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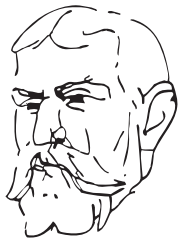

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ORIGINAL ARTICLE

THE POSSIBILITIES OF DISABILITY LEVEL DETERMINATION BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING WITH THE WHO DISABILITY ASSESSMENT SCHEDULE (WHODAS 2.0)

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ABSTRACT

The aim: To explore the possibilities of using the WHODAS 2.0 questionnaire in the field of medical and social expertise in Ukraine as an additional tool for the determination of the levels of human functioning in the main spheres of life.

Materials and methods: A check-up of 125 disabled people was conducted, their scores were determined using the WHODAS as well as their degree of disability according to generally accepted criteria in Ukraine. The study object was the disability level. The study subject – levels of functioning and disability assessment with the WHODAS 2.0.

Results: It is shown that most disabilities occur in the spheres of participation, life activity, and mobility, which is the biggest obstacle to the functioning of such people. An interval gradation of disability level determination is proposed based on the scores obtained by the respondent according to the WHODAS 2.0 with the selection of criteria for mild, moderate, severe, and very severe functional limitations.

Conclusions: Correlation analysis of indicators in different sections of the WHODAS 2.0 questionnaire with the disability criteria used in the practice of medical and social examination proves that the disability level assessment according to the WHODAS 2.0 meets the generally accepted criteria, therefore, this disability scale can be an objective tool for functional level assessment and disability group determination.

KEY WORDS: WHODAS 2.0, disability, International classification of functioning

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INTRODUCTION

The Convention on the Rights of Persons with Disabilities, adopted by the UN General Assembly on 13 December 2006 and signed by Ukraine on 16 December 2009, establishes the international obligations of the participating States in the field of rehabilitation of disabled people. These obligations include the implementation of measures to provide disabled people with opportunities to achieve and maintain maximum independence, the realization of physical and mental capabilities by organizing, strengthening, and expanding comprehensive rehabilitation services and programs. The UN Convention considers the concept of «disability» as an evolutionary concept that results from the interaction between health problems and the environment that may bother or assist a person to participate fully and effectively in society on an equal basis with others. In accordance with this international resolution, States shall take appropriate measures to ensure that disabled people have an equal access to the physical environment, transport, information, and communication, including information and communication technologies and systems, and other facilities and services provided to the population, both in urban and rural areas. Organizational and institutional improvement of the system of medical and social examination and rehabilitation of disabled people is one of the main directions of state programs.

The project of the Cabinet of Ministers of Ukraine «On approval of the Concept of reforming the system of medical and social examination» proposes to implement measures aimed at solving problems in the field of medical and social examination, in particular the application of foreign experience and provisions of the International Classification of Functioning, Disability and Health (ICF). The International Classification of Functioning, Disability and Health (ICF), adopted by the World Health Organization (WHO) in 2001, aims to provide a unification and determination of the limits for assessing health and health-related indicators. In addition, considering the provisions of the ICF, it is envisaged to determine the limits for describing these indicators in a «universal» language - in the form of a letter code system on a legal basis. This approach will ensure the identification of the predominant types of disability, accessibility of the physical and information environment to remove individual barriers by services, departments, and other organizations, regardless of organizational and legal forms and forms of ownership [1, 2].

The International Classification of Functioning, Disability and Health (ICF) is one of the key classifications of the WHO Family of International Classifications (WHO-

FIC). In 2016, the Ministry of Health of Ukraine officially initiated its introduction into the system of medical and social examination and rehabilitation in Ukraine [1, 3].

The use of the ICF to determine the disability level is a paradigm change of medical care in our country, the transition from purely «medical» and «social» models of disability to the so-called «biopsychosocial» model, which will consider various factors that limit daily human activities, including human interaction with the environment.

The ICF provides a detailed description of each function of the individual - at the level of the organism, person, or society, defines its operational assessment and disability as «a decrease in each domain of functioning» [1, 4]. However, the application of the ICF directly to assess and measure the disability level in everyday practice is difficult, as the classification is very detailed and broad. Therefore, in 1988, the experts of the World Health Organization (WHO) developed a single universal tool for assessing health and disability, which can be used for people who are over 18 years, without considering cultural aspects - WHO Disability Assessment Schedule, WHODAS. The valid and used current version is the WHODAS 2.0 [5].

The WHODAS 2.0 is a means by which it is possible to determine the disability level; it covers the levels of human functioning in the main spheres of life and directly corresponds to the aspects of «activity and participation» of the ICF. The schedule was developed as a standardized measure of disability associated with all physical and mental disorders, without reference to specific causes of disability, that is why it can be used to compare the disability level of people with different nosologies [6-9]. A unique feature of WHODAS 2.0, which distinguishes it from other disability measures, is its direct link to the ICF [9].

The use of this schedule was tested in many international population-based studies (Multi-Country Survey Study on Health and Responsiveness, World Health Survey, WHO / United Nations Economic and Social Commission for Asia and the Pacific (UNESACAP) project on improving disability statistics, etc.), in which it demonstrated high specificity and sensitivity to disability levels. In countries such as France, Spain, Germany, Turkey, South Korea and others, national studies on the validity of the WHODAS 2.0 for performance assessment were conducted, and their main results showed the usefulness, reliability, and sensitivity of the studied schedule in determining disabilities [10-12].

THE AIM

The article aims to explore the possibilities of using the WHODAS 2.0 questionnaire in the field of medical and social expertise in Ukraine as an additional tool for the determination of the levels of human functioning in the main spheres of life.

MATERIALS AND METHODS

The study object was the disability level. The study subject – levels of functioning and disability assessment with the WHODAS 2.0.

We examined 125 inpatient ill people, which had considered themselves disabled and incapable of work. Methods of study included: full clinical examination of the patients, interviewing the patients using the WHODAS 2.0 questionnaire, assessment of laboratory and functional parameters depending on the clinical protocols, mathematical and statistical methods.

The survey WHODAS 2.0 was administered in person. The interviewers used general interview techniques in a user-friendly style. Each participant was given privacy. This ensured a high comfort level, which in turn gave us the most accurate responses. All the interviews were conducted in a closed room where responses could not be overheard. The average time to complete this questionnaire was 20 minutes.

The respondent answered each question on a scale from 0 to 4, where «0» - «no disabilities», «1» - «minor disabilities «, «2» - «moderate disabilities «, «3» - «serious disabilities «, and «4» - «extremely difficult ones or impossible to perform». For each item that was positively endorsed, a follow-up question asked about the number of days (in the past 30 days) on which the respondent had experienced the difficulty.

The WHODAS 2.0 covers 6 domains of operation, including cognition, mobility, self-care, relationships, life and participation. There are several different versions of the WHODAS 2.0, which differ in the number of questions and the method of the survey – the version with 12, 36 questions, and the version 12 + 24. In this study, we used the most detailed version, which contains 36 questions related to the functional difficulties experienced by the respondent in six areas of life during the previous 30 days. Using this version, it was possible to calculate not only the general level of disability, but also individual levels for each of the six domains.

To calculate the WHODAS 2.0 final scores we used the complex variant, an item-response theory (IRT), which is officially approved by the World Health Organization. This type of scoring for WHODAS 2.0 allows for more fine-grained analyses that make use of the full information of the response categories for comparative analysis across populations or subpopulations. It takes the coding for each item response as "none", "mild", "moderate", "severe" and "extreme" separately, and then uses a computer to determine the summary score by differentially weighting the items and the levels of severity. Basically, the scoring has three steps:

Step 1 – summing of recoded item scores within each domain.

Step 2 – summing of all six domain scores.

Step 3 – converting the summary score into a metric ranging from 0 to 100 (where 0 = no disability; 100 = full disability).

The results were processed using a free Microsoft Excel program, available on the WHO website, which works according to the algorithm described above, and allows you to calculate the percentage of disabilities easily and quickly for individual domains and the entire WHODAS 2.0 [5, 9].

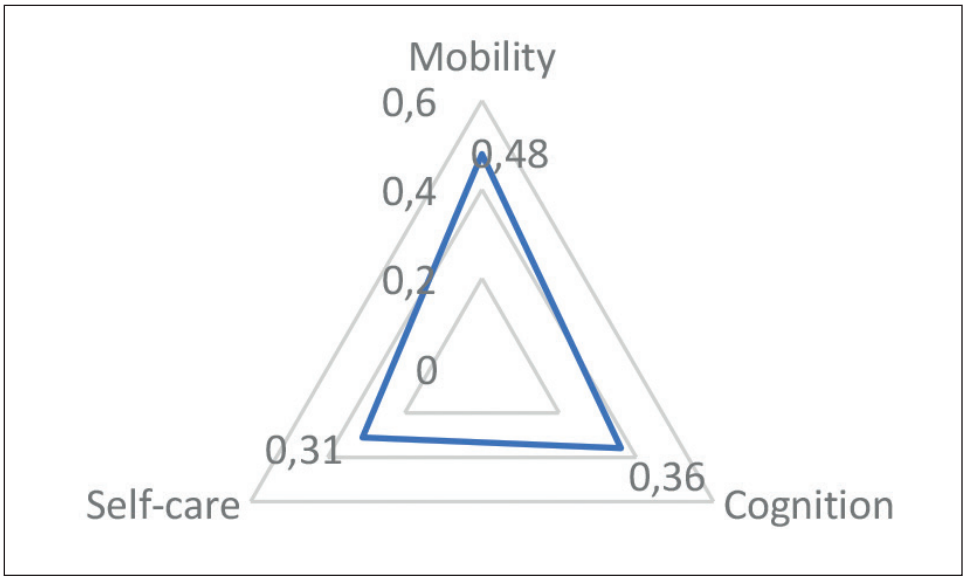

Fig. 1. The association between disability level and WHODAS 2.0 domains scores

Table I. The disability level based on the WHODAS 2.0

WHODAS 2.0 Overall Score	Disability level
< 25 points	mild
25-49 points	moderate
50-75 points	significant
> 75 points	severe

The disability levels of the examined patients were determined in accordance with the Instruction on the disability group determination, approved by the Act of the Ministry of Health of Ukraine №561, on September 5, 2011.

The statistical method and the method of expert assessment were used to process the research results [13, 17]. There were used such statistical methods as correlation analyses, analyses of variance, correspondence analyses, and methods of aggregation theory, for establishing the reliable connections between WHODAS 2.0 data and the disability levels determined with the usual method. The licensed software MS Excel for Windows © (licensed product Microsoft 365, № licenses 00201-11617-43662-AA947) was used.

RESULTS

We surveyed 125 patients of the clinic who considered themselves incapable of work and applied for a disability group. 68% of respondents did not work due to their health condition, 4% did not work due to socio-economic circumstances. The mean age of patients was 46.8 ± 5.1 years, 42.9% of them were women. 29% of respondents had higher education, 50% were urban residents.

Regarding nosological forms, patients with the pathology of internal organs predominated (79.1%); 16.5% of patients had the pathology of the visual organ as the leading one; 4.4% of respondents considered themselves incapacitated due to the neurological pathology.

The average score of all surveyed according to the WHODAS 2.0 was 25.8 ± 2.3 points.

The disabilities of patients in different domains were separately analyzed. The following data was collected.

The greatest functional limitations were related to the domain of participation, and the mean score for this component was 50.9 ± 3.1, consequently, this aspect of disabilities was the most noticeable for most patients. The limitation of the domains of life activities (32.1 ± 3.7) and mobility (24.4 ± 3.5 points) was important for patients as well. Regarding the limitation of the cognition function, the average score for this domain was 19.2 ± 2.4 points, and the limitation of the relationship aspect was 17.4 ± 2.9 points. The lowest score was observed for the self-care domain, 8.9 ± 2.0 points.

Thus, the biggest obstacle for disabled people is the limitation of so-called «participation», it means that such people are limited in the participation in social activities (for example, holidays, religious and other events) comparing to the same extent as healthy people do, able-bodied people's negative attitudes to disabled persons and discrimination against them, the time a person spends on maintaining health, etc. Such activities as doing all the necessary housework and daily activities at work or school, and mobility (moving inside the house and on the street) are essential limitations as well. The limitations of functioning related to the domain of cognition are significant – they are difficulties in concentrating, memorizing new information, analyzing problems, and finding solutions in real life. It is quite difficult for the respondents to maintain relationships with friends and communicate with new people. The low score in the domain of «self-care» (eating, hygiene

procedures, dressing) can be explained by the fact that it is significantly expressed mostly in people with severe disabilities who are not included in this study.

When calculating the severity of disability, there is a need for a procedure of gradation of the obtained data, their transfer to a unified scale. To implement this procedure, it is possible to use the so-called membership functions, which are designed to transfer natural numbers into a single dimensionless numerical scale with fixed limits.

We used the Harrington membership function:

$$\ln d(z_i) = -e^{-x_i},$$

$$z_i = \frac{x_i - x_{iB}}{x_{iB} - x_{iH}},$$

where d is a membership function;

zi is the value of overall performance in conventional units;

xi is the value of overall performance in the starting scale;

xin, xiv are lower and upper limits of the norm.

After gradation and transfer of the initial values to the interval [0-1], we obtain the following expression:

$$E = \sqrt{\frac{(d_1 - 1)^2 + (d_2 - 1)^2 + \cdots + (d_i - 1)^2}{n}} - \sqrt{\frac{1}{n}\sum_{i=0}^{n}(d_i - 1)^2}$$

where di is the value of the initial indicators xi, transferred to the interval [0–1];

n is the number of indicators.

The range of scores from 0 to 144, obtained by the patient according to the WHODAS, can be divided into the severity of the detected disabilities as follows: mild disabilities (a total score according to the scale up to 25 points), moderate ones (25-49 points), significant ones (50-75 points) and severe ones (more than 75 points). Most of the examined patients (55.3%) had mild disabilities, moderate ones were observed in 34.2% of patients, and significant ones- in 10.5%. No severe disabilities were observed, as the sample did not include respondents with severe disabilities (people with Group I disability). It corresponds to the proportion of disability by groups that is observed in society.

We examined the association between indicators for different domains of the WHODAS 2.0 questionnaire with the disability criteria with the help of Spearman correlation. For this analysis we used the score for the six different domains of WHODAS 2.0 and the levels of main life limitation established with the usual methods (work capacity, studying, mobility, behavior control, orientation, self-care, communication).

Among the obtained results, the following ones were statistically significant with $p < 0.05$. The domain of mobility was significantly positively correlated with the presence of self-care limitations according to the Instruction on the disability group determination ($\rho = 0.31$, $p < 0.05$); the domain of cognition correlated with the presence of disability ($\rho = 0.48$, $p < 0.05$). The severity of disability had a direct correlation with the limitations of cognition ($\rho = 0.36$, $p < 0.05$), and an inverse dependence on the limitations of mobility ($\rho = -0.27$, $p < 0.05$). Our data indicates that the WHODAS 2.0 survey correlates reliably, though weakly, with the disability level, measured with the help of the usual methods. So it may be used as an additional tool, but it can hardly replace the traditional methods of disability determination.

DISCUSSION

In the available literature, there is a limited number of publications on the use of WHODAS 2.0 in clinical practice linked to the physical rehabilitation [14]. Most publications relate to research on the use of WHODAS 2.0 as a screening method to assess the health status of people with cognitive impairment. The questionnaire was also used to assess disability in large samples of the population of different countries. Many publications provide data on the study of the impact of various diseases on the lives of patients. Several publications analyzed the questionnaire itself [6, 8, 12, 15, 16].

Analysis of these publications and our personal experience allowed us to draw conclusions about the advantages and disadvantages of the WHODAS 2.0 scale. Our opinion completely coincides with researchers who note the advantages of the scale in its psychometric properties. This applies to such positive characteristics as validity, informativeness, reliability and consistency of the scale parameters. To the advantages of the scale, of course, like other researchers, we would include its uniformity and versatility. The scale can be used in different nosologies, in different cultures, countries and age groups. Not the last criteria for the advantages of using WHODAS 2.0 are short time for its implementation and low material costs of the implementation, which is very important for the researcher.

The existence of several variants of the scale makes it possible to choose the best option for use in a particular case, which certainly relates to the advantages of this research tool. Another advantage is the ability to quantify the level of functioning of a person with any disease.

The disadvantage, both in our opinion and in the opinion of other researchers, is the coverage of the WHODAS 2.0 scale mostly of the activities and areas of participation of the ICF, while environmental factors are not considered.

J. Cruz and co-authors analyzed the relationship between dysfunction of the basic set of ICF and the severity of functioning problems according to objective studies [7].

C. Jacome and colleagues conducted a study on the feasibility of a baseline ICF kit for patients with chronic obstructive pulmonary disease (COPD), which confirmed the feasibility of using a baseline ICF kit in patients with COPD for a comprehensive assessment of functioning. They found, as in our study, that the most significant body functions and structural disorders were associated with the functions of exercise tolerance, sensations that are associated with cardiovascular and respiratory functions and the structure of the respiratory system. [8].

Several researchers believe that several ICF categories related to personal factors and unclassified terms were not covered by the WHODAS 2.0 scale [6].

In addition to using the WHODAS 2.0 scale for COPD, there are studies on the use of this tool in patients with diabetes. However, the use of the WHODAS 2.0 scale in various nosological forms, as done in our study, in the literature available to us, was not found. Therefore, it is not possible to make a detailed comparison of the results and conclusions of our work with the works of other authors.

CONCLUSIONS

1. The most significant limitations of functioning according to the WHODAS 2.0 are observed in the domains of participation, life activities and mobility, and this is the biggest obstacle to disabled people's functioning.
2. The disability level assessment with the WHODAS 2.0 corresponds to generally accepted disabilities, therefore, the disability scale can be an objective tool for quantifying the level of functioning and disability group determination.
3. The WHODAS 2.0 is standardized and universal, meets the main objectives of the ICF, considers all aspects of human functioning, does not require adaptation to cultural characteristics and is not tied to specific nosological forms, which allows its widespread use among the patients with different categories.
4. The use of the WHODAS 2.0 in the field of medical and social examination is appropriate along with objective examination methods to determine the degree of functional disorders of patients' organs and systems as an additional tool that will consider the impact of environmental factors on disabled people's lives, and it will allow you to develop and include effective rehabilitation measures in individual rehabilitation programs for disabled people.

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Conflict of interest:

The Authors declare no conflict of interest.

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