Work 41 (2012) 394-396
DOI: 10.3233/WOR-2012-0188-394
IOS Press

Interaction between employees' physical load factors and early support at the workplace

Simo Kaleva, MSc*, Dr. Johanna Turja, Marketta Kivistö, MSc and Dr. Jorma Seitsamo
Finnish Institute of Occupational Health, Topeliuksenkatu 41 a A, 00250 Helsinki, Finland

Abstract. Physical workload is a continuous problem, even in modern workplaces. The purpose of the survey was to determine the effect of support on employees' physical load factors at workplaces. Training, guidance and support were the main focus areas of the early support intervention, which aimed to enable supervisors to find weak signals of impaired ergonomics.
The survey was carried out in the form of a controlled longitudinal study, and the material was gathered via a questionnaire in both 2008 and 2010 from two co-operative trade groups. The final sample was 301 intervention subjects and 235 control subjects, and the response rate was 45% in both groups. We applied factor analysis to reduce the number of items. The physical load factors' sum score consisted of six items. We used logistic regression in the statistical analysis.

Encouragement to improve processes at the workplace increased the probability of positive change (i.e. decrease) in physical load factors. The same applied to working pace, if individuals could control it themselves. In contrast, workload and the support of supervisors had a reversed impact on workers' physical load factors. Focusing on promoting workers' ergonomics is still important in workplaces when aiming to decrease physical load factors.

Keywords: ergonomics, weak signals, effects, intervention, follow-up study

Introduction

Physical workload is a continuous problem, even in modern workplaces. The range of physical workload in today's workplaces is wider than it used to be. The number of information workers has increased rapidly during the last two decades. Loading of e.g. the arms, neck and shoulders occurs in a different way and gives different signals and symptoms of strain than previously. Musculoskeletal symptoms that are related to physical workload often result in sick leave. These symptoms usually receive attention too late, when they are already making work difficult. Early support is therefore needed at workplaces in order to promote employees' health and work ability.

If the workload is too heavy or if workers are exposed to awkward postures or repetitive movements, early weak signals of symptoms of reduced work ability may appear. In a new early support method, weak signals reveal potential reasons for lowered work ability. The role of supervisors is important in this method. Weak signals and their interpretation provide supervisors with a new perspective in supporting workers' work ability at an early stage.

The workforce needs tailored actions to help maintain their work ability at a needs-based level. These actions should focus on promoting workers' ergonomics – on achieving the necessary changes in working conditions. The purpose of this survey was to determine the effect of individual support on employees' physical load factors at workplaces.

Material and methods

The survey was carried out in the form of a controlled longitudinal study, and the material was gathered twice via a questionnaire. The initial questionnaire for the study sample was mailed in 2008 to co-operative trade groups, and the final questionnaire was sent in 2010. The final sample consisted of 301 intervention subjects and 235 control subjects. The response rate of the intervention group was 45.1% and of the control group 45.4%.

The main focus areas of the early support intervention were training, guidance and support for supervisors. Supervisors were taught to find and use weak signals to support workers' health and work ability by changing ergonomics when workers'

* Correspondent author Simo Kaleva. E-mail simo.kaleva@ttl.fi

musculoskeletal symptoms are still weak. This is a new way in which to look at work ability at workplace level. The understanding of weak signals and utilizing them at different workplaces is challenging. Weak signals vary from one workplace to another. In the study, supervisors were trained to bring weak signals up for discussion in intervention groups. The intervention consisted of homework, role playing, group work, and discussions between supervisors and trainers.

We used factor analysis to reduce the number of items. The physical load factors' sum score consisted of six items; carrying, lifting and holding; heavy physical work; awkward postures; standing at work; repetitive movements at work; and working with one's hands above shoulder level. The scale in these items was 1=good and 3=poor/problematic. We calculated the change in sum score of physical load factors by reducing the value of physical load in 2008 from the 2010 value. The difference was classified into two groups. The cut-off point was 0, where negative change was good, and positive values meant that the physical load increased. Cronbach's alpha coefficient was used to assess internal consistency reliability among the set of survey items. The Cronbach alpha of the scales was 0.87 in 2008 and 0.88 in 2010. We used logistic regression in the statistical analysis.

Results and conclusions

At baseline, nearly half of the respondents (49.4%) in the intervention group and in the control group (48.1%) reported that they experienced a great deal of physical load factors in their work. After a two-year follow-up they reported much fewer physical load factors (22.3% vs. 22.4%).

Encouragement to improve processes at the workplace increased the probability of positive change (i.e. decrease) in physical load factors (OR=1.6, 95% CL=1.0–2.4). This also applied to working pace (OR=1.3, 95% CL=1.0–1.8), if individuals could control it themselves. In contrast, workload (OR=0.6, 95% CL=0.4–0.8) and the support of supervisors (OR=0.7, 95% CL=0.6–1.0) had a reversed impact on workers' physical load factors (Table 1).

Employee control over work versatility, variability, and work methods had a smaller effect on physical load factors. Supervisors' support of work ability, continuous positive changes at the workplace and occupational health service's (OHS) support of work ability had no statistically significant effect on employees' physical load factors. There was also no group effect on physical load factors.

Encouragement to improve processes at the workplace, together with employee control over working conditions decreased physical load factors. It seems that if employees can influence ergonomics such as work methods and versatility and variability at work, physical load factors decrease. This is also the case if employees are able to influence their work pace. When ergonomics improve and physical load factors decrease, the health and work-ability of the workforce may improve over time. This requires effective co-operation between all participants at the workplace.

The contradictory results concerning supervisors' support and encouragement at work is difficult to explain. One reason may be supervisors' busy pace of work. They work in the same tasks as their employees. They may also not have enough knowledge of ergonomics and physical load factors, and thus not know that they should improve their work environment and also encourage employees to do so. The contents of supervisors' work may need long-term development in order to be able to support the functioning of work communities and the well-being of both themselves and their employees.

In the early support method, the aim is to notice weak signals, and for supervisors and the work community to notice factors such as an excessively heavy workload, awkward postures or repetitive movements at the workplace. The work community may have noticed these weak signals and employees may have encouraged each other to make improvements in order to lower physical workload. Focusing on promoting workers' ergonomics at workplaces is still important in the aim to decrease physical load factors.

Table 1
Odds ratios (OR) of early support at the workplace on employees' physical load factors.

Effect	OR	95% Wald Confidence Limits
Group	1.0	0.6–1.7
Encouragement to improve processes	1.6	1.0–2.4
Control over work pace	1.3	1.0–1.8
Control over workload	0.6	0.4–0.8
Supervisors' support and encouragement at work	0.7	0.6–1.0
Control over work versatility and variability	1.3	0.9–1.8
Control over work methods	1.2	0.9–1.6
Continuous positive changes at the workplace	0.9	0.6–1.4
OHS support of work ability	1.0	0.5–1.9
Supervisors' support of work ability	1.2	0.6–2.5