

# Polish validation of the University of Washington “quality of life” questionnaire in patients with cancer of the larynx

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## Abstract

The University of Washington Quality of Life questionnaire version 4 (UW-QoLv4), in English, is used worldwide to assess the quality of life in patients with head and neck cancer. The use of such a questionnaire in other languages requires translation and validation in that language, and our aim was to translate it into Polish (which we did) and validate it in a group of patients diagnosed with head and neck cancer who had been considered free of disease for at least six months during routine follow-up visits to the Lower Silesian Oncology Center, Wroclaw. Using the Polish version of the questionnaire, 66 patients filled in the translated version of UW-QoLv4 and the European Organization for Research and Treatment of Cancer (EORTC) questionnaires, which were compared and analysed. Results showed good reliability, which was confirmed by internal consistency (Cronbach's  $\alpha = 0.765\text{--}0.809$ ). The construct validity was confirmed, with strong relations between the UW-QoLv4 and the EORTC scale ( $p < 0.05$ ). We conclude that the Polish version of the UW-QoLv4 questionnaire seems to have been translated well, is valid, and is valuable for the assessment of quality of life among Polish patients with cancers of the head and neck.

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**Keywords:** quality of life; head and neck cancer; UW-QoLv4 questionnaire; validity; reliability; laryngeal cancer

## Introduction

Lately, the term “quality of life” (QoL), which was first described in the 1960s, has become increasingly popular.<sup>1</sup> According to the PubMed database, it has received 323 656 publications related to it. The World Health Organization (WHO) defines QoL as “the individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals.”<sup>2</sup> Several studies involving measurements of QoL have used specialised tools to assess the quality of life precisely related to many aspects.<sup>3</sup> The University of Washington Quality of Life ver-

sion 4 (UW-QoLv4) questionnaire was created in English for English-speaking populations and version 4 was specifically designed to measure the QoL in patients with cancer of the head and neck,<sup>4,5</sup> of which laryngeal cancer is the most common. In our previous study, we reviewed published reports about questionnaires for the assessment of QoL in patients with laryngeal cancer, and the UW-QoLv4 was one of the most widely used.<sup>6</sup>

The UW-QoL questionnaire was first published in 1993, and since then has been developed to its final stage. Its use in other languages and cultures requires detailed translation and adaptation, followed by psychometric validation. Although there is a wide range of validated translations in other languages, there has been none in Polish to date.<sup>7</sup> The aim of the present study was to translate and validate a Polish version of

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the UW-QoLv4 questionnaire using the previously validated QoL assessment instrument.

### Material and methods

The original English version of the UW-QoLv4 questionnaire was translated and adapted to the Polish language according to internationally accepted guidelines.<sup>8,9</sup> Two native Polish speakers who were also experts in the English language and culture translated the original English version of the UW-QoLv4 questionnaire into Polish. A third expert compared the two translated versions until a consensus was achieved. The consistent version was then back-translated into the English language by two native English speakers, who were also experts in the Polish language and culture. The back-translated version was then compared with the original English version. A team of experts repeated this process until they reached a consensus and created a final version of the Polish UW-QoLv4 questionnaire.

The questionnaire was validated psychometrically in a group of patients diagnosed with laryngeal cancer who had been considered free of disease for at least six months during routine follow-up visits at the Lower Silesian Oncology Center, Wrocław. Patients aged 18 and over who had been diagnosed with T3 and T4 squamous cell carcinoma located in the glottal part of the larynx and had had different types of treatment were included. Participants with any psychiatric disease, diabetes, and limb amputations were excluded because of the potential impact on their QoL. Data were collected between August 2017 and February 2018.

Before participation the study all patients signed written informed consent to the study, which had first been approved by the Institutional Ethics Committee. Patients were given Polish versions of the UW-QoLv4 questionnaire, the European Organization for Research and Treatment of Cancer (EORTC) questionnaire module (EORTC QLQ-C30) version 3.0, and the EORTC QLQ-H&N35 questionnaire. The EORTC questionnaires had already been translated and validated in Polish.<sup>10–13</sup> We also asked all patients to complete our authors' questionnaire giving personal background information. They completed all the questionnaires again after a 15-day period.

The UW-QOL questionnaire consists of 12 domains: pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste, saliva, mood, and anxiety, each followed by a scale that rates the importance of each during the previous seven days. The third part of the questionnaire consists of three questions: one about how the patient is feeling in comparison with before the development of the cancer; one about QoL related to health; and one about overall QoL. Each question is scored from 0–100, where 0 indicates the worst score, and 100 the best. These domains can be grouped into two scales; physical function and socioemotional function.<sup>14,15</sup>

In 1994, the European Organization for Research and Treatment of Cancer (EORTC) questionnaire module was

first developed to assess the QoL in patients with cancers of the head and neck, and was tested in more than five European countries. The result was a questionnaire that asked for detailed information about disease-related and treatment-related symptoms and social and sexual functions.<sup>16</sup> Hammerlid et al showed that the QLQ-C30 questionnaire was well-accepted by patients and that the results seemed to be sensitive to changes during the study year.<sup>17</sup> The reliability and validity of the EORTC module for head and neck cancer (QLQ-H&N35) and version 3.0 of the EORTC core (QLQ-C30) questionnaire have been confirmed in a large group of patients from many different countries with cancers at different stages of treatment. The EORTC QLQ-C30 and head and neck cancer (QLQ-H&N35) questionnaires have shown that they are reliable and sensitive to different groups of patients and types of treatment.<sup>18,19</sup> Version 3.0 of the EORTC QLQ-C30 module contains 30 questions, and the H&N35 module 35 questions. From the raw data collected from the questionnaire, the global, functional, and symptomatic scales can be calculated according to the instructions provided in the scoring manual.<sup>20</sup>

The reliability of the test and its internal consistency were measured using Cronbach's  $\alpha$ , and considered reliable when Cronbach's  $\alpha = 0.7–0.9$ . A Test-retest was also measured with an inter-class correlation coefficient (ICC). A test-retest reliability coefficient of greater than 0.4 is considered acceptable. To confirm construct validity, we compared the UW-QoLv4 score and EORTC scores statistically. Spearman  $\rho$  values were used to compare correlations between the variables, and probabilities of  $<0.05$  were accepted as significant. The results were analysed with the aid of Statistica<sup>®</sup> (version 12, StatSoft/Dell).

### Results

The English version of the UW-QoL questionnaire was successfully translated into the Polish language without any important discrepancies. There were no cultural differences or difficulties during translation, with the exception of the words “medicine” and “medication”, which in Polish exist as only one word, “lek”. The final version of the translated questionnaire is shown in the Appendix.

A total of 70 patients were included in the present study. Following verification of the completed questionnaires, four were excluded due to serious deficiencies that precluded further calculations, and finally, 66 patients were included in further analysis. Details of patients are shown in [Table 1](#).

The UW-QOLv4 domain scores and their rated importance are shown in [Table 2](#). The most good QoL results were reported in the shoulder domain ( $n = 54$ ), and the worst were reported mainly in the speech domain ( $n = 10$ ).

Analysis of the internal consistency of the UW-QOLv4 questionnaire scale, which is presented in [Table 3](#), shows high integrity as calculated by correlation of the questions,

Table 1  
Patients' personal details. Data are number, except where otherwise stated.

| Variable              |        |
|-----------------------|--------|
| Sex:                  |        |
| Male                  | 53     |
| Female                | 13     |
| Mean (SD) age (years) | 66 (9) |
| Marital status:       |        |
| Single                | 13     |
| Married               | 45     |
| Widowed               | 8      |
| Education:            |        |
| Elementary school     | 45     |
| Secondary school      | 15     |
| University            | 6      |
| Occupation:           |        |
| Housewife             | 1      |
| Employed              | 23     |
| Retired               | 42     |

which creates a scale with a summary score that oscillates between 0.647 and 0.221. The reliability coefficient for each question was in the 0.765–0.809 range (Cronbach's  $\alpha$ ), a test-

Table 2  
UW-QoL domain scores and UW-QoL importance.

| Variable   | Distribution of responses |    |    |    |    |    |     | Mean (SE)  | Importance of domain <sup>a</sup> |
|------------|---------------------------|----|----|----|----|----|-----|------------|-----------------------------------|
|            | 0                         | 25 | 30 | 50 | 70 | 75 | 100 |            |                                   |
| Pain       | 3                         | 5  | –  | 9  | –  | 16 | 33  | 76.9 (3.6) | 13/66                             |
| Appearance | 1                         | 3  | –  | 8  | –  | 18 | 36  | 82.2 (2.9) | 8/66                              |
| Activity   | 32                        | 4  | –  | 18 | –  | 21 | 21  | 70.8 (3.2) | 15/66                             |
| Recreation | 1                         | 12 | –  | 5  | –  | 24 | 23  | 71.5 (3.5) | 2/66                              |
| Swallowing | 1                         | –  | 3  | –  | 23 | –  | 37  | 84.4 (2.7) | 18/64                             |
| Chewing    | 5                         | –  | –  | 22 | –  | –  | 37  | 75.0 (4.0) | 2/64                              |
| Speech     | 10                        | –  | 15 | –  | 24 | –  | 16  | 57.4 (4.3) | 34/65                             |
| Shoulder   | 1                         | –  | 1  | –  | 8  | –  | 54  | 93.6 (2.2) | 2/64                              |
| Taste      | 2                         | –  | 10 | –  | 12 | –  | 41  | 80.6 (3.6) | 7/65                              |
| Saliva     | 1                         | –  | 5  | –  | 20 | –  | 39  | 83.8 (2.9) | 5/65                              |
| Mood       | 2                         | 17 | –  | 9  | –  | 23 | 15  | 62.1 (3.7) | 17/66                             |
| Anxiety    | 5                         | –  | 14 | –  | 28 | –  | 19  | 64.8 (3.8) | 16/66                             |

<sup>a</sup> 4 with none; 23 with one; 10 with two; 24 with three; 1 with four; and 4 with five.

Table 3  
Analysis of internal consistency and reliability of the UW-QOL v4 scale.

| Item       | Mean if deleted | SD if deleted | Corrected item:total correlation | Cronbach's $\alpha$ if item deleted |
|------------|-----------------|---------------|----------------------------------|-------------------------------------|
| Pain       | 829             | 164           | 0.509                            | 0.774                               |
| Appearance | 823             | 165           | 0.647                            | 0.764                               |
| Activity   | 834             | 165           | 0.615                            | 0.765                               |
| Recreation | 834             | 163           | 0.616                            | 0.763                               |
| Swallowing | 820             | 172           | 0.421                            | 0.785                               |
| Chewing    | 829             | 163           | 0.530                            | 0.772                               |
| Speech     | 848             | 170           | 0.221                            | 0.809                               |
| Shoulder   | 812             | 174           | 0.358                            | 0.789                               |
| Taste      | 825             | 167           | 0.380                            | 0.788                               |
| Saliva     | 822             | 171           | 0.368                            | 0.788                               |
| Mood       | 846             | 167           | 0.428                            | 0.783                               |
| Anxiety    | 843             | 168           | 0.340                            | 0.792                               |

Summary for scale: Mean (SD) 906 (183); n = 59.

Standardised Cronbach  $\alpha$  = 0.807.

Mean inter-item correlation = 0.269.

retest reliability was also excellent (ICC 0.86) indicating the high psychometric quality of the UW-QoLv4 scale.

There was a correlation between educational level and Cronbach's  $\alpha$  coefficient. In the group of patients with a higher educational level (n = 6), Cronbach's  $\alpha$  coefficient was higher ( $\alpha$  = 0.925) than that in the groups with elementary (n = 41;  $\alpha$  = 0.778) or high school (n = 12;  $\alpha$  = 0.731) education. The reliability coefficient in the small group of women (n = 12) was  $\alpha$  = 0.629, and in the large group of men (n = 47) was  $\alpha$  = 0.835.

All Spearman correlation coefficients ( $r_s$ ), are shown in Tables 4 and 5, and differ significantly from 0 at the level of  $p < 0.05$ . Coefficients significant at the level of  $p < 0.01$  are shown in bold, and coefficients significant at the level of  $p < 0.001$  are shown in italics.

## Discussion

The Polish version of the UW-QOLv4 questionnaire has been well translated and is a valid instrument for the measurement of QoL among Polish-speaking patients with cancers of the

Table 4  
Association between UW-QoL domains and EORTC-C30 scores.

| EORTC | PHF   | UW-QoL physical function domains |       |       |       |       |       | SEF   | UW-QoL social-emotional function domains |       |       |       |       |       | UW-QoL7 |       |
|-------|-------|----------------------------------|-------|-------|-------|-------|-------|-------|--|-------|-------|-------|-------|-------|---------|-------|
|       |       | AR                               | SW    | CH    | SP    | TA    | SA    |       | PN                                       | AC    | RE    | SH    | MO    | AN    |         |       |
| OL2   | –     | –                                | –     | –     | –     | –     | –     | 0.32  | –  | 0.49  | 0.51  | –     | –     | –     | –       | 0.38  |
| PF2   | –     | –                                | –     | –     | –     | –     | –     | –     | –  | –     | 0.26  | –     | –     | –     | –       | –     |
| RF2   | –0.33 | –0.44                            | –     | –0.40 | –     | –     | –     | –0.36 | –0.38                                    | –     | –     | –     | –     | –     | –       | –0.35 |
| EF    | –0.36 | –0.50                            | –     | –0.43 | –     | –     | –0.29 | –0.41 | –0.37                                    | –0.28 | –0.31 | –     | –0.28 | –     | –       | –0.30 |
| CF    | –0.36 | –0.53                            | –0.37 | –0.42 | –     | –     | –     | –0.53 | –0.47                                    | –0.42 | –0.47 | –     | –0.28 | –0.29 | –       | –0.45 |
| SF    | –0.39 | –0.37                            | –0.45 | –0.44 | –     | –     | –     | –0.41 | –0.41                                    | –0.34 | –0.42 | –     | –     | –     | –       | –0.42 |
| FA    | –0.44 | –0.34                            | –0.34 | –0.55 | –     | –     | –0.34 | –0.37 | –0.28                                    | –0.35 | –0.51 | –     | –     | –     | –       | –0.37 |
| NV    | –0.49 | –0.46                            | –0.33 | –0.66 | –     | –     | –0.30 | –0.47 | –0.35                                    | –0.48 | –0.60 | –     | –     | –     | –       | –0.42 |
| PA    | –0.45 | –0.55                            | –0.33 | –0.65 | –     | –     | –     | –0.46 | –0.43                                    | –0.44 | –0.44 | –     | –     | –     | –       | –0.47 |
| DY    | –0.35 | –0.41                            | –0.40 | –0.43 | –     | –     | –     | –0.41 | –0.49                                    | –0.44 | –0.28 | –     | –     | –     | –       | –0.42 |
| SL    | –0.42 | –0.32                            | –0.44 | –0.42 | –     | –     | –     | –0.37 | –0.44                                    | –0.40 | –0.29 | –0.32 | –     | –     | –       | –0.32 |
| AP    | –0.47 | –0.31                            | –0.28 | –0.59 | –     | –0.28 | –0.52 | –0.39 | –0.39                                    | –     | –0.40 | –0.28 | –     | –     | –       | –0.37 |
| CO    | –0.43 | –0.28                            | –     | –0.55 | –     | –     | –0.58 | –0.36 | –0.34                                    | –     | –0.42 | –     | –     | –     | –       | –0.28 |
| DI    | –0.52 | –                                | –     | –0.36 | –0.38 | –0.35 | –0.60 | –     | –0.26                                    | –     | –     | –     | –     | –     | –       | –     |
| FI    | –0.46 | –                                | –     | –     | –0.39 | –0.44 | –0.48 | –     | –0.25                                    | –     | –     | –     | –     | –     | –       | –     |

UW-QoL: PHF – physical function domain, AR = appearance, SW = swallowing, CH = chewing, SP = speech, TA = taste, SA = saliva, SEF = social-emotional function domain, PN = pain, AC = activity, RE = recreation, SH = shoulder, MO = mood, AN = anxiety, and UW-QOL7 = overall quality of life during the last 7 days.

EORTC: OL2 = global health status, PF2 = physical functioning, RF2 = role functioning, EF = emotional functioning, CF = cognitive functioning, SF = social functioning, FA = fatigue, NV = nausea and vomiting, PA = pain, DY = dyspnoea, SL = insomnia, AP = loss of appetite, CO = constipation, DI = diarrhoea, and FI = financial difficulties.

Table 5  
Association between UW-QoL domains and EORTC-QLQ-H&N35 scores.

| EORTC | PHF          | UW-QoL physical function domains |              |              |       |              |              | SEF          | UW-QoL social-emotional function domains |              |              |       |              |       | UW-QoL7      |
|-------|--------------|----------------------------------|--------------|--------------|-------|--------------|--------------|--------------|--|--------------|--------------|-------|--------------|-------|--------------|
|       |              | AR                               | SW           | CH           | SP    | TA           | SA           |              | PN                                       | AC           | RE           | SH    | MO           | AN    |              |
| HNPA  | <b>-0.38</b> | -0.53                            | <b>-0.33</b> | -0.44        | -     | -            | -            | -0.49        | -0.47                                    | <b>-0.37</b> | <b>-0.39</b> | -     | -0.28        | -0.26 | -0.44        |
| HNSW  | -0.45        | -0.50                            | -0.40        | -0.51        | -     | -            | -0.28        | -0.48        | -0.46                                    | <b>-0.37</b> | -0.44        | -     | -            | -     | -0.44        |
| HNSE  | -0.44        | -0.46                            | <b>-0.38</b> | -0.54        | -     | -            | -0.30        | -0.48        | -0.40                                    | -0.42        | -0.54        | -     | -            | -     | -0.44        |
| HNSP  | -0.46        | -0.44                            | -0.40        | -0.58        | -     | -            | -0.26        | -0.46        | -0.40                                    | -0.43        | -0.54        | -     | -            | -     | -0.44        |
| HNSO  | -0.48        | -0.47                            | <b>-0.36</b> | -0.65        | -     | -            | -0.30        | -0.45        | <b>-0.38</b>                             | -0.42        | -0.52        | -     | -            | -     | -0.45        |
| HNSC  | -0.49        | -0.51                            | -0.41        | -0.63        | -     | -            | -            | -0.51        | -0.48                                    | -0.53        | -0.52        | -     | -            | -     | -0.49        |
| HNSX  | -0.51        | -0.51                            | -0.45        | -0.62        | -     | -            | -            | -0.48        | -0.51                                    | -0.49        | -0.43        | -     | -            | -     | -0.46        |
| HNTE  | -0.46        | -0.41                            | <b>-0.40</b> | -0.57        | -     | -            | <b>-0.32</b> | -0.46        | -0.51                                    | <b>-0.39</b> | <b>-0.38</b> | -0.25 | -            | -     | -0.46        |
| HNOM  | -0.52        | <b>-0.37</b>                     | <b>-0.36</b> | -0.58        | -     | -            | -0.45        | -0.45        | -0.48                                    | <b>-0.37</b> | -0.43        | -0.29 | -            | -     | <b>-0.37</b> |
| HNDR  | -0.58        | -0.29                            | -            | -0.54        | -     | <b>-0.38</b> | -0.66        | <b>-0.34</b> | <b>-0.37</b>                             | -            | <b>-0.35</b> | -0.28 | -            | -     | -0.28        |
| HNSS  | -0.55        | -                                | -            | -0.43        | -0.31 | -0.43        | -0.65        | -0.31        | <b>-0.35</b>                             | -            | <b>-0.34</b> | -     | -            | -     | -            |
| HNCO  | -0.55        | -0.29                            | -0.30        | <b>-0.38</b> | -0.45 | <b>-0.36</b> | -0.45        | <b>-0.32</b> | <b>-0.32</b>                             | <b>-0.33</b> | <b>-0.34</b> | -     | -            | -     | -            |
| HNFI  | <b>-0.35</b> | -                                | -0.29        | -0.29        | -0.26 | -0.29        | -            | -            | -0.27                                    | -0.25        | -0.29        | -     | -            | -     | -            |
| HNPK  | -            | -0.24                            | -0.26        | -0.29        | -     | -            | -            | <b>-0.38</b> | <b>-0.33</b>                             | -0.40        | <b>-0.39</b> | -     | -            | -     | <b>-0.37</b> |
| HNNU  | -            | -0.31                            | -            | -0.26        | -     | -            | -            | <b>-0.36</b> | -  | <b>-0.36</b> | <b>-0.34</b> | -     | -0.27        | -     | -0.41        |
| HNFE  | -0.26        | <b>-0.34</b>                     | -            | -0.41        | -     | -            | -            | -0.42        | -0.28                                    | <b>-0.32</b> | -0.40        | -     | <b>-0.32</b> | -     | -0.43        |
| HNWL  | -0.48        | -0.45                            | -0.28        | -0.54        | -     | -            | <b>-0.33</b> | -0.48        | -0.28                                    | <b>-0.39</b> | -0.44        | -     | -0.41        | -     | -0.50        |
| HNWG  | -0.48        | <b>-0.36</b>                     | -0.25        | <b>-0.57</b> | -     | -            | <b>-0.39</b> | <b>-0.34</b> | -  | -0.27        | -0.40        | -     | -0.28        | -     | <b>-0.35</b> |

**UW-QoL:** PHF – physical function domain, AR = appearance, SW = swallowing, CH = chewing, SP = speech, TA = taste, SA = saliva, SEF = social-emotional function domain, PN = pain, AC = activity, RE = recreation, SH = shoulder, MO = mood, AN = anxiety, and UW-QoL7 = overall quality of life during the last 7 days.

**EORTC:** OL2 = global health status, PF2 = physical functioning, RF2 = role functioning, EF = emotional functioning, CF = cognitive functioning, SF = social functioning, FA = fatigue, NV = nausea and vomiting, PA = pain, DY = dyspnoea, SL = insomnia, AP = loss of appetite, CO = constipation, DI = diarrhoea, and FI = financial difficulties. HNPA = Pain, HNSW = Swallowing, HNSE = Senses problems, HNSP = Speech problems, HNSO = Trouble with social eating, HNSC = Trouble with social contact, HNSX = Less sexuality, HNTE = Teeth, HNOM = Opening mouth, HNDR = Dry mouth, HNSS = Sticky saliva, HNCO = Coughing, HNFI = Felt ill, HNPk = Pain killers, HNNU = Nutritional supplements, HNFE = Feeding tube, HNWL = Weight loss, HNWG = Weight gain.

head and neck. It can be used on a larger scale for cross-cultural studies comparing the QoL among these patients who originate from different cultures.

### Limitations of the study

We have included patients with T3 and T4 laryngeal cancers because we expect that cancer in these stages is more likely to affect the quality of life. However, there are not many patients with these stages of disease because most are diagnosed and treated at stages T1/T2.

### Conflict of interest

We have no conflicts of interest.

### Ethics statement/confirmation of patients' permission

Ethics approval and patients' permission have been obtained.

### Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.bjoms.2018.12.013>.

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