From the Department of Physical Medicine and Rehabilitation, University of Umeå, Sweden

ON VOCATIONAL REHABILITATION IN NORTHERN SWEDEN

With focus on
Life Satisfaction and Outcome Prediction

Michael Eklund

Umeå 1991
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AKADEMISK AVHANDLING

som med vederbörligt tillstånd av Rektorsämbetet vid Umeå Universitet för avläggande av doktorsexamen i medicinsk vetenskap kommer att offentligen försvaras i föreläsningssal D, Regionsjukhuset i Umeå, lördagen den 23 november 1991 kl 09.15

av

Michael Eklund

Umeå 1991
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At admission satisfaction with life as a whole (level of happiness) and with 6/8 domain specific life satisfaction items were significantly lower for the vocational rehabilitation clients than for the references. Psycho-socio-demographic items formed 5 factors, two were socio-demographic and three psycho-social characteristics. Only few were "handicapped" concerning orientation, mobility and self-care, while the majority were financially and/or occupationally "handicapped".

At the two-year follow-up 91% of the partly and 67% of those who at admission were completely vocationally disabled were undergoing education or were gainfully employed, giving a success rate of 77%. Moreover, return to work from unemployment resulted in significantly increased income. Successful rehabilitation resulted in normalization of the majority of life satisfaction domains. This was particularly true for overall vocational satisfaction. Level of happiness was increased but not up to the level of the references. At follow-up the level of or change in (admission/follow-up computations) vocational satisfaction were major predictors for level of or change in happiness. Hence, successful vocational rehabilitation led to increased social well-being.

For the total sample major predictors of outcome were: Level of experienced health and belief in vocational return. It is suggested that these two variables are useful instruments for vocational rehabilitation decision making. In the algic sub-sample signs and symptoms were - statistically - combined into 8 meaningful entities, characterizing regional, postural and relational syndromes. Whereas these may not necessarily be generalizable they may be of clinical descriptory value. However, only one of them contributed to outcome prediction; the major predictors for those algic subjects being belief in vocational return and sex.

Key words: Work, Vocational rehabilitation, Impairment, Disability, Outcome, Return to work, Earnings, Psycho-social aspects, Life Satisfaction, Happiness, Chronic pain.
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Umeå 1991
To: Marja-Leena,
Fredrik, Katarina, Johannes and Alexander
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Michael Eklund
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Abstract

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Original Papers

This dissertation is based on the following papers, which will be referred to in the text by their Roman numerals:


Introduction

On Work

"I think I am just most happy and most fulfilled, and most myself, and most being as if that's what I was meant to be when I am involved in my work" (1).

In physics work equalizes change in energy (2). From a historical point of view Grenholm (3) compared the purpose and value of work in six different theories. The Platonic theory poses that manual work, mainly done by slaves, has a low value. It produces products that satisfy human needs and its purpose is to give necessary resources for the maintenance of life. The Lutheran theory implies that salvation is achieved when God is served at work (4), which causes both joy and suffering (5). Consequently it has a high value. For Marx (6), "Labour is, in the first place, a process in which both man and Nature participate, and in which man of his own accord starts, regulates, and controls the material re-actions between himself and Nature". Its value is comparatively high (3). According to Taylor (7) the principal object of management should be to secure the maximum prosperity for the employer, coupled with the maximum prosperity for each employee. The value of work lies in its increase of prosperity for both the employer and his employees. The Human relations-school emphasizes that above all work satisfies the employees' social needs parallel to the production of resources for the society and himself (8). Finally, self-actualization (9,10) is the cardinal purpose of work in the socio-technical theory. For both the human relations-school and the spokesmen of the socio-technical theory the value of work encompasses the satisfaction of the worker's social needs.

Karlsson in his thesis (11) looked at the concept of work from another facet. He structured five "auxiliary concepts" of work: activity, purpose, needs, relation to nature, and social relations, as the basis for his attempt to provide a comprehensive, ontological concept of work. He concluded that "Work is man's doing in the sphere of necessity".

The Universal Declaration of Human Rights (12) has emphasized the basic right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment. Not until 1984 did the International Labour Organization (ILO, 13) adopt the concepts of contents and organization of work
among the basic requirements for work. This is an expression of the immense interest recently paid particularly in the social relations of work. Thus, work gives man a role (14,15,16), a way to independence and success (17), and attaches him firmly to reality (18).

On vocational disability and vocational rehabilitation

"Work for all – also for those suffering from low-back pain" (19)

According to the Statute Book of Sweden (20) the vocationally disabled have physical, intellectual, mental, or social work impediments or limitations and are expected to encounter obstacles in obtaining or maintaining a financially gainful occupation. This definition is rather a conglomeration of those given by the ILO (21) and the World Health Organization (WHO, 16). Gogstad (22) by "work-insufficiency" meant reduced or lost ability to work, i.e. to fulfil the "productive role" in society. The many facets of vocational disability made Moriarty (23) choose to define the vocational rehabilitation-eligible population instead. They have mental or physical disabilities, constituting a handicap to employment but they are expected to benefit from rehabilitation services.

"Full participation and equality" was the slogan chosen by the United Nations General Assembly for the International Year of Disabled Persons in 1981 (24). This is also the backbone of the Swedish definition of vocational rehabilitation which further includes non-medical preparatory or direct measures (25). According to Stolov (26) vocational rehabilitation services mean "any goods or service necessary to render a disabled individual employable". Hood et al (27) amalgamate the definitions in a declaration which says: "the target of return to work" embraces those workers who cannot work due to injuries or illness regardless of occupational cause and who are delayed in their return to work due to: 1) their unrealistic fears and doubts or secondary gains, 2) employer's concerns about reemploying them, 3) medical professionals' reluctance to release patients for fear of negligence proceedings, 4) legal need to preserve disability evidence, 5) unions' rules regarding seniority and transfer rights or, 6) a vocational counsellor's penchant for actualizing clients' full potential at the expense of simply restoring workers to the work force".
Aspects of vocational rehabilitation developments

"Work refines", "Work – a humiliating burden during the capitalistic era – has been made a point of honour a matter of glory, bravery, and heroism,
"The one who does not work must not eat" (28)

From antiquity up to the Middle Ages idle impaired people were looked upon with disapproval. In the 15th century the growth of the population paralleled a revival of economy but also increasing unemployment. Not until the 16th century did humanitarian ideas and voluntary work, stimulated by famine, wars and epidemics, emerge creating relief work and related programs (29). A universal 17th century attitude among writers and and economists (29) was: The more people the more work; the more work the more output; the more output the more wealth. During the 18th and 19th centuries labourers were often regarded as a factor of production, ignored as consumers (30); and in English the word "unemployment" did not come into common praxis until the mid-1890s (29). In Sweden (31) unemployment was primarily held as a social problem eliciting organization of relief work, which up to the 1930s as a rule was underpaid aiming at "stimulating" early return to the open market. In spite of relief work, impairments often led to chronic unemployment, starvation and early death (32).

While the First World War marked the point from which we had to learn to live with unemployment, the Second World War generated the Kjellman Committee in Sweden (33) and the Tomlinson Committee in Great Britain (34), which formed the bases for future vocational rehabilitation in these countries. For those disabled in war the shortage of manpower facilitated a successful return to work (34). In Finland only 10% of them stayed vocationally inactive (35).

In 1948 the Swedish National Labour Market Board (NLMB) was founded as the chief authority of Swedish labour market policy. This marked the beginning of the employment service on a county basis (36) and an era that guided Swedish vocational rehabilitation from a cash principle, paying "passive" unemployment allowance to a work principle, paying for "active" measures aiming at work. According to the Organization for Economic Co-operation and Development (OECD) employment outlook in 1989 (quoted by the NLMB, 37) Sweden that year was outstanding in this respect.

During the 1950s-1960s Swedish Labour Market policy was rather selective in order to ease the migration of manpower from branches with poor future prospects to expanding branches of business (31). For the vocationally disabled this urged the
development of alternative measures, mainly relief work and different kinds of sheltered work (31). In 1962 a new law of general public insurance was introduced in Sweden. According to this law the working capacity should be checked and all rehabilitation measures should be used before assessing premature pension (38). To meet this demand Employability Assessment Centres (AC), especially serving those in need of deepened vocational counselling, were developed (31).

In Sweden as in many other industrialized countries the oil crisis towards the mid-1970s initiated a remodelling of vocational rehabilitation plans (34). Thus Swedish ambitions of selective measures were replaced by more intimate contacts between the specialists in vocational rehabilitation and business life, industry and the vocationally disabled clients (39). During the 1980s and early 1990s codes have been developed in many industrialized countries, for instance in England (40), Sweden (41) and Finland (42), to provide realistic means of determining how best to put good intentions of early co-ordinated, community-based vocational rehabilitation intentions into practice. Abreast with the remodelling of the vocational rehabilitation plans, cognitive and behaviouristic counselling methods entered Swedish vocational rehabilitation during the 1980s (39). Such were job clubs (43) and enhancement of job seeking and vocational training seeking skills (39) emphasizing an active participation by the vocational rehabilitation client. In spite of these active approaches there remains a "hard core" of disabled unemployed subjects, who need special programs. One such program in Sweden was the "Work for Young Disabled" project (44).

Present Swedish vocational rehabilitation.

"Political Work is the Blood of Life in all Economical Work" (45).

Today the Swedish NLMB leads, co-ordinates, develops, sets the goals and landmarks and gives the economic framework of labour market policy executed by the 24 County Vocational Rehabilitation Services (CVRS). Both the NLMB and the CVRS have separate delegations responsible for vocational rehabilitation matters. Deepened vocational counselling and training are supplied by 103 ACs, including 37 Special ACs (directed to special groups of clients with impairments of vision, hearing, mobility, intellect and with psychiatric and social disabilities) and 19 county-branches.

Several laws support the Employment Offices (EO) in rehabilitation of the vocationally disabled. Among these the Act of Labour Market Policy (46) and the Law of Promotion ("Främjandelagen"; 47) focus the importance of helping elderly
and vocationally disabled to attain or to stay in a job. According to the Occupational Safety and Health Act (48) this should be achieved through changes at the work place but also through co-operation between the employer and the local EOs in the re-adaptation teams, found in companies with more than 50 employees. Finally, the Act of Employment Security (49) enjoins the employer to inform the CVRS about a notice concerning employees older than 57 years.

At all larger EOs, vocational rehabilitation is dealt with primarily by specially trained vocational counsellors. They are often supported by a physician (mostly a specialist in physical medicine and rehabilitation) found at all CVRSs. The basic intervention is Vocational Counselling, in appropriate cases followed by Extended Work-Training (EWT) at one or more places of work. In tricky client cases encompassing special problems in re-adaptation to the labour market and uncertainty of working capacity or future choice of profession the ACs offer an individually directed vocational rehabilitation opportunity. The initial rehabilitation period at the AC includes intensified individual counselling pursued in teams, which generally include vocational counsellors, a social worker, a psychologist, a nurse, a physiotherapist and a physician. Generally the client proceeds to EWT outside the AC or to deepened Practical Work-Training/ Evaluation at the AC's department of guidance. Further interventions used both at the EOs and ACs encompass: Sheltered Work, which aims at retaining and developing the client's knowledge, abilities, experiences and interests and furthermore, preparing the client for the general labour market. The 356 sheltered work shops are administered by the Samhall Foundation which has 24 regional foundations. All these places of work are available for the EOs. Sheltered Work Supplied by Government Employers is directed specially to those with socio-medical disability. The Labour Market Training Centers (TC) supply preparatory or practical education/training. Generally these training courses are organized by the NLMB but if appropriate, courses available in the general educational system or through Educational Associations may be applied for. Relief Work for maximally 6 months may be arranged if vocational rehabilitative interventions have failed. During rehabilitation/training at the AC or TC a general training allowance or sickness benefit secures the client's economy. In sheltered work and relief work general labour marker wages are applied.

Subsidies available for the vocationally disabled in 1991 are in brief: Grants for technical devices, given to both the employer and the employee to ensure remaining in or attaining a job; Subsidy for a personal assistant, directed to employers who employ or retain vocationally severely disabled; Starting allowances
for disabled persons, considered if the interventions are deemed inadequate when starting private enterprise; Introduction subsidy, given when deepened introduction at a new job or re-adaptation at the former job, following a longer period of vocational inactivity, is needed; and Salary contribution, substituting 25-100% of general labour market salaries, up to 4 years, of governmental, public, private or municipal employment. This contribution can be and often is prolonged.

*On prediction of vocational rehabilitation outcome*

"People want to work even while they hate it" (50).

In an early Swedish investigation at the State Work Clinic in Stockholm, the precursor of later ACs, 415 somatically (79%) and psychiatrically (21%) disabled vocational rehabilitation clients were examined (51). Psychological factors were found to be the most important barriers for future vocational activity both for psychiatrically and somatically impaired clients. At the same unit Levi (52) prospectively evaluated a few years later the 5-years outcome in a sample of 125 town-dwelling vocational rehabilitation clients with complex, severe and long-lasting physical, mental, social and vocational impairments and disabilities. He found that uncomplicated physical disabilities, short time-laps between the onset of disability and rehabilitation, good skill and long experience in the earlier profession, good pre-rehabilitation adaptation to work and marriage and good tolerance to emotional stress were associated with favourable outcome, while neurotic trends, criminality and serious alcoholism significantly correlated with failure.

In a prospective univariate investigation encompassing 208 vocational rehabilitation clients assessed at an AC in Gothenburg some 10 years later, Elmfeldt (53) showed that among 57 socio-demographic, psycho-social and physical items no particular prognosticator of vocational *success* could be found. In some contrast, for northern Swedish psychiatric first time applicants at EOs in 1968 (54) the major predictors 5 years later for vocational *success* were: low age, former education, professional experiences and a feeling of health.

In a Norwegian prospective investigation of the outcome of vocational rehabilitation Gogstad (22) considered a mixed sample of vocational rehabilitation clients discharged from the National Rehabilitation Institute in Bergen. The most powerful predictors of vocational *inactivity* 18 months later were the presence of mental disturbance and age above 45 years.

In Great-Britain Sheikh and Mattingly (55) prospectively investigated 2113 physically or mentally impaired adults discharged from two British Employment
Rehabilitation Centers (ERC). Predictors of successful outcome were a relatively brief period of unemployment prior to vocational rehabilitation, relatively high motivation, a low level of physical disability, a completion of rehabilitation course and a low level of general unemployment in the home area of the rehabilitee. In contrast, the type of impairment causing disability in the same population had no predictive power (56).

In the USA Hester et al (57) recently in a prospective multicenter investigation used the Menninger Return to Work Scale (58) to predict outcome. Among the 10 items of the scale low age, rural residence, further education and, surprisingly, higher level of wage-replacement were associated with return to work, whereas being divorced, widowed or separated, having drug or alcohol problems, having ligation pending and the length of disability were associated with rehabilitation failure.

Locomotor problems are common reasons for referral to vocational rehabilitation (59, 54, 57). For example, since at least the mid-1980s approximately 40% of those attending vocational rehabilitation services in Sweden have musculo-skeletal impairments (60). With this in mind surprisingly few reports have paid special interest in the outcome and possible predictors of outcome of this vocational rehabilitation clientele. In the late 1960s Natvig (59) retrospectively investigated vocational rehabilitation clients referred to the State Rehabilitation Institute of Oslo, Norway, due to low back pain. Among the 19 socio-medical items included in univariate analyses the closest covariances with successful outcome at the 6- and 12-months follow-up were attained by: painless back after physiotherapy, more than obligatory schooling, no evidence of alcoholism, practical aptitudes, above normal or normal intelligence, and short period of sick-leave before admission. Romàn (54) found that for first time vocational rehabilitation applicants with locomotor impairments the predictors of successful outcome were rather similar (cf above) to those of the psychiatric clients. In Great Britain Sheik (61) studied vocational rehabilitation clients with low back pain (cf above). He found no significant association between an early return to work and the items: history of occupational injury, work motivation, duration of unemployment, rate of completing the ERC course, social class, income and welfare benefits before rehabilitation.
"We are more aware of happiness when we are unhappy than when we are happy" (62).

The concept satisfaction as used in this dissertation is based on a subject's experienced contentment. An individual is satisfied - with a domain of life or with life as a whole - when aspirations and achievements meet. If an individual experiences that his aspirations exceed achievements too much, he will feel "not satisfied".

Satisfaction can therefore be defined as the degree to which an individual knows or believes that he can reach his goals. This definition is supported by investigations in the USA (63); and Michalos (64) labeled the difference between aspirations and achievement the: "goal achievement gap".

When a subject reports his level of satisfaction he relates hedonic affects to internalized roles (65). From the philosophical perspective this report is a "third person hedonic judgement" (66), meaning that hedonic qualities are brought to consciousness. This judgement is related to the activity preferences he has, his "standing wants" (67).

In agreement with Democrites, Tatarkiewicz (62) considered satisfaction with life as a whole to be synonymous with happiness. To be so satisfaction with life as a whole must be justifiable and of reasonable duration. Surface experiences, however pleasurable, do not provide happiness as such. Basically agreeing with this definition Veenhoven (68) summarized: "Happiness refers to life-as-a-whole".

Whitbeck (69) stated that: "to be happy, a person needs to be able to act in ways that serve many goals, aspirations and projects". This concept concurs with that of Pörn (70): "A person who is healthy carries with him the intrapersonal resources which are sufficient for what his goals require from him". The implication of what has been said above is that a happy subject (i.e. one who is satisfied with life as a whole) has functions which provide repertoires (abilities) for him to reach his vital goals.

If these assumptions are correct, domain-specific life satisfactions should be causally related to happiness. In a recent Scandinavian investigation (71) of happiness and domain-specific life satisfactions the majority of men and women aged 25-55 years reported that they were satisfied or very satisfied with life as a whole (= happy) and with 7/8 of the different domains of life. The only exception was satisfaction with the financial situation where about 40% reported that they were satisfied. One of the
domain-specific life satisfactions asked for was satisfaction with the vocational situation as such. Sixty percent of the men and 53% of the women reported that they were satisfied or very satisfied in this respect. These Scandinavian results are in general agreement with those, reasonably comparable, reports from other countries (for references see 71). The eight domain-specific aspects of life satisfaction built a 3-factor construct, all the factors being closely and positively associated with level of happiness. Based on the results satisfaction with life as a whole is dependent upon satisfaction with different domains, which (cf above) are related to the individual's aspirations (goals). In turn, these are dependent upon intraindividual structuring (or weighting) of goals implying that satisfaction with life as a whole is not simply the sum of satisfaction from different domains of life.

In this context it has been suggested that the essence of rehabilitation is "to support disabled subjects to reorientate themselves towards modified or new but realizable goals" (72). Successful rehabilitation therefore "ensures that subjects with impairment(s) which may lead to disabilities have their happiness secured or restored" (71).

**On work and satisfaction**

"We are, more than anything else, an innate system of preferences and distastes. Each of us bears within himself his own system, which to a greater or lesser degree is like that of the next fellow... (73)

In industrialized Western societies work, according to Habermas (quoted by Lahelma, 74), is the normal way of life – a norm; and Gurin et al (75) described the state of unemployment as "a struggle against demoralization and anomie". Hence, people who lose their jobs or for other reasons are unemployed have by several authors been found to have relatively low levels of vocational satisfaction and/or satisfaction with life as a whole (63, 68, 76). Through self-actualization and -esteem work may satisfy ultimate psychological needs (77), i.e. higher-level "growth" motives in contrast to the low-level "deficit" motives (78, also see 77). Herzberg (79) described two categories of subjective job satisfactors: *intrinsic* job satisfactors, inherent in the job itself – achievement, recognition, work itself, responsibility, advancement – and *extrinsic* job satisfactors – company policy and administration, supervision, interpersonal relationships, working conditions, salary, status and security – easily movable into other life areas. These satisfactors and their categories are quite similar to Jahoda's (50) structure of the reality of work. A dualistic interpretation of the subjective experience of work is also emphasized by
Gardell (9) who claims that work should satisfy: The need for self-determination and self-control, the need for meaningful work and the need for fellowship and common values with other people. Otherwise alienation (80) is imminent, expressing itself as an instrumental attitude towards work.

People who are intrinsically gratified by their jobs experience a higher degree of vocational satisfaction than those who only obtain extrinsic gratifications (75) and Herzberg (79) showed that achievement and recognition are the most potent resources of vocational satisfaction. The effect of extrinsic and intrinsic job satisfactors on satisfaction with life as a whole have been studied by several authors. In his survey of factors influencing happiness Veenhoven (68) found that the contribution of different job satisfactors to happiness is controversial and Inglehart (81) showed that changing societal values (materialism/post-materialism) influence job satisfaction/life satisfaction. A disaggregation model suggested by Rice et al (82) proposes that the relationship between job satisfaction and satisfaction with life as a whole is moderated by the importance of work (the strength of the norm). In later investigations Steiner and Truxillo (83, 84) demonstrated that although extrinsic and intrinsic job satisfactors are closely correlated – and both have significant impacts on satisfaction with life as a whole – only the effect of intrinsic job satisfaction on satisfaction with life as a whole is moderated by the perceived importance of work, thus, confirming the disaggregation model. Extrinsic job satisfactors appear to have a direct influence on satisfaction with life as a whole, not moderated by the importance of work. This has been termed a "spillover" effect. We have not been able to locate any reports on a possible causal chain: intrinsic/extrinsic job satisfactors ---> satisfaction with (overall) vocational situation ---> satisfaction with life as a whole (happiness), but several authors (68, 85, 86, 87) have found positive and significant correlations between overall vocational satisfaction and satisfaction with life as a whole. Other authors (75, 88, 71), have convincingly shown that the extent to which a subject reaches his vocational goals, as mirrored by reported level of vocational satisfaction, is but one of the contributors to satisfaction with life as a whole/happiness.
Aims of the study

The overall aims of this prospective investigation were:

- to gauge the effectiveness of vocational rehabilitation in terms of rate of return to work, earnings and life satisfaction.
- to search for meaningful predictors of vocational rehabilitation outcome.

It was further felt to be of interest:

- to deduce whether the particular sample investigated could be characterized by combinations of biological, psychological and socio-demographic variables.
Subjects

In studies I-IV 149 out of a consecutive series of 175 somatically impaired subjects, referred for vocational rehabilitation to the Umeå district vocational rehabilitation service during a five-month period, were studied (cf Fig. 1). There were no significant differences as regards age, sex, two-year outcome and vocational rehabilitation interventions between the respondents and the 26 non-respondents whose charts could be located. Two years later it was possible to locate all 149 subjects, while 126 in studies III-IV answered a mailed life satisfaction checklist. Study V encompassed a sub-sample of 80 subjects with non-specific locomotor pain ("algias").

In study IV 163 healthy non-selected, vocationally active subjects from age strata 25, 35, 45 and 55 were included as references. The male-female ratios of all the studied samples were approximately 1:1.

Figure 1. The consecutive series of the bodily impaired rehabilitation clients studied.
Methods

At admittance for vocational rehabilitation all 149 clients participated in a structured interview which included filling in several questionnaires and checklists. This was followed by a physical examination performed by the author (ME.) who also conducted/supervised all interviews/completion of the questionnaires. Two years later information on the current source of income and vocational rehabilitation interventions (n = 140) were gathered through a telephone interview. Completing reports concerning two-year outcome and interventions were obtained from the files of the EOs. There were no significant differences concerning sex, vocational outcome and interventions between the 126 life satisfaction respondents and the 23 subjects (149-126) who did not return the life satisfaction checklist.

Five basic outcome categories were computed: Group A (n = 28), including those who were vocationally active in the same job both at referral and at follow-up; Group B (n = 63), encompassing those who were vocationally active (n = 28)/inactive (n = 35) at referral but in a new job at follow-up; Group C (n = 24), comprising subjects in education at follow-up and; Group D (n = 34), containing 5 subjects who were vocationally active at referral but inactive at follow-up and 29 clients vocationally inactive on both occasions.

The socio-demographic items used in study I were (Appendix 1): age, sex, educational level, employment situation, actual (group A) or previous (groups B, C, D) occupation, duration of pre-rehabilitation sickness benefit, source and level of income at admittance and at follow-up and principal vocational rehabilitation interventions. Five of the six handicap dimensions, described by the WHO (16) in the Classification of Impairments, Disabilities and Handicaps: "ICIDH" (Appendix 2) were included.

Studies II and V encompassed six psycho-social variables. These were (Appendices 3 and 4): belief in vocational return, experienced health, vocational stimulation (modified from Esjörnsson, 89), vocational motivation (modified from Esjörnsson, 89), job satisfaction (including 4 extrinsic and 4 intrinsic job satisfactors; Simovici, 90) and vocational satisfaction which were subjected to factor (II) and discriminant analyses (studies II and V) together with five of the socio-demographic items (age, sex, income at admittance, educational level and employment situation). In studies III and IV the level of satisfaction with life as a whole (happiness) and with eight domains of life were reported on a checklist (Appendix 4) at admittance. Two years later the checklist was mailed to them. That checklist and a questionnaire on job satisfaction (8 items, cf Appendix 3) was also filled in by the references in study IV. For the "algia" subjects in V, 23 symptoms dichotomized into yes/no alternatives
were included in the structured interview. Furthermore, 24 signs were registered, coded as sign present/not present (Appendix 5).

Statistics
Throughout this dissertation the chosen level of significance was \( p \leq 0.05 \).

Non-parametric tests of significance
To evaluate co-variations of pairs of variables (studies I, IV and V) cross-tabulations or the Mann-Whitney "U"-test were performed. Wilcoxon's signed rank sum analysis (study III) was used to compare pairs of life satisfaction data.

Comparison of means
The paired \( t \)-test (study I) was performed to compare the paired observations of income at referral and at 2-years follow-up (the latter normalized for the average increase by 16\% during this particular period, 91). When several means (study II) were compared, i.e. when the independent variables were the psycho-socio-demographic factors and the dependent variable was outcome (groups A-D) the differences between outcome groups were scrutinized using factorial ANOVA (Analysis of Variance) with post-hoc tests.

Multivariate statistics
As a multitude of variables, both psycho-socio-demographic (study II), life satisfaction (studies III and IV) and symptom-sign variables and their factors (study V) characterized the investigated samples, factor analyses (studies II-V) were performed to explore whether factors (meta-factors in study V) mirrored the inter-relationships. Factors were excluded either using a factor-option or when the Eigenvalue attained by a factor was lower than 1.0. The cut-off limit for a variable's loading to be considered a significant contributor to a factor was 0.50. Discriminant analyses were used to deduce whether minimum sets of variables and/or factors could be identified, adequately predicting the two-year outcome (studies II, III, IV and V). The criterion for accepting the analyses was \( p \leq 0.05 \) (Wilks' Lambda). Individual items were not considered significant contributors if they had a standardized discriminant coefficient < 0.20.
Results

The major results of studies I and II are:

- At the 2-years follow-up 77% of the clients were successfully rehabilitated, i.e. they had the same or a new job or were in education or had returned to work from sickness or unemployment compensation. Ninety-one percent of those who were vocationally active and 67% (40% at work and 27% in education/training) of those who were vocationally inactive at admittance were vocationally active at the 2-years follow-up.

- Those who returned to work (group B) showed a significant earnings' enhancement, while the opposite was true for those who remained unemployable (group D) at the 2-years follow-up.

- At admission to vocational rehabilitation very few among the vocational rehabilitation clients were moderately or severely (ratings >2) handicapped (according to the ICIDH, 16) within the categories orientation (1%), mobility (1%) and self-care (3%). In contrast, 61% were rated as occupationally and/or financially (64%) handicapped.

- Those who continued in the same job (group A) appeared rather easily rehabilitated as all but one client required counselling only or combined with technical aids.

- Twenty percent of those vocationally active at follow-up were employed through salary contribution. However, 2/3 of the contributions were used for those 28 in group B who at admission had a job but had obtained a new job.

- The easily rehabilitated group A was excluded from the prediction analysis of the vocational outcome for the total sample (n = 149). Using the 11 psycho-socio-demographic variables the overall correctness of prediction (discriminant analysis) of groups B, C and D was 57%, while 65% of the clients in group D were correctly predicted. The major overall predictors were: experienced health, belief in vocational return/continuation, age and income. For group B relatively low level of vocational satisfaction had some but rather slight importance. For group C relatively young age in combination with being an employee were the major prognosticators. The
cardinal predictors of group D were relatively low level of experienced health, low belief in vocational return and low income.

- A factor analysis quite logically circumscribed all 11 socio-demographic and psycho-social variables within five factors explaining 74% of the variance. *Factor I*, labeled *Work Enrichment*, included vocational stimulation and job satisfaction. *Factor II* called *Vocational Drive* encompassed vocational motivation, belief in vocational return/continuation and age. *Factor III* contained a combination of education and income and was consequently termed *Educational Inequality*. *Factor IV* comprised sex and employment situation, designating *Vocational Establishment*. Finally, *Factor V* embraced vocational satisfaction and experienced health. It was labeled as *Vocational Health*.

- Using the factor scores above, the outcome groups A-D could be characterized. Outcome group A had significantly higher (unique) scores for *Vocational Establishment* and *Vocational Health* than any of the other groups. Group A also had a higher factor score for *Educational Inequality* than had group D (the rehabilitation failures). Furthermore, the successful rehabilitation clients (groups A-C) had significantly higher scores for *Vocational Drive* than had group D.

The major results of studies III and IV are:

- At admittance the levels of happiness and of satisfaction with 6 of the 8 domain-specific life satisfaction variables were significantly lower for the vocational rehabilitation clients than for the reference population. Particularly low levels were reported for satisfaction with the vocational situation.

- For groups A and D the levels of life satisfaction remained unchanged. Those facing major vocational changes (groups B-C combined) significantly increased their levels of satisfaction with all instrumental domains (self-care ADL, leisure, vocational and financial situation) as well as their level of happiness.

- Compared with the references, the vocationally successful groups (A-C) had "normalized" their levels of satisfaction with all domains, except satisfaction with self-care ADL and level of happiness. In contrast, for the
failures the level of satisfaction with the majority of domains, except satisfaction with partnership relations and contacts with friends and acquaintances, stayed significantly lower than for the references.

Using the trichotomy decrease/no change/increase from admittance to follow-up in levels of domain-specific satisfaction the corresponding trichotomy of level of satisfaction with life as a whole could be correctly classified for 63% of those (n = 80) who could check all life satisfaction items at admittance and at follow-up. The cardinal predictor was vocational satisfaction.

At follow-up the actual level of vocational satisfaction was also the most powerful classifier of gross level of happiness (82% correctly classified).

For the references the 8 job satisfaction items were entered into a discriminant analysis to deduce whether they, or a subset of them, could correctly classify gross level of vocational satisfaction dichotomized into satisfied (grades 5-6) vs not satisfied (grades 1-4). Among the set of four significant predictors, which correctly classified level of vocational satisfaction for 74% of the subjects, three were intrinsic satisfactors (work tasks, recognition and responsibility) and one was extrinsic (communication with peers).

The major findings in study V are:
The detailed results concerning prevalence of symptoms and signs are given in Fig.2, which also gives the factor constructs.

While 21% reported pain from only one area, 54% reported general "dorsalgia" (i.e. cervico-brachio-thoracico-lumbo-sacral-hip/lower limb pain).

The 23 symptoms built a 7-symptom factor construct and 19 of the 24 signs formed 8 sign factors. A subsequent factor analysis combined these 15 factors into an 8-meta-factor construct explaining 71% of the variance.
<table>
<thead>
<tr>
<th>SYMPTOMS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head/neck</td>
<td>76</td>
</tr>
<tr>
<td>Shoulder/upper extremity</td>
<td>69</td>
</tr>
<tr>
<td>Thoracic</td>
<td>50</td>
</tr>
<tr>
<td>Walking</td>
<td>75</td>
</tr>
<tr>
<td>Sitting</td>
<td>74</td>
</tr>
<tr>
<td>SIGNS</td>
<td>%</td>
</tr>
<tr>
<td>Positive brachial plexus test</td>
<td>58</td>
</tr>
<tr>
<td>Cervical hypermobility</td>
<td>15</td>
</tr>
</tbody>
</table>

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Single lifts: | |
Near the body | 66  | Lumber hypomobility | 14 |
With lumbar rotation | 83  | Secro-iliac dysfunction | 14 |
Repetitive lifts: | |
Over the shoulder level | 56  |
Under the shoulder level | 75  |
Repetitive cervical end-range movements | 45  |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Lumbo-sacral | 70  | Palpatory pain: | |
Standing | 69  | Hip | 68 |
Heavy lifts: | |
Single | 78  | Lower extremity | 16 |
Repetitive | 34  | Hip hypomobility | 15 |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Stooping | 60  | Neurological impairment: | |
No pain after lifts | 49  | SLR | 9 |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Weakness | 68  | Pelvis/lower extremity | 8 |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Stiffness | 69  | Positive lumbar rhizopathy test | 6 |
Pain | 100 |
Working arms elevated | 60  |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Stooping | 60  | Positive cervical rhizopathy test | 4 |
No pain after lifts | 49  |

29% Not explained

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Thoracic hypomobility | 29  | Scoliosis | 13 |
Lumbar hypermobility | 29  |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Pelvic tilt | 65  | Pelvis/lower extremity | 8 |
Lower cervical hypermobility | 68  |

**SYMPTOMS** | % | SIGNS | %
---|---|---|---
Pelvis/lower extremity | 68  | Positive lumbar rhizopathy test | 6 |
Repetitive lumbar end-range movements | 30  |
Paresthesias | 61  |

Figure 2. The prevalence and factor constructs of symptoms and signs.

These meta-factors were labeled (see figure 2): Sitting Syndrome (I), Light Lifting Syndrome (II), Heavy Lifting Syndrome (III), Hip Syndrome (IV), Straight Leg Raising (V), Lumbar Hypermobility (VI), Scoliosis (VII) and Sagittal Dorsalgia (VIII). In meta-factors II, III, and V the symptom and sign constituents were inversely loaded. Two of the meta-factors (II and IV) were age-related. Thus, age (trichotomized into ≤
29, 30-39 and ≥ 40 years) was negatively associated with meta-factor II and positively associated with meta-factor IV. Finally, females had significantly higher factor scores than males in meta-factor VI.

The discriminant analysis including sex, experienced health, belief in vocational return/continuation, vocational motivation Heavy Lifting Syndrome (III) and Sitting Syndrome (I) correctly and significantly classified 73% of the subjects. The most powerful overall predictors of outcome (success or failure) were: sex, belief in vocational return/continuation, vocational motivation, Heavy Lifting Syndrome and experienced health. For the failures, being a female with no belief in vocational return, with low vocational motivation, with relatively low experienced health and with palpatory pain in the upper cervical and upper extremities (meta-factor III with a negative connotation), were the main predictors.

General discussion

The main features of this investigation were:

- In the Umeå district vocational rehabilitation of subjects with somatic impairments had a good success-rate as nearly 80% could stay in or return to work. Moreover, return to work significantly enhanced earnings and led to increased levels of happiness and "normalized" all levels of domain-specific life satisfactions – with the exception of ADL-satisfaction.

- The outcome of vocational rehabilitation for a mixed sample of vocational rehabilitation clients could be predicted for 57%. For this sample level of experienced health and belief in vocational return were the major predictors of outcome; while gender and belief in vocational return were the major classifiers for the sub-sample (73% correctly classified) of clients vocationally disabled because of locomotor pain.

- A set of logical socio-demographic and psycho-social factors characterized the total sample of Northern Swedish vocational rehabilitation clients. Moreover, for vocational rehabilitation clients suffering from locomotor pain, symptoms and signs formed reasonable clinical regional, postural and relational entities.
It has been shown (27) that in the USA vocational rehabilitation professionals succeed to return 60-85% of their disabled clients to work. This is in general agreement with the present and previous Scandinavian findings (22, 53, 54). In congruence with the present findings, Carlsson and Corbett (92) have shown that significant individual earnings’ enhancement follow successful vocational rehabilitation.

It appears that the Swedish welfare system, at least as it is applied in vocational rehabilitation, allows subjects to seek vocational rehabilitation, and receive salary contributions, even though they have only minor handicaps (as defined by the ICIDH, 16). This may also indicate a reluctance of those responsible for client introduction to consider subjects with major disabilities eligible for vocational rehabilitation. The fact that the majority were gauged occupationally or financially handicapped to a great extent simply mirrors the effects of being on sickness benefit or on unemployment allowance.

The particularly low level of satisfaction with the vocational situation at admittance for vocational rehabilitation and, for the D-group at follow-up are indicators of particularly great aspiration-achievement gaps. The findings that, compared with a reference sample, significantly lower levels of domain-specific life satisfaction and level of happiness prevailed at admittance – with the exception of satisfaction with partnership relations and contacts with friends and acquaintances – may not only reflect vocational disability per se but also the effects of impairment(s) and other disabilities (72). I.e. in addition to being vocationally disabled the vocational rehabilitation clientele have lost other parts of their repertoires necessary for reaching their goals in life. The finding that at follow-up change in level of vocational satisfaction (III) and actual level of satisfaction with the vocational situation (IV) were the single-most important predictors of level of happiness contrasts the results of other investigations in non-selected populations (63, 82, 71) where expressive (emotion-related) domains of life satisfaction such as satisfaction with family life and partnership relations have been found to be the most important classifiers of level of satisfaction with life as a whole (happiness). The pronounced effect of level of or change in vocational satisfaction on level of happiness are probably due to the phenomenon that for the vocational rehabilitation clientele staying in or returning to work is a major aspiration – as related to other aspirations in life.

Hence, within the total structuring of the many different goals in life, the goal: to be vocationally active is assigned a heavy weight by the vocational rehabilitation clients.
This investigation was not designed to analyze whether the importance of work (the goal to be vocationally active) is a moderator of the possible relationship (cf. Introduction) between job satisfactors and satisfaction with life as a whole. The finding in the working reference population (IV) that intrinsic rather than extrinsic job satisfactors are potent classifiers of level of satisfaction with the vocational situation and, furthermore, that vocational satisfaction is a potent contributor classifying satisfaction with life as a whole may support the disaggregation theory (82, 83). On the other hand the findings may suggest a causal chain: intrinsic job satisfaction (satisfaction with facets inherent in the job itself) \( \rightarrow \) overall vocational satisfaction \( \rightarrow \) satisfaction with life as a whole (happiness).

For the total sample the overall most potent predictors of vocational outcome in terms of employability were experienced health and belief in vocational return. These two items mainly had a "negative" effect on the outcome as the combination: Low level of experienced health/low level of belief in vocational return were the cardinal classifiers of those who were unemployable (group D) at follow-up. The reason for this combination being a significant predictor of foremost failure may simply be that subjects reporting these low levels are too ill and/or disabled to have reasonable prospects of successful vocational rehabilitation. The predictive effects of the level of experienced health, which even for the "algic" sub-sample was a sizeable classifier (cf below), and of the subjects' own estimation of return to work, agree with those of other authors (93, 94, 95). It appears that these two items may provide the vocational counsellor with fundamentally important guidelines when contemplating vocational rehabilitation interventions. Furthermore, being educationally disadvantaged (cf the factor Educational Inequality below) is the most plausible explanation for the fact that relatively low income to some extent contributed to the prediction of failure.

While the returnees to a new job had no clear predictor, it quite reasonably appears that relatively young age and being an employee forecasted education. Such an employment situation implies limited possibilities for vocational modifications and hence leaves education as an attractive option, also as a preventive measure against future increased somatic problems.

Also for the "algic" sub-sample belief in vocational return/continuation was a major predictor of outcome, in terms of success or failure. Sex, however, also had a major predictive impact, i.e. females were at greater risk of failure than were males. That vocational motivation was a contributing predictor of rehabilitation failure for locomotor pain clients is in general agreement with Esbjörnsson (89), but disagrees
with Sheik (61). Finally, the fact that—with the exception of palpatory cervico-brachial dysfunction (pain)—symptoms and signs were poor predictors of outcome is supported by several recent investigations which have demonstrated that the predictive power of psycho-social factors by far exceeds that of physical factors as far as low back pain patients are concerned (94, 96, 97, 95).

In general congruence with Esbjörnsson (89) the level of experienced Work Enrichment (vocational stimulation/job satisfaction) did not differ between the outcome groups. It is, however, pertinent to note that job satisfaction has been reported as a significant predictor of several days' absence among female textile workers (98) and of recovery from low back pain after medical rehabilitation (99). The fact that the A-group had significantly higher scores for Educational Inequality (education/income) than had group D indicates that the latter have low education and income, which supports the results of the prediction analysis emphasizing the relative socio-economic disadvantage of the D-group, the failures. Thus, vocational rehabilitation staffs will continuously face on one hand "knocked-outs" (100) vulnerable to vocational disability and on the other those who have had or have given themselves opportunities to invest a good deal of themselves in education and in career success (101). It should be noted that this factor bears some resemblance to the factor termed Educational level described by Hester et al (58).

A high factor score on Vocational Establishment implies a quite easily rehabilitated client, needing only counselling and perhaps technical aids to continue in his present—often self-employed—working situation. Such a positive impact of being self-employed has also been observed after low-back surgery (102).

In contrast to the two demographic factors above, Vocational Drive (vocational motivation/belief in vocational return) represents a psychological bi-polarity. On one side the client is a Pawn, being poorly vocationally motivated, without a goal, with poor prospects of successful rehabilitation, or he is an Origin, intrinsically motivated, actively seeking his own goal (103). In this respect the vocational failures, in contrast to the successful ones, are definitely Pawns, with low Vocational Drive, while the opposite is true for those who at follow-up are vocationally active or aiming at being active after education. Besides being vocationally established, educationally relatively advantaged, dealt with through only counselling or technical aids and having relatively high Vocational Drive, the particularly favourable vocational situation of the A-group also appears from the fact that they experienced a unique high level of Vocational Health (experienced health/vocational satisfaction).
The factors and meta-factors encompassing symptoms and signs in the "algic" sub-sample appear to characterize meaningful clinical entities (see Fig. 2). It must, however, be remembered that from the epidemiological point of view this sample is only representative of itself, i.e. vocational rehabilitation clients in the Umeå district, with (generally) diffuse locomotor pain - dorsalgia. It feels, therefore, appropriate to say that it may be up to future research to analyze whether other sets of symptom and sign factors and particularly of meta-factor sets – the syndromes – are generalizable. Based on the factor analyses it is, however, suggested that the commonly used physiatric symptoms and signs can be combined into: 5 regional entities (Sitting Syndrome, Light Lifting Syndrome, Heavy Lifting Syndrome, Hip Syndrome, and Straight Leg Raising) and 2 postural entities (Scoliosis and Sagittal Dorsalgia). Given that one more sign than symptom factor was entered into the meta-factor analysis one meta-factor was identical with a sign factor. This was a relational factor where high scores characterized Lumbar Hypermobility. As previously mentioned only one of these factors had some predictive impact on vocational rehabilitation outcome.

The combination of symptoms and signs included in the Sitting Syndrome is in general agreement with findings by other investigators who have dealt with the hazards of sedentary work, in general (104), in electronics industry (105) and of cash register operators (106). Several investigators have described the injurious effects of lifting with lumbar rotation (107, 108, 109) and of burdening the neck and arms repetitively (for ref cf 110) but we have not been able to locate any literature demonstrating the combination which emerged for the meta-factor labeled Light Lifting Syndrome. This syndrome, which was significantly more common for the relatively young, focusses the combination of relatively lighter lifts, particularly when accompanied by lumbar rotation and repetitive cervico-brachial provocators. However, it was not associated with lumbo-sacral dysfunction. In contrast, the Heavy Lifting Syndrome, in agreement with literature (107, 109), elucidates that heavy lifting foremost was associated with low-back pain. The Hip Syndrome, quite logically, indicates age-dependent structural changes causing stiffnes and thereby interfering with lumbar end-range movements. Within the Straight Leg Raising the inverse loading of weakness vs signs of neurological impairments may appear confusing as it might be expected that neurological involvement would lead to experience of weakness. The only explanation that can be offered in this regional inverse relationship is that the reported weakness is rather a general symptom of feeling of illness than a reflection of true neurological signs of illness. This
explanation generally concurs with that of Waddel (111).

In agreement with Nachemsson (112) the factor combination of items within the factor Scoliosis indicates that a scoliotic posture does not predispose for lasting pain after lifts. In contrast, Sagittal Dorsalgia is a descriptor focussing stiffness and pain in the cervico-thoracic and pelvie-lumbar transitional zones, elicited particularly in static work done with arms elevated over the shoulder level. Several authors have emphasized the hazards of this working position (113, 114, 105).

High scores on the relational sign factor Lumbar Hypermobility indicated a disturbed thoraco-lumbar mobility pattern. This is well known from lumbar intervertebral degeneration (115) and from Scheuermann's disease (116). The fact that it was a predominantly female mobility factor finds support in clinical praxis, suggesting that there is a higher prevalence of hypermobility among women than among men.

Finally, from the holistic – in contrast to the bio-statistic (117) – point of view it feels gratifying to note that vocational rehabilitation not only has socio-economic dimensions but also may positively support the vocational rehabilitation client's experience of life as a whole. In other words, it appears that successful vocational rehabilitation is congruent with the aim of rehabilitation given in the introduction: "Rehabilitation is to ensure that subjects with impairment(s) which may lead to disabilities have their happiness secured or restored".
Acknowledgements

The research work resulting in this dissertation has been accomplished at the Institute of Physical Medicine and Rehabilitation, University of Umeå in close co-operation with the Umeå County Vocational Rehabilitation Service.

I wish to express my sincere gratitude to all those who in many encouraging ways have contributed to the realisation of this piece of work.

Foremost I wish to eulogize:

- Professor Axel R Fugl-Meyer, my mentor and co-author, an example and a friend, without whom this dissertation would not be a reality. He spared no time, energy or solidarity nor did his philosophical, clinical or statistical conceptual insights or his holistic sense of the total rehabilitation architecture ever cease. I feel, that for me these examples have been the cardinal guarantors of my development towards being a rehabilitation specialist.

- The 149 "subjects" for their consent to participate in this investigation.

- The 17 vocational counsellors and their former chief Karl Erik Borggren at the Umeå County Vocational Rehabilitation Service for helping me to localize the subjects and making all the practical arrangements which made interviews and physical examinations possible.

- Kerstin S Fugl-Meyer, co-author, tutor and friend, the creator of the life satisfaction questionnaire, so very central in the essence of the message in this dissertation.

- Inga-Britt Bränholm, my co-author and doctoral student colleague whose clear and calm conceptual thinking has been a source of development and stimulation.

- Margaretha Fahlgren, whose invaluable and stylish secretary skills are exposed on every page.
- Mats Långström, laboratory technician, for his careful and skilful work exposed in statistical analyses and graphics.

- Sture Eriksson, the co-worker who introduced me to multifactorial statistics.

- Anita Liuski for her efficient assisting secretary work.

- Barbro Jonsson, essential in her help finding statistical abstracts concerning Swedish vocational rehabilitation.

- My fellow colleagues and secretary staff at the Department of Physical Medicine and Rehabilitation, University Hospital of Umeå and former Östanlid hospital.

- My family, Maija-Leena, Fredrik, Katarina, Johannes and Alexander who really have endured me being only half a family member for so long.

This work has been partly supported by grants from the National Labour Market Board, Department of Vocational Counselling.
## Appendix 1

### Socio-demography

1. **True age:**

2. **Sex:**
   - 1 = Male
   - 2 = Female

3. **Educational level:**
   - 1 = Compulsory school
   - 2 = Further education

4. **Employment situation:**
   - 1 = Employee
   - 2 = Self-employed

5. **Actual/previous occupation:**
   - 1 = Professional/managerial
   - 2 = Clerical
   - 3 = Service/miscellaneous
   - 4 = Heavy manual
   - 5 = Industrial

6. **Duration of pre-rehabilitation sickness benefit (months)**

7. **Source of income at admittance:**
   - 1 = At work
   - 2 = Unemployed
   - 3 = On sickness benefit

8. **Income at admittance (hundreds of SEK/month)**

9. **Source of income at follow-up:**
   - 1 = In the same job
   - 2 = In a new job
   - 3 = In education
   - 4 = Vocationally inactive

10. **Income at follow-up (hundreds of SEK/month)**

11. **Vocational rehabilitation interventions:**
   - 1 = Counselling only
   - 2 = 1+ Technical aids
   - 3 = 1+ Employability assessment center
   - 4 = 1+ Education
   - 5 = 1+ Extended work training
Appendix 2

The ICIDH Classification of Handicap

1 Orientation handicap:
   0 = fully orientated
   1 = fully compensated impediment to orientation
   2 = intermittent disturbance of orientation
   3 = partially compensated impediment to orientation
   4 = moderate impediment to orientation
   5 = severe impediments to orientation
   6 = orientation deprivation
   7 = disorientation
   8 = unconscious

2 Physical independence handicap:
   0 = fully independent
   1 = aided independence
   2 = adapted independence
   3 = situational dependence
   4 = long-interval dependence
   5 = short-interval dependence
   6 = critical/interval dependence
   7 = special-care dependence
   8 = intensive-care dependence

3 Mobility handicap:
   0 = fully mobile
   1 = variable restriction of mobility
   2 = impaired mobility
   3 = reduced mobility
   4 = neighbourhood restriction
   5 = dwelling restriction
   6 = room restriction
   7 = chair restriction
   8 = total restriction of mobility

4 Occupation handicap:
   0 = customarily occupied
   1 = intermittently occupied
   2 = curtailed occupation
   3 = adjusted occupation
   4 = reduced occupation
   5 = restricted occupation
   6 = confined occupation
   7 = no occupation
   8 = unoccupiable
5 Economic self-sufficiency handicap:
0 = wealthy
1 = comfortably off
2 = fully self-sufficient
3 = adjusted self-sufficiency
4 = precariously self-sufficient
5 = economically deprived
6 = impoverished
7 = destitute
8 = economically inactive

Appendix 3

Modified Vocational Stimulation Questionnaire

Answer the following 10 items:

To what degree do you feel you have been able to influence your work?
(0 = to a low degree; 1 = to a high degree)

To what degree have you been able to influence your working pace at your present/former job?
(0 = to a low degree; 1 = to a high degree)

To what degree do you feel that your present/former job has been interesting and stimulating?
(0 = to a low degree; 1 = to a high degree)

To what degree do you feel you have been able to utilize your abilities and knowledge in your present/former job?
(0 = to a low degree; 1 = to a high degree)

To what degree do you feel your present/former job is/was monotonous and a matter of routine?
(0 = to a high degree; 1 = to a low degree)

Special knowledge and competence are needed to accomplish the work tasks I have had.
(0 = no; 1 = yes)

At home they were very keen on that I should have a good school report.
(0 = no; 1 = yes)

I always do my morning toilet according to a fixed routine and always keep strict habits concerning getting up in the morning and dressing.
(0 = yes, 1 = no)

My former/present job has hardly given me the satisfaction I had hoped to get.
(0 = yes; 1 = no)

I often feel that I have no influence on the development of my life.
(0 = yes; 1 = no)

Vocational Stimulation Index (Range 0–10)
Modified Vocational Motivation Questionnaire

Answer the following 14 items:

If I at the present moment could make a choice I should prefer to be on sickness benefit premature pension.
(0 = yes; 1 = no)

My nearest relatives feel that it would be better for me to get a premature pension.
(0 = yes; 1 = no)

When one has been/is absent from work one is accustomed to and rather enjoys being a home.
(0 = yes; 1 = no)

I avoid to start/to continue to work because I feel I would not make it.
(0 = yes; 1 = no)

It often happened/happens that I felt/feel uncomfortable in the morning when going to work.
(0 = yes; 1 = no)

Most often it is comfortable when other people decide and arrange things for me.
(0 = yes; 1 = no)

I believe there is a risk I get worse if I start/continue to work.
(0 = yes; 1 = no)

I always complete the tasks I have once started though they are not so important.
(0 = no; 1 = yes)

My nearest relatives believe that I soon will recover so that I can start/continue to work.
(0 = no; 1 = yes)

Work gives me a special satisfaction that I hardly can feel in another way.
(0 = no; 1 = yes)

After a period of training at work I certainly believe I will make it.
(0 = no; 1 = yes)

One feels more valuable as a human being when supported through one's own work th if one gets the support from elsewhere.
(0 = no; 1 = yes)

How do you assess your possibilities to return to/continue to work?
(0 = no possibilities; 1 = great possibilities)

Vocational Motivation Index (Range 0–14)
Job Satisfaction Questionnaire

How satisfying are/were the following aspects of your former/current job?

0 = Dissatisfying
1 = Moderately satisfying
2 = Satisfying

<table>
<thead>
<tr>
<th>Physical environment</th>
<th>Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>Chances of advancement</td>
</tr>
<tr>
<td>Peers</td>
<td>Recognition</td>
</tr>
<tr>
<td>Supervision</td>
<td>Responsibility</td>
</tr>
</tbody>
</table>

Job Satisfaction Index (Range 0–16)

Experience Health

How often do you feel healthy? Indicate the number which best suits you.

1 = Never/very rarely  2 = Rarely  3 = Rather rarely
4 = Rather often      5 = Often     6 = Very often/always

Belief in vocational Return/Continuation

How likely is it that you will continue in/return to work? Indicate the number which best suits you.

1 = Very unlikely  4 = Rather likely
2 = Unlikely       5 = Likely
3 = Rather unlikely 6 = Very likely
# Appendix 4

## Life Satisfaction Questionnaire

How satisfying are these different aspects of your life? Indicate the number which best suits you.

1 = Very dissatisfying  
2 = Dissatisfying  
3 = Rather dissatisfying  
4 = Rather satisfying  
5 = Satisfying  
6 = Very satisfying

<table>
<thead>
<tr>
<th>Life as a whole is</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>My ability to manage my self-care (dressing, hygiene, transfers, etcetera) is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My leisure situation is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My vocational situation is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My economy is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My sexual life is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My partnership relation is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My family life is</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>My contacts with friends and acquaintances are</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>
Appendix 5

Symptoms reported and signs registered.

<table>
<thead>
<tr>
<th>A</th>
<th>Symptoms</th>
<th>B</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 = No</td>
<td>1 = Yes</td>
<td>0 = Not present</td>
</tr>
</tbody>
</table>

**GROSS LOCALIZATION**
- Head/neck
- Thoracic
- Shoulder/upper extremity
- Lumbar/sacral
- Hip/lower extremity

**GROSS QUALITY**
- Pain (selection criterion)
- Stiffness
- Paresthesias
- Weakness

**PROVOCATORS**
- Walking
- Sitting
- Standing
- Stooping
- Working arms elevated

**INSPECTION**
- Scoliosis
- Impaired pelvic tilt (increased/decreased)
- Unilateral pelvic depression

**HYPOMOBILITY**
- Upper cervical
- Lower cervical
- Humero-scapular
- Thoracic
- Lumbar
- Hip

**HYPOMOBILITY**
- Cervical
- Lumbar

**SACRO-ILIAC DYSFUNCTION**

**PALPATORY PAIN**
- Upper cervical
- Lower cervical/shoulder
- Upper extremity
- Hip
- Lower extremity

**REPEATED MOVEMENTS**
- Cervical
- Lumbar

**SINGLE LIFTS**
- Near the body
- With lumbar rotation
- Heavy lifts
- Pain after lifts

**NEUROLOGICAL IMPAIRMENT**
- Craniad:
  - Head/neck/upper extremity
  - Positive brachial plexus test
  - Positive cervical rhizopathia test
- Caudal:
  - Pelvis/lower extremity
  - Straight leg raising (SLR)
  - Positive lumbar/sacral plexus test
  - Positive lumbar rhizopathia test
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