

Worker Participation in Job/Task Analysis, Hazard Identification and Development of Good Working Environment

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ABSTRACT

This paper describes VIDAR – a computer based program that facilitates the identification and analysis of physical and psychosocially demanding situations and how it was used in the processes of improving the work environment in a Danish company.

INTRODUCTION

Analysing tasks and jobs with the aim of reducing physical loads, repetition or awkward postures has been an ongoing exercise after the industrial revolution. Technology is developed and implemented without much thought about the consequences for the people who work within systems. It has created jobs for ergonomists, occupational hygienists, therapists, nurses etc, who in co-operation with engineers have developed ergonomics solutions e.g. handling equipment, organisation of workstations, job rotations. Many of the solutions have not been implemented successfully but the most successful are those with high commitment of different stakeholders in the company, that use multiple interventions and that use methods that actively involve the workers at risk (Forsman, Stridqvist, & Persson, 2006; Westergaard & Winkel, 1997). Several tools have been developed to analyse and improve the working conditions. A few of these require or facilitate worker involvement. This paper discusses the use of VIDAR; a computer based program containing an assessment tool for analysing complex tasks from a video recording of jobs and tasks, based on experience from the use of VIDAR in a private production company in Denmark.

VIDAR: A PARTICIPATORY TASK ANALYSIS TOOL

The VIDAR program facilitates the identification and analysis of both physical and psychosocially demanding situations, which then can be used in the processes of improving the work environment in a company. The programme was developed with the purpose of creating a tool that could be used by the workers or with involvement of the workers. First a person performing the tasks in focus is video recorded, then the video is shown on a computer and analysed using the VIDAR program. The people analysing the video can stop the video when any of them finds the situation demanding; either physically or mentally. The VIDAR assessment tool is then be filled in on the computer. VIDAR contains two assessment tools: one for physical and one for psychosocial factors. The tool for assessing the physical factors contains a body map (Kuorinka et al., 1987) to identify where the workers experience the physical stress and Borg's CR-10 scale (Borg, 1982) to assess the magnitude of the stress (see figure 1).

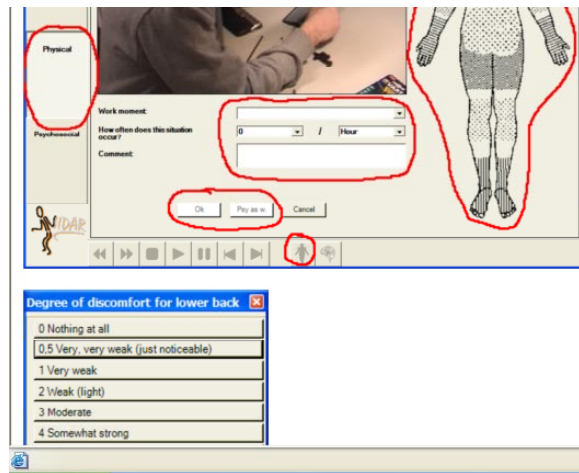
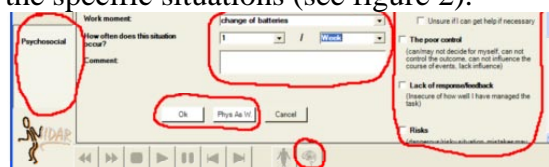


Figure 1 Tool for assessing physical demands

The tool for assessing the psychosocial factors contains specific questions aiming to classify the nature of the specific situations (see figure 2).



Open VIDAR file

You are able to open a previously saved VIDAR file. To do this, push either **Open** in

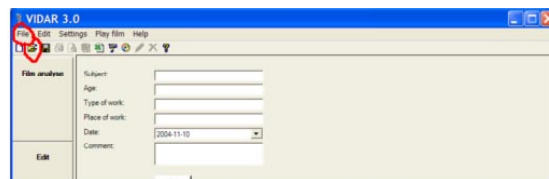


Figure 2 Tool for assessing psychosocial demands

The categories are based on action theory (Frese & Zapf, 1994) and control-demand theory (Karasek & Theorell, 1990). Comments and a description of the situation can also be added. The sheets are saved and the video replay is continued. When all the demanding situations are entered a report containing all the demanding situations containing pictures and the entered demands and comments can be printed and used in discussions about change.

EXPERIENCE USING VIDAR IN A DANISH PRODUCTION COMPANY

Background for and aim of the VIDAR project

The Company (120 employees) produced optical fibres. The production process was highly automated but assembly of modules was manual and transport of products was carried out manually or with the use of handling equipment. The company's workplace assessment had identified that heavy and awkward lifting, use of bad working postures, repeated movements, were a source to complaints. The Safety Committee decided in 2004 to conduct a project on working postures using VIDAR. The aims were: 1) to ensure that it is possible for the workers to use their body correctly to prevent strain and injury, and 2) to explore if video analysis based on the workers own analyses using VIDAR could reveal problems and led to the development of solutions that could be implemented and fully adopted by the workers (Olsen, 2005).

Method used in the VIDAR project

Six different tasks were video recorded. The video of each task was analysed in group meetings of workers who performed that specific task and facilitated by an external OHS consultant and the internal Health and Safety (HS) Coordinator. At the meetings, the workers were given a short introduction to the VIDAR program and the process and an introduction to physical and psychosocial loads/demands. The video was reviewed and stopped when one of the participants said stop and the situations analysed using the tools in the VIDAR program. It was necessary for the HS coordinator to help the group start pointing out demanding situations by asking them about different situations. It was helpful for the process that the HS Coordinator typed the answers onto the assessment tool. At the beginning of the analysis the workers only pointed out physically demanding situations but after a while they started to address psychosocially demanding situations too and the video from time to time had to be wound back to these situations. After the meetings a report with all the demanding situations was printed and handed over to the department's Safety Group which prioritised the problems for which they were going to find solutions and bring forward in the organisation for implementation. The HS Coordinator subsequently met with the Safety Group to ensure that it then made an action plan and that it also actually tried to follow the plan.

Results

The analysis revealed that different workers used different work methods and facilitated exchange of experience. Even though the tasks included in the VIDAR analysis were chosen because they were identified as physically demanding or performed at poorly organised workstations, the analyses revealed many psychosocially demanding situations and conditions as well as physical ones (see Table 1). More than half of the psychosocial loads and around half of the physical loads were unformulated or unknown before the VIDAR analyses.

Table 1 Tasks recorded, participants in the analyses, situations analysed, problems identified and solutions

Task (Video time, min)	Workers attending analysis	Selected situations		Unknown problem	Known problem	Further investigation	Solution
		Phy	Men				
		y	.				

1. Doping (20)	3 of 6	4	2	2	4	x	
2. Twist (24)	1 of 1	4	3	4	3		Org.
3. Raman (25)	2 of 6	2	3	3	2	x	
4. Tec-splice (60)	3 of 4	16	6	16	6	x	Equipm. Org.
5. Rewind (30)	2 of 6	3	3	3	3	x	Tec.
6. Packaging (20)	2 of 3	5	1	2	4	x	

Only two solutions were identified and implemented. The solution related to task 4 in table 1 improved working posture for all doing the task. The solution related to task 3 (a tool apron) was used by some workers and seemed to reduce their pain and discomfort but was not used by workers who had not experienced discomfort and pain. Both these solutions were integrated into other ongoing change projects. The HS coordinator had to identify this opportunity for the manager and safety representative even though they themselves participated in the change project. Three years later the company still uses VIDAR to analyse tasks that are considered to be hazardous/demanding.

It is concluded that VIDAR can facilitate the analysis of tasks and make it easier to prioritise resources to improve the work environment. The organisation must be willing to implement change and to incorporate the solutions in other projects. There has to be commitment from the workers, the safety organisation, managers and technical support staff/departments.

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