

Chapter 20

Survey of Patient-Reported Questionnaires Using the ICF as a Reference: An Illustration Using the ICF Core Set for Vocational Rehabilitation

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20.1 Introduction

Work disability is an important and growing public health burden. Over the past decades, employment rates have fluctuated, while rates of disability claims have remained high or even increased in many countries of the Organisation for Economic Co-operation and Development (OECD) [1]. It is estimated that on average, OECD countries spend 1.2 % of gross domestic product on disability benefits alone. Furthermore, around 6 % of the OECD-wide working-age population collected disability benefits in 2007 [2]. Work disability is a problem largely faced by developed and developing nations and is expected to increase with the ageing workforce and the increasing prevalence of chronic health conditions.

Working industries experience lost productivity, and financial impacts on work stakeholders and the healthcare system can be significant. For example, in the United States, the national cost of lost work productivity resulting from chronic conditions has been estimated at \$234 billion annually [3]. Work disability also has

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an effect on caregivers, in particular financial, employment and psychological stress. Finally, for the worker, there are higher rates of reported depression, loss of confidence, inability to cope, loss of income and loss of satisfaction in all aspects of life. For those with work disability, working is a “normalising” experience, allowing individuals to participate in society, promoting self-esteem and quality of life, as well as financial remuneration [4].

One key process to address work disability is vocational rehabilitation (VR), which has been used interchangeably with work or occupational rehabilitation [5]. Return-to-work strategies have been found to be helpful in mitigating the burden of chronic health conditions and the associated work disability [6]. For these reasons, the importance of VR and the desire to improve quality of care in the context of VR are vital in facilitating early and sustained return to work of individuals with work disability.

VR can be briefly defined as an approach provided to participants to optimise work participation [7]. It applies to patients with various health conditions, which can include mental, musculoskeletal and neurological health conditions and settings [8–10]. The broad variety of conditions and settings presents a challenge in choosing measurement tools or questionnaires which can be used. At the same time, there is a growing need to improve healthcare measurement in VR as part of assessment and quality reporting, and the shift in paradigm from traditional biomedical to biopsychosocial understanding of functioning has been significantly emerging in the last decade. Given these conditions, we need a common conceptual model and reference framework that can provide us with a platform to examine patient outcomes.

The International Classification of Functioning, Disability and Health (ICF) [11] by the World Health Organization (WHO) is a unifying framework to describe the functioning of individuals in VR [5, 7]. VR is a multifaceted specialty in rehabilitation and occupational medicine, and the ICF possesses the ability to encompass many of those facets using the ICF’s comprehensive set of domains [5, 7]. Moreover, the ICF was developed as a universal classification which can be applied to various cultures and health systems [5].

As a conceptual model, the ICF recognises that functioning and disability is a result of the interaction between components: body functions (“b”), body structures (“s”), activities and participation (“d”) and contextual factors, namely, environmental factors (“e”) and personal factors (Fig. 20.1). As a classification system, the ICF can serve as a basis for evaluating the breadth and complexity of VR services by providing a comprehensive list of functioning and disability domains in the form of alphanumeric-coded ICF categories that are arranged in a hierarchical manner [11]. Below is an illustration of this categorisation:

ICF component	d activities and participation
Chapter	d8 Major life areas
Second-level category	d850 Remunerative employment
Third-level category	d8500 Self-employment
	d8501 Part-time employment
	d8502 Full-time employment

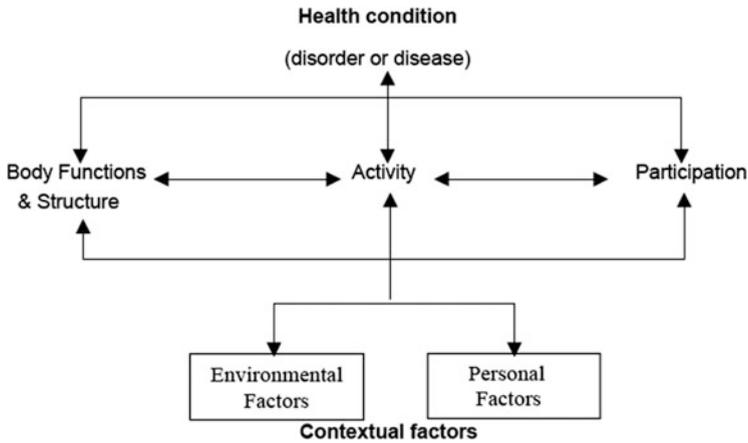


Fig. 20.1 International classification of functioning, disability and health (ICF) [11]

The ICF has 1,424 ICF categories, which make the utility of those categories not feasible. Hence, a brief and a comprehensive ICF Core Set (of domains) has been specifically developed for VR [12]. An ICF Core Set is a short list of ICF categories. The comprehensive version is lengthy, contains 90 categories (for a full list, see <http://www.icf-research-branch.org>), and is intended for multidisciplinary assessment, while the Brief ICF Core Set for VR consisting of 13 ICF categories (Table 20.1) serves as a minimum data set (i.e. list of functioning domains) that are to be reported in clinical studies or single-discipline clinical encounter within the context of VR to describe the impact of the disease on functioning [13]. The brief version can serve as a uniform data set because it identifies the essential issues experienced by patients in VR, which should be assessed, measured and evaluated.

The ICF Core Set essentially provides “what” to measure. “How” to measure an ICF category is possible by using a standard questionnaire, for example.

Hence, as part of the process in developing the ICF Core Set for VR, a systematic review was performed with linking of outcomes (including questionnaires) to the ICF [14]. The process basically involved linking of constructs found in the questionnaire items to the best fitting ICF category. This chapter will focus on patient-reported questionnaires (PRQ). Such questionnaires are commonly used in various fields of medicine and in VR [14] and are especially helpful when measuring constructs or latent variables. By providing a list of questionnaires that can assess the domains in the ICF Core Set, VR practitioners can now integrate the use of the ICF Core Set in their daily clinical practice by using those questionnaires.

The objective of this chapter is to present the PRQs that were linked to the 13 ICF categories of the brief version of the ICF Core Set for Vocational Rehabilitation.

Table 20.1 Title and description of ICF categories in the brief Core Set for Vocational Rehabilitation (total = 13 categories) [12]

ICF code	Title	Definition
d155	Acquiring skills	Developing basic and complex competencies in integrated sets of actions or tasks so as to initiate and follow through with the acquisition of a skill, such as manipulating tools or playing games like chess
d240	Handling stress and other psychological demands	Carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction or crises, such as driving a vehicle during heavy traffic or taking care of many children
d720	Complex interpersonal interactions	Maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions and acting in accordance with social rules and conventions
d845	Acquiring, keeping and terminating a job	Seeking, finding and choosing employment; being hired and accepting employment; maintaining and advancing through a job, trade, occupation or profession; and leaving a job in an appropriate manner
d850	Remunerative employment	Engaging in all aspects of work, as an occupation, trade, profession or other form of employment, for payment, as an employee, full or part time or self-employed, such as seeking employment and getting a job, doing the required tasks of the job, attending work on time as required, supervising other workers or being supervised and performing required tasks alone or in groups
d855	Non-remunerative employment	Engaging in all aspects of work in which pay is not provided, full time or part time, including organised work activities, doing the required tasks of the job, attending work on time as required, supervising other workers or being supervised and performing required tasks alone or in groups, such as volunteer work, charity work, working for a community or religious group without remuneration and working around the home without remuneration
e310	Immediate family	Individuals related by birth, marriage or other relationship recognised by the culture as immediate family, such as spouses, partners, parents, siblings, children, foster parents, adoptive parents and grandparents
e330	People in positions of authority	Individuals who have decision-making responsibilities for others and who have socially defined influence or power based on their social, economic, cultural or religious roles in society, such as teachers, employers,

(continued)

Table 20.1 (continued)

ICF code	Title	Definition
		supervisors, religious leaders, substitute decision-makers, guardians or trustees
e580	Health services, systems and policies	Services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle
e590	Labour and employment services, systems and policies	Services, systems and policies related to finding suitable work for persons who are unemployed or looking for different work or to support individuals already employed who are seeking promotion
b130	Energy and drive functions	General mental functions of physiological and psychological mechanisms that cause the individual to move towards satisfying specific needs and general goals in a persistent manner
b164	Higher-level cognitive functions	Specific mental functions especially dependent on the frontal lobes of the brain, including complex goal-directed behaviours such as decision-making, abstract thinking, planning and carrying out plans, mental flexibility and deciding which behaviours are appropriate under what circumstances; often called executive functions
b455	Exercise tolerance functions	Functions related to respiratory and cardiovascular capacity as required for enduring physical exertion

This chapter can guide clinicians and researchers in choosing which PRQ measure to use to operationalise the ICF in VR.

20.2 Methods

20.2.1 Overview of Original Study

The current study is based on a previous systematic literature review (original study), which linked concepts found in measures and questionnaires to the specific ICF categories [14]. That review utilised the following search terms and keywords, “Vocational rehabilitation”, “Return to work”, “Occupational rehab*”, “Work rehab*”, “Work reintegration”, “Job rehab*”, “Job reentry”, “Employ* rehab*” and “Employ* reentry”, in multiple databases: CINAHL, PsycINFO, Medline, Global Health, Vocation and Career Collection.

20.2.2 Database of Questionnaire Items

A database was created in an Excel spreadsheet (Microsoft Corporation 2007, Redmond WA), showing the items of each questionnaire, which have been linked to the ICF categories in the VR Brief ICF Core Set. Definition for each ICF category is provided in Table 20.1. Only standard patient-reported questionnaires with items linked to the VR Brief Core Set were surveyed.

20.2.3 Survey of Questionnaires

An inventory of PRQs corresponding to each ICF category included in the ICF Core Set for VR was developed.

20.3 Results

20.3.1 Item Database

Based on the systematic review, 229 articles were selected. From these, 650 measures were identified (154 were questionnaires and clinical tests) [14]. Of those measures, there were 68 PRQs.

A database was created showing the items of all the questionnaires that addressed the ICF categories of the Brief ICF Core Set for VR. The database shows a wide range of questionnaires covering domains on mental health to physical health. Table 20.2 shows the acronyms and the corresponding full name of each PRQ. Table 20.3 contains a list of PRQs where concepts of a particular ICF category were found.

A total of 855 items from the 68 PRQs were linked to ICF categories of the Brief ICF Core Set for VR.

20.4 Discussion

Effective VR is essential in mitigating the growing burden of work disability. At the same time, VR is a complex process with a wide array of domains to consider and examine. The ICF presents a comprehensive language and reference framework with which we can utilise in VR practice. In an effort to increase the utility of the ICF by practitioners, ICF Core Sets have been developed. An ICF Core Set is a short extract of ICF categories from the entire ICF classification that are relevant and specific to a health condition or setting. To capture functioning within the

Table 20.2 Acronyms and names of PRQs. Some PRQs are copyrighted and require permission before they can be used. Make sure to check with individual developers

Acronym	Name of questionnaire
4DSQ	Four-Dimensional Symptom Questionnaire [15]
ADS	Activities Discomfort Scale [16]
ASI	Addiction Severity Index [17]
BDI	Beck Depression Inventory [18]
BIPQ	Brief Illness Perception Questionnaire [19]
BORRTI	Bell Objects Relations and Reality Testing Inventory [20]
BQ	Baecke Questionnaire (with work, sport and leisure time index) [21]
CAN-E	Camberwell Assessment of Needs-European short version [22]
CES-D	20-item Center for Epidemiologic Studies Depression scale [23]
COPM	Canadian Occupational Performance Measure [24]
CSQ-8	Client Satisfaction Questionnaire-8 [25]
CWPP	Work Personality Profile [26]
DASS	Depression Anxiety and Stress Scale [27]
DMQ	Dutch Musculoskeletal Questionnaire [28]
EQ- 5D	Euro QOL [29]
ES	Empowerment Scale [30]
FQOLS	Flanagan Quality of Life Scale [31]
GAS	Goal Attainment Scale [32]
GRWA	Graded Reduced Work Ability Scale [33]
GSES	General Self-Efficacy Scale [34]
HADS	Hospital Anxiety and Depression Scale [35]
HAQ-II	Revised Helping Alliance Questionnaire [36]
HAT-QOL	Holmes Quality of Life [37]
HDRS	Hamilton Depression Rating Scale [38]
HS	Hope Scale [39]
HSCL	Hopkins Symptoms Check List [40]
ISEL	Interpersonal Support Evaluation List [41]
JCQ	Job Content Questionnaire [42]
JSQ	Cooper Job Stress Questionnaire [43]
LBOS	Low Back Outcome Score [44]
LOT-R	Life Orientation Test-Revised [45]
LSI	Life Skills Inventory [46]
MHLC	Multidimensional Health Locus of Control questionnaire (Form A) [47]
MWHLCS	Modified Wallston's Health Locus of Control [48]
MSQ	Minnesota Satisfaction Questionnaire [49]
MZDI	Modified Zung Depression Index [50]
ODQ	Oswestry Low Back Pain Disability Questionnaire [51]
OMPQ	Örebro Musculoskeletal Pain Questionnaire [52]
OSQOL	Quality of Life Scale [53]
PANSS	Positive and Negative Syndrome Scale [54]
PAR-Q	Physical Activity Readiness questionnaire- revised 2002 [55]

(continued)

Table 20.2 (continued)

Acronym	Name of questionnaire
PCS	Pain Catastrophizing Scale [56]
PDI	Pain Disability Index [57]
PDQ	Pain Disability Questionnaire [58]
PSEQ	Pain Self Efficacy Questionnaire [59]
QD	Quick-DASH [60]
QOLQ	Quality of Life Questionnaire [61]
RDQ	Roland-Morris Disability 24 Questionnaire [62]
ROMI	Rating of Medication Influences Scale [63]
RPQ	Rivermead Post Concussion Symptoms Questionnaire [64]
SAS-SR	Social Adjustment Scale – Self Report version [65]
SCISCE	Stages of Change Interview for Seeking Competitive Employment [66]
SERS	Self-Esteem Rating Scale [67]
SF-36	Short Form 36-item health survey [68]
SF-12	Short Form 12-item health survey [69]
SHC	Subjective Health Complaint Inventory [70]
SOC	Sense of Coherence Scale -29 [71]
STAXI	State-Trait Anger Inventory [72]
URICA	University of Rhode Island Change Assessment scale [73]
VBBA	Need for Recovery Scale (in Dutch) [74]
WAI	Work Ability Index [75]
WAIV	Work Alliance Inventory [76]
WAPGAR	Work APGAR – modified [77]
WCQ	Ways of Coping Questionnaire [78]
WEJS	Work Experience and Judgment Scale [79]
WHO-DAS	WHO-DAS [80]
WHO-QOL	WHO Quality of Life Measure- BREF [81]
WLQ-16	16-item version of the Work Limitations Questionnaire [82]

context of work disability, the ICF Core Set for Vocational Rehabilitation has been developed. However, an ICF Core Set consists of only categories and as such it does not prescribe how to assess those categories, although it does state what domains of functioning needed to be assessed. Hence, there is a critical need to be able to identify the measures that can be used to assess an ICF category. To assist busy healthcare practitioners in VR in implementing the ICF into everyday practice.

This chapter contains a list of PRQs that correspond to and capture the ICF categories in the Brief ICF Core Set for VR. This list will be able to guide VR practitioners in choosing the appropriate questionnaire to operationalise the ICF in their daily practice and improve their interventions by targeting the domains found to be problematic using the PRQs.

Table 20.3 Identified PRQs for each ICF category of the brief ICF Core Set for Vocational Rehabilitation

ICF category code	PRQs containing the concept of the ICF category on the first column	
d155	COPM	QOLS
	CWPP	SERS
	DMQ	WEJS
d240	DMQ	STAXI
	ISEL	WEJS
	JSQ	WCQ
	OMPQ	
d720	BORRTI	PANSS
	CWPP	SERS
	LSI	STAXI
d845	COPM	MHLOC
	DMQ	OMPQ
	HAT-QOL	SAS-SR
	ISEL	SCISCE
	LSI	WAI
	MSQ	
d850	ADS	WEJS
	ASI	CWPP
	BDI	OMPQ
	BQ	PDQ
	COPM	PSEQ
	DMQ	QD
	EQ- 5D	QOLQ
	FQOLS	SCISCE
	GRWA	SF-12
	HAT-QOL	SF-36
	JCQ	WAI
	JSQ	WAPGAR
	LBOS	WHO-QOL
	LSI	WLQ-16
		VBBA
	MHLOC	
MSQ		
d855	BDI	JCQ
	BQ	KAS
	COPM	PDI
	DMQ	PSEQ
	FQOLS	QD
	GRWA	RDQ
	HAT-QOL	WAI

(continued)

Table 20.3 (continued)

ICF category code	PRQs containing the concept of the ICF category on the first column	
e310	ASI	MHLC
	CAN-E	PANSS
	DMQ	PDQ
	HAT-QOL	PSEQ
	ISEL	WHO-DAS
	KAS	
e330	CWPP	OMPQ
	DMQ	PAR-Q
	JCQ	WAPGAR
	LSI	WEJS
	MSQ	
e580	ASI	LSI
	BIPQ	MHLOC
	CAN-E	ODQ
	CSQ-8	ROMI
	DMQ	URICA
	GAS	WAI
	HAQ-II	WAIV
	ISEL	WHO-QOL
	JSQ	
e590	ASI	JSQ
	DMQ	LSI
	JCQ	VBBA
b130	4DSQ	QOLQ
	BDI	OSQOL
	BQ	PANSS
	DASS	RDQ
	CAN-E	ROMI
	CES-D	RPQ
	DMQ	SCISCE
	FQOLS	SF-12
	GAF	SF-36
	GSES	SHC
	HADS	URICA
	HAT-QOL	VBBA
	HDRS	WCQ
	HS	WEJS
	HSCL	WHO-QOL
	LOT-R	

(continued)

Table 20.3 (continued)

ICF category code	PRQs containing the concept of the ICF category on the first column	
b164	BORRTI	MSQ
	CWPP	PANSS
	DMQ	PCS
	ES	SOC
	HDRS	URICA
	HS	WCQ
	KAS	WEJS
	LSI	
b455	BQ	OSQOL
	DMQ	RPQ
	MZDI	WEJS

Choosing the right questionnaire solely based on its contents is not as straightforward as it may seem. There are many questions that needed to be addressed first. Should users administer or apply the whole PRQ, although many of the other items in the PRQ probably are irrelevant? Or should the users only use a single corresponding category in the PRQ? But then, is that appropriate? What happens to the reliability of the PRQ when some items are taken out? If the whole PRQ is used for measuring one ICF Core Set category, will that not mean that several different probably extensive PRQs should be used to address other ICF categories?

From a pragmatic perspective, it is ultimately the decision of the vocational rehabilitation practitioner to pick and choose PRQs that aim to capture what the practitioner wants to capture. It must, however, be an informed decision with consideration to the concepts contained in the PRQ, the specific ICF category that needs to be prioritised, and efficiency.

The goal is to use only as few PRQs as possible to capture most, if not all, categories in the ICF Core Set for Vocational Rehabilitation given the limited amount of time in the clinics.

In a practical sense, although not advisable in research or when pooling data at patient group level, items from a PRQ can be selected that captures an ICF category. So, for example, for the 13 ICF categories of the ICF Core Set for Vocational Rehabilitation, one item can be obtained from one PRQ. Since some items might be linked to more than one ICF category, then in such a case, more than one ICF category can probably be addressed by only using one item. This is all about efficiency, which is necessary in vocational rehabilitation assessment with time as a limitation. One way to address efficiency while considering precision of measuring disability is through computer adaptive testing, where a clinician can have a precise assessment of disability yet the patient only answers less number of questions.

The list of PRQs suggests a diverse array of questionnaires, all of which assess functioning in VR at some level. The questionnaires assess common domains in the context of mental health, musculoskeletal conditions, general health and pain. This general finding emphasises the breadth of VR as a field of research and practice. PRQs are widely being used in VR practice. Hence, the emphasis on sound and robust outcome measurement is vital in facilitating adequate and appropriate return to work processes. There is an increasing focus on outcome measures in health and a growing need to improve healthcare measures, including those utilised in VR.

Our study has some limitations. First, we did not use the comprehensive version of the ICF Core Set for Vocational Rehabilitation which provides a comprehensive list of domains that covers the full spectrum of problems in functioning experienced by individuals undergoing vocational rehabilitation. With all the 90 ICF categories of the comprehensive version, however, this would also give a long list of questionnaires and again, loses feasibility. On the other hand, it is also possible that some of the PRQs have similar items due to conceptual overlap; hence some of them may be similar for some ICF categories. Second, we did not review the psychometric properties of the PRQs other than the face and content validity already provided by the ICF Core Set. The list of PRQs we provided here will benefit further from knowing the reliability properties such as test-retest and internal consistency and other aspects of validity such as construct validity and predictive validity. In return to work outcomes, it is also important that we know how responsive or sensitive a PRQ is to change in the status of the individual and to be able to answer whether the patient has truly recovered, deteriorated or remain unchanged. Third, while second-level ICF categories should be sufficient enough for general use, there are still various categories (third or fourth level) which have not been used as the basis for looking at PRQs. It may be difficult at times to exclusively claim that items of a PRQ measure specific categories, as they may measure only certain concepts within the categories. This refers particularly to those items measuring third-level categories which were then aggregated to second-level categories.

An interesting point to note was that the ICF category *d850 Remunerative employment* ($n = 31$) and the *d855 Non-remunerative employment* ($n = 14$) shared 11 PRQs. This shows the overlap between paid and nonpaid work-related activities and the importance of looking at both in VR [14]. Another interesting point was the relatively high number of PRQs on “quality of life” (QOL). The question arises why there are so many questionnaires, which were seemingly intended to measure the same construct. While this study is by no means a comprehensive description of why this may be the case, it might be that QOL while being a commonly used term amongst healthcare practitioners and has widespread recognised importance, the consensus on what it entails precisely is not so well defined [83].

20.5 Conclusion

The results of this study could act as a guide for healthcare practitioners in VR to integrate the ICF into everyday practice. By operationalising the ICF with PRQs, we are provided with a better understanding of assessing and evaluating patient needs based on a comprehensive biopsychosocial framework and informed care in VR.

The World Health Organization's ICF Core Set for Vocational Rehabilitation provides the "what" to measure in patients in vocational rehabilitation but does not specify "how" to measure them. This chapter can serve as a guide to clinicians in choosing which PRQs to use to operationalise the ICF in vocational rehabilitation fit for their purpose and setting.

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