

# Associations between rehabilitants' functional limitations and conclusions made by a multidisciplinary team during vocational rehabilitation evaluation: Turku ICF Study

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## ABSTRACT

**Purpose:** To investigate associations between functional limitations experienced by rehabilitants and multidisciplinary team's recommendations during vocational rehabilitation evaluation.

**Methods:** The descriptions of functional limitations were retrospectively identified for 32 patients with chronic musculoskeletal disorders. Vocational rehabilitation evaluation was conducted by a multidisciplinary team in an outpatient clinic of a university hospital. The descriptions were converted to ICF second-level categories. Square contingency coefficient Phi ( $\phi$ ) was calculated to describe the associations between ICF-categories appearing  $\geq 10$  times in the study sample and the recommendations given by a professional team. **Results:** In the study sample, 84 different ICF second-level categories were identified (average 18 codes/subject, range 9 - 25). Of them, 18 categories were observed for at least in 10 rehabilitants. Three statistically significant correlations were observed between these 18 categories and recommendations given by a rehabilitation team. Of them, positive association of moderate strength was found between joint mobility and muscle power functions and recommendation for retirement. Difficulties in walking showed weak negative correlation with recommendation for vocational rehabilitation. **Conclusions:** During vocational rehabilitation evaluation, the final recommendations given by rehabilitation professionals were only weakly correlated with functional limita-

tions experienced by rehabilitants.

**Keywords:** Occupational Rehabilitation; Rehabilitation Assessment; Work Ability; Work Capacity; Correlation

## 1. INTRODUCTION

To be successful, vocational rehabilitation evaluation should be able to answer to at least three questions. Firstly, if there is a need for rehabilitation measures at all, secondly, if preconditions for such measures exist, and, finally, what could be recommended as a concrete start point of rehabilitation. All three issues may vary widely in different settings depending on state and local politics, insurance policies, believes, and economic and employment situation among other factors. Of these three goals of vocational rehabilitation evaluation, the need for rehabilitation is probably less dependent on societal differences as it bases on person's health and restricted functioning and participation.

There are studies describing functional status of employees leading to a need for vocational rehabilitation, as well as studies on impact of functioning on rehabilitation success [1-3]. Different methods have been suggested to describe the impact of employee's health and social conditions on his or her engaging in employment. Such methods are, for example, Personal capability Assessment (PCA), California Functional Capacity Protocol (Cal-FCP), and International Classification of Functioning, Disability and Health (ICF). ICF is accepted by all members of World Health Organization and it could be regarded as the most standardized biopsychosocial framework for describing functioning and participation [4,5].

During the evaluation of rehabilitation need, professional team thoroughly collects data on rehabilitant's functional status. So far, however, it is unknown how much these data on functioning affect the final decisions and recommendations given by a team. We are not aware of reports on connection between functional limitations experienced by rehabilitant and recommendations given by a professional team. Is it really taken into account or does the decision mostly base on objective data (like, e.g., changes on x-ray images, blood tests, or objectively measured muscle strength)? Knowledge on how strongly recommendations made by professionals are driven by functional limitations which may help multidisciplinary team focus on the most important topics of collected data.

The purpose of the study was to investigate correlations between rehabilitants' functional limitations expressed in the unified form of ICF categories and recommendations given by a multidisciplinary team during vocational rehabilitation evaluation.

## 2. MATERIALS AND METHODS

The study was conducted in the out-patient clinic of the Department of Rehabilitation in Turku University Hospital, Finland. The clinic is specialized in comprehensive rehabilitation evaluation with an emphasis on determining abilities, skills, and motivational factors for the employment of persons with deteriorated work ability due to chronic medical conditions. In this study, all patients, referred for this evaluation because of a chronic musculoskeletal disorder and entered the clinic between 1 January 2011 and 31 December 2011, were included. Data from the electronic patient records were obtained for 32 persons (53% women). None was excluded from the study. The study was approved by the Ethics Committee of the Turku University Hospital.

All participants had a history of a chronic musculoskeletal disorder confirmed by a physician. Their capacity for work had started to deteriorate, and work disability was probable. The rehabilitation evaluation was conducted by a multi-professional team consisting of a physician, a rehabilitation planner, and a psychologist. The main goal of the evaluation was to form a comprehensive rehabilitation plan regarding a diagnostic and treatment strategy and appropriate medical and vocational rehabilitation measures with an emphasis on the vocational content. The final statement of the evaluation contained an opinion on the severity of the unemployment handicap. Patients, their earning-related pension insurance company, and the local employment agencies carried the responsibility for the practical implementation of the rehabilitation plan. The process of evaluation, the definitions of demographic variables, and the code extraction process have been previously described [6].

Each rehabilitant's electronic patient record was studied retrospectively, and each phrase that could potentially be interpreted as an ICF code was extracted and converted into appropriate ICF codes. The codes were extracted with as high a precision as possible. Due to the qualitative nature of the used patient records, no attempts were made to define the ICF quantitative qualifiers. Due to the retrospective nature of the study and the impreciseness of descriptions of s- and e-components (s = body structures and e = environmental factors), we agreed to include only b- and d-components (b = body functions, d = activities and participation) of ICF for further analysis.

The recommendations given by a rehabilitation team at the end of an evaluation process were defined by using two dichotomous variables: "recommendation of a long-term sick leave or disability pension—Yes/No", and "recommendation of further vocational rehabilitation measures—Yes/No".

## Statistical Analysis

The identified ICF categories were truncated to a form of second-level ICF category (letter with three digits). For practical reasons, further analysis included only categories which appeared >10 times in the study sample. Square contingency coefficient Phi ( $\phi$ ) was calculated for each frequent code along with a two-tailed Fisher's exact test for significance set at <0.05. Correlation strength of 0 - 0.19 was regarded as very weak, 0.2 - 0.39 as weak, 0.40 - 0.59 as moderate, 0.6 - 0.79 as strong, and 0.8 - 1 as very strong. All of the statistical analyses were performed using IBM® SPSS® Statistics version 21.

## 3. RESULTS

The mean age of rehabilitants (53% women) was 46.4 (range 29 - 60, standard deviation [SD] 8.9) years. The general educational level was low, and only four persons (13%) had a high school education. Most of the patients (78%) had some vocational education, mostly comparable to vocational school. Half of patients still had a valid job contract. Over 60% had a work history >20 years, and over 50% were manual workers.

In the study sample, 84 different ICF second-level categories were identified (average 18 codes/subject, range 9 - 25). Of these 84 categories, 18 were observed for >10 times. The multidisciplinary team recommended a long-term sick leave or disability pension for 8 and vocational rehabilitation measures for 10 rehabilitants. Three statistically significant correlations were observed between these categories and conclusions made by a rehabilitation team (**Table 1**). Of them, positive association of moderate strength was found between joint mobility

**Table 1.** Correlations between frequent functional limitations identified during vocational rehabilitation evaluation and recommendations made by a professional team. Results are reported as mean square contingency coefficient Phi ( $\phi$ ) values and Fisher's exact test for significance.

ICF category	Rehabilitation recommended		Long-term sick leave or pension recommended	
	$\phi$	Fisher's exact test	$\phi$	Fisher's exact test
b130 Energy and drive functions	-0.12	0.70	0.15	0.68
b134 Sleep functions	0.06	1.00	0.33	0.10
b140 Attention functions	-0.20	0.43	-0.08	1.00
b152 Emotional functions	-0.02	1.00	0.00	1.00
b265 Touch function	0.33	0.14	-0.14	0.69
b280 Sensation of pain	-0.09	1.00	-0.15	0.44
b710 Joint mobility	-0.20	0.45	<b>0.55</b>	<b>&lt;0.01</b>
b730 Muscle power functions	-0.25	0.25	<b>0.49</b>	<b>0.01</b>
d240 Handling stress and other psychological demands	0.22	0.25	-0.23	0.38
d410 Changing basic body position	-0.02	1.00	0.18	0.42
d415 Maintaining a body position	-0.12	0.70	-0.15	0.43
d430 Lifting and carrying objects	0.13	0.64	0.25	0.30
d450 Walking	<b>-0.39</b>	<b>0.05</b>	0.15	0.68
d540 Dressing	-0.15	0.47	0.30	0.12
d640 Doing housework	-0.09	0.67	-0.04	1.00
d825 Vocational training	-0.20	0.43	0.23	0.22
d850 Remunerative employment	-0.22	0.27	0.19	0.56
d920 Recreation and leisure	0.06	1.00	-0.11	0.68

and muscle power functions and recommendation for long-term sick leave or disability pension ( $\phi = 0.55$  and  $0.49$ , respectively). Difficulties in walking showed weak negative correlation ( $\phi = -0.39$ ) with recommendation for vocational rehabilitation.

#### 4. DISCUSSION

In this retrospective study of 32 participants in a vocational rehabilitation evaluation due to chronic musculoskeletal disorders, we found only few statistically significant associations between different functional limitations described in terms of ICF and final recommendations made by a multidisciplinary team. Namely, moderate positive associations were observed between joint mobility and muscle power functions and recommendation for long-term sick leave or disability pension. Difficulties in walking showed a weak negative correlation with recommended rehabilitation.

As far as we know, this is the first study on associations between functional limitations experienced by rehabilitants in vocational rehabilitation evaluation and con-

clusions made by a multidisciplinary team. We observed that the associations between functioning and recommendations may be described in unified terms of ICF and also quantitatively assessed. As this study is a descriptive evaluation of 32 cases, no strong inferences concerning the entire population with need for vocational rehabilitation should be made. The role of environment in person's participation level is one of the cornerstones of ICF, but due to a retrospective design of the study, the obtained data on environmental factors (e-component) were not considered to be reliable.

There is no doubt that recommendations made during vocational rehabilitation evaluation have to be affected not only by functional limitations experienced by rehabilitant but also by more objective data on health status collected through e.g. clinical examination, x-ray imaging, laboratory testing, previous documented history of illness etc. However, one could expect that experienced difficulties in daily functioning and participation would also have a great role in recommendations given by a professional team. Surprisingly, in this study, no strong

correlations between experienced functional limitations and final recommendations of disability or vocational rehabilitation were found. We can speculate that in our study settings, rehabilitation team made its decisions knowing that insurance policy requires objective data on rehabilitant's functional restrictions before pension or even vocational rehabilitation can be accepted. In this situation, functional obstacles experienced by rehabilitant may play an important role in detecting rehabilitation need but do not significantly affect the final recommendation.

This kind of assessment can be suggested to any multidisciplinary team focusing on vocational rehabilitation evaluation. While the exact results probably vary widely depending on different settings, further studies, conducted on larger samples and in prospective design, may help professionals to recognize what type of data significantly affects their recommendations.

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