

Summary

This literature review project aimed at the identification and prioritization of suitable areas for prevention and potential preventive strategies. The project was divided into four work packages:

WP 1: Overview of work-related musculoskeletal disorders structured according to affected areas of the body and diagnoses, and their prevalence in various fields of activity/occupational groups in Germany

WP 2: Attribution of the respective occupational stress/risk factors to MSDs

2.1: physical factors

2.2: psychological/psychosocial factors

2.3: combinations of 2.1 and 2.2

WP 3: Documentation of indices and indicators concerning the effects of particular MSDs when determining prioritization of relevant prevention topics

WP 4: Overview of potential prevention strategies evaluated for particular MSDs and listing of nationally and internationally prioritized and planned prevention activities, together with main research focuses

Main results are:

WP 1 Risk occupations

Based on an evaluation of reviews the following “top ten” risk occupations for MSD`s/symptoms were derived taking into account the frequency of employees in Germany in different branches:

- 1) Lumbar spine – metalworking occupations
- 2) Lumbar spine - transport and warehouse occupations
- 3) Lumbar spine – construction occupations
- 4) Lumbar spine - law enforcement and security occupations
- 5) Lumbar spine – health service
- 6) Shoulder and neck complaints – metalworking occupations
- 7) Shoulder – construction occupations
- 8) Tenosynovitis, synovitis, CTS – office occupations
- 9) Enthesopathies – assembly line workers (especially in meat/fish production)
- 10) Hip and knee joint arthrosis – agricultural occupations and forestry workers

WP 2.1 Physical factors

As in Work Package 1, based on an evaluation of review articles the following “top ten” risk activities for which successful prevention might be possible is compiled on the basis of the frequency of the disorders and assumed frequencies of the activities in the respective occupations:

1. Lumbar spine – heavy lifting and carrying
2. Lumbar spine – posture
3. Lumbar spine – heavy labor
4. Lumbar spine – whole body vibration when seated
5. Neck/shoulder pain – sedentary activity with neck flexion > 20°
6. Shoulder MSDs – combined stress of force and posture or force and rotation
7. CTS hand/wrist MSDs – combined stresses of force and repetition
8. Epicondylitis – combined stresses of repetition and force or posture and force
9. Knee osteoarthritis – combined stress of force and posture
10. Hip osteoarthritis – heavy lifting and carrying

WP 2.2 **Psychosocial factors**

A meta-analysis using longitudinal studies has been performed on the question of psychosocial risk factors of MSD. The results point towards the influence of psychosocial risk factors on the development of lower back problems. Especially high monotonous work, low social support from supervisors and colleagues, job insecurity as well as high job demands increased the risk for the development of low back pain. Our review suggests that psychosocial work stressors are antecedents of subsequent musculoskeletal problems. While some of the psychosocial work stressors in this investigation are inherent in a variety of jobs and cannot always easily be altered (e.g., high job demands), there are other psychosocial work stressors which are easier to change and for which there are already existing interventions.

Future research should conduct studies using cross lagged panel designs, where both predictor and criterion variables are assessed at both time points. This would allow to rule out an effect of a third variable potentially influencing both psychosocial risk factors and MSD. A thorough analysis of these relationships with the use of cross-lagged panel studies might lead to more specific statements on where to start with an intervention.

WP 2.3 **Combination of psychosocial factors and physical factors**

Only 16 studies were identified dealing with this issue. In all 16 studies, psychosocial factors - apart from physical occupational factors - can be assumed to have a **separate effect** on the occurrence of pain and complaints of the musculoskeletal system.

WP 3 **Indices and indicators**

The available data does not allow extensive analysis of the potential occupational influencing factors, particularly because this is secondary data, which brings with it not only the advantage of real-time analysis but also many disadvantages.

There is insufficient information available on the actual indirect costs, especially for the linking of diagnosis and occupational activity, and an urgent need for research at the international, European, and German levels is indicated.

Proposed measures are

- Analysis of data from occupational physicians derived from checkups, including the corresponding information on stress in and outside the workplace at companies such as AUDI, at which thousands of employees are regularly examined
- Conduction of a cross-cutting survey in major companies with the possibility of performing a prospective survey in the form of an intervention study based on it
- Implementation of an occupation-specific MSD module within the framework of the Helmholtz cohorts

WP 4 **Prevention strategies**

Using an evaluation of review articles the following fields of action are derived:

1. Interventions with a clear focus on interventions related to work organization
2. Interventions to reduce occupational disorders of the lower extremities
3. Interventions with a clearer focus on the prevention of occupational disorders of the shoulders linked to static work postures, but also interventions to reduce disorders from manual handling of loads.

4. Interventions to reduce the number of disorders caused by unfavorable static work postures, with consideration of combined disorders in the case of occupations with high rates of psychomental disorders.
5. Standardization and implementation of economic analyses in intervention studies
6. (Further) interventions, subject to especially close evaluation, in occupational groups with high exposure to manual load handling (e.g. in the construction industry or the healthcare professions).
7. Interventions focused on occupational groups and sectors that to date have not – or have only recently – become the focus of attention, above all in the services sector, as well as generally in all small and medium sized enterprises (SMEs). Intensification of efforts to find successful access and practical tools for SMEs, and monitoring of the use of available tools.
8. (Further) development and systematization of the early warning systems in primary prevention (risk assessment tools) and secondary prevention (occupational health screening and surveillance).
9. Comprehensive development of effective case management with workplace-focused return-to-work programs, with measures taken to remedy current co-operation deficits within the medical provision system.
10. Support of high-quality evaluative research with appropriate intervention and measuring methods.

It has to be taken into account that especially in this WP the concentration on review articles might have caused a relevant bias.

Considering methodological aspects due to the used selection criteria it can be summarised that the results of the four WP`s can provide a relevant basis for the identification and prioritization of preventive measures in the MSD field. However, this basis has to be supplemented and expanded by further knowledge from other countries and institutions dealing with prevention of MSD.