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Conclusions

Introduction

Musculoskeletal disorders constitute a major cause of morbidity, sickness absence, and disability in working populations. Despite numerous research efforts there is still difficulty to determine which factors are crucial at what stage in the development of musculoskeletal diseases. To better understand the relationship between risk factors and musculoskeletal disorders, a descriptive model was used that captures the interactive process of risk factors associated with sickness absence, disability, and health care utilization. This dynamic model, offered the conceptual framework for the research issues discussed in this thesis. The first issue addressed the dynamic character of low back pain over time and the impact of work-related risk factors on the occurrence of low back pain. The second issue elaborates on the consequences of low back pain complaints for sickness absence and disability and identifies intervention strategies to successfully enhance return to work.

Part 1

Dynamics of low back pain

The natural history of low back pain is variable with a continuously changing presence in individuals. The individual trajectories of low back pain within a certain time-window are described by its prevalence, incidence, and recurrence (chapter 2). Simultaneous assessment of these outcome measures in a longitudinal studydesign provides a better view of the natural history of low back pain and offers the possibility to identify risk factors for incidence and recurrence of low back pain. However, due to the dynamic nature of low back pain and because of the fact that most workers have had a previous episode of low back pain sometimes in their lives, it is far from easy to determine when a given episode of low back pain is independent from a previous episode or not. In fact, the incidence and recurrence of low back pain depend highly on the duration of the recall period and the time-window of investigation. Hence, the difference between incident and recurrent cases often arises by chance due to differences in time-window of investigation. It is remarkable to observe that the dynamic character of low back pain expressed by its variability within time-windows has hardly been addressed in literature yet.

The results from the 3 year follow-up among scafffolders (chapter 2) illustrated the changing presence of low back pain among individual workers. Hence, the dynamics of low back pain requires studying its changing character over time during consecutive follow-up measurements.

For diseases with strong episodic nature, such as most musculoskeletal disorders, it may not be sufficient to quantify health status over time in terms of prevalence, incidence, and recurrence. These dichotomous variables fail to capture a gradual aggravation of symptoms over time. Thus, it may be advised in longitudinal studies to include continuous variables such as severity of pain or magnitude of functional disability in order to describe the natural course of low back pain over time.

Risk factors

In many occupational populations physical and psychosocial workload and individual and health related risk factors are interrelated and may interact differently at every stage of low back pain. In scaffolders and other working populations exposed to high postural load, different endpoints of low back pain are consistently associated with physical load whereas the association with psychosocial aspects shows a more diverse pattern. The results in chapter 3 indicate that work related risk factors can vary according to different definitions of low back pain. In fact, each set of risk factors may cause a different reaction in a certain time window of a subject's history.

Different outcome measures can also be affected equally by the same set of risk factors. Despite the often used distinction between between incidence and recurrence of low back pain, chapter 2 demonstrates that both outcome measures are associated with psychosocial, physical, and health related risk factors. The results of chapter 2 and 3 suggest that the strong focus in the scientific literature on incidence studies showed should shift to include also recurrence of low back pain as outcome measure of interest.

Part II

Morbidity, sickness absence, and disability

It is well known that in occupations characterised by manual handling of materials, the prevalence of musculoskeletal complaints and sickness absence due to musculoskeletal disorders is high. However, muscoloskeletal complaints do not necessarily result in sickness absence, disability, or medical care seeking.

The analysis of the consequences of having back pain and the mechanisms underlying the decision to seek medical care is described in chapter 4. Nature and severity of low back pain and sickness absence were the strongest predictor of medical care seeking. Although back pain may be accompanied by other musculoskeletal complaints, comorbidity only plays a limited role in care seeking. It seems that health care utilization largely reflects the referral pattern according to medical guidelines. Age, seniority in the job, nationality, and self reported physical and psychosocial work load did not influence the decision among scaffolders with low back pain to seek medical care or not.

The prevalence of low back pain and its consequences for sickness absence and permanent disability have been documented in various occupational populations.

Chapter 5 demonstrated that among workers exposed to high physical load, the physical risk factors are far more important than psychosocial factors at work in predicting musculoskeletal sickness absence. Furthermore, the occurrence of severe low back pain predicts sickness absence of both short and longer duration. Hence, reducing physical load can be an effective preventive strategy addressing those workers experiencing severe low back pain.

The construction industry is a sector well known for its high disability rates. Ethnic minority groups are overrepresented in occupations with a high risk of work related disorders. Unfortunately, the available statistics on work related disability do not allow firm conclusions about disability in relation to ethnicity and work. Research on this point is scarce, making it difficult to draw far-reaching conclusions. Nevertheless, the conclusions presented in chapter 6 provide some indications for substantial differences in disability risks between ethnic minority groups and native Dutch workers. Possible explanations for the observed differences are sought in the older age at start of the job, lower level of education, language and communication difficulties, lower mobility at the labour market and less access to medical and social care. The fact that many medical guidelines for rehabilitation do not take into account ethnic differences may hamper successful reintegration and rehabilitation. The results of our study also suggest that stakeholders in the reintegrationprocess insufficiently attune their activities. Epidemiological studies targeting this problem need encouragement in an effort to contribute to the awareness of ethnicity associated disability and to facilitate appropriate guidelines for occupational health practice.

Intervention strategies and return to work

Intervention strategies to successfully enhance return to work after sickness absence due to low back pain have been actively sought for many years. In general, strategies are assigned to three main groups of interventions: 1) organisational and administrative, 2) technical, engineering, or ergonomic and 3) personal interventions. Guidance towards adequate strategies is hampered by limited information on sustainability of the intervention during follow-up. The conclusions of the review on intervention strategies in chapter 7 show that back-school type interventions, regardless of their programme and heterogeneity, are more effective after 60 days of sickness absence than non back-school interventions. Interventions in the subacute phase seem preferable, unless a strong intervention effect can be exercised in the early phase of low back pain.

In order to estimate the effect of interventions quantitatively the avoidable sickness absence among the referents, if these referents had undergone the same intervention, can be measured as the preventable fraction (PF). Variability of the PF largely depends on the stage and phase of back disorders and the time-window of investigation. Hence, interventions strategies studied in randomised controlled trials sometimes present successful results if the referents show a very long period of sickness absence. However, acknowledging that heterogeneity of the study population is substantial and large differences do exist between various reference groups, a major source of non-comparability between study results becomes apparent. Hence, it can be concluded that the success of the intervention also depends on the profile of the referents when left untampered.

Part III

Occupational injuries

In occupational populations both the working environment and the individual behaviour may act as dynamic modifiers of risks at work. Although meticulously implemented, workers cannot always abide preventive measures or avoid hazardous working conditions. An example of an occupational injury caused by the combined effect of a heavy load exceeding the maximum acceptable weight limit, an object not easy to handle, and lack of experience in lifting heavy loads is documented in chapter 8. Unfortunately, most workers facing occupational injuries become permanent disabled, resulting in loss of employment. In order to develop control measures an integrated improvement of working conditions by a stepwise approach is advocated.

Recommendations

Every thesis will eventually raise more questions than provide answers to the original questions posed. Although this seems contradictory it is in fact a reflection of the perpetuum mobile of science and an illustration of its dynamic character. The approach in this thesis was accordingly, acknowledging that low back pain is a dynamic entity associated with various determinants in a constantly changing occupational environment. Occupational epidemiology and occupational health care may benefit from this approach by identifying future areas of research and by providing guidance to implement interventions and appropriate guidelines.

Although some recommendations have already been advocated in the previous parts, more general recommendations are presented in order of appearance of the chapters in this thesis:

1. The variability in individual trajectories of low back pain within a certain time-window has hardly been addressed in research. Future studies should consider definitions of prevalence, incidence, and recurrence of low back pain that match the chosen time-window of research, and include continuous variables of severity of pain and functional disability, in order to better understand the natural course of self-reported low back pain in working populations. Furthermore, to broaden the insight into the variability of low back pain, it may be advisable to study prevalence, incidence, recurrence, and recovery in the same population.
2. Continuous assessment of risk factors is needed in order to identify their interrelations and associations with different stages of occurrence of aggravating low back pain over time.
3. When different types of back pain patients are attended by different health care providers, it is advisable to identify the factors that determine the specific type of care-seeking due to low back pain.

4. Severe low back pain is a risk factor for sickness absence and contributes to a worse prognosis of return to work. Therefore, an effective preventive strategy should focus on severity of low back pain rather than the onset of low back pain. Future research might elaborate on the relationships between risk factors and sickness absence due to low back pain in different occupational groups.
5. There are many assumptions but few facts why workers from ethnic minority groups have an elevated risk of becoming disabled. Because stakeholders in the reintegrationprocess insufficiently attune their activities and current guidelines for rehabilitation do not take into account ethnic differences, there is a clear need for research projects to assess all factors associated with this important issue. For instance, it would be challenging to study differences in health care needs between ethnic minorities and native groups, or to study differences in ideas about care and incapacitation to work between different ethnical groups.
6. Few methodologically qualified studies have focused on intervention strategies concerning return to work after sickness absence due to low back disorders. Surprisingly fewer studies have focused on workload and its consequences on return to work. In general, an organisational and technical intervention, sustained over a follow-up period of at least 1 year, with special attention to the recurrence of sick leave due to low back pain, should be the aim in future research.
7. Occupational injuries and deseases must be taken seriously. Some workers may be more vulnerable to working conditions than others. The main problem is that selection on vulnerability is almost impossible due to lack of insight into determinants of individual charateristics that predict future occupational injuries and deseases. Therefore, measures should be taken according to a worst case scenario as if all workers were equally vulnerable and susceptible to the injury. Research efforts to estimate the impact of workplace intervention in the prevention of occupational injuries are advocated in order to prevent workers from facing new injuries in time.

This study of musculoskeletal disorders in scaffolders hopefully contributes to the development of a sound scientific basis for occupational health programmes directed at primary and secondary prevention of occupational low back pain. Epidemiological research in occupational populations is challenging and preventive strategies to reduce sickness absence, disability, and occupational injuries are not yet specific enough. May these recommendations provide enough topics to successfully accelerate the progress of research on musculoskeletal disorders in occupational populations.