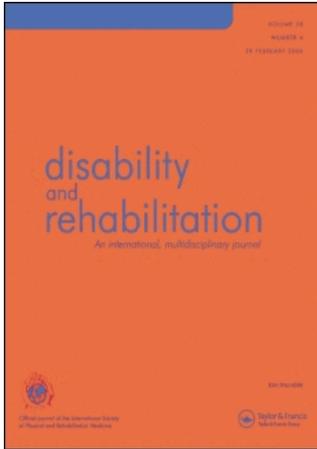


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CLINICAL COMMENTARY

The use of the ICF to describe work related factors influencing the health of employees

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JOOST VAN DER GULDEN[¶] and ROB OOSTENDORP[†][†] Dutch Institute of Allied Health Care, HAN University, The Netherlands[‡] University of Rotterdam, The Netherlands[§] Department of Occupational Medicine of the UMC St Radboud, The Netherlands[¶] UMC St Radboud, Centre for Quality of Care Research, The Netherlands*Accepted for publication:* March 2004**Abstract**

Purpose: There are many models describing the responses of the human organism to work. However, the description of the effects on a personal level is rather limited. For this purpose the authors propose to use the concepts and the terminology of the ICF – the International Classification of Functioning, Disability and Health.

Method: This article starts with a description of a model from occupational medicine, the Van Dijk model. Subsequently an overview of the health state of employees is presented, including the external and personal factors that may influence participation in work.

Results: The schematic representation of the external and personal factors presented in this article is an expansion of the ICF-scheme. The scheme can be useful to describe problems of persons related to the working situation, and to identify the points of application of care for different professionals. Although the scheme does not have the intention to be complete, it might be useful in the development, execution and evaluation of programmes designed to prevent absenteeism in general or in specific groups, and to stimulate the return of people with absence due to illness. It is shown that the items of the Van Dijk model can be described using specific terms of the ICF.

Conclusion: With the elaboration of the ICF scheme and the model of Van Dijk, expanded with ICF terms, the gap between the terminology used by professionals in health care, and the terminology used by professionals in occupational medicine is partly filled.

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Introduction

The process in which work exposure evokes responses in the human organism is described in many models. One frequently used model in the Netherlands is the one of Van Dijk *et al.*¹ (1990) presented in figure 1 (English version derived from the work of Van der Beek).² In this model the working situation is characterized by work demands (quality of work) and the employee's decision latitude. Work demands can be differentiated in task contents, working conditions, terms of employment, and social relationships at work. Decision latitude is the extent of autonomy and opportunities for the employee to improve (or to worsen) the working situation by means of altering the work demands. The work demands in combination with the work capacity (the total of all physical, cognitive and emotional characteristics of the employee) may result in short-term (temporary) health effects and eventually in long-term (lasting) health effects. In this model the scope is work. The effects

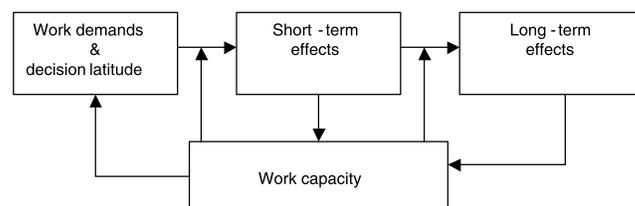


Figure 1 Model of work load and work capacity (Van der Beek).²

of work exposure are visualized as short-term and long-term health effects.

Although in the literature on occupational health much effort is given to the description of work demands, the description of work capacity and of short-term and long-term health effects is rather limited. It is the aim of this article to make clear that the ICF terminology can be used to describe these items of the Van Dijk model, while on the other hand the Van Dijk model can be used to elaborate the ICF-scheme.

The ICF

In 2001 the WHO published the International Classification of Functioning, Disability and Health (ICF).³ The predecessor of the ICF, the ICIDH (International Classification of Impairments, Disabilities and Handicaps), has been used in fields like rehabilitation medicine, physiotherapy, mental health and specific diseases, and for different purposes (such as statistics, the development of (electronic) registration systems, guidelines, research). In a special issue of *Disability and Rehabilitation*, devoted to the new ICF, several applications of the ICF are discussed. Examples are the use of the ICF in mental health,⁴ in measuring childhood disability⁵ and the use of the ICF by nurses and allied health professionals.⁶

The revision process of the ICIDH and the development of the ICF is the reflection of a conceptual shift from 'a consequence of disease classification' to 'a components of health classification' (WHO).³ The ICF encompasses functioning as universal human experience that can be conceptualized and classified from different perspectives: the perspective of the body (body functions and structure) and the perspective of the individual and the society (classification of personal activities and participation) (see the grey blocks in figure 2). 'Functioning' is the ICF umbrella term encompassing body functions, body structure, activities and participation; 'disability' is the ICF umbrella term for impairments, activity limitations and participation restrictions.⁷

On activity and participation level functioning can be subdivided into 'capacity' and 'performance' (what an individual can do and what he actually does) by using qualifiers.

The functioning (both the capacity and the performance) of the individual can be influenced by the disease/disorder, but also by external factors (the environment) and by personal factors (also visualized in figure 2). The influence on functioning can be negative (inhibiting functioning) and positive (stimulating functioning).

The terms 'health' and 'health state' are used to indicate both the (threatening) disease/disorder and the functioning of the person. This is in accordance with the broad definition of health by the WHO ('Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity').

The ICF consists of a classification of functions, a classification of structures, a classification of activities and participation and a list of external factors. The ICF does not include a list of personal factors; there was no consensus on the structure of such a list internationally.

Work related items in the ICF

In ICF terms, participation in work and the execution of activities related to work can be described using the classification of activities and participation (work and employment d840–d859). The kind of work a person performs, can be partly described by the activities that are needed. These can be subdivided in general activities, such as solving problems (d175), making decisions (d177), undertaking multiple tasks (d220), and in more specific tasks, such as driving (d475) (when you are a bus driver) and preparing meals (d630) (when you are working in a hospital kitchen).

Work as such is an external factor. Like all external factors, work may influence:

- the functioning of an individual on all three levels: functions/structure, activities and participation. Work may influence functioning in a positive way: support by the superior may increase productivity, and the availability of adapted furniture may result in a decreased incidence of low back pain. But the influence can also be negative: too much noise might result in impairments in hearing, movements of the trunk in a rotated position may eventually result in low back pain, and there can be a relation between bad air quality and limitations in performing activities, and between tiffs and wrangles during work and restrictions in participation in work (such as sick leave). A decrease in functioning by negative influences of work might even end in a disease. Mediated by changes (impairments) in functions on cellular and tissue level, including tissue adaptation—people can become ill by their work.
- personal factors. Work can positively influence personal factors: support by colleagues may result in more work satisfaction, and a reintegration

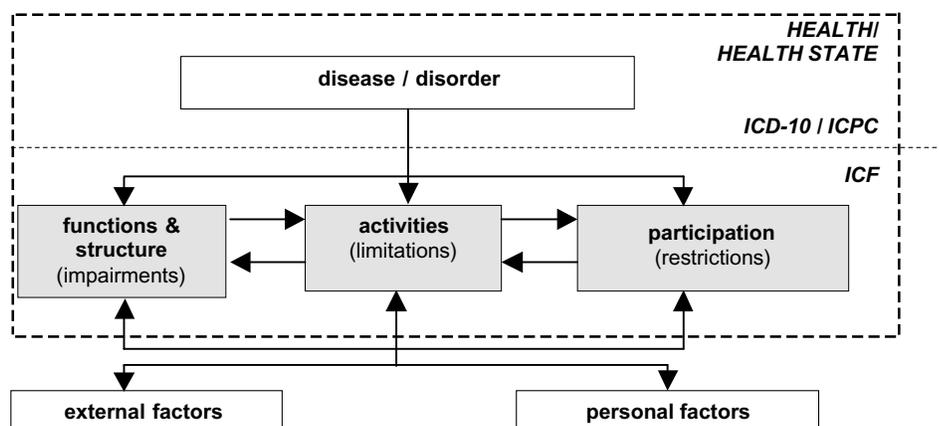


Figure 2 Scheme derived from the ICF (WHO).³ Grey = (problems in) functioning. The disease/disorder can be classified using the ICD-10 (International Statistical Classification of Diseases and other health related problems) or the ICPC (International Classification of Primary Care). The three levels of functioning and the external factors can be classified using the ICF.

programme—given to a person who wants to return to work—may give a change in coping style and an increase in work motivation. In turn, work can influence personal factors in a negative way; bad working conditions can result in demotivation and dissatisfaction.

Vice versa it is possible that external factors, such as work, are influenced by functioning and by personal factors. A positive and motivated individual may alter social relationships at work.

The ICF contains a systematic description of functions and structures, activities and participation, which can be used to describe the effects of work on the functioning of the individual, both by the individual him- or herself as well as by other persons involved.

Expanded ICF-scheme

By expanding the blocks 'external factors' and 'personal factors' of figure 2, it becomes clear that participation in work can be influenced by many different external and personal factors. This is presented in figure 3.

A central issue of the scheme is that there must be a balance between the (physical and mental) load caused by external factors (work related and not work related) and the (physical and mental) carrying capacity of the person to prevent problems in functioning and the development of diseases.

As becomes evident from the scheme, whether or not a person works, suffers from health complaints or is

absent from work, seems to be the result of a complex of factors (for example^{2, 8, 9}). This is no new finding: in occupational epidemiology various researchers have established the relation of multiple factors with a health complaint or absenteeism from work (for example^{10, 11}). However, none of them have tried to communicate in terms of ICF about the work related factors or the problems in functioning.

Important parts of the scheme:

- *Determinants on macro level*
These determinants are for instance legislation, technological and economic developments and the labour market. For example, in 2002 new legislation in the Netherlands was introduced to stimulate participation in work. People on sick-leave remain on the payroll of employers for 2 years instead of 1 year, and both employer as well as employee are obliged to work together to facilitate return to work. The recent decrease in influx of people who are fully or partially unable to work (and therefore receive a disability pension) is influenced by this legislation, but also by the present economic problems which can increase the threshold for sickness.
- *Determinants on meso and micro level*
Determinants on meso level are related to the company involved and determinants on micro level to the specific job of the person. This block contains four different blocks: terms of employment, social relationships at work, task contents and working conditions (derived from

The use of the ICF

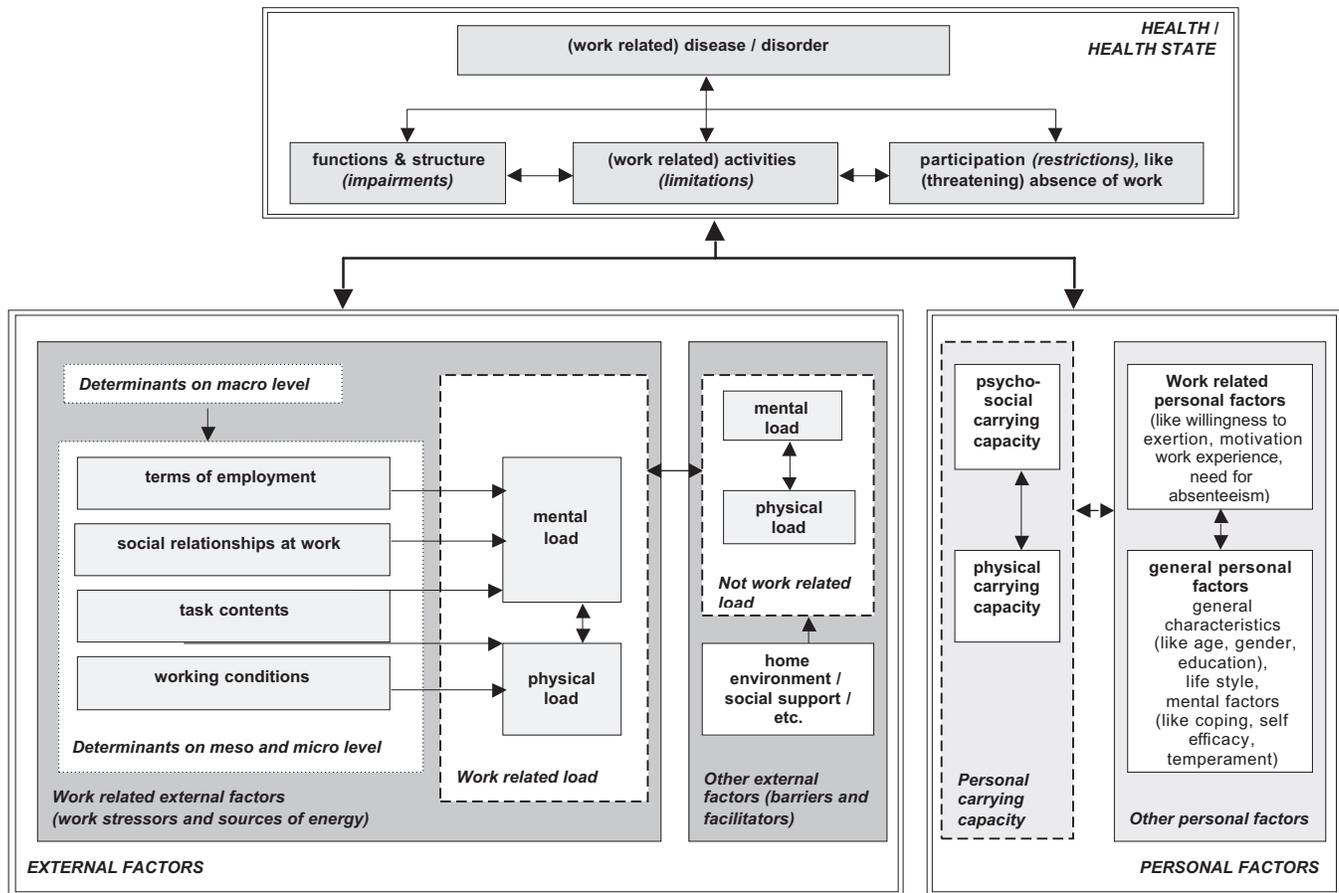


Figure 3 The expanded ICF-scheme in which both work related external factors, other relevant external factors and personal factors influencing functioning (including work related activities and participation in work) are incorporated. The scheme is already presented in a different form in Dutch.^{12, 13}

the Van Dijk model). Of course it is possible to extend each of these blocks: the block called 'working conditions' can be subdivided into physical aspects (which can be further subdivided into vibrations, noise, air quality, radiation), biological and chemical agents, ergonomic aspects (furniture, computer screen, computer mouse), dangers, hygiene, and the availability of aids for protection. The block called 'task contents' contains for example physical work demands (duration, intensity), psychological work demands (complexity, responsibilities, work pressure), decision latitude and work autonomy.

- *Other external factors (barriers and facilitators)*
Not only work influences participation in work, there are other relevant external factors like the home environment (the housing, the cooperation of the partner in household activities, the care for

(young) children or other family members), leisure (type, frequency, duration), and social support. All these factors will influence the mental and physical load of a person.

- *Carrying capacity*

Whether or not problems arise depends not only on the load (work related and not work related) but also on the characteristics of the person involved. The level to which a person can be loaded is an important item. There must be a balance between load and carrying capacity of the person to avoid problems.¹⁷ The scheme is fully compatible with the idea of multifactorial relationships between load and carrying capacity at the level of tissues and organs and at the level of the individual and society. An idea that seems to be confirmed by evidence; psychosocial factors for instance can have a profound influence on tissue

adaptation.¹⁵ However the relationships between load and carrying capacity on and between the different levels are not presented separately in the scheme. The relationship between load and carrying capacity on tissue and organ level, including the adaptive capacity on tissue and organ level—part of the grey block ‘functions & structure’—is not mentioned separately to avoid complicating the scheme.

- *Other personal factors*

The carrying capacity of a person is influenced by many factors:

general personal factors—divided into:

general characteristics, like age, gender and education

life style, like smoking, eating and drinking habits, occupational style

mental factors, like temperament, self efficacy and coping style.

work related personal factors, like motivation/drive, work experience and willingness to exertion.

The scheme does not have the pretension to be complete; it gives an impression of the factors which can influence participation in work, the prevention of absenteeism and the success of reintegration programmes.

Discussion

CHANGES IN TIME

With the scheme presented it is possible to describe the situation of an individual at a certain moment in time. This description can be both from the perspective of the individual (how does he or she evaluate his/her functioning, the load imposed by the work and other external factors and his/her carrying capacity) as well as from the perspective of the professional (what are his/her conclusions based on history taking, physical examination and examination of the work demands). Furthermore the scheme can be used to describe the desired situation (level of participation, kind of work demands) and the goals of intervention.

The scheme does not contain a time factor as the Van Dijk model (short-term and long-term health effects). To decide whether changes have taken place (for instance a decrease in health status or an increase in carrying capacity) the model must be applied on different moments in time. Temporary changes and lasting effects in health can be found by comparing (problems in) functioning on different points in time. In this way short-term and

long-term effects of work, but also the effects of multi-disciplinary reintegration programmes and the effects of changing for example working conditions on both health complaints and level of absenteeism can be evaluated. This can be done for individual employees (as an instrument in case management) or for groups of employees (for instance by evaluating the success rate of different reintegration programmes, back schools, and company bound programmes (like lunch walking, going to work by bike, fitness programmes and stress management programmes)) with respect to functioning and the return to work rate.

USE OF THE SCHEME

The scheme can be used in several ways. Here are some examples:

- in the process of care for an individual person, as an overview of all aspects that might be relevant for this particular person;
- in work settings to improve for instance working conditions for groups of employees and to give an indication of the influence of these changes on the personal level (as indicated by the individual him or herself);
- in the development of (multiprofessional) guidelines for specific patient categories;
- in the selection or development of relevant assessment and communication instruments;
- in education.

It is clear that for professionals of different background not all blocks of the scheme are of equal importance. A psychologist will probably focus on mental impairments and on personal factors, a physician on the disease and its symptoms, a physiotherapist on (impairments in) functions and (limitations in) activities, an occupational therapist on (limitations in) activities and technical aids (external factors), and for an occupational hygienist it is probably relevant to expand all the blocks mentioned as determinants on meso and micro level. For this profession all aspects of the working conditions (light, noise, vibrations) are probably relevant. It is not important for the usefulness of the scheme whether the professional takes the person as his scope, or focuses on the work demands. For the professional directed on treating a patient, the scheme makes clear which work related factors can be of influence on the health of the patient and for professionals focusing on interfering in work demands, the scheme gives information on the possible effects of this intervention on the

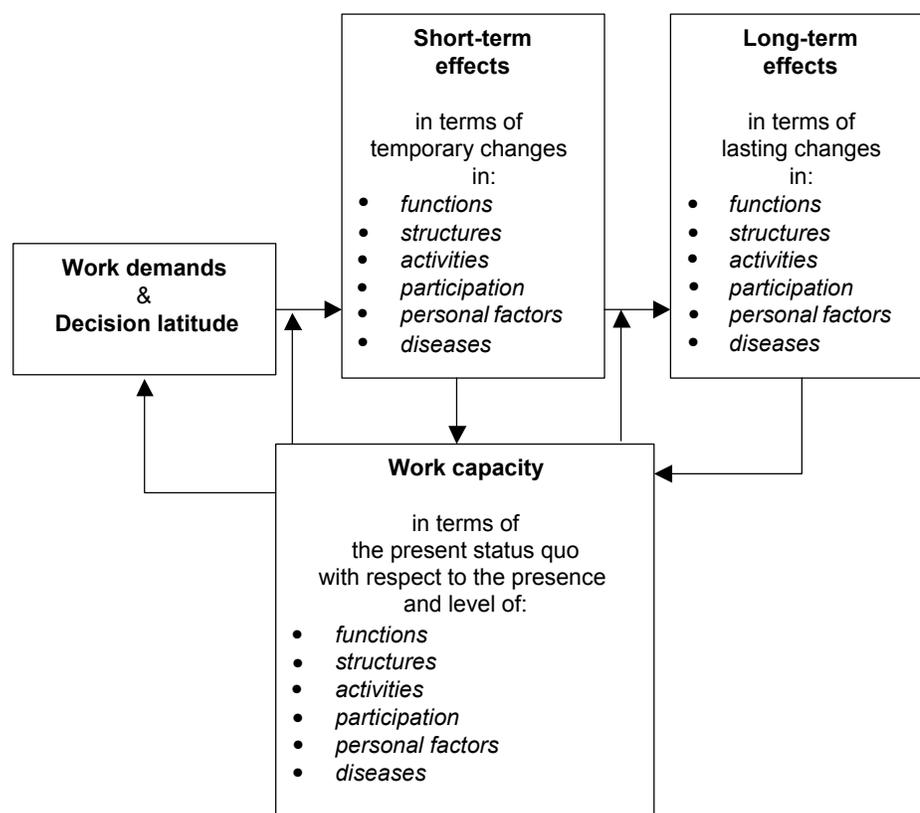


Figure 4 Model of work load and work capacity² expanded with ICF-terms (in italics).

persons involved. When both groups of professionals use the same scheme, it will enhance mutual understanding of the scope of the different professions and creates uniformity of language useful in the communication, both within as well as between groups of professionals.

In a multidisciplinary professional setting figure 3 can be used to discuss the situation of a specific client and to highlight the contribution of different professions in the prevention of absenteeism and in the development, execution and evaluation of reintegration programmes (to stimulate the return of people with absence due to illness). As the ICF terminology is already accepted by many different professionals, such a multidisciplinary use is a challenging opportunity.

APPROACH

It is questionable whether assessment of all aspects separately leads towards an integrated view of the health problem of the employee. A significant percentage of the—multifactorial and multisituational determined—work related health problems are described as aspecific.^{16, 17} This rather mechanistic approach may be inap-

propriate for these highly complex problems. A systems approach may overcome these problems with focus on the occupational performance and reported health status. Aspecific problems might be the result of a disbalance between load and carrying capacity. A load that is too high and/or a carrying capacity that is too low can be the result of many (interfering and partly opposing) factors.

COMPLETENESS OF THE SCHEME

Although the scheme does not have the pretension to be complete, some variables known as important for the health status must be included. An example is the financial and personnel management of the company involved; it may be that this item can be added as a separate block within the block 'Determinants on meso and micro level'. Other examples are the cognitions and personal meaning of work for the employee.¹⁸ Maybe these items can be added to the block 'work related personal factors'. The exact location must be discussed with reference to the overlap within the ICF itself between mental functions and personal factors.

CONCLUSION

The scheme presented may not be perfect yet, but, as indicated in the paragraph on models, it is the aim of this article to make clear that the ICF terminology can be used to describe items of the Van Dijk model, while on the other hand the Van Dijk model can be used to elaborate the ICF-scheme. The elaboration of the ICF-scheme is presented in figure 3. The items in the Van Dijk model can be described by using specific terms from the ICF. In figure 4 these items are indicated. When these two figures can be used to fill the gap between the terminology used by professionals in health care and the terminology used by professionals in occupational medicine, one of the barriers for communication is taken away.

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