

Abstract. Currently, many service organizations encounter challenges that set new requirements for management: individual employees face changes to worksites, job tasks, and work communities while there is a simultaneous decrease in recruitment and increase in the average age of employees. Both physical and psychosocial burdens caused by these factors can lower the work ability and productivity of the employees. The aim of this study was to find solutions for the management of these load factors in workplaces where stakeholders from different subdivisions inside the municipal organization work together. The concept of a shared workplace, which is common in industry, was contemplated to find successful ways to manage work ability and productivity. The case organization in this study was a municipal business unit providing meal and cleaning services to target workplaces, namely two kindergartens and four schools. The objective of the study was to find practical solutions for observed challenges related to work environment and practices at the target workplaces. Study materials were comprised of Occupational Safety and Health documents and statistics, interviews, and observations of work activities. Root cause analysis, by applying the 5*Why-methodology, was carried out to find ultimate causes for the work ability challenges. Practical solutions for the challenges were sought at participatory development sessions. Based on the results, a generalizable model for the management of load factors at shared workplaces in the public sector was proposed.

Keywords: Participatory development, Shared workplace, Work ability.

1 Introduction

1.1 Background

Public organizations face various challenges in the present economic situation in Europe. One main challenge is related to work life itself. Working life is in a continuous process of change and jobs and work tasks are constantly examined and re-structured for optimization purposes. While the average age of employees is increasing, there is a simultaneous decrease in recruitment due to budgetary reasons. The common goal of the municipal processes being able to provide a sense of well-being at different levels may become unclear. These factors cause both physical and psychosocial burdens that can lower an employee's work ability and productivity (Reiman et al. 2017).

In this article, we focus on a participatory development process in which both macroergonomic and microergonomic development needs (Hendrick & Kleiner 2001) were identified inside a municipal organization. More specifically, our study targeted workplaces where stakeholders from different subdivisions inside the municipal organization work together. In industry, such workplaces can be identified as shared workplaces (Väyrynen et al. 2012). This study was carried out as part of the "Work ability management at a shared workplace" project which sought solutions for the management of harmful load factors at work. An important point in the project was to examine if the concept of a shared workplace could be useful for finding means to successfully manage work ability and productivity at municipal workplaces.

1.2 General Concepts

Finnish legislation defines the shared workplace as a workplace where one employer exercises main authority and other employees of several employers or self-employed individuals work simultaneously or successively so that their work can affect other workers' safety and health. In this case, the employers and self-employed individuals are required by mutual cooperation to make sure that their actions do not endanger the health and safety of any employee at the workplace (Occupational Safety and Health Act 738/2002).

During recent decades many organizations have increasingly outsourced many operations, especially various support operations, in order to focus on their core business (Nenonen 2012). This has increased the occurrence of both shared workplaces and situations that are in many ways similar to shared workplaces.

According to many studies, allowing employees to participate in the development of their own work increases both well-being and productivity at work (van Eerd et al. 2010). The concept of participatory design and development covers all design and development activities where the users of the systems or products are systematically involved in and actively provide input into the design and development process. For example, common design tools are different kinds of models and prototypes, analysis methods, check-up lists and various discussion, ideation and group work techniques (Langford & McDonagh 2003). Participatory design aims to extract and utilize the tacit knowledge possessed by the users or employees (Spinuzzi 2005).

1.3 Objectives

The case organization in this study was a municipal business unit that provided meal and cleaning services. The case organization and its' work ability management processes supplemented with economic analyses have been reported earlier by Reiman et al. (2017). In their research, further studies for workplace level were issued as a topic for future research. In this study, we respond to this research challenge by providing an in-depth study of two kindergartens and four schools to whom this business unit provided its services. In our study, the subject workplaces were considered shared workplaces where different actors interacted to provide services aimed at educating children and youngsters. Our special interest was to find microergonomic Occupational Safety and Health (OSH) development needs and to provide a macroergonomic development process in which solutions for these challenges are provided.

A prerequisite for our study was to include all stakeholder groups working at the target workplaces in the development process. Even though the business unit providing the meal and cleaning services was our initial observation unit, we expanded our study to cover all relevant actors at these workplaces. This included the employees, management, and OSH actors from all sectors. By engaging these stakeholder groups in collaborative work, management practices were brought forward to further spread best practices, healthier work environments, and improved work communities. The principles of continuous improvement were also present throughout the participatory process. Furthermore, macroergonomics were emphasized as cooperation processes and organizational practices inside the shared workplaces and inside the municipal organization were assessed. A wider goal of the study was to formulate a generalizable model for the management of harmful load factors at shared workplaces.

The research questions of the study were the following:

1. What kind of physical and psychosocial load factors occur at shared workplaces of a municipal organization from the viewpoint of meal and cleaning service employees?
2. What kind of practical solutions can be found to reduce the load factors?
3. What kind of a management model could be used to manage work ability at such shared workplaces?

2 Methods

The materials for this study were gathered from six workplaces (two kindergartens and four schools). The kindergartens and schools that acted as target workplaces were considered shared workplaces although the researchers identified that these workplaces did not necessarily fulfill all the requirements for a shared workplace according to legislation since all the employees at these workplaces worked under one employer (municipality). Figure 1 presents the actors in one of the schools. The students and their guardians are in the center surrounded by various actors, including the employees of the school and the meal and cleaning services organization. Some of the actors work permanently at the school, while some carry out work tasks on the school premises irregularly or are important stakeholders in relation to the operations carried out at the school but primarily work elsewhere. The actors in the outer ring formed the group of stakeholders that were engaged in the participatory development process depicted in the following discussion.

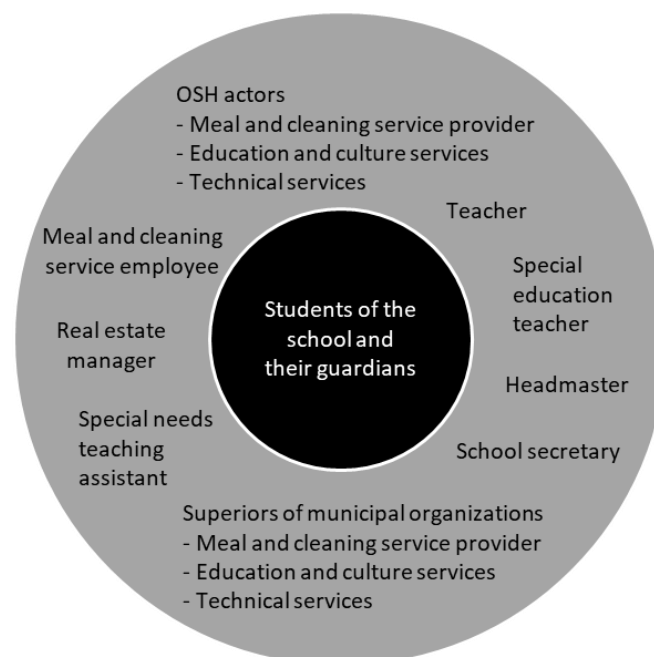


Fig. 1. The actors in one of the schools that acted as a target workplace.

The kindergartens and schools acting as target workplaces were chosen so that they would form a representative sample of workplaces where the meal and cleaning service employees of the municipal case organization work. The target worksites could be characterized by the following properties (the acronyms for the target workplaces are used in the Results section):

- K1: Kindergarten operating in an old building.
- K2: Kindergarten operating in a new building.
- S1: School with a small number of students operating in a new building.
- S2: School with a large number of students operating in a new building together with many other operations, such as library, kindergarten, and youth work.
- S3: School with a large number of students operating in an old listed building.

- S4: School with a large number of students operating in an old building that was currently under renovation.

The participatory development process that was carried out in the study is pre-sented in Figure 2. After choosing the target workplaces and identifying the relevant stakeholder groups in each case, the development process was carried out in each target workplace over a nine-month period.

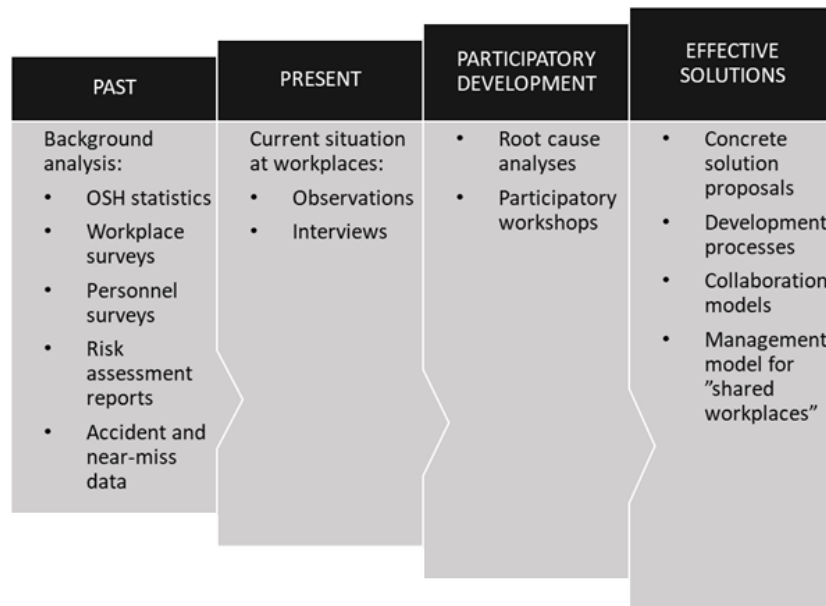


Fig. 2. The development process carried out in the case organizations.

In the background (PAST) and current status (PRESENT) analysis stages, multiple data sources were utilized. First, the past situation at the target workplaces was analyzed through workplace specific OSH statistics, accident and near-miss data, risk assessment reports, personnel surveys, and workplace survey reports. Second, the present work environments and practices were observed at the target workplaces. The observations were performed by following the cleaning and meal service personnel during their daily work routines for approximately 0.5 workdays per workplace. This was carried out by the researchers, in most cases in cooperation with the OSH representative of the case organization. Personnel were also directly interviewed during the observations. Based on the analyses described above, researchers made tentative proposals for the most significant development targets for every workplace. The development targets were categorized by their origins into physical and psychosocial categories. Based on the past and present data, visualized descriptions of the problems were formed. These descriptions contained both written and visual information about the observed individual challenges, as well as their causes and possible solutions.

In the participatory development stage, the researchers followed the premises of Lean-oriented 5*Why-methodology to identify the root causes for the existing development targets (Ohno 1988). Basically, the question "Why?" was expressed several times for each identified development challenge. Participatory development sessions (workshops) comprised of personnel from all groups at the target workplaces, as well as other actors relevant to the operations at the workplace, were organized to identify development solutions for the identified challenges. The goal of the workshops was to engage all relevant stakeholder groups for each workplace in the development of the work. At each workplace, representatives of the employee groups, employers, and OSH personnel took part in the workshops and, at some workplaces,

representatives of stakeholders functioning in the same building, such as library staff, youth workers, or caretakers, were present. Participatory development sessions resulted in practical ideas and sharing of best practices.

By working out concrete and practical solutions to the observed challenges, utilizing participatory design and the cooperation of the various stakeholders the development process aimed at designing better operational models and work practices, as well as creating safer and healthier work environments and communities. In addition, the idea of continuous improvement and engaging different stakeholders in the development of shared workplaces was illustrated in the development process. As a result, to contribute to organizational management processes, a simplified model for identifying and managing OSH problems at shared workplaces in the public sector was created for future use.

3 Results

The past and present phases carried out at the target workplaces provided material for the root cause analysis and following workshop phases. As an example, a visualization of the root cause analysis for the musculoskeletal disorders of the meal service employee working at a kindergarten is presented in Figure 3. Similar analyses were carried out on the cleaning service employees, and also with problems related to psychosocial load factors. The participatory development sessions focused on finding solutions, especially to these root causes, that had been identified by the 5*Why –process.

The development challenges identified at target workplaces were divided into 17 separate themes. The number of practical challenges related to each theme in each kindergarten (K1–K2) and school (S1–S4), as well as the total number of solutions suggested in the participatory workshops, are listed in Table 1. The solutions suggested in the workshops included both new practices and good practices already in use at some workplaces that could be spread to other worksites by the different stakeholders taking part in the workshops. In addition to development challenges listed in Table 1, wider subjects for development that were often common for several worksites were recognized during the process. These included challenges in identifying and engaging all stakeholder groups in the initial foundational planning process of premises, promoting communality between the actors of the shared workplace, the demand and supply of knowledge related to ergonomics among the employees, and recognizing the mutual interest of the community in addition to the interest of individual actors or organizations.

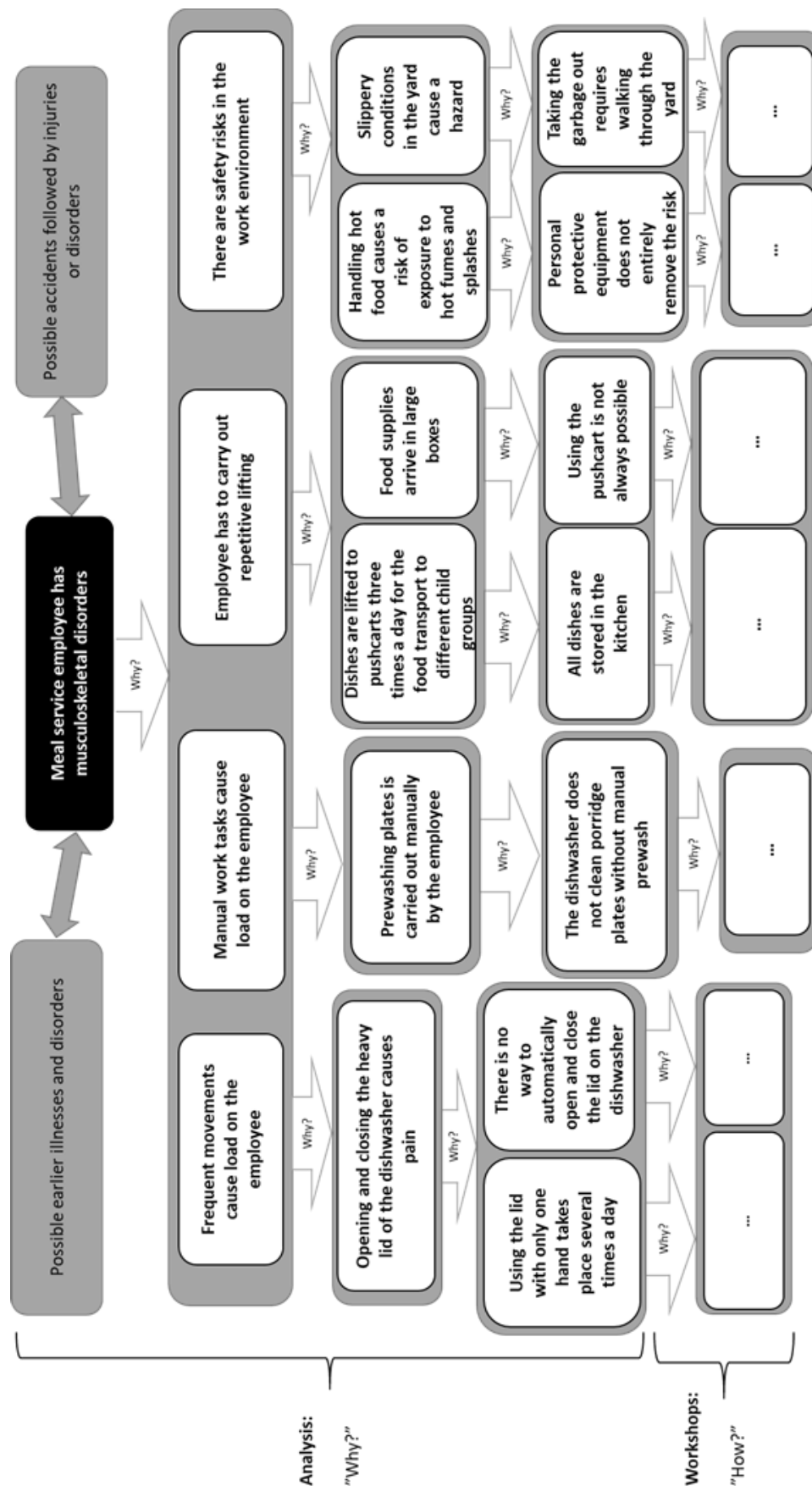


Fig. 3. As an example, the results of the root cause analysis conducted on musculoskeletal disorders caused by physical load factors in the work of the meal service employee working at a kindergarten.

Table 1. Number of development challenges identified at each worksite, along with new solutions and already identified good practices suggested in the workshops.

Development challenge	K1	K2	S1	S2	S3	S4	Solutions (N)
Premises and materials	-	-	2	2	6	1	5
Furnishings	3	-	1	2	4	2	8
Lifting	3	1	1	2	4	1	11
Work postures	2	1	3	2	2	2	7
Tools	2	1	-	2	4	1	4
Machinery	1	-	2	3	1	1	4
Tidiness of premises	-	-	-	2	2	3	2
Waste management	-	-	1	2	1	2	4
Ventilation	-	-	2	1	1	1	1
Hearing protection	-	-	1	1	1	1	3
Danger of slipping/tripping	1	1	1	2	4	1	6
Accident risk	2	-	-	4	4	2	8
Work clothing	-	-	2	1	1	2	1
Cooperation and flow of information	1	-	1	-	1	-	11
Interruptions and changes	1	1	2	1	4	2	-
Adequacy of time	1	1	3	3	3	1	5
Simultaneous actions	1	-	1	4	-	2	6

4 Discussion and Conclusions

This study aimed at identifying physical and psychosocial load factors in the work of meal and cleaning service employees working at kindergartens and schools, as well as finding practical solutions to observed challenges in their work. The identified load factors were divided into 17 development challenge themes and solutions were found to almost all of these challenges in workshops that engaged all relevant stakeholder groups of these shared workplaces.

Furthermore, a generalizable model for the management of harmful load factors at shared workplaces in the municipal sector was formulated during the study. A model based on the analysis of background material related to the current OSH situation in the organization, observations carried out at the workplace, and participatory development workshops that engaged all relevant stakeholder groups was developed and determined to be functional. In addition to solutions to individual development challenges, the process also provided information on the management of larger subjects for development, which can be generalized to other similar municipal workplaces. The model is presented in Figure 4.

In this research, the concept of a shared workplace was applied to a situation in the municipal sector, where a separate municipal business unit provided services to municipal organizations. This situation does not entirely fulfill the legislative definition of a shared workplace, since the municipality acts as an employer for both the employees of the business unit providing meal and cleaning services, as well as the schools and kindergartens. However, the situation is similar to that at many actual shared workplaces – the employees come from various organizational backgrounds to carry out their own tasks in a work environment where employees of other organizations simultaneously carry out their own work, in such a manner that their actions have an effect on the health and safety of other employees. Due to the

outsourcing of operations to other businesses or separate business units, these kinds of situations are common in today's work life. This kind of organizational complexity sets new challenges at many branches of industry, including the municipal sector, and not only at branches where shared workplaces have traditionally been widespread, such as construction or manufacturing industries.

This study provides an example how OSH management in the complex organizational environment of the public sector could benefit from the concept of a shared workplace, along with engaging all relevant stakeholder groups in OSH development. The development process presented in this study can be applied to various situations where there are several stakeholder groups or actors working at the same workplace.

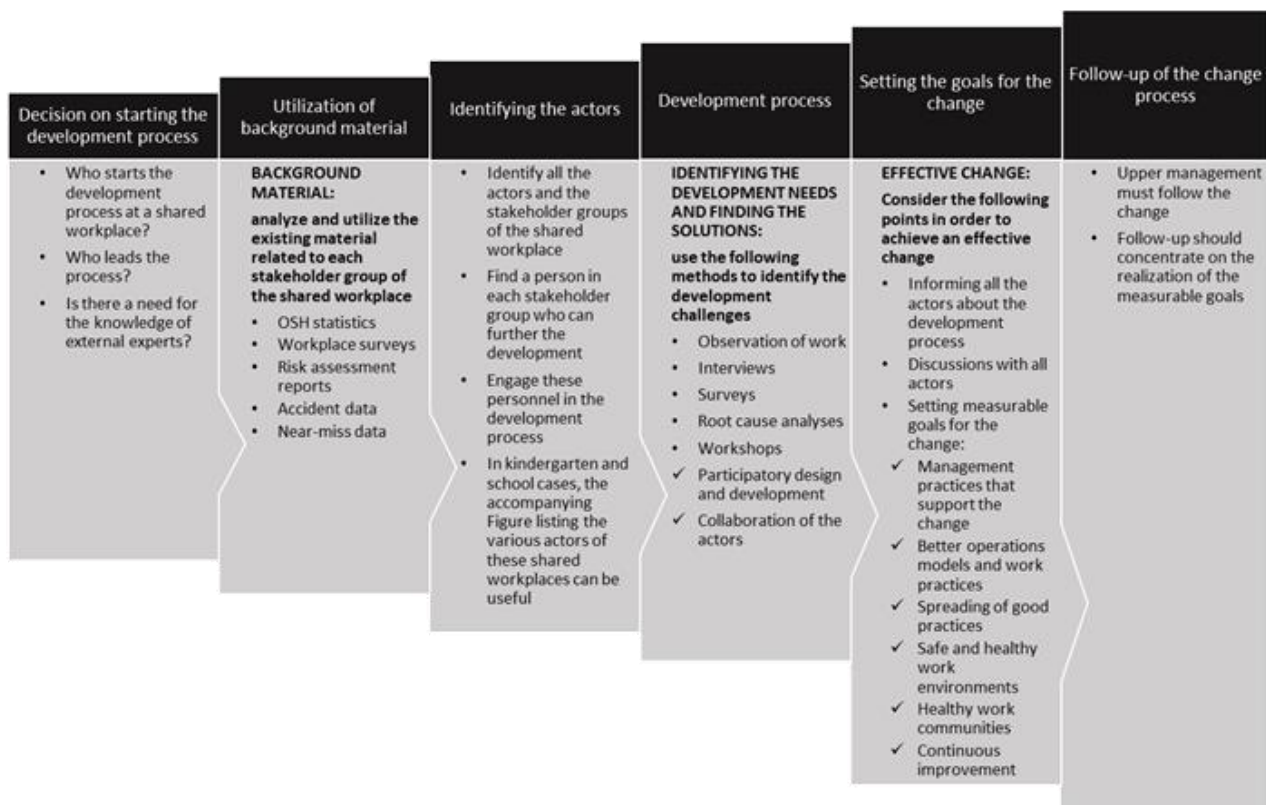


Fig. 4. The model for the management of harmful load factors at shared workplaces in the municipal sector.

Acknowledgements

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