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Chapter 4

How can we help employees with chronic diseases to stay at work? A review of interventions aimed at job retention and based on an empowerment perspective

Abstract

Objectives. A growing number of persons aged 16-65 is hampered by a chronic condition in performing job activities. Some of them quit the labour market prematurely. Vocational rehabilitation used to focus on (re)entering the labour market. Recently more attention is paid to interventions aimed at job retention. Some of these use an empowerment perspective. The objective of this study is to describe the characteristics, feasibility and effectiveness of such vocational rehabilitation interventions in order to decide which approaches are fruitful.

Method. The Medline, Embase, Cinahl and Psycinfo databases were systematically researched for studies published between 1988 and March 2004. Studies were included if they were experimental, included an intervention that aimed at job retention by means of solving work-related problems, used an empowerment perspective and concerned employees with one of the following chronic illnesses: diabetes mellitus, rheumatic diseases, hearing disorders, multiple sclerosis, inflammatory bowel disease, epilepsy, chronic kidney failure, COPD and asthma.

Results. Nine studies were detected. The aims of the intervention programs were to improve psychosocial skills or implement work accommodations. They were structured as individual (6x) or group programmes (3x). They used methods like education (9x), assessment (7x), counselling (5x), training or role playing (5x). The most important outcome measures were employment status (5x), actions to arrange work accommodations (3x), and psychosocial measures like self-efficacy and social competence (3x). Employment status was claimed to be positively influenced in four out of five studies, obtaining work accommodations was successful in all three studies and psychological outcome measures improved in two out of three studies.

Conclusions. There is some evidence that vocational rehabilitation interventions that pay attention to training in requesting work accommodations and feelings of self-confidence or self-efficacy in dealing with work-related problems are effective. There is no evidence for greater effectiveness of group programs compared to individual programs. Attention has to be paid to feasibility aspects such as recruitment of participants and cooperation between medical professionals, occupational physicians, and vocational rehabilitation experts. Medical specialists and nursing specialists should pay more attention to work. Although many studies claim effectiveness, evidence for this was often weak due to short follow-up and the lack of control groups. More rigorous evaluation is needed.

Introduction

An increasing number of people aged between 16 and 65 are hampered by a chronic disorder or handicap in performing job activities [5]. Persons with a chronic disorder are less often employed than others. In the Netherlands, 45% are employed, as opposed to 60% of the general population [3]. If employed, 15 to 58% of them experience difficulties in performing physical, psychosocial or environmental work demands [18]. Factors associated with the employment situation of people with a chronic condition have been the subject of many studies. Apart from the severity of functional impairments, sociodemographic and psychological factors, attitudes and beliefs, job characteristics, social support in the workplace, organizational factors and macro-economic factors are reported as being decisive for maintaining employment [16,6,7]. Only a few studies on work-related problems are qualitative and conducted from a patients' perspective. These patients have rheumatoid arthritis, diabetes or hearing loss and they mention psychological factors such as a lack of self-acceptance and assertiveness, social factors such as a lack of support from colleagues or managers, and insufficient work accommodations as factors which may lead to job loss [19,10].

Vocational rehabilitation used to focus on efforts for persons with a chronic disease or handicap to enter or re-enter the labour market. Recently, more attention has been paid to job retention instead of a return to work, since the idea is emerging that it is easier to maintain a job than to find a new one. At the same time, legislation in the USA and European countries at the end of the 20th century aimed to encourage higher employment rates for people with chronic health conditions. In the USA and the UK, employees are entitled to ask 'reasonable accommodations' of their employers to enable them to continue working [8]. In the Netherlands, recent disability pension legislation has made employees themselves more responsible for job retention.

Another development in the past decade is the gradual replacement of traditional vocational rehabilitation services in which the client has a rather passive role by an 'empowerment' oriented approach. The empowerment perspective in health care originates from patient education and self management practices for chronic diseases. The aim is to provide 'a combination of knowledge, skills and a heightened self-awareness regarding values and needs, so that patients can define and achieve their own goals'[11]. Empowerment in rehabilitation has been conceptualized to include intrapersonal components such as a sense of control or self-efficacy, interactional components such as critical awareness of the resources needed, knowledge and skills for managing resources, and behavioural components such as participatory behaviour and coping behaviours [30].

Vocational rehabilitation interventions aimed at job retention which use an empowerment perspective are promising. In order to advise about future programs we reviewed the literature. We studied the characteristics of these intervention programs, their feasibility and effectiveness. As evidence for effectiveness depends on methodological quality of effectiveness studies, this was assessed as well.

Material and methods

Chronic diseases

Nine rather common chronic somatic conditions were selected which represent diseases of different organ systems, presumably with an impact on work ability: diabetes mellitus, rheumatic diseases, hearing disorders (excluding deafness), multiple sclerosis, inflammatory bowel disease, epilepsy, chronic kidney failure, COPD and asthma. Diseases with dominant psychosocial aspects, such as low back pain, were deliberately excluded in order to focus on the consequences of somatic diseases.

Search strategy

The Medline, Embase, Cinahl and Psycinfo electronic databases were searched for articles with an abstract in English, German, French or Dutch, over the period 1988 to March 2004. References of selected articles were checked for new relevant titles. In addition, experts gave advice about relevant articles. A single search strategy in which groups of search terms for disease (patients), interventions and outcome measures respectively were combined with the Boolean term AND gave only a few results. We concluded that the field of vocational rehabilitation is so peripheral to regular medicine that articles are generally not indexed by combining intervention terms with outcome terms. A separate search strategy was eventually developed for each database in which terms referring to vocational rehabilitation interventions and terms referring to work-related outcome measures were all combined with the Boolean term OR [14]. Subsequently, this search strategy was combined with a specific chronic condition using the term AND. The Appendix presents the search strategies for each of the four databases.

Selection of articles

All titles or abstracts were screened using the following inclusion criteria: the article reports on an experimental study, includes a description of an intervention which might

use an empowerment perspective, and the intervention is conceivably aimed at job retention by means of solving work-related problems. Empowerment perspective has been defined as offering knowledge and skills to clients which enable them to adopt an active attitude in defining and solving problems. If there was any doubt about inclusion, the last author (FvD) also screened the abstract. Full text articles of citations meeting these criteria were assessed to see whether the interventions really aimed at job retention and used an empowerment perspective. There were no restrictions concerning methodological qualities or outcome measures.

Data extraction

The following characteristics of the intervention programs were described: chronic disease of the participants, objectives of intervention, intervention methods, group meeting or individual counselling/training, number and discipline of trainers/counsellors, and recruitment procedure. If available, data on the feasibility of the intervention programs were collected. The following characteristics of the studies were assessed: pretest and/or posttest measurement, use of control group, number of participants, follow-up period, outcome measures and effectiveness.

Results

Search and selection of studies

The initial database search yielded 1849 citations. After deducting double citations, 1505 remained. The numbers were 333 (rheumatic diseases), 204 (epilepsy), 181 (diabetes mellitus), 147 (multiple sclerosis), 85 (partial hearing disorder), 44 (inflammatory bowel disease), 60 (chronic kidney failure) and 451 (COPD and asthma). Twenty-nine citations were selected based on title and abstract. They were assessed anew based on the full text. Finally, nine studies met all the inclusion criteria [1,2,11,16,20,21,22,23,24]. Three studies were found through experts' advice or when checking references. Three authors had published two studies each. The studies covered the following diseases: rheumatic diseases, diabetes, multiple sclerosis, chronic kidney failure, hearing impairment, visual impairment or blindness, and one study combined people with various miscellaneous disorders. No studies were found of patients with inflammatory bowel disease, epilepsy, COPD or asthma.

Table 1. Characteristics of intervention programmes.

| Author | Disease or handicap | Objectives of intervention | Intervention methods | Structure of intervention (number of participants per group) | Number and discipline of trainers or counsellors | Recruitment procedures |
|-----------------------------------|-----------------------------------|--|---|---|--|---|
| Getty and Hetu, 1991 Canada | Occupational hearing impairment | To initiate a problem-solving process by offering psychosocial support, making persons understand disorder, consequences and aids, and developing coping skills. | Assessment Education Group discussion Trial of hearing aid Role playing | Group meetings 4 x 2 hrs or 1.5 day, plus follow-up meeting (8 + spouses) | Two occupational health nurses | Invitation during home visit by known nurse |
| Rasgon et al., 1993 USA | Kidney failure in-centre dialysis | To maintain employment by learning to fit dialysis in life, changing perceptions of unemployment, and increasing feelings of being in control. | Psychosocial assessment Education Counselling | Individual counselling, several sessions | Clinical social worker | Referral by physician to social worker of dialysis centre prior to dialysis |
| Rasgon et al., 1996 USA | Kidney failure home dialysis | To maintain employment | Psychosocial assessment Education Counselling | No clear information, probably individual counselling, several sessions | Social worker + nurse educator | No information, probably similar to Rasgon, 1993 |
| LaRocca et al., 1996 USA | Multiple sclerosis | To examine employment experiences and offer information and referral services in order to alleviate stress and enable persons to continue working | Assessment Education Counselling | Individual counselling, 2x 1 hr, and possibility for extra counselling | Psychologist + employment specialist | Invitation by telephone after screening during regular visit MS Centre |
| Petermann et al., 1997 Germany | Diabetes type 1 | To improve social competence in work and non-work situations Reflection | Education Group discussion Role playing | Group meetings 4 x 3 hrs (6-8) | Two diabetes educators | Invitation during stay in hospital for insulin regulation |

Table 1. Continued.

| Author | Disease or handicap | Objectives of intervention | Intervention methods | Structure of intervention (number of participants per group) | Number and discipline of trainers or counsellors | Recruitment procedures |
|--------------------------------|---|--|---|--|--|---|
| Allaire et al., 1997 USA | Arthritis or rheumatic disease | To enhance sense of control and self-efficacy and to enable participants to solve their work-related problems | Education Peer interaction Individual exercises | Group meetings 10 x 3 hrs (8-12) | Volunteers or staff of patient organization (no clear information on number) | No clear information |
| Rumrill and Garnette, 1997 USA | MS, spinal cord lesion, blindness and deafness, and other | To increase self-efficacy in work accommodation request process, knowledge about legal rights, behavioural activities related to job accommodation | Assessment of work barriers and accommodation needs, Education (written material), Training, including role playing | Individual training, 1x | Rehabilitation professional | Flyers and announcements to rehabilitation centres, referral from practitioners, advertisements, mail solicitation |
| Rumrill, 1999 USA | Visual impairment and blindness | To increase confidence, knowledge and activity concerning the process to get work accommodations | Assessment of work barriers and accommodation needs Education Counselling Training, including role playing, monitoring | Individual training, 2x | Rehabilitation professional | Referrals from local independent living centres, vocational rehabilitation agencies, ophthalmologists, student disability service programmes, consumer advocacy organizations |
| Allaire et al., 2003 USA | Rheumatic diseases | To identify work barriers and accommodations, acquire knowledge of legal rights and skills in requesting work accommodations | Assessment of work barriers and accommodation needs Education Counselling / Training | Individual counselling 2 x 1.5 hr | Rehabilitation counsellor | Recruitment through rheumatologist who sent a letter and screening form |

Characteristics of intervention programs

Table 1 summarizes the characteristics of the interventions. Job retention was the ultimate goal for all studies apart from Allaire et al. (1997), who combined job retention with job attainment for unemployed persons [1]. Most authors mentioned several - often related - objectives which are thought to contribute to job retention. The phrasing of the objectives reflects the occupational background of the trainers or authors. The objectives can be classified in the following categories (not in table):

- to increase knowledge (about the disorder and its consequences, legal rights and work accommodations)
- to gain a clear understanding of work-related problems or work barriers
- to increase feelings of control (general control or perceived self-efficacy in the process to request work accommodations)
- to develop skills (coping skills and social competences)
- to increase activities aimed at work accommodations

Ensuing from specific objectives, combinations of the following topics were discussed with the participants: information about chronic disorder and its social consequences, job-related interpersonal and emotional issues, assertiveness and communication skills, work barriers and work accommodations, strategies to get work accommodations, and legal rights (not in table).

Six interventions consisted of individual training or counselling sessions. One of these was intended for significant others as well. The number of sessions varied from one to several. The other three interventions were group programs. The number of these two or three hour group meetings varied from four to ten, the number of participants per group varied from six to twelve patients, except for the hearing impairment group. This group tended to be quite large due to the presence of accompanying spouses. Two group interventions were run by two trainers at the same time, the intervention in the third study presumably had only one trainer.

All interventions offered education, combined with counselling (5x), assessment (7x), or training, which often included role playing (5x). Once cited methods were trial of hearing aids, reflection, individual exercises, and monitoring. In case of group programs, group discussions, exchange of experiences, role playing and other peer interactions took place during the meetings. Some interventions were more oriented towards the psychological and social consequences of disease for functioning at work, others towards practical solutions of work-related problems. Most interventions were mainly or purely oriented towards work, but some were aiming at a wider perspective. For instance, Rasgon et al. were oriented towards the self-management of disease,

choosing an appropriate treatment modality for renal failure and learning how to fit this into one's daily life. However, fitting treatment in working life and changing negative ideas about employment were also objectives of the intervention [22].

Trainers or counsellors had varied occupational backgrounds: psychologist, employment specialist, rehabilitation counsellor, occupational health nurse, social worker, specialized nurse educator, trained volunteer or staff member from a patient organization.

Recruitment procedures varied with respect to the organization that took the initiative, the extent to which people were stimulated to participate, and the magnitude of the group of potential participants. Organizations involved were outpatient clinics, local community health centres, vocational rehabilitation organizations, HMOs, and patient organizations. They often operated in cooperation (not in table). A standard recruitment procedure was an invitation by letter or telephone call after a regular visit to an outpatient clinic. A not intensive, large group approach was used by Rumrill and Garnette who approached potential participants with flyers, announcements about rehabilitation centres and advertisements. In addition, patients were referred by practitioners [24]. Getty and Hetu used an intensive small group approach. Occupational nurses screened employees for audiological problems and, already known to the employees, paid a home visit to the hearing impaired employees and invited them and their spouses to participate [12].

All studies except two used current employment as an inclusion criterion [23,1]. Self-reported worries about future employment problems due to disease were an additional inclusion criterion in two studies (not in table) [17,2].

Feasibility of the interventions

Three studies paid explicit attention to the feasibility of the program. Getty and Hetu were positive about the feasibility of group meetings for hearing impaired workers and their spouses. Their opinion is based on a high participation level (89%) among the first group, due to an intensive recruitment procedure, and successful implementation later on [12]. Allaire et al. (1997) studied attendance and satisfaction with a comprehensive group meeting program for arthritis or rheumatic disease patients. They concluded that the program was promising and patients were satisfied. However, program development and repetition were hampered by difficulties in soliciting program participants, and a lack of volunteers and staff group meeting managers from the patient organization [1]. LaRocca et al. stated that a modest individual job retention program for MS patients was feasible. The opinion is based on the successful cooperation between health care

Table 2. Study characteristics: methodological characteristics, outcome measures and results

| Author | Pretest-posttest measurement and use of control group | Number of patients (+ controls) | Follow-up after intervention | Outcome measures | Results |
|--------------------------------|---|---|---|---|--|
| Getty and Hetu, 1991 Canada | Pretest-posttest, without control group | 48 and 41 spouses | 2 and 3 months (telephone interview and group discussion) | Use of hearing aids Handicap questionnaire | More use of hearing aids 2 pos. and 2 neg. changes in handicap questionnaire (36 items) Increased awareness and self-confidence (qualitative data) |
| Rasgon et al., 1993 USA | Posttest only, with nonrandomised control group | 45 and significant others (+ 57 controls) (64 blue-collar and 38 white-collar workers) | At least 6 months and well over four years on average | Employment status | Blue-collar workers: 47% retained job vs. 24% (controls) (OR=2.8, chi-square=3.78, p<0.05) White-collar workers: 47% retained job vs. 48% (controls), not stat. sign. |
| Rasgon et al., 1996 USA | Posttest only, without control group | 30 of whom 19 employed | At least 6 months | Employment status | 14/19 persons retained job |
| LaRocca et al., 1996 USA | Pretest-posttest, with randomized control group | 23 (+ 20 controls) | 1 year | Employment status | 19/23 retained job, vs 19/20 (controls), not stat. sign. |
| Petermann et al., 1997 Germany | Pretest-posttest, with semi-randomised control group | 60 (+ 62 controls) | 6 months | Perceived social competence in four domains: mobility at work, work problems, hypos at work, coping with others. Metabolic control. | Exp.: improvement in coping with others (before: 14.7 after:13.7, p<0.05) Exp. better metabolic control (p<0.005) Controls: improvement in hypos at work (before: 14.9 after:13.4, p<0.05) |

Table 2. Continued

| Author | Pretest-posttest measurement and use of control group | Number of patients (+ controls) | Follow-up after intervention | Outcome measures | Results |
|--------------------------------|---|---------------------------------|------------------------------|---|---|
| Allaire et al., 1997, USA | Pretest-posttest, without control group | 141 of whom 37 employed | 6 months | Employment status | 34/37 employed persons retained job 24/104 unemployed persons gained job Increased self-confidence (qualitative data) |
| Rumrill and Gannette, 1997 USA | Posttest only, with stratified randomised control group | 18 (+ 18 controls) | 8 weeks | Self-efficacy in accommodation request process ADA knowledge test Work accommodation process activity scale | No stat. sign. improvement in self-efficacy (exp.59.9 vs. contr. 51.2) More ADA knowledge (p<0.001) More requests (p<0.001), meetings with employers (p<0.01), and implementation of work accommodations (p<0.01) |
| Rumrill, 1999 USA | Posttest only, with stratified randomised control group | 23 (+ 23 controls) | 16 weeks | Self-efficacy in accommodation request process ADA knowledge test Work accommodation process activity scale | Improvement in self-efficacy (exp. 59.4 vs. contr. 45.3, p<0.001) More ADA knowledge (p<0.01) More requests (p<0.001), meetings with employers (p=0.001), and implementation of accommodations (p=0.16) |
| Allaire et al., 2003 USA group | Pretest-posttest, with stratified randomised control | 122 (+ 120 controls) | 24-48 months | Time to job loss permanent job loss | Delay in job loss (p=0.03) Temporary or permanent job loss 25/122, compared to 48/120 (controls) (OR=0.58, p=0.05) |

providers and employment specialists. However, recruitment of patients during the regular visit to the MS centre was problematic, as MS patients were seldom interested in the program. On the other hand, if they were, they were enthusiastic. Nevertheless, they mainly followed counsellors' recommendations in minor or very concrete problems. More complex and subtle problems, for instance involving intellectual dysfunction, family problems, and emotional distress were avoided. The authors conclude that clients apparently did not want to anticipate future problems. Yet, when they occur, it is probably too late to intervene [17].

Methodological quality of the studies and outcome measures

Table 2 presents the study characteristics. All studies were quantitative, although some also collected qualitative data. Four studies used a randomised control group (RCT), two studies used a semi- or nonrandomised control group and three studies had no control group at all. Four studies used only posttest measurement. The total number of patients in experimental groups varied between 18 and 141. Numbers of controls varied from 18 to 120. Follow-up varied from eight weeks to 24-48 months. The longer follow-up periods were used when job retention was the outcome measure.

Data on the following outcome measures were obtained:

- employment status or similar concepts, such as temporary or permanent job loss (5x),
- actions to get work accommodations (3x),
- self-report instruments to assess psychological measures such as self-efficacy or social competence (3x),
- knowledge of disability regulations (2x),
- disease or disability symptoms (2x).

Outcome of the interventions

Employment status was measured in five studies. Two of the three studies using a control group reported effectiveness. Forty-seven percent of blue-collar workers with chronic kidney failure kept their job after a follow-up of at least six months, compared to 24% of the control group. The intervention made no difference for white-collar clients [22]. Employees with rheumatic diseases had a job retention rate of 97/122, compared to 72/122 in the control group after 24-48 months follow-up. However, the effect had almost faded for those followed for four years [2]. Employees with multiple sclerosis had a job retention rate of 19/23 after a one-year follow-up, compared to an even higher

retention rate of 19/20 in the control group. On the other hand, this was not statistically significant, three out of four who lost their job in the experimental group were already on sick leave at the start of the intervention, and the retention rate was high for both groups [17]. Two studies measured job retention without the use of a control group. Fourteen out of nineteen employed persons with chronic kidney failure retained employment after at least six months [23]. People with rheumatic diseases showed a job retention rate of 34/37 after a six month follow-up [1].

In three studies the participants' actions to arrange work accommodations were measured. A higher use of hearing aids was reported after following a group training course for hearing impaired employees. There was no control group, but the authors argue that these participants with occupational hearing loss had not previously sought medical or audiological advice themselves. The focus on hearing aids during the intervention makes it convincing, in their opinion, that the result is a consequence of the group meetings [12]. Rumrill studied a varied group of chronic diseases (1997) and people with visual impairment or blindness (1999) who received almost the same intervention. He reported more requests for work accommodations, more meetings with employers to discuss them, and more implementations of accommodations, compared with a control group. He also reported more knowledge about disability regulations (the Americans with Disabilities Act) [24,25].

Three studies, all with a control group, collected psychological outcome measures. A pretest-posttest design was used to study the effectiveness of a psychotherapy oriented training for young adults with diabetes type 1. The experimental group showed an improvement in coping with others in general (5 items 5 point scale, before-after = 14.7-13.7), but no differences in dealing with work-related problems or mobility at work. The control group performed even better in dealing with hypoglycaemia at work (5 items, 5 point scale, before-after = 14.9-13.4). The authors stated that they possibly took the target group too wide. Only offering training to those patients who actually experienced difficulties at work or in social relations estimated to be 20-40%, would probably have given more impressive results [21]. Two studies investigated perceived self-efficacy in the process of requesting work accommodations. Both used a post-test only design. In the first no statistically significant improvement in self-efficacy was found compared to the control group (experimental 59.89, control 51.17, range 10-100). This was explained by a high sense of self-efficacy from the beginning. The second study showed improved self-efficacy (experimental 59.39, control 45.26, range 10-100) [24,25].

Two studies measured health related outcomes. Employees with diabetes showed a better metabolic control [21]. Persons with occupational hearing impairment showed no clear improvement in experience of handicap [12].

In two studies qualitative data were collected on psychological functioning. Participants in the studies on hearing impairment and the study of Allaire et al. (1997) on arthritis and rheumatic diseases expressed greater self-confidence as an effect of the intervention. Furthermore, information about legislation on work accommodations, and understanding strengths and limitations in job performance were mentioned as helpful by the participants in Allaire's study [12,1].

Discussion

Nine studies were found on the effectiveness of empowerment based intervention programs aimed at job retention for employees with a chronic somatic disorder. The selected studies varied in intervention methods, recruitment procedures and outcome measures. This heterogeneity makes it impossible to combine the results in a meta analysis. However, it offers the possibility to reflect on the potential benefits of the variety of approaches. All intervention programs combined education with other methods like counselling or training. These methods might all contribute to empowerment, offering a combination of knowledge and skills, so that patients can define and achieve their own goals. Which type of intervention method is working best can not be concluded. As increased self-confidence was mentioned by several participants as important, methods aimed at increasing this seem worthwhile to include.

Most studies measuring job retention reported effectiveness. All studies measuring participants' activities to implement work accommodations showed positive results. Studies measuring self-efficacy or social competence had varied results.

Although many studies claimed effectiveness, it was not always supported by strong evidence based on a strong study design. Three studies did not make use of a control group. The number of participants in some studies was low. The follow-up period was seldom more than one year. Only the studies of LaRocca et al, Petermann et al, and Allaire et al (2003) meet the methodological criteria of pre testing, use of a control group, a sufficient number of participants and long follow-up period [2,17,21].

A drawback of our review is the limited number of studies we found, reflecting presumably that part of the interventions will not be scientifically evaluated. The evidence based medicine tradition is not yet adopted fully in the field of occupational medicine.

Our results have implications for vocational rehabilitation practices aimed at employees with a chronic condition, and implications for future research. Firstly, the feasibility of vocational rehabilitation programs is a prerequisite for their effectiveness. A main reason why so few rheumatic arthritis patients participate in vocational rehabilitation programs is that medical professionals are unaware of these programmes [9]. It is important that medical specialists and nursing specialists pay more attention to work-related problems of patients, and it is important for them to cooperate with employment or vocational rehabilitation specialists, especially where recruitment procedures are involved for this kind of intervention programs.

Secondly, the large variety of secondary objectives which are thought to contribute to job retention show that interventions may focus on different aspects of the employee and his or her environment. This requires a comprehensive conceptual model to understand work-related problems and work disability. The International Classification of Functioning, Disability and Health (ICF) of the World Health Organization offers a model of disability in general which is applicable to work disability. In this model disability is considered as the outcome of a process in which biological, psychological and social factors are interrelated [27,29]. The model presents a social rather than a medical perspective in which disability is perceived as an aspect of the relationship between a person and his environment, or as a gap between personal capabilities and demands from outside which may be reduced by increasing capability or by reducing demand. The model includes interventions intended to reduce the disability outcome. These can be directed on the individual, e.g. behaviour changes, or directed on external support, e.g. modifications to the physical and social environment. The model illustrates why an employee with a chronic condition experiences problems in a unique way, depending not only on the severity of functional limitations but also on job demands, support from colleagues or managers, personal skills, organizational features and social regulations.

Thirdly, the great variety of intervention methods points to the lack of clarity concerning the effectiveness of methods. When a vocational rehabilitation intervention contributes to the objective of job retention, it is not clear how this objective is achieved. One can simply inform people about the consequences of chronic disorders and practical solutions for work-related problems. Or try to change their mind about their potentials in a psychotherapy-oriented intervention, or offer training in dealing with work barriers and negotiating about work accommodations. Some authors state that a purely educational approach is insufficient for behavioural change [26,13]. This corroborates the qualitative findings in the studies presented which stress the importance of self-efficacy or self-confidence as an intermediate factor. Whether these psychological states are best improved by counselling, role playing or other kinds of training and to

what extent group meetings are beneficial is unclear. Bandura's social cognitive theory which is often used in the field of health education and health behaviour and which is cited in some of the studies cited might be helpful. Bandura hypothesizes self-efficacy as a prerequisite for changes in behaviour. He mentions several sources for improvement of self-efficacy, including learning through personal experience, learning through observations or through other people, and verbal persuasion [4]. These three sources are used in role playing, in exchanging experiences in group meetings, and in counselling. Future studies should pay attention to these theoretical aspects [16].

Fourthly, future research should have a strong study design, in order to acquire more evidence for effectiveness. Various outcome measures like job retention, behavioural and psychological measures should be used, combined with a pretest-posttest design, randomized control groups, a long follow-up, precise inclusion criteria, and a large number of study participants. As far as job retention is concerned, a follow-up period of years instead of months is preferable. On the other hand, we have to realize that this field resembles the larger field of chronic disease management in which control procedures and a long follow-up raise serious problems, which make the interpretation of differences between experimental and control group notoriously difficult [28].

At the end, one disadvantage of the empowerment perspective should be mentioned. The perspective is based on the employees' ability and responsibility to solve problems. However, we might forget that employees are not the only ones responsible for job retention. Employers should be prompted to take their responsibility as well and national policies should enable them to do so [15,20].

Vocational rehabilitation programs aimed at job retention may be worthwhile. For the recruitment of patients medical professionals, occupational physicians and vocational rehabilitation experts, have to cooperate more closely. In addition, more rigorous evaluation of these programs is needed.

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Appendix Search terms

Medline

Search strategy for work-related terms (explode function), Mesh terms or free text words (all fields): “return to work”[All Fields] OR “workplace”[MeSH Terms] OR “employment”[MeSH Terms] OR “employment status”[All Fields] OR “work disability”[All Fields] OR “sick leave”[MeSH Terms] OR “job satisfaction”[MeSH Terms] OR “work ability”[All Fields] OR employability[All Fields] OR “occupational medicine”[MeSH Terms] OR “rehabilitation, vocational”[MeSH Terms] OR “occupational health”[MeSH Terms] OR “disability management”[All Fields].

Search terms for chronic diseases, all Mesh major topic, except where otherwise specified: Diabetes mellitus/ Rheumatic diseases/ Hearing loss [Majr] NOT deafness [Mesh] OR Hearing impaired persons [Majr]/ Inflammatory bowel diseases/ Multiple sclerosis/ Kidney failure, chronic/ Epilepsy/ Asthma OR Pulmonary disease, chronic obstructive.

Embase

Search strategy for work-related terms (Subject headings, not exploded except where otherwise specified (exp), not focused, or text words (mp)): work resumption OR workplace OR employment OR employment status(mp) OR work disability OR absenteeism OR job satisfaction OR work ability (mp) OR work capacity OR job performance OR employability OR occupational medicine OR vocational rehabilitation OR occupational health OR occupational health service OR disability management (mp)

Search terms for chronic diseases, (all terms exploded and focused, unless otherwise specified) :Diabetes mellitus/ Rheumatic diseases/ Hearing loss (not exp)/ Crohn disease (not exp) or ulcerative colitis (not exp)/ Multiple sclerosis/ Chronic kidney failure/ Seizure, epilepsy and convulsion/ Chronic obstructive lung disease or asthma.

Cinahl

Search strategy for work-related terms (Subject headings, not exploded except where otherwise specified, and not focused, or text words (mp)): job re-entry OR employment (exp) OR work disability (mp) OR work capacity evaluation OR sick leave OR disabled OR job satisfaction OR work ability (mp) OR employability (mp) OR occupational health services (exp) OR rehabilitation, vocational OR disability management (mp) OR job performance.

Search terms for chronic diseases, (all terms exploded and focused): Diabetes mellitus/ Rheumatic diseases/ Hearing loss, partial/ Inflammatory bowel diseases/ Multiple sclerosis/ Kidney failure, chronic/ Seizures or epilepsy/ Lung diseases, obstructive.

Psycinfo

Search strategy for work-related terms: (free text words or Subject headings (DE)): (job-satisfaction) in DE) or ((employee-absenteeism) in DE) or ((job-performance) in DE) or (work-disability) or ((employment-status) in DE) or ((disabled-personnel) in DE) or ((reemployment) in DE) or (return-to-work) or (job-retention) or (job-maintenance) or ((disability-management) in DE) or (occupational-health) or ((vocational-rehabilitation) in DE) or (occupational-medicine) or ((employability) in DE) or ((occupational-adjustment) in DE) or (work-ability)

Search terms for chronic diseases (all subject heading, unless otherwise specified): Diabetes-mellitus/

Rheumatoid-arthritis/ (Hearing-disorders not deaf) or partially-hearing-impaired/ Ulcerative-colitis or colon-disorders/ Multiple-sclerosis/ Kidney-diseases/ Epilepsy or epileptic-seizures or convulsions/ Asthma or Lung disorders or copd (free textsword).

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