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Assessment of the development and implementation of tools in contract cleaning

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ABSTRACT

This paper illustrates and discusses problems with the implementation and use of ergonomic tools and techniques in the process of cleaning. Cleaning is an occupation with a high risk of developing work-related disorders. One high-strain task where recommended tools and techniques are difficult to apply is cleaning staircases. This study evaluated the muscular activity of cleaners while mopping staircases using two different mop handles and found that an easily adjustable mop handle can decrease a cleaner's physical load. The results also show that the implementation and contextualization of the mop are of great importance for how a mop is used. A more holistic approach is needed to improve the benefits of good tools and techniques in cleaning work. More research is needed on how workplace organization can be improved to support the implementation of strategies to increase the health of professional cleaners.

1. Introduction

1.1. The aim of the study

During the last decade, new tools and better work techniques have entered the cleaning industry. Nevertheless, cleaners are the workers with the highest risk of developing work-related disorders and also have a high risk of leaving their job before their intended retirement (AFA, 2009; Hopsu et al., 2003; SWEA, 2003). The aim of this paper is twofold: (1) to evaluate muscular activities when mopping staircases using two different mop handles and (2) to identify and discuss difficulties with the implementation of new tools and techniques in cleaning work. The use and implementation of tools and techniques has been given little attention not only by earlier research but also within the cleaning industry. Without good implementation strategies, the benefits produced by these new tools could be lost.

1.2. Earlier research in the cleaning work area

Cleaning work is a worldwide profession with millions of employees (Louhevaara et al., 1998). Cleaning is an important job to ensure many people's safety, wellbeing and health. Dust contains particles that can contribute to allergic reactions and damage respiratory organs, and unclean dirty areas can increase the risk of accidents at work places. A clean environment also contributes to higher productivity, quality of work and job satisfaction. Keeping the indoor environment dirt-free also protects it from degradation, which can save money (Hopsu et al., 1994; Kumar and Kumar 2008; Louhevaara, 1997; Wolkoff et al., 1998). Previous research on cleaning work has found that cleaners are exposed to many risks when performing their work. Factors such as repetitive movements, working in static and awkward postures and minimal muscular rest are all risk factors for developing the work-related disorders identified as frequently occurring with cleaning work (Bell et al., 2006; Bernard, 1997; Buckle and Devereux, 2002; Hägg, 2000; Hägg et al., 2008b; Johansson and Ljunggren, 1989; Nordander et al., 2000; Unge et al., 2007; Weigall et al., 2005). Other factors, such as time pressure, inconvenient working hours, limited opportunities to influence the work, low appreciation and little respect from other people are also common problems that cleaners face (Aickin, 1998; Aurell, 2001; Messing et al., 1998; Weigall et al., 2005; Woods and Buckle, 2006). In a report from the Swedish Work Environment Authority, SWEA (2003), which presents statistics about the professions with the highest level of monotonous work, including statistics regarding cleaners, 29.3% of the cleaners reported physical illness and pain due to their work. Similar statistics can be found in a report from 2009 by AFA insurance.[1] The AFA's report shows that out of all of the professions in Sweden, cleaners have the highest risk of developing chronic illnesses that necessitate employer compensation. Cleaners exhibit more than twice as many cases of chronic illnesses per year and per

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[1] AFA Insurance is an organization owned by Sweden's labor market parties. The organization insures employees within the private sector, municipalities and county councils. AFA also finances research which aims to improve health in working life.

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1000 employees than the average figures for all occupations (AFA, 2009). In addition, the report from SWEA (2003) shows that cleaners experience the lowest amount of work environment improvements to reduce work-related pain and disorders.

In the cleaning occupation, floor mopping is a high risk task that requires repetitive movements and a static muscular load. Mopping is often performed with little time for muscular rest, which increases the risks (Hägg et al., 2008a; Søgaard et al., 1996). The most commonly reported symptoms among cleaners are pain in the back, neck, arms and hands, which are areas where the muscles used to mop are located (Aickin, 1998; Johansson and Ljunggren, 1989; Louhevaara et al., 1998; Søgaard et al., 1996). Lately, new equipment and better working techniques has made it possible to reduce the muscular load when cleaning floors, but many of these improvements cannot be applied when, for example, the design of the facility makes the new devices and techniques impossible to adopt. Earlier studies of cleaning tools and working techniques state that the use of poorly designed cleaning equipment is a contributing factor to awkward postures, i.e., a bent, twisted back and elevated shoulders. A poor cleaning tool, therefore, increases the risk of musculoskeletal disorders among professional cleaners, and the use of more ergonomic tools is recommended (Bell et al., 2006; Weigall et al., 2006; Woods and Buckle, 2005). However, staircase cleaning is not mentioned in almost any study of tools and cleaning techniques. In an early article, Lindqvist (1982) wrote about the technological developments in floor cleaning and pointed out that staircase cleaning was an area where modern technological development has been minimal. According to Lindqvist (1982), level floor cleaning has been improved by new methods using machines and modern improved tools, but staircase cleaners still use the same methods as were used 100 years ago, often scrubbing while kneeling and handling heavy buckets of water. Since the 1980s, dry methods, which decrease the muscular load of the cleaners, have appeared in cleaning work. Microfiber cloth, which requires no water, reduces the weight of the mop and the friction between the floor and the mop. Dry methods can be applied when floors are light to moderately dirty (Hopsu et al., 2000; Hägg et al., 2008a). Aurell (2001) describes the dry methods as a revolution for the cleaning industry, as they not only reduce muscular load but also provide a better result. These dry methods have also become more common in staircase cleaning. However, because staircases are often in frequent use by people coming in from the outdoors, they accumulate more stains and are covered with tougher dirt than many other indoor environments. Staircase cleaning, therefore, often requires damp or wet methods, which increase friction and, therefore, the muscular load. Modern machines have also decreased the load of level floor cleaning but cannot be used to clean staircases. Additionally, the recommended technique for mopping level floors, in which the cleaner walks straight forward pushing the mop in front (Hagner and Hagberg, 1989; Hägg et al., 2008a), cannot be adopted here. Instead, a side-to-side method must be implemented to reach and clean each step, thereby increasing the load on the upper extremities, especially when the staircase is wide. The technique that is recommended and is often used when cleaning staircases is to walk from the top of the staircase backwards while mopping the step 1–2 levels above. Walking backwards allows the cleaner to work in an upright position and without flexing the neck. The hands and arms should never be raised above shoulder level and, therefore, the length of the mop handle is important (Antonsson et al., 2006; Hägg et al., 2008a; Woods and Buckle, 2005).

In a study by Antonsson et al. (2006) of cleaners who suffer from work-related disorders, staircase cleaning is identified as one of the highest risk tasks (Antonsson et al., 2006). The study is one of the few qualitative studies of cleaners' working environments and uses interviews to investigate the causes of work-related disorders among cleaners. The study found that it is not unusual for cleaners to have staircase cleaning as their only task or to perform it full-time. In such cases, these cleaners often manage stairwells in, for example, apartment houses in which water access is limited and heavy buckets of water need to be carried between the stairwells, as well as up and down the stairs, if there is no elevator. Inside office buildings or schools, this necessity is less of a problem because a cleaning supply room can be accessible within the building where an ordinary washing machine can be placed. In this case, the mop can be taken directly from the machine and be used while moderately damp. This approach makes buckets of extra water unnecessary and, if extra water is needed, the access to water is closer, and buckets can be easily transported on a cart when the cleaners do not need to go outside to reach the next staircase.

The work environment for cleaners is in need of scientific improvements, and much can be done to decrease the physical load for cleaners and reduce their health hazards (Hägg et al., 2008a) in their environment accordingly. Although relatively little research has been done on cleaning work, several studies have focused on the importance of ergonomic tools and techniques. However, successfully implementing these tools and techniques for a sustained workplace improvement is often forgotten. There is a gap in knowledge about this implementation, and a holistic perspective is needed to improve cleaning work. Organizational and interior layouts can be overlooked when cleaning companies decide in which techniques, tools and machines to invest. The quality of the tool is irrelevant if it is not possible to use it because of interior design or other circumstances. During the last five years, research regarding cleaning work has sharply declined, and scientific papers in the area have become difficult to find. However, Swedish newspapers and trade magazines write every month about cleaners' poor working environments and highlight the problems cleaners face in their everyday work, such as stress, low social status and ergonomic risk factors. These highlighted problems show that much must still be done in the area, and the cleaners must not be forgotten.

1.3. Background

This paper describes one subproject of a three-year action program that was a collaboration between Luleå University of Technology (LTU), the Swedish Environmental Research Institute (IVL) and the Center for Musculoskeletal Research in Sweden. The program was finished in 2008 and attempted to identify the causes of pain and work-related disorders among professional cleaners and to find solutions to decrease these problems (Antonsson et al., 2006, 2008; Antonsson and Schmidt, 2007; Hägg et al., 2008a, 2008b; Kumar 2006, Kumar et al., 2008a, 2008b).

2. Methods

2.1. Participants

Thirteen professional cleaners in Sweden participated in the study. The average age of the cleaners was 48 years, and the average job experience was 15 years with a range of 2–36 years (the standard deviation was 10 years). Cleaners who wanted to participate and felt that they had the time were asked to sign up for the experiment. Of these volunteers, the cleaning managers selected individuals such that the final participants represented a wide range of ages, years of experience and types of experiences. The cleaners participating in this study were all familiar with staircase cleaning because it was a part of their everyday job, but none of them had staircase cleaning as their only work task. All of the