

International Encyclopedia of Rehabilitation

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WHODAS II: Disability self-evaluation in the ICF conceptual frame

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Introduction

Overview

The World Health Organisation Disability Assessment Schedule II (WHODAS II) is an instrument developed by the World Health Organisation (WHO) in order to assess behavioural limitations and restrictions to participation experienced by an individual, independently from a medical diagnosis (WHO 2004). The conceptual frame of reference of this instrument is the *International Classification of Functioning, Disability and Health* (ICF) (WHO 2001a), endorsed by 191 countries as the normative system to classify the health status of individuals (WHO 2001b). The ICF belongs to the *Family of International Classifications* of the WHO, and is directly related to the ICD-10 (*International statistical classification of diseases and health problems*) (WHO 1992).

The independence of evaluations provided by the WHODAS II from the medical diagnosis is conceptually in accord with the ICF. The ICF does not observe disability from the exclusive viewpoint of the medical model proper to all the previous classification systems, as was prevalent in its direct precursor ICIDH (*International Classification of Impairments, Disabilities, and Handicaps*) (WHO 1980) too, but from the so-called ‘biopsychosocial approach’. This perspective, being indifferent towards the hierarchical order of possible health states based on medical standards, is focused on the context-dependent impact of a disability on the person’s functioning, being neutral in respect to the etio-pathological aspects of the disability. The principle of etiological causality is replaced by the notion of parity:

“This means that persons with physical disease conditions may experience the same or different activity limitations and participation restrictions as those with mental disease conditions, so that it is inaccurate and prejudicial to assume that certain forms of disability are inextricably linked to one disease rather than another” (Üstün et al. 2001).

The overall findings of the Cross-Cultural Applicability Research Study, conducted by the WHO to assist the ICIDH revision process, indicated that the ideal of parity between physical and mental health disablements is “a new concept, both for professionals and for persons affected by disablements” (Trotter et al. 2001).

Why is Disability Self-Evaluation Important?

One of the complications in evaluating functioning and disability arises from the fact that a person’s own understanding of their well-being may not accord with the appraisal of medical and

professional experts. As the Nobel Prize-winner Amartya Sen stated (2002) about self-reported measures of morbidity which have severe limitations and can be extremely misleading, there is a conceptual contrast between health perception versus observation. Tension often exists between internal or subjective views of health and health-related conditions, based on the person's own perceptions, and external or objective views, based on the observations of doctors or professionals of individual health status. In Sen's well-known research (1998, 2002) on the differences of the self-perception of one's own pathological condition (morbidity), North Americans were found to have morbidity scores ten times higher than that perceived by people of Bihar, one of the poorest Indian states. According to these results, we should infer that health conditions of people of Bihar are better than those of North Americans and that intervention projects to improve the health and quality of life of people living in developing countries are hard to defend (Federici and Meloni 2010; Federici and Olivetti Belardinelli 2006). Also, according to that authoritative perspective, we should discourage professionals in rehabilitation by using a self-report tool such as WHODAS II which derives the nature of disability directly from the person's responses.

Nevertheless, we observe that objective measurements are also insufficient for understanding the triadic circularity of factors, which influence functioning and disability in the biopsychosocial model just because, as the WHO states (WHO 2002), studies show that observation evaluation alone, like a diagnosis,

“does not predict service needs, length of hospitalization, level of care or functional outcomes. Nor is the presence of a disease or disorder an accurate predictor of receipt of disability benefits, work performance, return to work potential, or likelihood of social integration. This means that if we use a medical classification of diagnoses alone we will not have the information we need for health planning and management purposes. What we lack is data about levels of functioning and disability. ICF makes it possible to collect those vital data in a consistent and internationally comparable manner”.

Therefore, we agree with Kayes and McPherson (2010), who assert that “using both an ‘objective’ measure and a subjective rating scale may be appropriate and the only way of truly capturing the phenomenon of interest”. In fact, in rehabilitation, self-report measurements are widely accepted as regards concepts which are hard to measure from an objective standpoint (well-being, pain, feelings, sensation) but, in the presence of precisely quantifiable variables, the best measurement tools are the objective ones.

Undoubtedly, it is possible to question what is objective and to verify that “‘objective’ measures are not necessarily invariant across populations”, or that “there is a risk that the measured outcome will lack clinical relevance”, or that “‘objective’ measures may be subject to technical difficulties which may impact on the accuracy of the data yielded” (Kayes and McPherson 2010), or that a measure, as far as objectivity goes, may be influenced by subjective factors in terms of the administration procedure. Therefore, rather than debating the scientific bounds of so-called objective measurements, it is important to select the right measurement tool to fit the concept to be evaluated, taking into account, as the main fitting requirements, the context of reference as well as the population addressed.

To conclude, the integrated use of self-reported and objective measures may promote the best measurement of capacity and performance. In fact, even if capacity is assessable by objective measures, performance cannot disregard a self-reported evaluation, especially in rehabilitation. Consequently, if capacity were classified by a core set of ICF codes, performance might be

measured by WHODAS II which, by assessing the degree of self-perceived disability, is conceptually compatible with the ICF.

Psychometric features

Forms

There are different forms of the WHODAS II, each of them has been structured in relation to the number of item (6, 12, 24, 12 + 24 and 36), the mode of administration (self-administered or administered by an interviewer) and the user to whom the interview is proposed (subject, clinician, caregiver). In any case, the WHO recommends the use of the 36 item form administered by an interviewer for completeness.

The 36-Item Interviewer Administered, Day Codes Version, assesses the limitations in activities and restrictions in participation experienced by an individual, independently from a medical diagnosis. Specifically, the instrument is designed to evaluate the functioning of the individual in six activity domains:

1. Understanding and communicating (6 items)
2. Getting around (5 items)
3. Self-care (4 items)
4. Getting along with people (5 items)
5. Life activities (8 items)
6. Participation in society (8 items)

The questions in each domain should be answered considering a limited time-span: the last thirty days of a person's daily life.

The participants interviewed by means of the WHODAS II are asked to indicate the experienced level of 'difficulty' by taking into account the way in which they normally perform a given activity, and including the use of whatever support or/and help by a person (aids).

For every item receiving a positive answer, the subsequent question asks the number of days (*"in the last 30 days"*) in which the interviewed has met such a difficulty, in terms of a 5-point ordinal scale: a) Only one day; b) Up to a week (= from 2 to 7 days); c) Up to two weeks (= from 8 to 14 days); d) More than two weeks (= from 15 to 29 days); e) Every day (= 30 days).

Then, the person is asked how much the difficulties have interfered with his/her life. Respondents should answer the questions according to the following references:

1. Degree of difficulty (the increase in the effort, discomfort or pain, or slowness, or differences in general);
2. Health conditions (disease or illness, or injury, or mental or emotional problems, or related to alcohol, or problems associated with drug abuse);
3. The last 30 days;
4. The average between good and bad days;
5. The way in which they normally perform the activity.

The items that refer to activities not experienced in the last 30 days are not classified.

Translations

The WHODAS II was translated into the following languages: Arabic (Badr and Abd El Aziz 2007; Badr and Mourad 2009), Czech (Švestková et al. 2009), Dutch (Karsten et al. 2010; Meesters et al. 2010; Schippers et al. 2010; van Tubergen et al. 2003), English (Alexopoulos et al. 2003; Andrews et al. 2009; Baron et al. 2005; Baron et al. 2008; Chisolm et al. 2005; Chopra et al. 2004; Chopra et al. 2008; Chwastiak and Von Korff 2003; Derrett et al. 2009; Gallagher and Mulvany 2004; Goyal and Kulkarni 2002; Hudson et al. 2008a; Hudson et al. 2008b; Kessler et al. 2003; MaGPIe Research Group 2003, 2004; McArdle et al. 2005; McKibbin et al. 2004; Mubarak 2005; Perini et al. 2006; Pyne et al. 2003; Roth et al. 2006; Scott et al. 2006; Von Korff et al. 2005; Wang et al. 2006), French (Bonnewyn et al. 2005; Norton et al. 2004), German (Kemmler et al. 2003; Pösl et al. 2007; Schlote et al. 2009; Schlote et al. 2008), Korean (Kim et al. 2005; Kim et al. 2008; Yoon et al. 2004), Italian (Annicchiarico et al. 2004; Federici et al. 2009; Federici et al. 2003; Leonardi et al. 2010; Meucci et al. 2009), Norwegian (Soberg et al. 2007), Polish (Chachaj et al. 2010; Pyszel et al. 2006), Portuguese (Brazil) (Gil et al. 2009), Spanish (García-Campayo et al. 2010; Lastra et al. 2000; Luciano et al. 2010a; Luciano et al. 2010b; Luciano et al. 2010c; Matías-Carrelo et al. 2003; Vázquez-Barquero et al. 2000), Swedish (Pettersson et al. 2006), Turkish (Donmez et al. 2005; Ertugrul and Ulug 2004; Ulug et al. 2001), and Multilingual (ESEMeD and MHEDEA 2000 investigators 2004; Rehm et al. 1999; Scott et al. 2009; Sousa et al. 2010; Von Korff et al. 2008). Korean, Polish and Swedish translations are not provided by WHO (2004).

Psychometric properties

The international literature was searched by using the main databases of the scientific production indexed: the Cambridge Scientific Abstracts – CSA, PubMed, and Google Scholar, since 1990 until May 2010. The following search terms were used: “whodas” or “who-das” in the field query “title” and “abstract”. Table 1 shows the list of the 74 studies, by specifying, for each the type of study, number of participants, nationality, field of research, and main purposes and results.

Sixteen studies have investigated the psychometric properties of the WHODAS II (Andrews et al. 2009; Baron et al. 2005; Buist-Bouwman et al. 2008; Chisolm et al. 2005; Federici et al. 2009; Luciano et al. 2010a; Luciano et al. 2010b; Luciano et al. 2010c; Meesters et al. 2010; Pösl et al. 2007; Rehm et al. 1999; Schlote et al. 2009; Sousa et al. 2010; Ulug et al. 2001; Vázquez-Barquero et al. 2000; Von Korff et al. 2008; Yoon et al. 2004) and one reports the translation into Spanish and its adaptation to the Latino culture (Matías-Carrelo et al. 2003).

Rehm (1999) describes the development and psychometric testing of the World Health Organization (WHO) disablement screening instrument for the general population. Two samples were used: the cross-cultural sample of the WHODAS II field tests in 19 countries (N = 1323 from Austria, Cambodia, China, Cuba, Greece, India, Italy, Japan, Lebanon, Luxembourg, the Netherlands, Nigeria, Peru, Romania, Spain, Tunisia, Turkey, the United Kingdom, and the United States), and an Ontario (Canada) general population sample (N = 802). The 19-country cross-cultural sample was used to conduct a psychometric analysis of the screening instrument. Unidimensionality was tested by confirmatory factor analysis, and by non-parametric (Mokken scale analysis) and parametric methods of item response theory (IRT) (Birnbaum's two-parametric-model). To assess unidimensionality, all 12 items were hypothesized to contribute to one latent variable, which is interpreted as level of disablement. Results showed that the disablement screener had good properties with respect to classical test theory, but lacked compatibility with respect to IRT criteria. This lack of compatibility with IRT criteria generally leads to a test that must be redefined for each new sample and each time it is administered. Hence, the results reported in this paper suggest that the WHO disablement screener needs revision if it is to serve as an international cross-cultural instrument.

Vázquez-Barquero and collaborators (2000) have studied the development of the Spanish version of the WHODAS II through a pilot cross-cultural analysis with 54 Spanish, 50 Cubans and 59 Peruvians, male and female, adults. Factor analysis, analysis of redundancy and missing values were conducted. The scores of the modified version of the instrument were compared with those of other countries. The Authors, however, failed to reach a clear and definitive assessment of the tool, merely to suggest further study on its psychometric properties.

Ulug et al. (2001) have assessed the reliability and validity of Turkish version of the WHODAS II, in a study with 60 patients diagnosed with schizophrenia. The Cronbach's Alpha, calculated for each of the six domains, reached values between .60 and .90, making possible to assess an acceptable internal consistency of the instrument. Regarding construct validity, domain scores displayed significant positive correlations with each other as well as with the total DAS score. According to the Authors, therefore, the WHODAS II is able to distinguish patients from control subjects; in addition, the results show that the Turkish version of the instrument has satisfactory requirements of validity and reliability.

The study by Yoon et al. (2004) was conducted to assess the Korean version of the WHODAS II. The sample consisted of 1204 elderly (aged 65 years or over) South Korean, community residents. In this study the WHODAS II-K showed high levels of internal consistency and reliability (*split-half*, *inter-rater* and *test-retest reliability*). In the correlation analyses, scores on the WHODAS II-K were significantly correlated with the unfavourable conditions in the all variables on health condition and contextual factors. Partial correlations of scores on the WHODAS II-K with the health condition were significant even after controlling for contextual factors. Therefore, the conclusion of the authors was that the WHODAS II-K is a reliable and valid instrument for assessing disability in elderly population.

Then, a preliminary study (Baron et al. 2005) of validity was conducted on 67 Canadian subjects suffering from scleroderma. (The title of the poster displayed a substantive confusion that we attributed to a misprint). The short abstract also did not provide sufficient information for an assessment of the study.

Chisolm et al. (2005) examined the psychometric properties of the English version of the WHODAS II, in a sample of 380 adults with hearing loss. The results of the analysis of convergent validity showed that the WHODAS II-E is correlated with the scores of the *Abbreviated Profile of Hearing Aid Benefit* (APHAB), the *Hearing Aid Handicap for the Elderly* (HHIE), and the SF-36 (*short form*). The internal consistency of scores in different domains was satisfactory, except for the domain "Interactions and relationships with others". The test-retest stability was adequate for the scores of all domains.

One of the most comprehensive psychometric analysis conducted, to date, on the WHODAS II is the work of Pösl et al. (2007), under the direction of G. Stucki, University of Monaco. The Authors evaluated the usefulness of the WHODAS II for measuring functioning and disability in patients with musculoskeletal diseases, internal diseases, stroke, breast cancer, and depressive disorder. The validation of the German version of the WHODAS II was conducted in a sample of 904 patients from 19 rehabilitation centers and clinics in Bavaria. There was, among other things, a convergent validity with the SF-36. The conclusions of the study confirmed the structure of six domains of the WHODAS II; furthermore, the instrument appeared reliable and valid, and showed sensitivity to change similar to that of the SF-36 in the corresponding subscales.

Buist-Bouwman et al. (2008) assessed the factorial structure, the internal consistency and the discriminant validity of the ESEMeD version of the WHODAS II, which was used in a *European*

Study of Epidemiology of Mental Disorders. The sample was 8796 adults. The study confirms the structure of six factors of the WHODAS II, found a good internal consistency of the instrument and also the results of discriminant validity appeared, on a preliminary analysis, acceptable.

Von Korff et al. (2008) considered the psychometric properties of a WHODAS II modified for use in the *World Mental Health Surveys* with the addition of filter items in different subscales. Internal consistency and validity of the modified WHODAS II were generally supported, but the use of filter questions impaired measurement properties of the instrument.

Andrews et al. (2009) used the 12 Item WHODAS 2.0 in the second Australian Survey of Mental Health and Well-being (N = 8841 adults aged 16–85). They reported the overall factor structure and the distribution of scores and normative data (means and SDs) for people with any physical disorder, any mental disorder and for people with neither. By Confirmatory Factor Analysis, a theoretical hierarchical solution that included a single second-order factor representing disability – a *Global Disability* latent variable – and six first-order factors that represent the six domains of disability was chosen as the best fitting model. People with mental disorders had high scores (mean 6.3, SD 7.1), people with physical disorders had lower scores (mean 4.3, SD 6.1). People with no disorder covered by the survey had low scores (mean 1.4, SD 3.6). The paper provides normative data for the 12 item version of the WHODAS 2.0.

The study of Federici et al. (2009) had as its general aim to provide a contribution to the validation of the Italian version of the WHODAS II, considering the widespread consent about the usefulness of the tool. Specifically, the authors wanted to test if the WHODAS II can be regarded as a reliable instrument to assess the functioning and the self-perception of disability in persons with normal abilities and disabled participants, by the means of the analysis of some psychometric characteristics such as the reliability (internal homogeneity, Cronbach's alpha) and the validity (principal components analysis). The Italian version of the WHODAS II has been adapted by the Authors in the same format of the English one (*36-Item Interviewer Administered, Day Codes Version – February 2000*), because this was the most recent version of the instrument. The Authors have deleted the Italian items of the “SEZIONE 3: Resoconto generale sulla salute” and of the “SEZIONE 5. Attribuzione e impatto” since they were not included anymore in the last format of the English version. The WHODAS II was administered to a sample of 500 participants (185 males and 315 females), divided into two sub-samples: 271 normal adults and 229 disabled adults. Moreover, the disabled participant group comprised 111 motor disabled, 45 mental disabled and 73 sensory disabled. The findings obtained show a good correspondence with the original structure of the WHODAS II. Furthermore, the internal consistency of most subscales, estimated by means of the Cronbach's Alpha, was found to be high in the examined sample. Regarding the factorial structure of the instrument, the results confirm the presence of six main factors, according to the six activity domains expected to be assessed by the WHODAS II. The study of Federici et al. (2009) presents, however, some limitations: first, the three subgroups of disabled do not match each other for participant number, age and sex; moreover, the enrolment of mental disabled respondents ran into difficulties because it was not easy to access the centres for mental disabled in Italy. Finally, it has not been studied nor the convergent validity nor the reliability test – retest of the instrument. It is therefore desirable a research prosecution which proposes, among other things, to reach standard scores for each macro-category of disability. Normative scores of disability would be useful to integrate the self-evaluation of a single individual about his/her functioning in a specific context. Indeed, by comparing the disability self-evaluation of a single individual to standard scores it will be possible to assess how much each factor of the biopsychosocial determinants of the individual's functioning influences the disability self-evaluation of that person.

Schlote et al. (2009) measured the internal consistency, inter-rater-reliability and validity of the WHODAS II for its application with stroke patients and their closest others. Patients (N=102) were assessed 6 months and 1 year after stroke with the self- and proxy-rating versions of the instrument. The modified Rankin Scale (mRS) as well as patients' statements about 'Recovery' and 'Independence' were used as measurements for validity. Patients' statements concerning individual restrictions and limitations were compared with the WHODAS II items. Internal consistency can be regarded as good to excellent, inter-rater-reliability as satisfactory to good. Correlation coefficients between WHODAS II Scales and validation measures ranged from fair to high. Correspondence between stroke related problems and WHODAS II items was good. The WHODAS II is a valid, generally reliable and useful instrument for the assessment of stroke patients over the first year after stroke.

Luciano et al. (2010b) examined the known-groups' validity of the 12-item WHODAS II by evaluating its ability to discriminate between patients with/without major depression, patients with depression with/without medical comorbidity, and patients with depression with different depression severity (N = 3,615 with a first-time diagnosis of major depressive episode). The 12-item WHODAS II, the PHQ-9, and a chronic medical conditions checklist were administered. The statistical analyses indicated that the 12-item WHODAS II was able to discriminate between patients with/without depression and between those with different depression severity. The results support the discriminant validity of the 12-item WHODAS II for major depression, being quite recommendable its use in epidemiological research. In another study Luciano et al. (2010c) explore the dimensionality, internal consistency and construct validity of the 12-item WHODAS II. The principal component analysis and the subsequent confirmatory factor analysis indicated that the 12-item WHODAS II is one-dimensional. The instrument showed adequate internal consistency ($\alpha=0.89$) and construct validity because it was significantly associated with quality of life and depression severity (convergent validity) and was able to discriminate between patients on sick leave and those that were working (discriminative validity). Luciano et al. (2010a) in the last study on 12-item version of WHODAS II used a non-parametric item response method (Kernel-Smoothing) implemented with the TestGraf software to examine the effectiveness of each item and their options in discriminating between changes in the underlying disability level. Item response analyses indicated that the twelve items forming the WHO-DAS II perform very well. All WHO-DAS II items were very good at assessing overall disability.

Meesters et al. (2010) investigated the validity and responsiveness of WHODAS II in patients with Rheumatoid Arthritis (N = 85). The self-administered 36-item WHODAS II was applied at admission for rehabilitation and 6 weeks after discharge. The internal consistency of the instrument was determined with Cronbach's- α . Associations between the WHODAS II and other outcome measures were determined by Pearson's rank correlation coefficients. Responsiveness measures included the standardized response mean (SRM), effect size (ES) and responsiveness ratio (RR). The WHODAS II appeared to be internally consistent, valid and responsive to assess disability in patients with established RA. The instrument showed significant floor effects regarding the subscales—'understanding communicating' and 'getting along with people'.

Finally, Sousa et al. (2010) evaluated the psychometric properties of the 12-item interviewer administered screener version of WHODAS II among older people living in seven low- and middle-income countries (urban sites in Cuba, Dominican Republic and Venezuela, and rural and urban sites in Mexico, Peru, China and India). The sample size for each country was between 2000 and 3000 participants. Principal component analysis, confirmatory factor analysis and Mokken analyses were carried out to test for unidimensionality, hierarchical structure, and measurement invariance across 10/66 Dementia Research Group sites. Strong internal consistency and high factor loadings for the one-factor solution supported unidimensionality. The Mokken results strongly support that

the WHODAS II 12-item screener is a unidimensional and hierarchical scale confirming to item response theory (IRT) principles, at least at the monotone homogeneity model level.

In conclusion, the review of international literature on the WHODAS showed a broad consensus on the reliability and validity of the instrument, although there is a lack of standardized scores for the different translations of the WHODAS and the scarcity of particularly thorough studies do not guarantee that the cultural and psychometric requirements have been met by the instrument.

Clinical and research use

A comprehensive overview of scientific literature on WHODAS II showed that most studies have investigated the correlation between the 6 domains of the WHODAS and/or its total score with the scores obtained on scales measuring depression (Alexopoulos et al. 2003; Banerjee et al. 2008; Chwastiak and Von Korff 2003; Karsten et al. 2010; Kemmler et al. 2003; Kessler et al. 2003; Kim et al. 2005; Luciano et al. 2010b; Luciano et al. 2010c; McKibbin et al. 2004; Schippers et al. 2010; Scott et al. 2006; Scott et al. 2009; Von Korff et al. 2005; Wang et al. 2006; Yoon et al. 2004), pain (Chwastiak and Von Korff 2003; Pyszel et al. 2006; Soberg et al. 2007; Stucki and Sigl 2003; Yoon et al. 2004), schizophrenia and psychotic disorders (Chopra et al. 2008; Ertugrul and Ulug 2004; Janca et al. 1996; Lastra et al. 2000; McKibbin et al. 2004; Mubarak 2005; Norton et al. 2004; Pyne et al. 2003; Schippers et al. 2010; Ulug et al. 2001), quality of life (Baron et al. 2008; Chopra et al. 2004; Donmez et al. 2005; ESEMeD and MHEDEA 2000 investigators 2004; Goyal and Kulkarni 2002; Hudson et al. 2008a; Hudson et al. 2008b; Kemmler et al. 2003; Leonardi et al. 2010; Luciano et al. 2010c; Meucci et al. 2009; Mubarak 2005; Pösl et al. 2007; Pyne et al. 2003; Pyszel et al. 2006; Rehm et al. 1999; Soberg et al. 2007), sleep disorders (Roth et al. 2006), diabetes (Andrews et al. 2009; Von Korff et al. 2005), ageing (Alexopoulos et al. 2003; Donmez et al. 2005; Kim et al. 2005; Yoon et al. 2004), rheumatic disorders (Baron et al. 2005; Baron et al. 2008; Meesters et al. 2010; Stucki and Sigl 2003; van Tubergen et al. 2003), multiple sclerosis (Chopra et al. 2008), anxiety disorders (Andrews et al. 2009; Bonnewyn et al. 2005; García-Campayo et al. 2010; Perini et al. 2006; Schippers et al. 2010; Scott et al. 2006; Scott et al. 2009; Wang et al. 2006), childhood trauma (Gil et al. 2009), cancer (Andrews et al. 2009; Chachaj et al. 2010), stroke (Schlote et al. 2009; Schlote et al. 2008), substance use/abuse (Andrews et al. 2009; Schippers et al. 2010; Scott et al. 2006; Scott et al. 2009; Wang et al. 2006), craving (Schippers et al. 2010), coping skills (Badr and Abd El Aziz 2007; Badr and Mourad 2009), cognitive functions (Kim et al. 2008; Yoon et al. 2004), hearing or vision impairment (Andrews et al. 2009; Badr and Abd El Aziz 2007; Badr and Mourad 2009; Banerjee et al. 2008; Chisolm et al. 2005; McArdle et al. 2005), general health (Norton et al. 2004; Pyszel et al. 2006), limitations of activity and restrictions in participation (Pettersson et al. 2006; Post et al. 2008; Schippers et al. 2010) or in epidemiological and comorbidity national and international surveys (Bonnewyn et al. 2005; Buist-Bouwman et al. 2008; Donmez et al. 2005; ESEMeD and MHEDEA 2000 investigators 2004; Kessler et al. 2003; MaGPIe Research Group 2003, 2004; Scott et al. 2006; Scott et al. 2009; Wang et al. 2006).

The results obtained in these studies emphasized, first, that the WHODAS II is a useful, reliable and valid tool for assessment of disability, functioning and social participation, and is sensitive to changes like the SF-36 (Medical Outcomes Study Short Form 36); secondly, it facilitates the use of the ICF as a conceptual framework for the assessment of the limitations in activity and participation, and effectively discriminates between normal/healthy and disabled/sick people (Ertugrul and Ulug 2004). Some studies suggest using the WHODAS II together with the SF-36 (Baron et al. 2005; Chwastiak and Von Korff 2003; Leonardi et al. 2010; Perini et al. 2006; Pyne et al. 2003; Soberg et al. 2007; Von Korff et al. 2008; Von Korff et al. 2005) or with the WHO Quality of Life – short version (WHQOL-BREF) in order to improve the health profile (Chopra et al. 2004; Goyal and Kulkarni 2002; Kemmler et al. 2003) or together with Coping Inventory for Stressful Situations (CISS) and Matching Person and Technology (MPT) to assess the individual coping

strategies and the predispositions to assistive technologies (Federici et al. 2003). Actually, the WHODAS II is a tool relatively complex and difficult to administer with full co-operation in psychiatric patients who reported that they were healthy and denied “emotional or mental problems” as described in the WHODAS II (Chopra et al. 2004).

References

- Alexopoulos GS, Raue P, Areán P. 2003. Problem-solving therapy versus supportive therapy in geriatric major depression with executive dysfunction. *American Journal of Geriatric Psychiatry* 11(1):46-52.
- Andrews G, Kemp A, Sunderland M, Von Korff M, Ustun TB. 2009. Normative data for the 12 item WHO Disability Assessment Schedule 2.0. *PloS one* 4(12):e8343.
- Annicchiarico Ro, Gibert K, Cortes U, Campana F, Caltagirone C. 2004. Qualitative profiles of disability. *Journal of Rehabilitation Research and Development* 41(6):835-846.
- Badr HE, Abd El Aziz HM. 2007. Role of Gender in Coping Capabilities among Young Visually Disabled Students. *The Journal of the Egyptian Public Health Association* 82(5-6):365-77.
- Badr HE, Mourad H. 2009. Assessment of visual disability using the WHO disability assessment scale (WHO-DAS-II): role of gender. *The British Journal of Ophthalmology* 93(10):1365-1370.
- Banerjee A, Kumar S, Kulhara P, Gupta A. 2008. Prevalence of depression and its effect on disability in patients with age-related macular degeneration. *Indian journal of Ophthalmology* 56(6):469-74.
- Baron M, Hudson M, Taillefer S. 2005. Preliminary study of the validity of the World Health Organization Disease [sic.] Assessment Schedule (WHODAS II) in patients with scleroderma (ssc). *Annals of the Rheumatic Diseases* 64(Suppl 3):948.
- Baron M, Schieir O, Hudson M, Steele R, Kolahi S, Berkson L, Couture F, Fitzcharles MA, Gagné M, Garfield B et al. 2008. The clinimetric properties of the World Health Organization Disability Assessment Schedule in early inflammatory arthritis. *Arthritis and Rheumatism* 59(3):382-390.
- Bonnewyn A, Bruffaerts R, Van Oyen H, Demarest S, Demyttenaere K. 2005. The impact of mental disorders on daily functioning in the Belgian community. Results of the study "European Study on Epidemiology of Mental Disorders" (ESeMeD). *Revue medicale de Liege* 60(11):849-54.
- Buist-Bouwman M, Ormel J, De Graaf R, Vilagut G, Alonso J, Van Sonderen E, Vollebergh W, ESEMeD T, MHEDEA 2000 Investigators. 2008. Psychometric properties of the World Health Organization Disability Assessment Schedule used in the European Study of the Epidemiology of Mental Disorders. *International Journal of Methods in Psychiatric Research* 17(4):185-197.
- Chachaj A, Malyszczak K, Pyszel K, Lukas J, Tarkowski R, Pudelko M, Andrzejak R, Szuba A. 2010. Physical and psychological impairments of women with upper limb lymphedema following breast cancer treatment. *Psycho Oncology* 19(3):299-305.

- Chisolm TH, Abrams HB, McArdle R, Wilson RH, Doyle PJ. 2005. The WHO-DAS II: psychometric properties in the measurement of functional health status in adults with acquired hearing loss. *Trends in Amplification* 9(3):111-126.
- Chopra PK, Couper JW, Herrman H. 2004. The assessment of patients with long-term psychotic disorders: Application of the WHO Disability Assessment Schedule II. *Australian and New Zealand Journal of Psychiatry* 38(9):753-759.
- Chopra PK, Herrman H, Kennedy G. 2008. Comparison of disability and quality of life measures in patients with long-term psychotic disorders and patients with multiple sclerosis: an application of the WHO Disability Assessment Schedule II and WHO Quality of Life-BREF. *International Journal of Rehabilitation Research* 31(2):141-9.
- Chwastiak LA, Von Korff M. 2003. Disability in depression and back pain: evaluation of the World Health Organization Disability Assessment Schedule (WHO DAS II) in a primary care setting. *Journal of Clinical Epidemiology* 56(6):507-14.
- Derrett S, Langley J, Hokowhitu B, Ameratunga S, Hansen P, Davie G, Wyeth E, Lilley R. 2009. Prospective outcomes of injury study. *Injury Prevention* 15(5):e3.
- Donmez L, Gokkoca Z, Dedeoglu N. 2005. Disability and its effects on quality of life among older people living in Antalya city center, Turkey. *Archives of Gerontology and Geriatrics* 40(2):213-223.
- Ertugrul A, Ulug B. 2004. Perception of stigma among patients with schizophrenia. *Social Psychiatry and Psychiatric Epidemiology* 39(1):73-77.
- ESEMeD, MHEDEA 2000 investigators. 2004. Disability and quality of life impact of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatrica Scandinavica* 109(Suppl. 420):38-46.
- Federici S, Meloni F. 2010. A Note on the Theoretical Framework of World Health Organization Disability Assessment Schedule II. *Disability and Rehabilitation* 32(8):687-691.
- Federici S, Meloni F, Mancini A, Lauriola M, Olivetti Belardinelli M. 2009. World Health Organization Disability Assessment Schedule II: A contribution to the Italian validation. *Disability and Rehabilitation* 31(7):553-564.
- Federici S, Olivetti Belardinelli M. 2006. Un difficile accordo tra prevenzione e promozione [A difficult agreement between prevention and promotion]. *Psicologia clinica dello sviluppo* 10(2):330-334.
- Federici S, Scherer MJ, Micangeli A, Lombardo C, Olivetti Belardinelli M. 2003. A Cross-Cultural Analysis of Relationships between Disability Self-Evaluation and Individual Predisposition to Use Assistive Technology. In: Craddock GM, McCormack LP, Reilly RB, Knops HTP, editors. *Assistive Technology - Shaping the Future*. Amsterdam: IOS Press. p. 941-946.
- Gallagher P, Mulvany F. 2004. Levels of ability and functioning: using the WHODAS II in an Irish context. *Disability and Rehabilitation* 26(9):506-17.

- García-Campayo J, Zamorano E, Ruiz MA, Pardo A, Pérez-Páramo M, López-Gómez V, Freire O, Rejas J. 2010. Cultural adaptation into Spanish of the generalized anxiety disorder-7 (GAD-7) scale as a screening tool. *Health and Quality of Life Outcomes* 8(8):1-11.
- Gil A, Gama CS, Rocha de Jesus D, Lobato MI, Zimmer M, Belmonte-de-Abreu P. 2009. The association of child abuse and neglect with adult disability in schizophrenia and the prominent role of physical neglect. *Child Abuse and Neglect* 33(9):618-624.
- Goyal U, Kulkarni KS. 2002. Efficacy of Menosan, a polyherbal formulation in the management of menopausal syndrome with respect to quality of life. *Indian Journal of Clinical Practice* 13(8):37-40.
- Hudson M, Steele R, Taillefer S, Baron M, Research CS. 2008a. Quality of life in systemic sclerosis: psychometric properties of the World Health Organization Disability Assessment Schedule II. *Arthritis and Rheumatism* 59(2):270-278.
- Hudson M, Thombs BD, Steele R, Watterson R, Taillefer S, Baron M, Canadian Scleroderma Research Group Investigators of the Canadian Scleroderma Research Group. 2008b. Clinical correlates of quality of life in systemic sclerosis measured with the World Health Organization Disability Assessment Schedule II. *Arthritis and Rheumatism* 59(2):279-284.
- Janca A, Kastrup M, Katschnig H, Lopez-Ibor JJJ, Mezzich JE, Sartorius N. 1996. The World Health Organization Short Disability Assessment Schedule (WHO DAS-S): a tool for the assessment of difficulties in selected areas of functioning of patients with mental disorders. *Social Psychiatry and Psychiatric Epidemiology* 31(6):349-354.
- Karsten J, Hartman CA, Ormel J, Nolen WA, Penninx BWJH. 2010. Subthreshold depression based on functional impairment better defined by symptom severity than by number of DSM-IV symptoms. *Journal of Affective Disorders* 123(1-3):230-237.
- Kayes NM, McPherson KM. 2010. Measuring what matters: does 'objectivity' mean good science? *Disability and Rehabilitation* 32(12):1011-1019.
- Kemmler G, Schmied B, Shetty-Lee A, Zangerle R, Hinterhuber H, Schüssler G, Mumelter B. 2003. Quality of life of HIV-infected patients: Psychometric properties and validation of the German version of the MQOL-HIV. *Quality of Life Research* 12(8):1037-1050.
- Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS. 2003. The Epidemiology of Major Depressive Disorder: Results from the; National Comorbidity Survey Replication (NCS-R). *Journal of the American Medical Association* 289(23):3095-3105.
- Kim J-M, Stewart R, Glozier N, Prince M, Kim S-W, Yang S-J, Shin I-S, Yoon J-S. 2005. Physical health, depression and cognitive function as correlates of disability in an older Korean population. *International Journal of Geriatric Psychiatry* 20(2):160-7.
- Kim J-M, Stewart R, Kim S-W, Yang S-J, Shin I-S, Kim Y-H, Yoon J-S. 2008. BDNF genotype potentially modifying the association between incident stroke and depression. *Neurobiology of Aging* 29(5):789-792.

- Lastra I, Vázquez-Barquero JL, Herrera Castanedo S, Cuesta MJ, Vázquez-Bourgon ME, Dunn G. 2000. The classification of first episode schizophrenia: a cluster-analytical approach. *Acta Psychiatrica Scandinavica* 102(1):26-31.
- Leonardi M, Raggi A, Antozzi C, Confalonieri P, Maggi L, Cornelio F, Mantegazza R. 2010. The relationship between health, disability and quality of life in myasthenia gravis: results from an Italian study. *Journal of neurology* 257(1):98-102.
- Luciano J, Ayuso-Mateos J, Aguado J, Fernandez A, Serrano-Blanco A, Roca M, Haro J. 2010a. The 12-item World Health Organization Disability Assessment Schedule II (WHO-DAS II): a nonparametric item response analysis. *BMC Medical Research Methodology* 10(1):45.
- Luciano JV, Ayuso-Mateos JL, Fernandez A, Aguado J, Serrano-Blanco A, Roca M, Haro JM. 2010b. Utility of the twelve-item World Health Organization Disability Assessment Schedule II (WHO-DAS II) for discriminating depression "caseness" and severity in Spanish primary care patients. *Quality of Life Research* 19(1):97-101.
- Luciano JV, Ayuso-Mateos JL, Fernández A, Serrano-Blanco A, Roca M, Haro JM. 2010c. Psychometric properties of the twelve item World Health Organization Disability Assessment Schedule II (WHO-DAS II) in Spanish primary care patients with a first major depressive episode. *Journal of Affective Disorders* 121(1-2):52-58.
- MaGPIe Research Group. 2003. The nature and prevalence of psychological problems in New Zealand primary healthcare: a report on Mental Health and General Practice Investigation (MaGPIe). *The New Zealand Medical Journal* 116(1171):1-15.
- MaGPIe Research Group. 2004. General practitioner recognition of mental illness in the absence of a 'gold standard'. *Australian and New Zealand Journal of Psychiatry* 38(10):789-794.
- Matías-Carrelo LE, Chávez LM, Negrón G, Canino G, Aguilar-Gaxiola S, Hoppe S. 2003. The spanish translation and cultural adaptation of five mental health outcome measures. *Culture, Medicine and Psychiatry* 27(3):291-313.
- McArdle R, Chisolm TH, Abrams HB, Wilson RH, Doyle PJ. 2005. The WHO-DAS II: measuring outcomes of hearing aid intervention for adults. *Trends in Amplification* 9(3):127-43.
- McKibbin C, Patterson TL, Jeste DV. 2004. Assessing Disability in Older Patients With Schizophrenia Results From the WHODAS-II. *Journal of Nervous and Mental Disease* 192(6):405-413.
- Meesters JJJ, Verhoef J, Liem ISL, Putter H, Vliet Vlieland TPM. 2010. Validity and responsiveness of the World Health Organization Disability Assessment Schedule II to assess disability in rheumatoid arthritis patients. *Rheumatology* 49(2):326-333.
- Meucci P, Leonardi M, Zibordi F, Nardocci N. 2009. Measuring participation in children with Gilles de la Tourette syndrome: a pilot study with ICF-CY. *Disability & Rehabilitation* 31(1):S116-S120.
- Mubarak AR. 2005. Social functioning and quality of life of people with schizophrenia in the northern region of Malaysia. *Australian e-Journal for the Advancement of Mental Health* 4(3):1-10.

- Norton J, de Roquefeuil G, Benjamins A, Boulenger J-P, Mann A. 2004. Psychiatric morbidity, disability and service use amongst primary care attenders in France. *European Psychiatry* 19(3):164-167.
- Perini SJ, Slade T, Andrews G. 2006. Generic effectiveness measures: Sensitivity to symptom change in anxiety disorders. *Journal of Affective Disorders* 90(2-3):123-130.
- Pettersson I, Törnquist K, Ahlström G. 2006. The effect of an outdoor powered wheelchair on activity and participation in users with stroke. *Disability and Rehabilitation: Assistive Technology* 1(4):235-243.
- Pösl M, Cieza A, Stucki G. 2007. Psychometric properties of the WHODASII in rehabilitation patients. *Quality of Life Research* 16(9):1521-1531.
- Post MWM, de Witte LP, Reichrath E, Verdonschot MM, Wjlhuizen GJ, Perenboom RJM. 2008. Development and validation of IMPACT-S, an ICF-based questionnaire to measure activities and participation. *Journal of Rehabilitation Medicine* 40(8):620-627.
- Pyne JM, Sullivan G, Kaplan R, Williams DK. 2003. Comparing the Sensitivity of Generic Effectiveness Measures With Symptom Improvement in Persons With Schizophrenia. *Medical Care* 41(2):208-217.
- Pyszel A, Malyszczak K, Pyszel K, Andrzejak R, Szuba A. 2006. Disability, psychological distress and quality of life in breast cancer survivors with arm lymphedema. *Lymphology* 39(4):185-192.
- Rehm J, Üstün TB, Saxena S, Nelson CB, Chatterji S, Ivis F, Adlaf E. 1999. On the development and psychometric testing of the WHO screening instrument to assess disablement in the general population. *International Journal of Methods in Psychiatric Research* 8(2):110-122.
- Roth T, Jaeger S, Jin R, Kalsekar A, Stang PE, Kessler RC. 2006. Sleep Problems, Comorbid Mental Disorders, and Role Functioning in the National Comorbidity Survey Replication. *Biological Psychiatry* 60(12):1364-1371.
- Schippers GM, Broekman TG, Buchholz A, Koeter MWJ, van den Brink W. 2010. Measurements in the Addictions for Triage and Evaluation (MATE): an instrument based on the World Health Organization family of international classifications. *Addiction* 105(5):862-871.
- Schlote A, Richter M, Wunderlich MT, Poppendick U, Moller C, Schwelm K, Wallesch CW. 2009. WHODAS II with people after stroke and their relatives. *Disability and Rehabilitation* 31(11):855-864.
- Schlote A, Richter M, Wunderlich MT, Poppendick U, Möller C, Wallesch CW. 2008. Use of the WHODAS II with Stroke Patients and Their Relatives: Reliability and Inter-Rater-Reliability. *Die Rehabilitation* 47(1):31-38.
- Scott KM, McGee MA, Wells JE, Browne MAO, New Zealand Mental Health Survey Research Team. 2006. Disability in Te Rau Hinengaro: The New Zealand Mental Health Survey. *Australian and New Zealand Journal of Psychiatry* 40(10):889-895.

- Scott KM, Von Korff M, Alonso J, Angermeyer MC, Bromet E, Fayyad J, de Girolamo G, Demyttenaere K, Gasquet I, Gureje O et al. 2009. Mental-physical co-morbidity and its relationship with disability: results from the World Mental Health Surveys. *Psychological Medicine* 39(1):33-43.
- Sen A. 1998. Mortality as an Indicator of Economic Success and Failure. *Economic Journal* 108(446):1-25.
- Sen A. 2002. Health: perception versus observation. *BMJ* 324(7342):860-861.
- Soberg HL, Bautz-Holter E, Roise O, Finset A. 2007. Long-term multidimensional functional consequences of severe multiple injuries two years after trauma: a prospective longitudinal cohort study. *The Journal of Trauma* 62(2):461-470.
- Sousa RM, Dewey ME, Acosta D, Jotheeswaran AT, Castro-Costa E, Ferri CP, Guerra M, Huang Y, Jacob KS, Rodriguez Pichardo JG et al. 2010. Measuring disability across cultures--the psychometric properties of the WHODAS II in older people from seven low- and middle-income countries. The 10/66 Dementia Research Group population-based survey. *International Journal of Methods in Psychiatric Research* 19(1):1-17.
- Stucki G, Sigl T. 2003. Assessment of the impact of disease on the individual. *Best Practice & Research: Clinical Rheumatology* 17(3):451-473.
- Švestková O, Angerová Y, Sládková P. 2009. The International Classification of Functioning, Disability and Health (ICF) - Quantitative Measurement of Capacity and Performance. *Ceska a Slovenska Neurologie a Neurochirurgie* 72/105(6):580-586.
- Trotter RT, II, Üstün TB, Chatterji S, Rehm J, Room R, Bickenbach JE. 2001. Cross-cultural applicability research on disablement: Models and methods for the revision of an international classification. *Human Organization* 60(1):13-27.
- Ulug B, Ertugrul A, Göğüs A, Kabakçı E. 2001. Yetiyitimi Degerlendirme Çizelgesinin (WHO-DAS-II) sizofreni hastalarında geçerlilik ve güvenilirliği [Reliability and validity of the Turkish version of the World Health Organization Disability Assessment Schedule-II (WHO-DAS-II) in schizophrenia]. *Türk Psikiyatri Dergisi* 12(2):121-130.
- Üstün TB, Chatterji S, Bickenbach JE, Trotter II RT, Room R, Rehm J, Saxena S. 2001. *Disability and Culture: universalism and diversity*. Seattle: Hogrefe and Huber.
- van Tubergen A, Landewe R, Heuft-Dorenbosch L, Spoorenberg A, van der Heijde D, van der Tempel H, van der Linden S. 2003. Assessment of disability with the World Health Organisation Disability Assessment Schedule II in patients with ankylosing spondylitis. *Annals of the Rheumatic Diseases* 62(2):140-5.
- Vázquez-Barquero JL, Vázquez Bourgón ME, Herrera Castanedo S, Saiz J, Uriarte M, Morales F, Gaite L, Herrán A, Üstün TB, Grupo Cantabria en Discapacidades. 2000. Versión en lengua española de un nuevo cuestionario de evaluación de discapacidades de la OMS (WHO-DAS-II): Fase inicial de desarrollo y estudio piloto [Spanish version of the new World Health Organization Disablement Assessment Schedule II (WHO-DAS-II): Initial phase of development and pilot study]. *Actas Españolas de Psiquiatría* 28(2):77-87.

- Von Korff M, Crane P, Alonso J, Vilagut G, Angermeyer M, Bruffaerts R, de Girolamo G, Gureje O, de Graaf R, Huang Y et al. 2008. Modified WHODAS-II provides valid measure of global disability but filter items increased skewness. *Journal Clinical Epidemiology* 61(11):1132-1143.
- Von Korff M, Katon W, Lin EHB, Simon G, Ludman E, Oliver M, Ciechanowski P, Rutter C, Bush T. 2005. Potentially Modifiable Factors Associated With Disability Among People With Diabetes. *Psychosomatic Medicine* 67(2):233-240.
- Wang J, Adair CE, Patten SB. 2006. Mental health and related disability among workers: A population-based study. *American Journal of Industrial Medicine* 49(7):514-522.
- World Health Organization (WHO). 1980. ICIDH: International Classification of Impairments, Disabilities, and Handicaps. A Manual of classification relating to the consequences of disease. Geneva: WHO.
- World Health Organization (WHO). 1992. ICD-10: International Statistical Classification of Diseases and Related Health Problems, 10th Revision. Geneva: WHO.
- World Health Organization (WHO). 2001a. ICF: International Classification of Functioning, Disability, and Health. Geneva: WHO.
- World Health Organization (WHO). 2001b. International Classification of Functioning, Disability and Health (ICF) [Internet]. Geneva: WHO; [cited 2010 June 3]. Available from: <http://www.who.int/classifications/icf/en/>
- World Health Organization (WHO). 2002. Towards a Common Language for Functioning, Disability and Health: ICF The International Classification of Functioning, Disability and Health [Internet]. Geneva: WHO; [cited 2010 June 3]. Available from: <http://www.who.int/classifications/icf/training/icfbeginnersguide.pdf>
- World Health Organization (WHO). 2004. WHODAS-II - Disability Assessment Schedule Training Manual: A guide to administration [Internet]. Geneva: WHO; [cited 2010 June 3]. Available from: http://www.who.int/icidh/whodas/training_man.pdf
- Yoon JS, Kim JM, Shin IS, Yang SJ, Zheng TJ, Lee HY. 2004. Development of Korean version of World Health Organization Disability Assessment Schedule II (WHODAS II-K) in Community Dwelling Elders. *Journal of the Korean Neuropsychiatric Association* 43(1):86-92.

Table 1. International literature on WHODAS II. The table shows the list of the 74 studies, by specifying for each type of study, number of participants, nationality, field of research and main purposes and results.

Articles published in international journals	Type of study	Nationality	Subjects	Area of research	Purposes	Results
1. Alexopoulos et al. (2003). Problem-solving therapy versus supportive therapy in geriatric major depression with executive dysfunction.	Quantitative empirical study of clinical treatment	United States	25	Psychiatry	Comparison of the effectiveness of for problem-solving therapy and supportive care in a group of elderly subjects with executive dysfunction.	Effectiveness of treatment for problem-solving recognized.
2. Andrews et al. (2009). Normative data for the 12 item WHO Disability Assessment Schedule 2.0.	Psychometric quantitative empirical study	Australia	8841	Public Health/Epidemiology	Provide a brief, reliable and valid measure of global disability for use in epidemiological and health services research	Age and sex-specific norms for the WHODAS 2.0 12 item version.
3. Annicchiarico et al. (2004). Qualitative profiles of disability.	Qualitative empirical study	Italy	96	Disability and rehabilitation	Identification of profiles of functional disability in parallel to increased levels of disability.	Identification of four groups of individuals with disabilities.
4. Badr et al. (2007). Role of Gender in Coping Capabilities among Young Visually Disabled Students.	Correlational quantitative empirical study	Egypt	200	Disability and rehabilitation	Evaluation of the role of gender in coping skills among young visually disabled students.	Correlation occurred.
5. Badr et al. (2009). Assessment of visual disability using the WHO disability assessment scale (WHO-DAS-II): role of gender.	Correlational quantitative empirical study	Egypt	200	Disability and rehabilitation	Study the role of gender in coping with disability in young visually impaired students	Correlation occurred.
6. Banerjee et al. (2008). Prevalence of depression and its effect on disability in patients with age-related macular degeneration.	Correlational quantitative empirical study	India	53	Psychiatry	Assessment of depression effects on disability in patients with visual macular degeneration.	Correlation occurred.
7. Baron et al. (2008). The clinimetric properties of the world health organization disability assessment schedule II in early inflammatory arthritis.	Psychometric quantitative empirical study	Canada	172	Medicine	Evaluation of clinimetric properties of the WHODAS II in patients with early inflammatory arthritis.	Good reliability and validity.
8. Bonnewyn et al. (2005). The impact of mental disorders on daily functioning in the Belgian community.	Epidemiological correlational quantitative empirical study	Belgium	2419	Medicine	Assessing the impact of mental disorders on daily functioning of the Belgian population.	Correlation occurred.
9. Buist-Bouwman et al. (2008). Psychometric properties of the World Health Organization Disability Assessment Schedule used in the European Study of the Epidemiology of Mental Disorders.	Psychometric quantitative empirical study	Netherlands	8796	Psychiatry	Validation of the version of WHODAS used in the European Study of the Epidemiology of Mental Disorders (ESEMED).	Good reliability and validity and factorial structure confirmed.
10. Chachaj et al. (2010). Physical and psychological impairments of women with upper limb lymphedema following breast cancer treatment.	Correlational quantitative empirical study	Poland	404	Medicine	Identify factors associated with worse physical and emotional functioning of breast cancer survivors with upper extremity lymphedema.	Correlation occurred.
11. Chisolm et al. (2005). The WHO-DAS II: psychometric properties in the measurement of functional health status in adults with acquired hearing loss.	Psychometric quantitative empirical study	United States	380	Disability and rehabilitation	Definition of the psychometric properties of the WHODAS II for a sample of adults with onset of hearing loss.	Good reliability and validity.
12. Chopra et al. (2004). The assessment of patients with long-term psychotic disorders: Application of the WHO Disability Assessment Schedule II.	Psychometric quantitative empirical study	Australia	20	Psychiatry	Evaluation of the WHODAS II in patients treated for long-term psychotic disorders.	Good reliability and validity.
13. Chopra et al. (2008). Comparison of disability and quality of life measures in	Correlational quantitative empirical	Australia	40	Psychiatry	Comparison between the application of the WHODAS II and the WHOQOL-BREF in the evaluation of	Correlation confirmed.

patients with long-term psychotic disorders and patients with multiple sclerosis: an application of the WHO Disability Assessment Schedule II and WHO Quality of Life-BREF.	study				patients with psychotic disorders and multiple sclerosis.	
14. Chwastiak et al. (2003). Disability in depression and back pain: evaluation of the World Health Organization Disability Assessment Schedule (WHO DAS II) in a primary care setting.	Psychometric quantitative empirical study	United States	149	Medicine	Evaluation of measurement properties of the WHODAS II in two disorders commonly encountered in primary care setting.	Good validity and responsiveness to change.
15. Derrett et al. (2009). Prospective outcomes of injury study.	Epidemiological correlational quantitative/qualitative empirical study	New Zealand	2500	Epidemiology	(1)To quantitatively determine the injury, rehabilitation, personal, social and economic factors leading to disability outcomes following injury in NZ; (2) to qualitatively explore peoples' "lived experiences" and perceptions of injury-related disability outcomes.	Results will be published.
16. Donmez et al. (2005). Disability and its effects on quality of life among older people living in Antalya city center, Turkey.	Correlational quantitative empirical study	Turkey	840	Medicine	Detection of frequency and severity level of disability for older people living in Antalya city center; evaluation of the effects of disability and variables associated with it on living conditions.	Frequency and severity detected; correlation detected.
17. Ertugrul et al. (2004). Perception of stigma among patients with schizophrenia.	Correlational quantitative empirical study	Turkey	60	Psychiatry	Measurement of the relationship between the symptoms and other characteristics of schizophrenic patients with self-perceived stigma.	Correlation occurred.
18. ESEMeD/MHEDEA 2000 investigators. (2004). Disability and quality of life impact of mental disorders in Europe.	Epidemiological correlational quantitative empirical study	Belgium, Germany, Italy, Spain, France and Netherlands	21425	Psychiatry	Survey on the impact of the state of mental health and specific mental and physical disorders on work performance and quality of life in six European countries.	Correlations occurred.
19. Federici et al. (2009). World Health Organization Disability Assessment Schedule II (WHODAS II): A contribution to the Italian validation.	Psychometric quantitative empirical study	Italy	500	Disability and rehabilitation	Validation of the Italian version of the WHODAS II.	Good validity and reliability and factorial structure confirmed.
20. Federici et al. (2009). International Literature Review on WHODAS II (World Health Organization Disability Assessment Schedule II).	Literature review	Italy	0	Disability and rehabilitation	To ascertain the international dissemination level of the WHODAS II's use and, at the same time, analyse the studies regarding the psychometric validation of the WHODAS II translation and adaptation in other languages and geographical contexts.	All studies point out the WHODAS II as an effective and reliable instrument in order to assess the disability.
21. Federici et al. (2010). A Note on the Theoretical Framework of World Health Organization Disability Assessment Schedule II.	Critical analysis	Italy	0	Disability and rehabilitation	Comments and critiques 'WHODAS II with people after stroke and their relatives' by A. Schlote et al.	
22. Gallagher et al. (2004). Levels of ability and functioning: using the WHODAS II in an Irish context.	Correlational quantitative empirical study	Ireland	1304	Disability and rehabilitation	Correlational analysis between socio-demographic variables, causes of disability and domains of individual functioning and ability discovered by the WHODAS II.	Correlations confirmed.
23. García-Campayo et al. (2010). Cultural adaptation into Spanish of the generalized anxiety disorder-7 (GAD-7) scale as a screening tool.	Correlational quantitative empirical study	Spain	212	Psychiatry	Carry out the cultural adaptation into Spanish of the 7-item self-administered GAD-7 scale	Correlations occurred
24. Gil et al. (2009). The Association of Child Abuse and Neglect with Adult Disability in Schizophrenia and the Prominent Role of	Correlational quantitative empirical study	Brazil	99	Psychiatry	To assess long-lasting effects of childhood trauma on the functional outcome of adult patients diagnosed with schizophrenia.	Correlations occurred

Physical Neglect.						
25. Goyal et al. (2002). Efficacy of Menosan, a polyherbal formulation in the management of menopausal syndrome with respect to quality of life.	Correlational quantitative empirical study	India	40	Medicine	Assessment of the effects of Menosan, a polyherbal formulation, on quality of life in menopausal women.	Correlation confirmed; efficacy of Menosan demonstrated.
26. Hudson et al. (2008a). Quality of life in systemic sclerosis: psychometric properties of the World Health Organization Disability Assessment Schedule II.	Psychometric quantitative empirical study	Canada	402	Medicine	Study of validity of the WHODAS II in patients with systemic sclerosis.	Good validity.
27. Hudson et al. (2008b). Clinical correlates of quality of life in systemic sclerosis measured with the World Health Organization Disability Assessment Schedule II.	Correlational quantitative empirical study	Canada	337	Medicine	Identification of clinical features of systemic sclerosis that best correlate with the quality of life related to the health of patients.	Clinical correlates identified.
28. Janca et al. (1996). The World Health Organization Short Disability Assessment Schedule (WHO DAS-S): a tool for the assessment of difficulties in selected areas of functioning of patients with mental disorders.	Analytical study	Switzerland	0	Psychiatry and medicine	Study of characteristics of the WHODAS-S as a clinical tool for evaluation of individual functioning in psychiatric subjects.	Detection of a good utility and ease of use and acceptable reliability for use by clinicians belonging to different schools and psychiatric traditions.
29. Karsten et al. (2010). Sub-threshold depression based on functional impairment better defined by symptom severity than by number of DSM-IV symptoms.	Correlational quantitative empirical study	Netherlands	2157	Psychiatry	To define clinically significant depression below the DSM-IV threshold for Major Depressive Disorder (MDD) by means of functional impairment	Correlation occurred
30. Kemmler et al. (2003). Quality of life of HIV-infected patients: Psychometric properties and validation of the German version of the MQOL-HIV.	Psychometric quantitative empirical study	Germany	207	Medicine	Convergent validity study of the German version of the Multidimensional Quality of Life Questionnaire for HIV/AIDS on a sample of HIV-infected patients.	Good validity and reliability of the Multidimensional Quality of Life Questionnaire for HIV/AIDS; convergent validity demonstrated.
31. Kessler et al. (2003). The Epidemiology of Major Depressive Disorder: Results from the; National Comorbidity Survey Replication (NCS-R).	Epidemiological correlational quantitative empirical study	United States	9090	Medicine	Survey on prevalence, correlates and clinical relevance of the DSM disorders and assessment of treatments adequacy.	Prevalence, correlates and clinical relevance identified; inadequacy of treatment detected.
32. Kim et al. (2005). Physical health, depression and cognitive function as correlates of disability in an older Korean population.	Correlational quantitative empirical study	South Korea	1204	Psychiatry	Survey on independent associations between physical health, depression, cognitive function and disability in the older Korean population.	Correlations confirmed.
33. Kim et al. (2008). BDNF genotype potentially modifying the association between incident stroke and depression.	Correlational quantitative empirical study	South Korea	500	Psychiatry	Survey on the role of a genotype (val66met) of the neurotrophic factor derived from the brain (BDNF) in the association between stroke and depression.	Correlation confirmed.
34. Lastra et al. (2000). The classification of first episode schizophrenia: a cluster-analytical approach.	Qualitative empirical study	Spain	86	Psychiatry	Check the classification of a schizophrenic population into subgroups for similar symptoms profiles.	Division into subgroups confirmed, but not predictive.
35. Leonardi et al. (2010). The relationship between health, disability and quality of life in myasthenia gravis: results from an Italian study.	Correlational quantitative empirical study	Italy	102	Medicine	Assess the relationship between HRQoL and disability in a group of patients with MG	Correlation occurred
36. Luciano et al (2010a) The 12-item World Health Organization Disability Assessment Schedule II (WHO-DAS II): a nonparametric item response analysis	Psychometric quantitative empirical study	Spain	3615	Psychiatry	Examine the effectiveness of the WHO-DAS II items and their options in discriminating between changes in the underlying disability level by means of item response analyses	WHO-DAS II items and options discriminate well among different latent levels of disablement and that it is a

						nonbiased instrument with respect to gender
37. Luciano et al. (2010b). Utility of the twelve-item World Health Organization Disability Assessment Schedule II (WHO-DAS II) for discriminating depression "caseness" and severity in Spanish primary care patients.	Psychometric correlational quantitative empirical study	Spain	3615	Psychiatry	Ability of the 12-item WHODAS II to discriminate between patients with/without major depression, patients with depression with/without medical comorbidity, and patients with depression with different depression severity	Discriminant validity of 12-item WHODAS II
38. Luciano et al. (2010c). Psychometric properties of the twelve item World Health Organization Disability Assessment Schedule II (WHO-DAS II) in Spanish primary care patients with a first major depressive episode.	Psychometric correlational quantitative empirical study	Spain	3615	Psychiatry	Analyse the dimensionality, internal consistency and construct validity of the 12-item WHO-DAS II	Reliability and validity of 12-item WHODAS II
39. MaGPIe Research Group. (2004). General practitioner recognition of mental illness in the absence of a 'gold standard'.	Correlational quantitative empirical study	New Zealand	845	Psychiatry	Comparison between the general practice of recognition of mental illness and the cases identified by diagnostic instruments and screening.	Correlation is not verified; variability between instruments and between clinical opinion and screening and diagnostic tests.
40. MaGPIe Research Group. (2003). The nature and prevalence of psychological problems in New Zealand primary healthcare: a report on Mental Health and General Practice Investigation (MaGPIe).	Correlational quantitative empirical study	New Zealand	70	Medicine	Study of the degree of disability and other factors that influence the recognition, management, course and outcome of mental disorders in patients of New Zealand.	Correlations confirmed.
41. Matias-Carrelo et al. (2003). The Spanish translation and cultural adaptation of five mental health outcome measures.	Qualitative empirical study of translation and adaptation	Spain	130	Medicine	Spanish translation and adaptation of five measures of mental health.	Semantic, technical and content equivalence demonstrated.
42. McArdle et al. (2005). The WHO-DAS II: measuring outcomes of hearing aid intervention for adults.	Correlational quantitative empirical study	United States	380	Disability and rehabilitation	Assessment of reactivity of the WHODAS II to the short and long term effects in applications of acoustic devices.	Good reactivity of the WHODAS II, correlation detected.
43. McKibbin et al. (2004). Assessing Disability in Older Patients With Schizophrenia Results From the WHODAS-II.	Psychometric quantitative empirical study	United States	76	Medicine	Evaluation of reliability and validity of the WHODAS II in older patients with schizophrenia.	Strong evidence of good reliability and some evidence of good validity.
44. Meesters et al. (2010). Validity and responsiveness of the World Health Organization Disability Assessment Schedule II to assess disability in rheumatoid arthritis patients.	Psychometric quantitative empirical study	Netherlands	85	Medicine	Investigate the validity and responsiveness of the World Health Organization Disability Schedule II (WHODAS II) in patients with established RA.	Internal consistency, validity and responsiveness to assess disability
45. Meucci et al. (2009). Measuring participation in children with Gilles de la Tourette syndrome: a pilot study with ICF-CY.	Quantitative empirical study	Italy	10	Neuropsychiatry	Describe the complete range of functional profiles of children with TS; define the functioning and the difficulties in social participation.	Therapeutic elements must be identified by an environment change
46. Mubarak AR. (2005). Social functioning and quality of life of people with schizophrenia in the northern region of Malaysia.	Correlational quantitative empirical study	Malaysia	258	Medicine	Investigation on the relationship between social functioning and quality of life of people with schizophrenia in Malaysia.	Correlation confirmed.
47. Noonan et al. (2009). Comparing the content of participation instruments using the international classification of functioning, disability and health.	Review of instruments that operationalize participation	Canada	0	Disability and rehabilitation	Compare the content of participation instruments using the ICF classification	WHODAS II have questions which did not contain any ICF categories related to the domains in the activities and participation component.
48. Norton et al. (2004). Psychiatric	Correlational	France	124	Psychiatry	Investigation on the relationship between psychiatric	Correlations confirmed.

morbidity, disability and service use amongst primary care attenders in France.	quantitative empirical study				morbidity, disability and use of services in French patients.	
49. Perini et al. (2006). Generic effectiveness measures: Sensitivity to symptom change in anxiety disorders.	Correlational quantitative empirical study	Australia	169	Medicine	Study with convergent measures on sensitivity to change in people with anxiety disorders.	Convergent validity demonstrated.
50. Pettersson et al. (2006). The effect of an outdoor powered wheelchair on activity and participation in users with stroke.	Quantitative and longitudinal empirical study	Sweden	32	Disability and rehabilitation	Self-evaluation of the limitations in activities and restrictions in the participation of people with stroke, before and after the use of an outdoor powered wheelchair.	Positive effects of wheelchair found.
51. Pösl et al. (2007). Psychometric properties of the WHODAS II in rehabilitation patients.	Psychometric quantitative empirical study	Germany	904	Disability and rehabilitation	Validation of the German version of the WHODAS II.	Good validity and reliability and factorial structure confirmed.
52. Post et al. (2008). Development and validation of IMPACT-S, an ICF-based questionnaire to measure activities and participation.	Psychometric quantitative empirical study	Netherlands	276	Disability and rehabilitation	Validation of the IMPACT-S, an ICF-based questionnaire to measure activity and participation.	Good concurrent validity, test-retest reliability and internal consistency.
53. Pyne et al. (2003). Comparing the Sensitivity of Generic Effectiveness Measures With Symptom Improvement in Persons With Schizophrenia.	Correlational quantitative empirical study	United States	134	Medicine	Study with convergent measures on the sensitivity of generic effectiveness in improving the symptoms of people with schizophrenia.	Convergent validity demonstrated.
54. Pyszel et al. (2006). Disability, psychological distress and quality of life in breast cancer survivors with arm lymphedema.	Correlational quantitative empirical study	Poland	1000	Medicine	Assessment of disability, psychological distress and quality of life in breast cancer Polish survivors with arm lymphedema.	Correlations confirmed.
55. Rehm et al. (1999) On the development and psychometric testing of the WHO screening instrument to assess disablement in the general population.	Psychometric quantitative empirical study	Austria, Cambodia, China, Cuba, Greece, India Italy, Japan, Lebanon, Luxembourg, Netherlands, Nigeria, Peru, Romania, Spain, Tunisia, Turkey, U K, United States	1323 + 802	Disability and rehabilitation	describe the development and psychometric testing of the World Health Organization (WHO) disablement screening instrument for the general population	The WHO disablement screener needs revision, if it is to serve as an international cross-cultural instrument.
56. Roth et al. (2006). Sleep Problems, Comorbid Mental Disorders, and Role Functioning in the National Comorbidity Survey Replication.	Epidemiological correlational quantitative empirical study	United States	9282	Psychiatry	National survey on the prevalence of sleep disorders, or the associations of sleep disorders with role disorders related to comorbidity of mental disorders.	Correlations confirmed.
57. Scherer et al. (2006) Opportunity is possibility; performance is action: Measuring participation	Commentary	United States	0	Disability and rehabilitation	WHODAS II and participation	
58. Schippers et al. (2010). Measurements in the Addictions for Triage and Evaluation (MATE): an instrument based on the World Health Organization family of international classifications.	Correlational quantitative empirical study	Netherlands	945	Psychiatry	Evaluate a measurement tool (MATE) for assessing characteristics of people with drug and/or alcohol problems for triage and evaluation in treatment	Correlation occurred
59. Schlote et al. (2008). Use of the WHODAS II with stroke patients and their	Psychometric quantitative empirical study	Germany	168	Disability and rehabilitation	Measurement of the reliability of WHODAS II with stroke patients and their relatives.	Good reliability.

relatives: reliability and inter-rater-reliability.	study					
60. Schlote et al. (2009). WHODAS II with people after stroke and their relatives.	Psychometric quantitative empirical study	Germany	102	Disability and rehabilitation	Measurement of the internal consistency, inter-rater-reliability and validity of the WHODAS II	WHODAS II is a valid, generally reliable and useful instrument for the assessment of stroke patients
61. Scott et al. (2006). Disability in Te Rau Hinengaro: The New Zealand Mental Health Survey.	Correlational quantitative empirical study	New Zealand	12992	Psychiatry	Study on relationship between the disability and the presence of mental disorders and chronic physical conditions in the population of New Zealand, controlling comorbidity, age and sex.	Correlations identified.
62. Scott et al. (2009). Mental-physical comorbidity and its relationship with disability: results from the World Mental Health Surveys.	Correlational quantitative empirical study	Colombia, Mexico, USA, Belgium, France, Germany, Italy, Netherlands, Spain, Ukraine, Israel, Lebanon, Nigeria, South Africa, Japan, China, New Zealand	85088	Medicine	Survey on mental-physical comorbidity and on its relationship with disability.	Small correlation identified.
63. Soberg et al. (2007). Long-term multidimensional functional consequences of severe multiple injuries two years after trauma: a prospective longitudinal cohort study.	Prospective quantitative empirical study	Norway	105	Medicine	Evaluation, through prospective cohort study, of the functioning and quality of life in patients with severe multiple injuries.	Correlation identified.
64. Sousa et al. (2010). Measuring disability across cultures--the psychometric properties of the WHODAS II in older people from seven low- and middle-income countries. The 10/66 Dementia Research Group population-based survey.	Psychometric quantitative empirical study	Cuba, Dominican Republic, Venezuela, Mexico, Peru, China, India	(2000/3000 for each country)	Psychiatry	Evaluation of the psychometric properties of the 12-item interviewer-administered screener version of the WHODAS II among older people	Strong support for the 12-item WHODAS II as a unidimensional hierarchical scale
65. Stucki et al. (2003). Assessment of the impact of disease on the individual.	Review of self-administered measures on the health	Germany	0	Medicine	Implementation of an algorithm for the selection of current measures for the assessment of health conditions.	About the WHODAS states that the validity and reliability of the instrument are still under investigation.
66. Švestková et al. (2009). The International Classification of Functioning, Disability and Health (ICF) - Quantitative Measurement of Capacity and Performance.	Correlational quantitative empirical study	Czech Republic	200	Medicine	Analyze the structure of causal factors in terms of Activities (Capacity) and Participation (Performance).	
67. Ulug et al. (2001). Reliability and validity of the Turkish version of the World Health Organization Disability Assessment Schedule-II (WHO-DAS-II) in schizophrenia.	Psychometric quantitative empirical study	Turkey	90	Psychiatry	Validation of the Turkish version of the WHODAS II in patients with schizophrenia.	Good reliability and validity.
68. van Tubergen et al. (2003). Assessment of disability with the World Health Organisation Disability Assessment Schedule II in patients with ankylosing spondylitis.	Correlational quantitative empirical study	Netherlands	214	Medicine	Convergent validity study in patients with ankylosing spondylitis.	Convergent validity demonstrated.

69. Vázquez-Barquero et al. (2000). Spanish version of the new World Health Organization Disablement Assessment Schedule II.	Psychometric quantitative empirical study	Spain	163	Psychiatry	Validation of the Spanish version of the WHODAS II.	Good validity and reliability and factorial structure confirmed.
70. Von Korff et al. (2005). Potentially Modifiable Factors Associated With Disability Among People With Diabetes.	Correlational quantitative empirical study	United States	4357	Medicine	Identification of potentially modifiable factors associated with disability in people with diabetes.	Correlations identified; identification of factors.
71. Von Korff et al. (2008). Modified WHODAS-II provides valid measure of global disability but filter items increased skewness.	Psychometric quantitative empirical study	Colombia, Mexico, United States, Belgium, France, Germany, Italy, Netherlands, Spain, Ukraine, Israel, Lebanon, Nigeria, Japan, China, New Zealand.	38934	Medicine	Validation of a modified version of the WHODAS II with filter items.	Good reliability and general validity, but the use of filter questions adversely affects the properties of the instrument.
72. Wallesch et al. (2010). WHODAS II - Practical and theoretical issues.	Critical analysis	Germany	0	Disability and rehabilitation	Response to 'A Note on the Theoretical Framework of World Health Organization Disability Assessment Schedule II' by Federici et al.	
73. Wang et al. (2006). Mental health and related disability among workers: A population-based study.	Correlational quantitative empirical study	Canada	5383	Medicine	Survey on the prevalence of psychiatric syndromes and related disability in a population of adult workers.	Prevalence and correlations identified.
74. Yoon et al. (2004). Development of Korean version of World Health Organization Disability Assessment Schedule II (WHODAS II-K) in Community Dwelling Elders.	Psychometric quantitative empirical study	Korea	1204	Neuropsychiatry	Validation of the Korean version of the WHODAS II with elderly subjects.	Good validity and reliability and factorial structure confirmed.

Total number of subjects: 232,320 (+ 22000/33000)