

Behavioural change phases of different stakeholders involved in the implementation process of ergonomics measures in bricklaying

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Abstract

The objective of this qualitative study was to assess whether a hypothesised sequential order of behavioural change phases would be fulfilled in different groups of stakeholders involved at the start of a process to implement ergonomics measures in bricklaying teams. The measures include trestles, bricklaying scaffolds, mast climbing work platforms, and cranes. The behavioural change phases were: (1) being aware of measures, (2) understanding measures, (3) wanting measures, (4) intention to buy or hire measures, (5) ability to use measures, (6) using measures (experience), and (7) continuing to use measures. Structured interviews were conducted to examine the change phases in two groups of stakeholders (employers/work planners, $n = 11$, and foremen/bricklayers, $n = 9$, from nine companies) thought to be relevant in the decision to adopt and use the ergonomics measures. The relationship between fulfilled and unfulfilled change phases by each stakeholder (group) and actual use of each ergonomic measure requires further study, so as to improve the selection of suitable implementation strategies. The interaction between fulfilled and unfulfilled change phases for different stakeholder groups and actual use of measures warrants further study, so as to improve the selection of suitable implementation strategies.

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1. Introduction

Many ergonomics measures have been recommended in order to reduce the physical work demands on bricklayers and bricklayers' assistants (Luttmann et al., 1991; Vink et al., 2002; Luijsterburg et al., 2003). Mechanising the transport of bricks and mortar and adjusting bricklaying working height are two types of ergonomics measures that have been shown to be effective in reducing the physical work demands and

lower back discomfort in bricklayers and bricklayers' assistants throughout the working day (van der Molen et al., 2003a, b). Implementing measures that reduce the physical work demands in teams of Dutch bricklayers is necessary because of the high prevalence of (sustained) musculoskeletal symptoms in these two jobs (van der Molen et al., 2004) and the high disability rates (Arbouw/EIB, 2001). Also, in other countries (e.g. the UK) actions have been recommended that encourage the bricklaying industry to make greater use of existing effective measures to reduce the problems of manual handling (Reid et al., 2001). However, knowledge about effective strategies to implement these measures is scarce. Identifying the barriers to implementation in relevant stakeholder groups (e.g. employers, work planners, foremen and bricklayers) is necessary in order

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to select or develop strategies that overcome these barriers.

In general, little is known about the barriers to the implementation of ergonomics measures (Haslam, 2002; Kuijer et al., 2002; de Jong et al., 2003). The identification of these barriers among stakeholders (e.g. employers, managers, supervisors, workers) is considered to be a requirement for the implementation of ergonomics measures. Linking interventions to known barriers may increase the use of proposed ergonomics measures (Grol and Jones, 2000; Jensen and Kofoed, 2002).

Changing the behaviour of different stakeholders is a major challenge when it comes to increasing the use of ergonomics measures at work sites. Several behavioural change phases are thought to be passed through before desired behaviour occurs in relevant stakeholder groups (Rogers, 1995; Prochaska and Velicer, 1997). The change towards actual implementation is recognised as the major change in the whole process. When the existing theories and models, with respect to implementation research, are taken into account (Rogers, 1995; Prochaska and Velicer, 1997; Grol and Jones, 2000), there are seven consecutive behavioural change phases that are relevant to achieving the adoption of ergonomics measures in the construction industry. These phases have been adapted (after Grol and Wensing, 2001; NIGZ, 2001) and modified for the construction sector (van der Molen et al., *in press*). With respect to the implementation process for measures, the seven phases for stakeholders are as follows:

- Phase 1: being aware of health risks and the effect of proposed ergonomics measures,
- Phase 2: understanding the proposed ergonomics measures,
- Phase 3: wanting to provide bricklaying teams with ergonomics measures,
- Phase 4: intention to buy or hire the proposed ergonomics measures,
- Phase 5: ability to use the proposed ergonomics measures,
- Phase 6: using the ergonomics measures (experience), and
- Phase 7: continuing to use the ergonomics measures.

In each of these phases, an obstacle may arise that causes a stakeholder not to proceed to the next step in the change process towards adopting an ergonomics measure. Moreover, little is known about perceived individual and environmental barriers to the implementation of ergonomics measures in the category of 'late adopters' (Rogers, 1995). It has been suggested that many implementation projects focus on the innovators or early adopters for modelling purposes (Bandura 1986; Bartholomew et al., 2001, p. 98) or increasing the



Fig. 1. Trestle.

extent of intervention sustainability (Grol and Jones, 2000), leading to an over-estimated appraisal of the degree of compliance when it comes to the proposed intervention measure in other groups such as the 'late majority' (Rogers, 1995).

The objective of this study was to assess whether the hypothesised sequential order of the first five behavioural change phases would be followed in two groups of stakeholders, working within 'late adopter companies', before any strategies were initiated to increase the use of four ergonomics measures in bricklaying teams. Employers/work planners and a group of foremen/bricklayers were studied. Both stakeholder groups were considered to be relevant with respect to the adoption and use of the ergonomics measures in teams of bricklayers.

The ergonomics measures were trestles (see Fig. 1), bricklaying scaffolds (see Fig. 2), mast climbing work platforms (see Fig. 3), and cranes (see Fig. 4). Trestles are simple and cheap aids for optimising the height at which bricks and mortar can be picked up. Bricklaying scaffolds (manually adjustable with limited possibilities for adjusting the working height) and mast climbing working platforms (electrically adjustable to any bricklaying height) are more invasive and expensive measures aimed at optimising the working height when laying bricks in a wall and for optimising the height for picking up bricks and mortar.

The installation of bricklaying scaffolds and mast climbing working platforms is performed by skilled, mostly external, personnel. The bricklaying teams themselves can adjust the bricklaying scaffolds (e.g. replacing consoles) or operate the work platform. Cranes, with special applications for the transport of

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