diagnostic battery of tools of the contemporary clinician and speech therapist. For this reason, the aim of the present study was to validate the Voice Disability Coping Questionnaire in Polish.

Future research should be focused on using specific coping strategies in case of different larynx pathologies, different occupational groups, or in assessment of voice therapy outcomes.

CONCLUSION

The PL-VDCQ is a valid and a reliable tool which can be implemented in clinical practice for evaluating patients with dysphonia and for investigating coping strategies in patients for research purposes.

VDCQ – Voice Disability Coping Questionnaire

Imię i nazwisko Data urodzenia

Staram się dowiedzieć jakie są reakcje ludzi w odpowiedzi na ich problemy z głosem. Istnieje wiele sposobów radzenia sobie w takich okolicznościach. Prosimy o określenie częstotliwości występowania podanych reakcji i odczuć w przypadku Pani/Pana problemu z głosem. Poniżej znajduje się lista stwierdzeń opisujących możliwe odczucia / reakcje. Prosimy zaznaczyć tylko jedną odpowiedź.

	Nigdy	Prawie nigdy	Czasami	Całkiem często	Bardzo często	Zawsze
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Piśmiennictwo

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