TNO-report
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Repetitive strain injuries (RSI): a pilot study for a sector-oriented approach of RSI in SME's

Final report on progress and achievements and executive summary of the results

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TNO Work and Employment (formerly NIA TNO) is a service organization in the areas of innovation of work, organization and technology, and employment research.

- WHO Collaborating Centre in Occupational Health
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1. Final report on progress and achievements

1.1 Introduction

The aim of this project was to get a better insight in the prevalence of Repetitive Strain Injuries (RSI), in the key risk factors for a high prevalence of RSI within different industries in the Netherlands and Belgium, as well as successful policies in the prevention of workrelated musculoskeletal symptoms within SME's.
The data and information collected in this pilot has delivered useful examples of best and worst practices, successful and unsuccessful policies within SME's and has presented the Dutch and Belgian trade union confederations as well as their government with a unique and broad insight into the prevalence of RSI. This information can provide a solid base for future awareness programmes in the Netherlands and Belgium, and perhaps in other European countries as well.

In preparation for the broad inventory into RSI prevalence (task 3) and the case studies (task 4) literature was acquired and analysed (task 1) and the project methodology was discussed and developed in co-operation with the Dutch and Belgian trade union confederations the FNV and ACV (task 2). The results of this review of the literature and defining the concepts and methodology was also used in preparation of the general information brochure "RSI, de prijs van vooruitgang?". The results of the core of the project, task 3 and 4, were presented to representatives from the FNV and ACV, as well as occupational health professionals concerned with the prevention of RSI within their enterprises during a recently held conference in Eindhoven, The Netherlands (task 5). In the following the main tasks of the project and the achievements reached will be discussed in more detail. This report concludes with a short summary of the project results.

1.2 Description Task 3

Due to changes in legislation on occupational health and safety in 1990, aiming to promote preventive action in the workplace, a national Monitor on Stress and Physical Workload was developed in the Netherlands. The purpose of this Monitor was to monitor risks for and consequences of stress and physical load at work, preventive actions taken in companies to reduce these risks and organisational and environmental variables that facilitate preventive actions. This large database is used to identify risk groups and risk factors for work related neck and upper limb symptoms in The Netherlands, with the aim to get better insight in the prevalence of work related neck and upper limb disorders, in the key causes and risk factors, as well as in successful policies at small and medium-sized enterprises (SME's). Although this Monitor was developed for research in the Netherlands, the monitor has also been distributed in Belgium to get broader insight in the Belgian situation.
The research questions that have been answered in this part of the project are:

- which are the high risk occupations and high risk industries with regard to potential risk factors for work related neck and upper limb symptoms?
- what is the total prevalence of work related neck and upper limb symptoms and what are occupation specific and industry specific prevalences?
- do small and medium sized enterprises have higher prevalences of workrelated neck and upper limb symptoms than large enterprises?
- what is the variation between occupations and industries with regard to preventive measures for counteracting work related neck and upper limb symptoms?
- which risk factors for work related neck and upper limb symptoms can be identified?

The sampling procedure for the selection of companies and employees was representative of the national distribution of industrial sector, size of the company and region. When a company decided to participate, the employer and an employees' representative were personally interviewed with a structured interview. Secondly, a sample of employees was given a questionnaire provided the employer gave permission for this. The data collected through this Monitor cover more than 10.000 employees in the Netherlands and more than 1000 employees in Belgium.
The complete results of task 3 are presented in the following reports (enclosed):
Report nr: 9800293 'Work related neck and upper limb symptoms (RSI): high risk occupations and risk factors in the Dutch working population'
Report nr: 9900409 'Work related neck and upper limb symptoms (RSI): high risk occupations and risk factors in the Belgian working population'

1.3 Description Task 4

The SME's to be selected for the case studies in the Netherlands were contacted with the help of the FNV. Through the activities of the Dutch union confederacy SME's that could provide best/worst cases were contacted. In Belgium all participating SME's were provided through the Belgian trade union confederacy ACV. TNO Work & Employment also supplied and requested SME's previously known to have improved their companies' working conditions to participate in the case studies. All SME's were contacted and visited by researchers from TNO Work & Employment. The selected SME's were visited for an interview with the employer, a workplace analysis and for distribution of questionnaires among employees involved in high-risk jobs. The protocol for the visit was designed in co-operation with the FNV and ACV. The interview with the employers and the questionnaire that was handed out among the employees are presented in the appendices of report nr: 9900405 'Repeterend werk en RSI-preventie in 20 bedrijven: Bedrijfsrapportage' (enclosed).
A total of 20 companies were visited. A complete description of the jobanalysis, interview and results of the questionnaire for each of the 20 companies can be found in the above mentioned report. About half the companies had mostly VDU work and the other half of the companies were occupied with industrial work. 16 of the companies were located in the Netherlands and the other 4 in Belgium.

The various solutions for the prevention of RSI and risk factors promoting the development of complaints of neck and upper limbs are described in a separate summary report focusing on the practical solutions found in SME's: report nr: R9900403 'Aanpak van RSI in de praktijk: Succes- en faalfactoren belicht' (enclosed). This report offers a practical handbook that can be consulted by employers in most SME's in the Netherlands and Belgium.
The draft reports of the findings during our visits to the SME's have been sent to all participating SME's for comment. None of the companies have replied with comments to be processed in the report. A few of the SME's have replied with comments on the usefulness of the information collected during the visit. The companies have been given a practical translation of the information that was collected so their participation in this study could be useful in determining their future strategies to combat RSI. For the book that we plan to publish the various companies will remain anonymous.

1.4 Description Task 5

Approximately 50 representatives of various organisations, companies and trade unions were present during the conference on the results of this study. The programme of the conference (appendix 1) included presentations by the researchers, ample opportunity for the participants to take part in discussions and share problems and experiences regarding prevention of RSI with each other. The conference ended with provocative statements to be defended or opposed in a discussion. All participants received a summary of the research results and a press release that was also send to news agencies. Furthermore the participants were given the opportunity to order all reports.
In addition general information on RSI, titled 'RSI, de prijs voor vooruitgang?' meant to increase awareness among workers is in press and will be distributed on large scale by the FNV (text enclosed).
Finally, at this point we are preparing a book that will be published in September/October largely based on the results of this project, supplemented with results from other projects, so that a large group of Dutch and Belgian enterprises can be reached with this information. The European Commission will be properly referenced and you will receive the publication in due course.

2. Executive summary of the results

2.1 Introduction

Physical complaints of neck and upper limbs are an emerging area of occupational hazards due to monotonous repetitive work. Recent data on the prevalence of severe and less severe disorders of the neck and upper extremities are scarce. A review of the international literature shows that disorders of the neck, shoulder, arm and hand are associated with workrelated physical and psychosocial riskfactors. Aside from these effects on the well-being of the individual employee, musculoskeletal complaints and disorders also affect productivity, the quality of work and the competitiveness of small/medium sized enterprises. The aim of this project was to get a better insight in the prevalence of Repetitive Strain Injuries (RSI), in the key risk factors for a high prevalence of RSI within different industries in the Netherlands and Belgium, as well as successful policies in the prevention of workrelated musculoskeletal symptoms within SME's.
The project has two parts: an assessment of the prevalence, risk factors and high risk groups of workrelated neck and upper limb symptoms in Dutch and Belgian employees and an inventory and evaluation of health and safety policies regarding these problems in 20 selected companies in the Netherlands and Belgium.

2.2 Part 1 : assessment of prevalence, risk factors and high risk groups of RSI

In this study the prevalence of neck and upper extremity complaints were registered for more than 10.000 employees working in about 1000 companies in the Netherlands, and about 1100 employees from 100 companies in Belgium. In the questionnaire distributed among the employees questions were asked on the presence of risk factors for RSI, symptoms regarding these problems and whether these were considered workrelated. Also, questions were asked on general characteristics of the organisation, and on the company policy with regard to health and safety issues aimed at reduction of musculoskeletal problems. In the questionnaire work related neck and upper limb symptoms were defined as 'having had any pain or discomfort in neck, arm, elbow, wrist or hand, in the past 12 months'. The project is thus mainly focused on work related neck and upper limb symptoms rather than to work related neck and upper limb disorders.
An overall prevalence of 30% neck or upper limb symptoms was found in the Dutch working population in the past year. For the Belgian population an overall prevalence of 39% was found. In the Netherlands neck and shoulder complaints were reported by 19% of employees, wrist and hand complaints were reported by 10%, and elbow complaints were reported by 6% of employees. In Belgium 28% of the population reported neck complaints, 22% reported shoulder complaints, wrist and hand complaints are reported by 15% of employees and elbow complaints are reported by 8%. It is remarkable that almost two thirds of those reporting symptoms

reported two or more symptoms of neck or upper limbs. Although it is possible that employees with health problems have been more eager to respond than employees without problems, which may have overestimated the true prevalence, these data show that work related neck and upper limb symptoms (RSI) are very prevalent in the Dutch and Belgian working population and therefore merit attention.
When comparing the Dutch and the Belgian working population it becomes clear that both countries have the same 'high-risk-professions'. Tailors (47% nl, 66% be), bricklayers, carpenters , other construction workers (43% nl, 54% be), loaders, unloaders , packers (42% nl) and secretaries (45% be) have a high prevalence of neck and upper limb symptoms. In addition, women reported more complaints than men, also after the registered differences in risk factors.
Riskfactors that were related to symptoms (risk estimates around 1.5) are: 'working in the same postures/position for long periods of time', 'working with a bend or rotated neck', 'frequent bending and turning of the head', 'frequent bending and turning of the wrists', 'working with vibrating tools', 'high job demands' and 'lack of social support from superiors or colleagues'. A weaker relationship (risk estimate around 1.2) was found for repetitive motions with arms, hands or fingers, reaching with arms or hands, working while lifting the arm(s), using a lot of force on equipment and not being able to use enough skills.

2.3 Part 2: inventory and evaluation of health and safety policies in selected companies

A total of 20 companies in the Netherlands and in Belgium were asked to participate in this research project. Companies were selected if they had high risks for repetitive strain injuries and if they had already started or completed a prevention program to reduce the risks for work related neck and upper limb symptoms. The companies were visited, the manager was interviewed, the workplace and the employees observed and a self administered questionnaire was distributed. The interview with the manager addressed issues like the organisation of work, the actions that have been taken to reduce the risks of musculoskeletal disorders, and the factors that influence the successfulness (or failure) of their health and safety policy. Furthermore the workplace and worktasks were observed and analysed. The employees questionnaire focused on musculoskeletal complaints and the preventive actions taken by the companies according to the employees.
Several different preventive actions have already been taken to prevent or reduce complaints of neck and upper limbs. The effectiveness of the various policies influencing the prevalence of workrelated musculoskeletal disorders has never been proven. This is exactly the reason why it is important to learn from practical experience with successful preventive policies. To prevent severe and long-term disorders, complaints have to be heard and dealt with in an early stage. By creating an atmosphere within the company where it is acceptable to discuss work related physical complaints, it is possible to bring a halt to developing problems and start preventive actions in an early stage. It is even better if risk factors are pinpointed before actual complaints arise. This can be done during the compulsory "Risk In-

ventarisation and Evaluation" (compulsory for all companies in the Netherlands and Belgium) providing it is properly focused on musculoskeletal problems.
A few of the solutions that were found during the field study are:

- repetitive tasks are taken over by machines;
- improved layout of the workplace;
- new equipment or machines;
- new furniture;
- introduction of special products to reduce risk (such as wrist supports);
- improving the organisation of work by increasing decision authority, increasing variation in tasks and providing more frequent rest breaks;
- preventive training programmes.

According to the questioned employees, solutions to reduce risks of RSI have not been introduced in many companies over the past year. More than 40% of the employees in the Netherlands and Belgium wish their companies' health and safety policy regarding workrelated neck an upper limb disorders to improve. In general, employees would like to see more new equipment and machines, improved workplace layout and better furniture. The employees that have had experience with these kinds of solutions are very positive about it although they claim these solutions did not significantly decrease the physical work load of their jobs. It should also be noted that even though most companies did offer some kind of improvement in the working conditions, neck and upper limb related complaints were still often reported by the employees in the questionnaires. It is possible that employees are positive about the measures taken because it gives them the feeling that their problems are being dealt with, but that the applied solutions are still not sufficient to actually reduce the workrelated neck and upper limb symptoms.
Based on the results of this field study a successful health and safety policy to reduce work related neck and upper limb symptoms should at least include the following.

- an extensive knowledge of the company and the jobs at risk;
- employees input regarding the selection of adequate solutions and their implementation;
- proper instructions on the use of new equipment and furniture;
- a high level of communication between management and employees;
- a thorough evaluation of the implemented solutions.

Appendix 1: Programme for the symposium: RSI in België en Nederland"

Symposium RSI in België en Nederland

Klachten, risicofactoren en aanpak in de praktijk

Maandag 7 juni
13.00 – 17.00
Bestuursgebouw TU Eindhoven
Laplace, Eindhoven

Organisatie: TNO-Arbeid, ACV en FNV

Waarom dit symposium.

In de afgelopen jaren is veel onderzoek naar repeterende arbeid onder de noemer van RSI uitgevoerd. Met financiële steun van de Europese Commissie heeft TNO-Arbeid in samenwerking met de vakbonden FNV in Nederland en ACV in België onderzoek uitgevoerd om een beter zicht te krijgen op risicofactoren voor het ontstaan van arbeidsgerelateerde aandoeningen aan de nek en de bovenste ledematen. Op basis van meer dan 10.000 werknemersenquêtes is een gedetailleerder inzicht in risicofactoren gerelateerd aan sectoren en functies ontstaan. Daarnaast zijn twintig bedrijven in Nederland en België bezocht, zijn de taken met een repeterend karakter, de risicofactoren voor het ontstaan van RSI bij deze taak of taken, de genomen maatregelen en de daarmee opgedane (positieve en negatieve) ervaringen beschreven. Deze informatie is gebaseerd op interviews van werkgever en werknemers en een analyse van de taken ter plekke.

Doel symposium.

Voor het symposium wordt een beperkte groep personen uitgenodigd afkomstig uit de sfeer van onderzoek, dienstverlening (arbodiensten), vakbeweging en overheid.
Na een aantal korte presentaties over de resultaten van de diverse deelprojecten zal er ruim gelegenheid zijn hierop te reageren.
De organiserende projectpartners zien vervolgens graag een discussie ontstaan over de mogelijkheden de verkregen inzichten te vertalen naar concrete interventies, nieuwe beleidsinitiatieven en andere initiatieven waarin sociale partners, overheden en dienstverlenende instellingen een rol kunnen spelen. Doordat vertegenwoordigers uit Nederland en België aanwezig zijn, komen wellicht nieuwe inzichten tot stand.
In het programma is dan ook veel ruimte voor discussie ingeruimd.
Discussie die zal worden geprikkeld met behulp van een aantal stellingen die tijdens het symposium worden gepresenteerd.

Een samenvatting van de onderzoeksresultaten is beschikbaar voor de deelnemers en tevens krijgt u de gelegenheid het boek dat zal verschijnen over de resultaten met korting te bestellen.

Symposium RSI in België en Nederland

Klachten, risicofactoren en aanpak in de praktijk

Maandag 7 juni
13.00 – 17.00
Bestuursgebouw TU Eindhoven
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Organisatie: TNO-Arbeid, ACV en FNV

Programma

13.00 - 13.30	**Ontvangst**
13.30 – 14.15	**RSI in Nederland en België** Presentatie van de onderzoeksresultaten van het project over het voorkomen van RSI klachten en risicofactoren in Nederland en België, uitgesplitst naar verschillende branches.
14.15 – 14.30	**Pauze**
14.30 – 16.00	**Workshops** In de parallelle workshops worden de resultaten van de bedrijfsbezoeken gepresenteerd. Aan de hand van enkele cases wordt vervolgens ingegaan op de risico-factoren en de daarbij gehanteerde aanpak in de bedrijven, zowel inhoudelijk als organisatorisch. Hierna volgt een discussie over interventiemogelijkheden op bedrijfsniveau en activiteiten op sectorniveau die het ondernemingsniveau kunnen ondersteunen. • Workshop 1: RSI bij beeldschermarbeid • Workshop 2: RSI in de industrie en andere bedrijfstakken
16.00 – 16.45	**Plenaire discussie** In het laatste onderdeel bestaat de mogelijkheid om de aanpak van RSI op meso en nationaal niveau te belichten. Welke mogelijkheden zijn er op sectoraal niveau, welke landelijke initiatieven bestaan, of zijn gewenst. Welke rolverdeling tussen overheid en sociale partners is effectief, etc. Om de discussie te prikkelen zullen een aantal stellingen worden gebruikt. Een vergelijking van de Belgisch en Nederlandse ervaringen zal het debat zonder meer verlevendigen. Getracht wordt om een vertegenwoordiger van de Belgische en Nederlandse overheid de gelegenheid te beiden als eerste op de stellingen te reageren.
16.45 – 17.15	**Afsluiting met een drankje.**