Applied Ergonomics 51 (2015) 172–179

Contents lists available at ScienceDirect

Applied Ergonomics

journal homepage: www.elsevier.com/locate/apergo

Work demands and health consequences of organizational and technological measures introduced to enhance the quality of home care services – A subgroup analysis

Gunn Robstad Andersen*, Synne Bendal, Rolf H. Westgaard

Norwegian University of Science and Technology, Department of Industrial Economics and Technology Management, Alfred Getz veg 3, SB1, 12.etg, N-7491 Trondheim, Norway

ARTICLE INFO

Article history:
Received 3 July 2014
Accepted 28 April 2015
Available online 27 May 2015

Keywords:
Rationalization
Musculoskeletal health
Work environment

ABSTRACT

This study of home care workers in a Norwegian municipality aimed to examine the effect of two measures involving organizational (job checklists) and technological (personal digital assistants) job aids on perceived work demands and musculoskeletal health. Questionnaire data was collected in 2009 (n = 138, response rate 76.2%) and 2011 (n = 80, response rate 54%). Forty-six home care workers responded at both waves. Respondents were assigned into 'high', 'moderate' and 'low' strain groups based on their responses to open and closed survey questions regarding impact of the two measures. One-way ANOVA with post-hoc t-tests and regression analyses investigated group differences and examined development in variables. Perceived work demands and health effects over the two-year study period were unchanged overall, yet significant differences between subgroups were highlighted. Work demands and shoulder-neck pain remained high for high-strain workers, but were reduced for low and moderate strain workers. Management should be aware of diversity in worker responses to rationalizations and give priority to supplementary, targeted measures to counteract adverse effects.

1. Introduction

Private and public enterprises are continually striving for higher productivity; in particular, public enterprises attempt to transform rule-based, bureaucratic organizations to organizations efficiently delivering quality services to satisfied users. Municipal home care services (HCSs) is a good example of this trend. In Norway, as in other countries, there is a move towards shifting patients away from institutionalized care to care delivered at less specialized units or (preferably) patients' own home. Accordingly, the work duties of home care workers (HCWs) become increasingly complex, requiring an upgrade of individual nursing skills, as many HCWs were recruited at times when work activities could be less demanding. In parallel HCSs are frequently reorganized to ensure quality and efficiency in care to patients, and cost savings to the municipality. Although many studies report on work intensification of HCWs and musculoskeletal health problems in particular (Brulin et al., 1998, 2000; Cheung et al., 2006; Cloutier et al., 2008; Dellve et al., 2003; Fjell et al., 2007; Ono et al., 1995; Zeytinoğlu et al., 2001), few offer a detailed account of rationalization processes and their consequences for work environment.

The present study is based on the HCS of a large municipality in Norway. HCWs in this municipality have been the subject of an ongoing study by our research group. High sick leave has been the norm since the early 2000s, and the municipality introduced a concerted action plan to reduce this sick leave, following inspection and receiving orders from the Norwegian Labor Inspectorate in 2003 (Andersen and Westgaard, 2013). The orders had a particular focus on job demands generating excessive time pressure. A survey of HCWs in 2009 showed that mentally demanding working conditions, more so than physical work demands, were a source of musculoskeletal pain predominantly centered at the shoulder-neck region and that such pain was mediated by perceived general tension (Andersen and Westgaard, 2014). Physical work demands had an additional, direct link to low back pain. The overall effect of interventions to improve working conditions and reduce sick leave was negligible, due to parallel measures (e.g., merging home care units, changes to unit management) introduced to rationalize the HCS (Andersen and Westgaard, 2013). One cause of low impact of

* Corresponding author. Tel.: +47 73596816.
E-mail addresses: Gunn.Robstad.Andersen@iot.ntnu.no (G.R. Andersen), Synne.Bendal@iot.ntnu.no (S. Bendal), Rolf.Westgaard@iot.ntnu.no (R.H. Westgaard).

http://dx.doi.org/10.1016/j.apergo.2015.04.020
0003-6870/

the work environment interventions was large variation in priorities and beliefs within the organization, from practicing HCWs to municipal administrators, which hampered communication across organizational levels and served as a barrier to effective change management (Andersen and Westgaard, Submitted for publication). The result is consistent with production system rationalizations in general, including organizational change: it is difficult to avoid predominant negative effects of such measures on work environment and worker health, unless management pays attention to such secondary effects (Westgaard and Winkel, 2011).

HCWs of the same municipality were from 2009 to 2011 exposed to further measures, primarily motivated to enhance the quality of patient care, but considered by decision-makers to make jobs more fulfilling, standardized and efficient by expanding on job duties and providing organizational (job checklists) and technological (personal digital assistants, PDAs) job aids. The measures involve elements that could be perceived strenuous, such as changes to work procedures and acquiring new skills; however, workers may appreciate the quality-enhancing aspects. The study aims to examine changes in perceived work demands of HCWs from 2009 to 2011, comparing those who have struggled with the changeover process with those who are coping with the new work practices. It is hypothesized that HCWs of the first group are distinguished by higher perceived work demands. A further aim, based on HCWs represented in both 2009 and 2011 surveys, is to examine whether perceived work demands or perceived general tension in 2009 are predictive of musculoskeletal pain in 2011. Such insight is potentially important to establish a best way of minimizing strain when introducing new work procedures.

2. Methods and material

2.1. Participants

At study start in 2009, 6 of 11 home care units in the municipality signed up for participation. In the follow-up survey in 2011, one unit was omitted due to low response rate, resulting in five participating units. HCWs with employment fraction $\geq$50% were invited to fill in a questionnaire on the two occasions. At wave 1 in 2009, 138 HCWs responded to the survey (response rate 76.2%; (Andersen and Westgaard, 2014)). However, 20 HCWs from the unit omitted in the follow-up survey were excluded from the wave 1 survey in the present analysis to enable a more correct comparison of the two waves, leaving 118 respondents (90% female, 78% with professional health care education as either registered nurse or enrolled nurse). At wave 2 in 2011, 80 HCWs responded (response rate 54%; 90% female, 78% with professional health care education). Forty-six respondents filled in the questionnaire at both occasions. Thirty-four respondents, who participated in 2011 but not in 2009, included 23 HCWs who were employed in 2009 but did not respond at the time, 8 HCWs had been employed between 1 and 2 years, and 3 HCWs employed less than 1 year.

2.2. Setting and case description

In the present HCS, the municipality constitutes the superior 'administrative' authority responsible for ensuring overall good quality of services. Being the decision-making body, the commissioning of organizational changes and quality-enhancing measures resides at the municipal, administrative level. Table 1 includes a description of the new work program (i.e. organizational measure involving job checklists) and the technological device introduced to the HCS, and shows anticipated positive effects and potential negative impact, as described by the decision-makers. Improved quality of care and efficiency were stated objectives for both measures. Supplementary measures implemented at changeover to the two new procedures were offered to all employees to ensure positive effects and reduce negative impact. These included a two-day training course, close follow-up by unit staff to ensure compliance, and assistance and additional individual training if individuals indicated such needs. Specifically for the new work program, these activities were embedded in a separate project focusing on competence and quality improvement, to ensure successful implementation. We were not in a position to observe these activities, which took place over a limited period and at different times at each unit. The new work procedures were well established at time of the wave 2 questionnaire.

2.3. Procedure

Initial conversations were carried out to gain insight in aspects of the HCS relevant for the composition of questionnaires, such as the organization of work duties, organization-specific work demands and significant changes and events. Prior to the data collection, one of the researchers participated on staff meetings at each unit to present the study and give practical information about participation.

At wave 1, questionnaires in paper format were put in an envelope together with a letter of information and an informed consent form, and placed in each employee's personal shelf at work. Filled-in questionnaire and informed consent form were to be placed in a sealed mail box in the staff room within two weeks. Two reminders were sent by letter to increase participation. Data collection was carried out between March 26 and May 4 2009, and was finally closed on June 29 2009. At wave 2, questionnaires and informed consent forms were placed in individual envelopes and sent to the units where the unit leaders handed them out to the HCWs. The HCWs individually returned the filled-in questionnaire and informed consent form to one of the researchers by mail. The data collection was carried out between May 31 2011 and December 8 2011, and was finally closed on February 22 2012. In both waves the HCWs were remunerated with NOK 200 (=24€) for participating. The study was approved by the municipal executive, the Regional Committees for Medical and Health Research Ethics (REC) (no. 4.2009.19) and Norwegian Social Science Data Services (NSD) (no. 21036).

2.4. Questionnaires

The distributed questionnaire of 2009 comprised altogether 129 items; the questionnaire of 2011 was a short-version consisting of 52 items. The present study is based on a selection of items measured at both occasions and new questions concerning changes to the work situation succeeding the previous wave. Items measured twice to enable comparisons included VAS scales quantifying occupational exposure in terms of perceived physical, mental, social and emotional work demands, and VAS scales quantifying perceived general tension and pain in the shoulder-neck and low back regions. Respondents were asked to assess work demands in terms of putative precursors to health symptoms, by including the phrase "… demands at work have resulted in tiredness, stress or tension in daily life the past six months". Respondents were asked to place a mark wherever appropriate on 10 cm lines with end points 0 (not at all) and 10 (to a large extent). Organization-specific examples of each demand were placed in brackets. *Physical demands* was exemplified as heavy lifting, unpleasant postures, physical layout of work place, high work pace, lack of necessary equipment and car driving. *Mental demands* was exemplified as fear of making mistakes, task overload and frustrations regarding equipment and facilities. *Social demands* was