International Journal of Industrial Ergonomics 48 (2015) 149–157

Contents lists available at ScienceDirect

International Journal of Industrial Ergonomics

journal homepage: www.elsevier.com/locate/ergon

Analysis of worker strategies: A comprehensive understanding for the prevention of work related musculoskeletal disorders

Marie-Eve Major [a, b, *], Nicole Vézina [b, c]

[a] Faculté des sciences de l'activité physique, Université de Sherbrooke, 2500 boul. de l'Université, Sherbrooke, Québec, J1K 2R1, Canada
[b] CINBIOSE, Université du Québec à Montréal, C.P. 8888, Succursale Centre-ville, Montréal, Québec, H3C 3P8, Canada
[c] Département de Kinanthropologie, Université du Québec à Montréal, Case postale 8888, Succursale Centre-ville, Montréal, H3C 3P8, Canada

ARTICLE INFO

Article history:
Received 28 July 2014
Received in revised form
23 January 2015
Accepted 4 May 2015
Available online 22 May 2015

Keywords:
Work related musculoskeletal disorders
Strategy
Work activity analysis
WMSDs prevention
Ergonomic research
Seafood processing industry

ABSTRACT

By documenting the strategies developed by food processing workers to manage their musculoskeletal pain and discomfort in order to remain on the job, the present article seeks to increase awareness of a different "way of approaching" WMSDs inspired by the ergonomic approach centred on work activity analysis. Based on a mixed methods approach, an ergonomic work activity study combined with a multiple case study was conducted. Sixteen female seafood-processing workers were followed up during two consecutive work seasons using a range of interviews as well as observations of work activity throughout the entire study. A large variety of musculoskeletal pain management strategies developed by those workers to remain on the job were identified. This identification and the process of categorizing the strategies led to the development of a framework for studying worker strategies. The mixed methods approach made it possible to better pinpoint and understand obstacles to the development of workplace strategies and then identify avenues for change to improve working conditions.

Relevance to industry: The framework constitutes a valuable contribution for the prevention of WMSDs by representing a methodological tool for documenting worker strategies. Very few tools of this kind are currently available for practitioners and researchers. In becoming aware of the existence of such coping strategies, companies can gain a better understanding of the difficulties workers have to cope with.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Today, it is widely recognized that there is a need for a multidimensional approach in order to understand work-related musculoskeletal disorders (WMSDs) as well as establishing guidelines to reduce them. At the same time, the establishment of corresponding prevention strategies remains a difficult task.

A major challenge – one the international community increasingly deems important – is establishing a shared vision of ergonomics that reflects the rich traditions that have influenced it (Wilson, 2000; Vézina, 2001; Daniellou, 2005, 2010; Buckle, 2010). Meeting this challenge depends on people's readiness to engage in constructive dialogue. Because the wealth of concepts and methods arise from different frames of reference, compromise is vital in order to ensure that the different approaches are mutually accessible and understandable (Daniellou, 2005).

By presenting "coping strategies" developed by manufacturing workers, the present article seeks to increase awareness of a different "way of approaching" WMSDs (Bourgeois et al., 2006). Here we present the results of a study that concentrated on the concept of "strategies", a concept which is at the core of a work activity-centred approach to ergonomics (Guérin et al., 2006; St-Vincent et al., 2011). Our study went further by incorporating a mixed methods approach (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2011) to evaluate its relevance while studying strategies.

The concept of "strategies" has been consistently discussed for many years in numerous French-language publications, namely in the French-speaking ergonomists' approach to work activity (Laville et al., 1972; Gaudart, 1996; Coutarel, 2004; Cloutier et al., 2005; etc.). However, very little on this subject has been published in English. Worker-developed strategies to better cope with an environment can be considered in relation to operating

* Corresponding author. Faculté des sciences de l'activité physique, Université de Sherbrooke, 2500 boul. de l'Université, Sherbrooke, Québec, J1K 2R1, Canada. Tel.: +1 819 821 8000x65937; fax: +1 819 821 7970.
E-mail addresses: marie-eve.major@usherbrooke.ca (M.-E. Major), vezina.nicole@uqam.ca (N. Vézina).

http://dx.doi.org/10.1016/j.ergon.2015.05.003
0169-8141/© 2015 Elsevier B.V. All rights reserved.

methods, know-how, ways of using workplace equipment, postures and body movements, communication, time management, reformulation or disregard of rules, or workstation changes, etc. The strategies identified in the present field study reflect how workers adjusted, adapted or regulated the way they performed their work in order to meet production requirements while protecting their health.

Strategies are defined as "behaviours, know-how or attitudes developed by the person involved to maintain a balance between themselves and their environment" (Major and Vézina, 2011; Major, 2011). Whether these strategies are individual (Toupin, 2005; González and Weill-Fassina, 2005; etc.) or collective in nature (Caroly, 2010; etc.), an understanding of worker-developed strategies facilitates an in-depth analysis of work situations and can constitute a basis for suggesting changes in the working environments studied (Bourgeois et al., 2006; Guérin et al., 2006; Major and Vézina, 2012). We start with the premise that each individual develops strategies that reflect his or her own characteristics (age, gender, height, experience, aspirations, state of health, symptoms, etc.) and what it is possible to do in their particular work context. Increasing their operational leeway (margin of manoeuvre) makes it possible for them to develop efficient strategies in their workplace. The operational leeway refers to the possibility of regulating one's work activity. If the operational leeway is sufficient, it allows one to develop regulation strategies and maintain one's health while achieving production objectives (Vézina, 2001, 2010). To prevent WMSDs, the ergonomist will try to enlarge this operational leeway in the workplace in order to facilitate the development of efficient strategies.

Our research focused on female workers in crab processing plants in two Canadian provinces (Newfoundland and Quebec) and we looked, in particular, at the strategies developed by those workers to stay at work in spite of the musculoskeletal pain they were experiencing. Earlier research from Grady and Kapsalis (2002) has shown that a number of issues arise from the seasonal nature of the work and the broader employment context, such as the absence of, or very limited, job opportunities in such remote areas. The hours spent on sick leave or on injury convalescence, which are not recognized for unemployment insurance purposes, may explain why female crab plant workers would choose to remain on the job in spite of health problems. They are thus forced to find ways to manage this situation themselves (Howse et al., 2006; MacDonald et al., 2008; Major and Vézina, 2011). When staying on the job is the only way they can qualify for eventual unemployment insurance, they are apparently prepared to forgo submitting claims to their respective workplace health and safety commissions and stay on the job, even when experiencing major pain and WMSDs.

Given this situation, the aim of this study was to document the strategies developed by female crab-plant workers to manage their musculoskeletal pain and discomfort in order to remain on the job. We were interested in documenting the different types of strategies ('what' and 'how') in order to construct a framework for studying workers' strategies and that could be used for the prevention of WMSDs. Furthermore, we wanted to explore 'why' workers rely on those types of strategies.

2. Methodology

2.1. Approach and research strategy

The study was conducted using a mixed methods approach (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2011). The methodology draws on an ergonomic study centred on work activity analysis (Daniellou, 2005; Guérin et al., 2006; St-Vincent et al., 2011), carried out in a field research context (Sieber, 1982; Burgess, 1986), and based upon a multiple case study research strategy (Yin, 2009). Such a strategy is useful for studying a contemporary phenomenon in its real-life context and is recognized as a comprehensive research strategy (Yin, 2009).

2.2. Participants

We carried out a multiple case study of 16 crab processing-plant workers whom we monitored for two consecutive years; eight from a plant in the province of Newfoundland and eight from a plant in the province of Quebec (Quebec North Shore). All the subjects were female since WMSDs seem to particularly affect more women in the fish and seafood-processing industry (Messing and Reveret, 1983; Olafsdottir and Rafnsson, 1998; Nordander et al., 1999; Quansah, 2005). Subjects had to be experiencing work-related pain episodes that could have led them to develop pain management strategies. Purposeful sampling was used to select information-rich cases to obtain an in-depth understanding of the aims (Patton, 1990). Key informants in each plant were first identified and then met with to suggest key participants (snowball sampling strategy). Sample size was determined upon feasibility criteria (Patton, 1990) and on data saturation (Mayer et al., 2000; Pope and Mays, 2006; Walker, 2012). Since data collection and analysis occurred concurrently, it was possible to verify if we were reaching the point at which no new information was generated.

The average age of the eight workers from the Quebec North Shore was 46 (+/− 7.2), with an average of 12 years seniority (+/− 3.6); the average age of the workers from Newfoundland was 47 (+/− 5.2), with an average of 23 years seniority (+/− 5.7).

In terms of musculoskeletal symptoms, all of the participants reported musculoskeletal symptoms (i.e., ache, discomfort, pain, numbness, loss of motion, swelling or stiffness) at, at least, one site of the lower extremities (hips, knees, ankles, feet). Of the 16 workers, 15 reported pain at, at least, one site of the upper extremities (shoulders, elbows, wrists, fingers) as well as for the back region (upper, middle and lower back). Pain was reported at some sites for the whole duration of the season, particularly for the shoulders (14/16) and with the highest level of pain. All participants reported that they had decided to remain at work despite experiencing pain. A complete description of the musculoskeletal symptoms and their variations is presented in a complementary paper as part of the doctoral thesis of Major (2011).

The subjects in the study worked at different workstations, enabling the researchers to take into account different work situations (sorting, packaging, etc.) and identify the broadest possible range of strategies to manage their musculoskeletal pain and discomfort. The number of workstations occupied in each plant was very similar, with a total of 23 in Newfoundland and an average of 2.9 workstations (+/− 1.3; max 5) per worker and 22 on the Quebec North Shore with an average of 2.8 workstations (+/− 1.9; max 6) per worker.

2.2.1. Plant characteristics

The plant in Newfoundland employed 300 production workers while the plant on the Quebec North Shore employed 130. The crab processing method used in each plant was similar, although in the Newfoundland plant, where equipment is more modern, there was a greater compartmentalisation of tasks.

2.2.2. Ethical considerations

The protocol was approved by the affiliated Research Ethics Committees of the Université du Québec à Montréal and Memorial University. The subjects received a letter presenting the project from the main researcher and were given the opportunity to ask questions. The subjects were assured that all data would remain

Download English Version:

https://daneshyari.com/en/article/1096002

Download Persian Version:

https://daneshyari.com/article/1096002

Daneshyari.com