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Evaluation and development of an ergonomic complement to the Value Stream Mapping tool

a NOVO multicenter Study plan

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Society
Efficiency

Patient
Quality

NOVO

Employee
Work environment

**3rd NOVO Symposium
Sustainable Nordic Health Care Systems**

December 9 – 10, 2009

**National Research Centre for the Working Environment (NRCWE)
Copenhagen, Denmark**

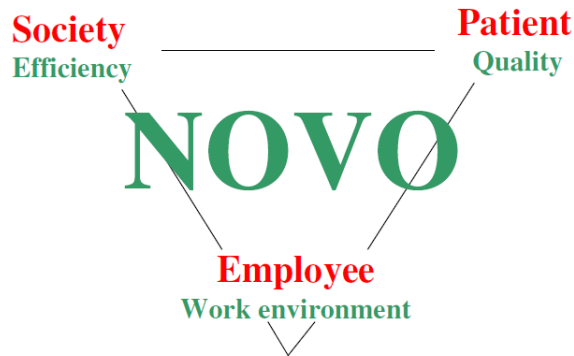
ABSTRACT BOOK
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Preface

Since year 2007 the Nordic Council of Ministers has granted the establishment and development of a Nordic Network for scientists, “NOVO-nätverket” (NOdisk FoUnätverk inom Vård och Omsorg). The main motivation for this initiative is the limited, if any, positive long-term impact of much work environment research if productivity and quality issues are not considered simultaneously. Due to this, the Network has introduced the NOVO triangle (our Logo) aiming at joint consideration of these three factors:



The network promotes R&D initiatives within the NOVO triangle by establishing meeting places for researchers and practitioners as well as organising activities for dissemination of knowledge to practitioners. The vision of the NOVO network is a “Nordic Model for Sustainable Systems” in the health care sector.

One of the meeting places for the researchers is the NOVO Symposium organised once a year. The 1st and 2nd NOVO Symposia took place in Gothenburg (2007) and Helsinki (2008). This year, the 3rd Symposium is hosted by the Danish National Research Centre for the Working Environment in Copenhagen. Our main focus is on efficient and health-promoting management – employee interaction, previously identified by the network as a key research issue on the road towards sustainable production systems in the health care sector. According to this, the first day of the Symposium is initiated by Gunnar Ahlborg presenting a key note entitled “Developing efficient and health-promoting management – employee interaction in hospitals”.

Rationalisation, particularly in lean production, is another topic identified by the NOVO network as crucial for obtaining sustainable production systems in the health care sector. At present, numerous Nordic health care workplaces undergo comprehensive rationalizations inspired by rationalisation fads in industry. Thus, we have asked Rolf Westgaard to give an overview of this issue when initiating the second day of the Symposium. His presentation is entitled “Occupational musculoskeletal and mental health: significance of rationalisation and opportunities to create sustainable production systems in health care – a systematic review”.

A total of 28 abstracts have been submitted to the Symposium. All have been scrutinised by two referees to ensure quality and relevance. A major part of the included abstracts relate to one or both main issues touched upon in the key note presentations. We estimate that the present Symposium has managed to attract a significant part of the ongoing, and indeed expanding, amount of Nordic research within this field.

A main task for the NOVO network the last year has been to develop two Nordic multicenter applications for later submission to national R&D councils. The aim is to convert our vision of a “Nordic Model for sustainable systems” into examples of Nordic co-operation in practice. Thus, Lotta Dellve presents a plan for Nordic research co-operation on “Management - employee interaction in hospital: a NOVO multicenter study plan”. Kasper Edwards presents the other plan entitled “Evaluation and development of an ergonomic complement to the Value Stream Mapping tool – a NOVO multicenter Study plan”.



Gender issues are important to consider in studies of health care organisations. At the present conference, no abstract has gender aspects as their main point. Therefore, we welcome scientific discussions regarding gender aspects during the conference. At the present Symposium, 50% of the presenters and 58% of the participants are females.

We want to thank Bodil Holst, Pia Gøtterup and Pia Dukholm from the Danish National Research Centre for the Working Environment for their professional assistance in the preparation of the symposium. The Nordic Council of Ministers is acknowledged for their financial support.

Jørgen Winkel
Co-ordinator of the NOVO network
until Dec. 31, 2009
NRCWE, Denmark and
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Programme



Wednesday 9.12.2009

08:30 09:00 Reception, coffee/tea

09:00-09:30 Opening

Kjeld Møller Pedersen, Chairman of the NRCWE board
 Palle Ørbæk, Director General of the NRCWE,
 Jørgen Winkel, co-ordinator of the NOVO network

09:30-10:30 Keynote Lecture

Developing efficient and health-promoting management – employee interaction in hospitals
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10:30-11:00 Coffee/tea

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18:00- ??: Symposium dinner



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09:00-10:00 Keynote Lecture

Occupational musculoskeletal and mental health: significance of rationalization and opportunities to create sustainable production systems in health care – a systematic review

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10:00-11:00 Coffee/tea

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Rationalization in health care

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A tool for considering job content in the development of production flow by value stream mapping at hospitals

Caroline Jarebrant 42

Evaluation and development of an ergonomic complement to the Value Stream Mapping tool – a NOVO multicenter Study plan

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12.30-13.30 Lunch

13:30-15:00 Session 6

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15:00-15:30 Coffee/tea

15:30-16:00 Summing up and next NOVO Symposium. Plenum discussion.

Jörgen Winkel, Sweden/Denmark
Lotta Dellve, Sweden
Kari Anne Holte, Norway

16.00 Closure of the symposium





Abstracts





Wednesday 9.12.2009

Keynote Lecture:

**Developing efficient and health-promoting management – employee interaction
in hospitals**

Gunnar Ahlborg Jr
Institute of Stress Medicine, Region Västra Götaland, and Sahlgrenska Academy, University of Gothenburg,
Sweden



Developing efficient and health-promoting management – employee interaction in hospitals.

Ahlborg Jr G.

Institute of Stress Medicine, Region Västra Götaland and Occupational and Environmental Medicine, Sahlgrenska Academy at the University of Gothenburg, Sweden

Background

Public health care is increasingly challenged with demands from citizens and stakeholders for more accessible, efficient and good quality care. At the same time, countries like ours have to deal with e.g. aging populations, large groups of refugees with other cultural background and war experiences, and the increasing competition due to globalisation. These challenges put a lot of pressure on the health care systems, calling for new ways of organizing and providing health care services. Several trends can be seen including centralisation/mergers, privatisation, technology dependence and process orientation (e.g. lean production). Demands on health care professionals to increase their efforts to “work smarter, not faster” in order to produce more health care of sufficient quality for the patients but without increasing costs tend to increase stress, illness and sickness absence if they are not given the right prerequisites for engaging in improvement work. However, the complexity of health care makes it difficult to manage. Hospitals are by tradition hierarchical both with regard to management structure and inter-professional relations. This often makes power relations diffuse and sometimes contraproductive when it comes to organisational development. In 2001, Glouberman and Mintzberg presented the model of “the four worlds”, most obvious in hospitals (1). They named these worlds “community” (trustees), “control” (managers), “cure” (physicians) and “care” (nurses) and claimed that the problem was that they represented different sets of activities, ways of organising and unreconciled mindsets which were disconnected. Bridging the cleavages between these worlds by integrating them through coordination and collaboration was proposed as one solution in order to achieve fundamental change.

This calls for new strategies and methods if we want to develop efficient and health-promoting management – employee interaction in hospital organisations. We need to mobilise the full engagement and creativity of all professional groups in order to be successful. There is a demand for leadership that can interact with multi-professional teams to create positive spirals of engagement and creativity (2). In Western Sweden, for the past five years, we have increased our efforts in that direction by establishing a partnership between academia and practice that will facilitate the growth of knowledge and understanding of how to resolve these complex issues.

Researcher – practitioner partnership

The partnership relation between our multidisciplinary research group, now including researchers from the University of Gothenburg, The University of Skövde and the Institute of Stress Medicine, and the public health care provider Region Västra Götaland (VGR) was first established in 2004. This partnership was based on the VGR document Personalvision 2010, which was the result of a previous communication process involving managers, union representatives and various professional groups within the organisation. The document describes a desired future situation regarding e.g. leadership, employeeship, work environment and health in this large organisation with about 50,000 employees, including some 1,800 managers on various levels. The question was, could a more long-term mutual engagement in research provide the practitioners with knowledge that would increase the likelihood of achieving the goals specified in the visionary document.

First explorative stage

Our strategy was first to explore the situation as experienced by the middle managers and simultaneously to initiate a longitudinal study of psychosocial work environment, stress and health in a sample of VGR-



employees. At this stage, the aspects of organisational efficiency and quality of care were not explicitly addressed. The results of this first wave of projects showed that 1) stress-related mental health problems were prevalent among the health care workers and seemed related to psychosocial factors at work (3), 2) first and second line managers handled their subordinates' stress by acting as a "shock absorber" and their own stress by either identifying with or distancing themselves from the leader role (4), and 3) the managers experienced an increasing administrative burden, ethical dilemmas and need for better organisational support (5).

One step further

Based on this knowledge, we entered a second wave of studies focusing on leadership support, workplace communication and inter-professional cooperation. We identified contextual conditions of importance for organisational support, i.e. compound identities, legitimacy-building processes (6) and handling of different logics as either integration or segmentation (7). Also the development of a self-report instrument designed for assessing managers' stress, coping strategies and resources was launched. This was based on the previous qualitative information, and the intention was that it should be sufficiently sensitive to changes following intervention. In these studies, interviews were accompanied by direct observations including "shadowing" the leaders. One investigation explored how ward managers valued and handled dialogue in relation to their subordinates as well as to their own superiors. They regarded dialogue as an important part of their communication, but the dialogic content was only obvious in one of the four different dimensions of communicative actions that emerged from the data (8). Further interviews with managers confirmed the problems in communicating upwards in the managerial system about problems in the workplace and about their own stress (9).

A qualitative study of the multi-professional cooperation and learning as well as the relation between manager and co-workers in three psychiatric units identified problems in all these aspects (10, 11). Cooperation was more directed towards protecting the unit from the surrounding environment than towards development of quality and efficiency of the care. Also, the leaders seemed to avoid addressing matters that could potentially create conflicts in the group. A strategy that may conserve the prevailing situation rather than promote development.

Moving to intervention

An intervention study addressed one of the dilemmas most often expressed by the interviewed managers, namely how to manage their time use when dealing with their strategic, relation oriented and administrative duties in an optimal way. By combining shadowing, semi-structured observations, interviews, a stress questionnaire and heart rate measures, a detailed picture of the daily work, including time use, communicative actions and stressful events, was obtained for ten managers. The participants received group wise and individual feed-back as part of the intervention. Fragmentation, disruptions, absence of time for reflection between different events and for dialogue with their own superior were some boundless conditions that resulted in goal conflicts and challenges of sustainable balancing of time between clinical work, interaction with employees, administrative work, strategic networking – and own recovery (7, 12, 13, 14). Other results highlight patterns of communication and legitimacy-building, i.e. to balance operative and contextual uncertainties (14, 15)

Since insufficient communication seemed to be a common problem, both within the managerial system and in the daily health care work, we decided to evaluate a method for dialogue training in work groups in an intervention study. In this on-going study pairs of hospital wards/units are randomised to either intervention or control condition. A structured communication intervention method termed Dialogging was used. We hypothesise from experiences of a pilot study that this will improve e.g. team climate and efficiency as well as health and well-being among the employees (16). Quantitative methods will be used to measure effects on e.g. work demands, social support, team climate, feed-back, mental health and well-being. Qualitative methods will be used for process evaluation including a special study of the participating ward managers.



Health promotion, efficiency and quality

This process of multidisciplinary research in partnership with health care practitioners of different professions has been characterised by mutual learning and a deeper understanding of the complexity of organising and providing public health care. Those in our research group who, like myself, have been devoted to research on work environment and health for many years, have gradually become aware of the necessity to include aspects of efficiency/productivity and of quality of care in the research that aim to increase sustainability of both the health care workers' health and of the organisations in which they work (see also the Key Note by Westgaard & Winkel, the present Symposium). This motivated us to take part in the development of the NOVO research network.

Another concept that fits well into the development of our research is "health-promoting hospitals" (organisations), recently adopted by VGR. At present, we are engaged in an extensive R&D-programme that focus on the implementation of a health-promoting approach in organisational development and daily work throughout an organisation comprising four hospitals. From our longitudinal cohort study of a random sample of VGR employees we know that the employees in this hospital group is at the positive end regarding engagement in health promoting life-style activities, psychosocial work environment and mental health compared to all hospital workers in the entire region. It is a challenge to try to further improve the situation in this regard.

The implementation processes are planned and managed by the people working within the organisation, while the research group will follow the work and measure if the desired effects are achieved. Our intervention will be in terms of feed-back with reflection upon the results obtained at baseline and at the periodic follow-ups. Also, we initially took part in educational activities directed at managers, sharing some of our knowledge and experiences from previous studies. We use the ideas illustrated by the "NOVO triangle" of efficiency, quality and work environment as a model when deciding upon methods and measurements. This calls for the use of several sources of information, e.g. quantitative data from the hospital registers, from surveys of employees and patients, and qualitative information from managers at different levels of the organisation, from documents and from representatives of various professional groups. This setting also allows for embedded studies like the one in planning as a NOVO multicenter study of manager – employee interaction (see Dellve et al, the present Symposium).

Concluding remarks

The complexity of the issue must be acknowledged if researchers are going to make relevant and significant contributions to the development of health care organisations that are efficient in providing health services of sufficient quality in ways that are sustainable, also with regard to employee health. Our experience is that such research needs to be multidisciplinary, both theory and empirically driven, interactive with health care practice, process oriented (micro, meso and macro processes) and it needs to combine quantitative and qualitative approaches. Communication and learning should often be in focus between team members of different professions, between the first line managers and their co-workers, horizontally and vertically within the managerial system, and between the top management and the political leadership.

Results should be discussed and reflected upon jointly by the researchers and their practitioner counterparts and, whenever suitable, be transformed into tools for practical use in education and work practices.

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The mediating effects of self-efficacy on the relationship between transformational leadership and psychological well-being: A longitudinal field study

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Introduction

Transformational leaders employ a visionary and creative style of leadership that inspires employees to make independent decisions and developments in their work (Bass, 1990; 1999). There is some evidence that a transformational leadership style is linked to employee health and well-being (Dunham-Taylor, 2000; Shieh, et al, 2001, Sosik, & Godshalk, 2000 and Seltzer et al, 1989). However, there is less research that has focused on the psychological mechanisms that may explain this link. It is possible that transformational leaders influence their followers' self-efficacy and thereby influencing psychological well-being in followers. This study aims to extend previous work by examining the validity of a direct link longitudinally and testing the mediating effects of self-efficacy.

Method

The study was carried out within the elderly care sector in a Danish local governmental department. At time 1, questionnaires were distributed to 551 staff and 447 questionnaires were returned yielding a response rate of 81% for time 1 analysis. At time 2 the questionnaire was distributed to 521 staff and 274 returned the questionnaire, yielding a response rate of 53% for time 2 analysis. Surveys were sent to all employees working at the centers and thus new staff was included in the second round of the survey. A theory-driven model of the relationships between leadership, self-efficacy and psychological well-being was tested using Structural Equation Modelling.

Results

The relationships between transformational leadership, self-efficacy and psychological well-being was tested both cross-sectionally (T1 and T2) and longitudinally (T1 to T2). The results indicated that followers' self-efficacy did mediate the relationship between transformational leadership style and psychological well-being. There was only limited evidence of the existence of a direct path between leadership behaviour and employee well-being found in previous research. Only at time 1 did we find a direct relationship between transformational leadership and well-being, suggesting partial mediation at this point in time. Also a reciprocal effect was found whereby followers' self-efficacy at time 1 influenced their appraisal of the manager's transformational leadership style at time 2.

Conclusions

Our results indicate that the psychological mechanism by which managers influence their followers' well-being may be through the creation of a sense of self-efficacy. Further, it appears that followers' self-efficacy influenced managers' transformational leadership style. This may be because employees high in self-efficacy welcome the challenges offered by the transformational leader or that they simply evaluate their manager more positively.



Hospital middle managers' valuation and handling of workplace dialogue

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A psychosocial climate promoting reciprocal, appreciative and respectful communication and dialogue in the workplace is thought to have positive impact on employee health as well as on development of quality and efficiency of the work. Middle managers have a key role as communicators in the complex organisation of hospitals.

Aim

To develop a theoretical understanding of how first line managers at hospitals in Western Sweden value and handle dialogue in the organisation.

Methods

The study design was explorative and based on grounded theory. Data collection consisted of interviews and observations. Eleven managers at two hospitals in Western Sweden were chosen as informants, and for four of them, observation was also used. Isaacs' (2000) definition of dialogue was used.

Result

The core category that emerged in the analysis was managers' communicative actions. These could be either strategically or understanding-oriented and experienced as equal or unequal from a power perspective. Four different dimensions of communicative actions could be identified: collaborative, nurturing, controlling and confrontational actions. Only the first of these, understanding-oriented and performed equitably by the participants, had a subcategory with an obvious dialogic character according to the definition used. The observations confirmed the categories that emerged from the interviews. All four types were used depending on the situation and the persons involved. Managers claimed to value dialogue highly and had strategies for creating arenas and relationships for it, but this could be constrained by external circumstances or ignorance of the frameworks needed to conduct and accomplish dialogue. Absence of dialogue between the ward managers and their superiors could inhibit the flow upwards in the management system of knowledge important for improving quality and efficiency.

Conclusions

Dialogue was only present in one of four types of communicative actions that emerged from the analysis. Managers and their superiors should be offered guidance in understanding consequences of, consciously choosing and strengthening the communication component in leadership.



Health care managers' approaches to balancing their time-commitments at work and in life

Tengelin E., Arman R., Wikström E., Dellve L.

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Aim

To explore lower health care managers' approaches to a balanced time distribution regarding stress, work-commitment and recovery during their everyday work and at home.

Background

Complexities in managerial work require skills in delimiting tasks and defining boundaries in time and commitment to balance competing demands. Even though challenges in manager work are described in earlier studies, processes of proactive handling of these challenges to prevent damaging stress effects are less explored.

Methods

A mixed method design was used with the main focus on qualitative grounds, including participant observations as well as qualitative interviewing of individuals and groups.

Results

This study described how health care managers' everyday practicing of leadership occurred in a context of time fragmentation and perceptions of boundlessness with their time commitment divided between their public work assignment and private, personal integrity. A first step in boundary setting was in this context recognising areas with conflicting expectations and inexhaustible needs. Participating in clinical practice, interaction with employees, fulfilling administrative duties, and taking active part in strategic networking were all considered as important areas of managerial practice which included time-consuming demands and compound perspectives. The contradictory messages concerning managers' performance in these areas arose from own compound identity as manager, but also contradictory expectations from co-workers, the professional collective, top-management, and society and media. Expectations and needs could be perceived as impossible to fulfill without an unreasonable amount of work and commitment, and, consequently, strategies to delimit time commitment in a legitimate way were needed. Due to uncertainties and lack of clear routines, goals and collective agreement on how to balance conflicting time commitments, strategies based on time frames, relational resources, and acknowledged organisational structures and norms were used in order to establish, but also renegotiate and dissolve, boundaries. Through this process the managers' own understanding of a good leadership was manifested.

Conclusion

Boundaries in lower health care manager work are established through a process of individual acknowledging, reflection, negotiation, and manifestation, where boundary setting as well as boundary dissolving are important mechanisms for achieving balance in time commitment.



Hospital nurses' attitudes toward sickness absenteeism and their well-being at work: A qualitative study.

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The purpose of this research was to examine the experience and contentment of nurses at their occupations as well as their attitude towards absence from work due to illness. The research endeavours to increase knowledge of and to deepen the understanding of the influencing factors in this matter. Employees' contentment at their place of work and their absence from work due to illness is a growing concern in the world today. Studies show that the absence of employees from work due to illness and a lack of employees in the field of nursing is a problem in Iceland, as well as elsewhere. At the same time, studies show that increased strain on nurses in their work affects their wellbeing and health and increases absenteeism due to illness.

In this research, the contentment of surgery nurses at Landspítali University Hospital will be examined as well as their attitude towards work absenteeism due to illness and the main influencing factors in the matter. Qualitative research was made and data gathered with open individual interviews. When analysing the data, a method of grounded theory was used. The participants were ten nurses from Landspítali University Hospital's recumbency ward.

The conclusions show that the nurses' feelings toward their work are twofold. On the one hand they are very satisfied in their work, but on the other hand they find their work very stressful. They believe that absence from work due to illness is very common but find it difficult to call in sick because of the conditions in their place of work. A just acknowledgement of the value of their work and the management in the workplace has an influence on their contentment and attitude towards absence from work due to illness.

The main conclusion of this research is that nurses are very satisfied in their work but a lack of just financial compensation from the community and a certain amount of passivity on behalf of the management lead to increased stress, so their feelings towards work become twofold. That fact has a negative impact on absence from work due to illness. Based on the conclusions from the research, a certain model is put forward. The model shows the overall relations of influencing factors concerning the contentment and attitude of nurses and is the contribution of the research in the field of human resource management. The conclusions from the research can be used by healthcare managers, since they point out possible ways to satisfy the needs of employees and to increase their success at their work.



Management - employee interaction in hospital: a NOVO multicenter study plan

Dellve L. and the multicenter study-group

Dept. Occupational Medicine, Sahlgrenska Academy at Göteborg University

The general goal of the Nordic multicenter programs is to contribute to the development of sustainable systems in health care organizations that facilitate: quality of care, a sustainable work environment and effectiveness. In this work, the first and second line managers hold key positions through their closeness to practice and integrated responsibility for the work environment, the budget, and the development of caring/curing practice. Today, there are many empirical studies demonstrating the importance of leadership qualities and strategies for the occupational health of employees and the quality of care. A few studies have described the challenges and daily hassles health care managers face in this work. Most common challenges are handling the fragmentation between employee interaction, strategic work, clinical work and administrative duties, while the most stressful are concerning conflicts regarding identity and legitimacy. To successfully handle these challenges, not only personal skills but managerial support structures are needed. However, there seem to be a large variation in some managerial conditions: (a) the number of subordinates (span of control), (b) the degree of participating in clinical work, and (c) communication of goals up-wards and down-wards in the organisation. We do not know how variations in these managerial conditions contribute to management – employee interaction or organisational sustainability. It would be interesting to study how structural managerial conditions differ between countries and how they may contribute to the focused “NOVO-outcomes”.

Object

This proposal focuses on the leadership – employee interaction and communication, structural organizational conditions, and its importance for quality of care, a sustainable work environment and effectiveness. Specifically the importance of first and second line managers’ span of control and their combining of managerial and clinical work will be studied. Further, the communication of goals and challenges regarding quality of care, work environment and budget, up-wards and downwards will be compared within each studied hospital and between the studied Nordic hospitals (What goals and practical challenges are communicated? What goals and practical challenges are not communicated?).

Method

The study will start with comparison of cross- sectional data. We will use common methodology for collecting data, as far as possible, allowing for some focused comparisons. Register-based data, questionnaire and interviews will be used and analyzed with both quantitative and qualitative methods.

Process

First, we will write a general research plan for the multicenter study. This shared writing process started after the meeting in September. The general research plan will be finished at the end of 2009. Second, each national research-group adjust the research plan/proposal to their conditions (hospital, country) and wider scope of interest. All research groups seek funding within their countries. Third, we complement the research plan regarding the comparison between countries. This proposal will be jointly sent to the Nordic Council and/or EU. The proposed multi center study is planned for a four-year period.



Performance and work environment of telenurses in Swedish Health Call Centres

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Background

Health call centres, HCC (in Swedish sjukvårdsrådgivning), are a new phenomenon in Sweden (Wahlgren 2004). It shares several characteristics with its counterpart in England and Scotland (Smith, in press) and healthcare triage in several parts of the US (May et al. 2003) and Canada (Collin-Jacques 2003).

A new occupational group called telenurses has emerged. These are all registered nurses with long experience of nursing in clinical settings. The telenurses' main preoccupation is to take care of Swedish citizens, on the phone, when they report sickness, pain, or otherwise are worried. The telenurses are supposed to make a first assessment of the callers' problems and advise them on what to do (Andersson Bäck 2008, 2009).

It means that the HCC on the one hand deals with healthcare matters and provides a medical service with nursing in focus, and on the other hand the HCC is organized as a call centre and uses the same technology, and in many cases similar practices and rhetoric, as any other call centre (cf. Fernie and Metcalf 1998; Thompson and Callaghan 2002). The presentation will describe and analyze working conditions in relation to orders, pace, repetitiveness, work intensity performance management and healthcare worker autonomy.

Materials and methods

The paper draws on documentation, aggregate statistics, data and accounts from the press. In particular, it analyzes evidence from the authors' case studies of a local HCC in West Sweden. This case study was a 5-year longitudinal study starting from the service's introduction 2002 until 2006. The empirical findings originate from about 70 semi-structured interviews and workplace observations with actors at central and local levels: trade unionists, politicians, officials, managers and telenurses as well as 400 users of the health call centre's service.

Results

The analysis of HCC and the telenurses work are described and discussed in terms of contradictory conditions such as control versus autonomy; participation versus exclusion; professional responsibility versus professional vulnerability; upskilling versus deskilling; younger versus older nursing generations; work intensification versus less physical work; isolation and freedom; and customer service versus nursing service. HCC means a controlled work that is also borderless, requiring the telenurses to set the definitive frontiers of their duty.

Conclusions

The work of telenurses is complex and involves a vulnerable position between public management, healthcare colleagues and care-seeking citizens. The HCC is routinised and takes a certain format motivated by the vulnerable state of the care-seekers in order to guarantee universal access, equality, medical security, evidence-based advice and coherent guidelines integrating healthcare in an area. At the same time, telephone advice nursing requires flexibility, problem-solving and tailored relations with the care-seeker. Theoretical or higher-order contextual knowledge as well as social and analytical skills are needed in order to identify (assess/diagnose) symptoms, solve problems and give advice (cf. Frenkel et al. 1999) as professional service worker (Batt 2000).



Conditions for carrying out tasks and achieve goals in daily work in a surgical department

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The objectives of health care can be seen as the center of what nursing staff is doing, who are employed and what resources are needed. However, the employees' actions, what they do at work, also depend on how the staff interpret the aims and values, experiences, aspirations and expectations of the work. The purpose of this study was to examine consensus on long-term and daily goals and conditions for carrying out tasks and achieve goals in daily work.

Methods

The present case study was conducted at a surgical department in the middle of Sweden with about 100 employees. The data collection involved individual interviews with management, group interviews with anesthetist and surgical registered nurses and assistant nurses and a review of target documents for health care in the present county council, hospital and department. The interview method used was ARIA job content analysis supplemented by questions about documents and records. The ARIA method is a systematic review of the work commitment, influence on work planning and barriers to perform tasks in a timely manner and of high quality.

Results

The work in the surgical department was time bound, time pressure was often high, and there were many social contacts at work and very little time when working alone. Influence on the day's work was limited. The interviews gave no concrete examples of how written target documents were used in daily practice. In the daily practice of the surgery department a clear daily goal was to be finished with today's surgical programs. When patients were cancelled from the daily surgery program due to lack of time, resources or operating rooms, it was perceived by staff as a quality shortcoming.

It was clear for each nurse what they themselves would do, but understanding what other professions or colleagues would do or not was not always so clear. Various methods of improving team work in the operating room and clarify respective responsibilities had been discussed at staff meetings. It was unclear whether improved team work and clearer division of responsibilities had been stated objectives by the management, and it was not clear whether the staff perceived it as a goal.

The first line managers expressed the absence of discussions of long-term goals that could lead to a consensus on the management level. Neither the staff discussed the overall and long-term objectives or had knowledge of the overall objectives set for health care or surgery in the county.

It was difficult to identify a relationship between the overall, long-term goals and the more concrete everyday goals. No clear communication between these goals seemed to exist.

Conclusion

Comprehensive and long-term goals for the activity were rarely discussed among the staff. Activities tended to be targets, for example was it unclear whether improved team work was an activity or a goal. No management or target documents seemed to be used in the daily work of the surgical department. Individuals and their organisational knowledge were very important in the daily work unless the person was available there was no information available.



Work culture, job satisfaction and efficiency in Norwegian nursing homes: a focus on oral staff reporting.

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When dealing with questions of job satisfaction and work organization in Norwegian nursing homes, the present researcher has found oral reports to be among the highly valued parts of the work among health care personnel as an arena for both sharing knowledge, preparing for patient care and for socializing. Whether they represent both a meaningful and efficient activity is a question for debate. The answer to such a question depends on how efficiency is conceived and defined. The research is mainly based on two long-term fieldwork studies (participant observation and interviews) from 1988-89 (18 months) and in 2004-05 (6 months), but also studies of shorter duration (see e.g. Jacobsen 2005, 2007, 2008).

As part of recent reforms within both the specialized and municipal health care systems in Norway, it has been a pronounced goal of Norwegian health authorities to limit the practice of oral reports in favor of more efficient, in the sense of less time consuming and less costly, written electronic reports. Alternative views on efficiency in staff reports and communication, though, are sparsely dealt with in academic writings and public reports. Depending on how efficiency is defined, oral communication could as well be said to be more efficient than electronic reporting systems. In some nursing home facilities, introducing written electronic reports has been accompanied by the staff practicing the “old” oral reports in addition, sometimes secretly. They tend to defend this double practice both based on professional considerations, that oral reports help them perform better and more efficiently in the care work, and for the reason that it is important for their job satisfaction. Hence, oral reports continue to be a part of their work culture.

Written reports are clearly less time consuming, more standardized and hence more efficient to put to use, and they also contain less words and less general talk not strictly to the point than oral reports. They are also more efficient in the sense of involving less staff, since each staff member report on “their patients” to the next in charge.

Oral reports may be efficient in quite other ways. First, oral reports are doing several important things simultaneously, like educating students and new staff members in addition to sharing relevant patient information. Second, things which provide important contextual information regarding the work shift, but which cannot be reduced to information specific to particular patients and hence written in electronic reports, can still be easily and effectively shared orally. Third, patient specific information which for ethical and other reason should not be documented in written form may be shared in an oral report meeting. Fourth, by employing more contextually sensitive words informed by “insider’s information”, oral communication can more than written communication convey several types of information at the same time, using so-called “forceful features” (Lamond 2000). And finally, oral reports may, through both its competence building and socializing aspects, increase job satisfaction. All these different functions of oral reports may be viewed as important for effectively preparing the staff for good patient care.



Experience with self-scheduling in hospital wards, from an employer and employee perspective

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For nurses scheduling of working hours is stated to be critical for resource utilization, employee satisfaction and to the delivery of patient care (Silvestro et al 2000). In Norway, the most common schedule-type has been departmental rostering, planned by the manager alone or in corporation with the units' employee representative (Norsk Sykepleierforbund 2007). The last years some health care institutions have moved towards more employee-participating scheduling processes. The aim of this study is to explore and describe how an employee-participating scheduling process called self-scheduling is used and experienced. Special attention is given to how self-scheduling interacts with the composition of part-time/full-time work among the employees in the hospital ward.

The study is an explorative case study using qualitative methods. Open interviews both individually and as focus group interviews were used. Informants were employees, managers, safety deputy and union officials in a ward with 5 different units at a hospital in southern Norway, totally nine informants. Interview guides were developed and used during the interviews and covered topics like initialization, development, implementation and institutionalizing of the self-scheduling. The interviews were recorded and thereafter the interviews were transcribed to text.

The results show that self-scheduling in this hospital ward is a dynamic and iterative process that involves both the employees and their manager. The manager is essential in organizing employee participation in the self-schedule process. Self-scheduling enables the different units to adapt their shift schedule to both the employee's and hospital's needs. The employee experienced self-scheduling to be beneficial for their well-being. The managers' experience was that self-scheduling expands the possibilities of the employers to increase the cost efficiency of the ward as compared to departmental rostering. However, self-scheduling alone does not reduce the amount of part-time employers in the wards studied. On the other hand, self-scheduling gives the employees a means of increasing the individual working hours temporarily from schedule to schedule.



The NOVO-triangle as a concept in designing a study of a developmental process in a hospital organisation: The HiP study (Health promotion in practice)

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Background

Health promotion is to identify and promote factors and processes contributing to sustainable health more than identify risks for ill-health. These factors and processes can be found on an individual, workplace, organisational or/and societal level. There are two fundamental approaches to implementing health promotion in the workplace; one focuses on individual responsibility for how to manage health and lifestyle, while the other is characterized by a view of health as a product of many factors, many of which are outside the control of the individual. In earlier studies, the best effects have been shown when focus is put on both these approaches and on all levels simultaneously. In designing a study of how a health promoting perspective can be implemented and integrated into the daily work of a hospital organisation, we used the NOVO triangle perspective. One of our aims is to assess the effects regarding work environment, productivity and quality.

Method

This is a prospective study using a combination of qualitative and quantitative methods. It allows us to follow the changing processes and the integration of a health promotion perspective in the organisation and everyday tasks as well as the effects at individual, workplace and organisational level. The studied organisation is a hospital group (Skaraborgs sjukhus) in the western region of Sweden consisting of four hospitals with a total sample of 4 500 employees (82 per cent women and 18 per cent men).

Data collection

The quantitative baseline and follow up data will be collected in February 2010, 2011 and 2012. A questionnaire has been created covering the dimensions that have been identified in the literature relating to all three “corners” in the NOVO-triangle. A total sample of all employees, both supervisors and subordinates will receive the questionnaire. The questionnaire addressed to the supervisors also covers areas regarding their span of control, systematic occupational health and safety management (SOHSM), relations to their own supervisor, colleagues and subordinates. Register data connected to the corners in the NOVO-triangle include sickness absence, logistics and patient safety variables. Qualitative data will be collected through focus groups and individual interviews, open observations and through written documents (for example balanced score cards and business plans). Grounded theory and content analyses will be used in the analysis.

Conclusion

There is still a lack of knowledge of what can promote health, but also how the methodology can be complemented and developed with a design that integrates productivity, quality and work environment. This study will hopefully contribute with knowledge that can be used in the constant development of health care organisations.



Work environment and quality of care in Danish eldercare – ideas for a research proposal

Aust B.

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We, the research group on working conditions in Danish eldercare at the National Research Centre for the Working Environment in Copenhagen, have been studying the physical and psychosocial working conditions of employees in municipal eldercare over the last years. Central in this research are two cohort studies which both started in 2004: one cohort with more than 10,000 employees in eldercare and one cohort with all students in eldercare schools in 2004 (about 5,700 students). Three waves of questionnaire surveys have been conducted in both cohorts and we are currently analysing the data with regard to developments in work environment over the last 5 years.

Baseline results from both cohorts confirmed the well-known problems in this job group: high sickness absence and high turn-over as well as high physical and psychosocial demands. However, the results also showed that large differences can be found between the different municipalities and even more between the different elderly care homes or centres for home care. These differences show that it is possible to create a good working environment in eldercare - despite the high demands. Further, our analysis showed a positive relationship between quality of care and the wish to stay at the workplace: employees, who self reported that the quality of care at their workplace is high wished to stay at their workplace to a higher degree than employees who reported that the quality of care at their workplace is not high.

On the background of these cross-sectional findings, we would now like to study the relationship between quality of care and working environment in more detail. With our cohort studies we have the possibility to study this relationship prospectively, e.g. to find out if a good work environment leads to higher quality of care. We also hypothesis that high quality of care in turn can lead to an even better (psychosocial) work environment, for example with regard to high meaning of work and possibilities for development. We can also test existing theoretical models about the relationship between quality of care and work environment, for example the Sirdal model.

Another part of this new research project could be the further development of the existing tools measuring quality of care in eldercare.

We are currently preparing a research proposal which includes these and other plans for further research of the topic. In our presentation we will present cross sectional results and plans for the new research proposal. We would like to get feedback on our ideas and maybe establish cooperations with others interested in the same topics.



Musculoskeletal disorders, physical workload and psychosocial work environment - a follow-up study of personnel in the health care sector and teachers

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Disorders in the musculoskeletal system are the leading cause of occupational injuries. An increased risk has been associated with a high physical workload, as well as a poor psychosocial work environment. Further, individual factors in terms of a high BMI, smoking and physical inactivity may influence the incidence of disorders. However, it is not obvious which of these factors that is the most important and should be given priority to in preventing measures. To disengage the significance of the risk factors, there is a need for studies including occupational groups with a large contrast in exposures.

Personnel in the health care sector have high prevalences of musculoskeletal disorders and several well-known physical risk factors. Teachers, on the other hand, are considered to have high psychosocial demands, but a varied/mobile work and a relatively low physical workload.

This study focuses on five different occupational groups (operating-room nurses, assistant nurses, anaesthetic nurses, personnel performing ultrasound examinations, as well as senior-level teachers) with a large contrast in physical and psychosocial exposures. Among 100 subjects in each group, the incidence of musculoskeletal disorders is assessed by interviews and physical examinations, and the psychosocial work environment by questionnaire. Further, information about individual factors is collected. The physical workload is recorded by technical measurements of postures, movements and muscular activity.

Two years after baseline, we intend to perform a follow-up study of the musculoskeletal health using the same methods. Then, the incidence of new cases will be assessed according to the above mentioned risk factors.

In cooperation with Ergonomics & Aerosol Technology at the Faculty of engineering in Lund (LTH), we will also suggest ergonomic interventions in the operating environment at the hospital in Helsingborg. The interventions may be tested in advance by computer simulations and virtual reality. Then, the physical workload and risk of disorders associated with the changes may be predicted.

Preliminary results will be presented from a pilot-study of musculoskeletal health and psychosocial work environment among operating-room nurses, assistant nurses at anaesthetic nurses, all working at the hospital in Helsingborg.



Disturbing events in the operation theatre, a study of variation in perceptions between different professions

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The purpose of this study was to uncover disturbing factors and occurrences in the physical as well as the organizational domain of operation theatre work from the perspective of the different professional groups working there. Unnecessary disturbances in the operation theatre add cognitive load to an already cognitively demanding high-risk activity, which could have implications for both the work environment of the health care professionals and the quality of the care provided.

A semi structured interview was conducted with 15 participants working in a Swedish surgical unit. In order to gain as complete a picture as possible of the practice, the participants were recruited from all the professional groups working in the operation theatre thus illuminating the research object from several angles. During the interview a virtual model, visualizing one of the unit's operation theatres was used to facilitate reflection. The interview questions concerned the following topics: interaction with colleagues, perceived safety risks, and the work environment both generally in the unit and in the visualized operation theatre.

The results indicate that there are variations in the ways in which different professional groups in the operation theatre look upon what can be regarded as disturbing factors. Problems with long set-up times for surgery were mentioned several times by different professional groups, but the phenomenon was explained differently and the processes involved appeared to be perceived differently by the various groups. Unnecessary talk and people running about in the operation theatre were regarded as disturbing by most participants, indicating that they shared common knowledge of the problems. In spite of this common knowledge, the participants appeared to have individual opinions about when and how the disturbances occurred, preventing them from being as considerate of each other as desired. Extensive use of telephones was regarded as a disturbing factor by several groups, but the nature of the disturbance was described differently by different groups. Most participants reported that the virtual model made a difference and several participants mentioned that it helped them remember things that otherwise would not come to mind.

The variation in the perceptions of crucial or disturbing events in the surgical process between different professional groups, indicated in the results, is something that could both create tension between different professions and induce unnecessary sources of error. In extension, it could have implications for both the psychosocial wellbeing of the professionals and for the safety of the patient. The groups appears to have limited insight into the processes and practices of their fellow professional groups working in the operation theatre, insight that, if established as a common view, probably would provide a foundation for improvements of efficiency, patient safety and the work environment of the professionals.



Group dynamics, professional stereotypes and dominance – the performance of interdisciplinary teams in hospitals

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The aim of this study is to identify the effect of dominant members on group dynamics, and whether or not the likelihood of dominance in interdisciplinary teams stems from professional stereotypes. The study has three distinct parts: The effect of dominance on group dynamics; the effect of dominant members entering a group; and the existence of professional stereotypes. We have chosen to focus on professions from the military and health care systems, which are traditional and strictly hierarchic organizations, with clearly defined and dominating professions exposed to working tasks that in most cases can only be performed by interdisciplinary teams.

The setup for observation, two maneuvers for the military groups and strategic decisions with high impact and tight time schedules in the medical groups, emphasize the groups' ability to make the best decisions under rapidly changing conditions and/or high levels of stress. Shifts in role structure, predominant interpersonal behavior, and emergent dynamic patterns are discussed in the light of the SPGR theory. SPGR is an acronym for "Systemizing the Person-Group Relation" (Sjøvold (2007) SGR vol 38 num 5). Observations of group behavior is performed and analyzed according to the SPGR method using the twelve category observation method and SPGR standardized peer-reporting questionnaire.

Our findings indicate that dominant members may influence the group dynamics in a dysfunctional way. Dominant members in groups tend to act as point attractors freezing the structure of the group, which was the case for both the military and medical groups. A high degree of medical order and dominance is both needed and appreciated in order to ensure a patient's safety and efficient medical treatment, especially in acute situations. Extensive autonomy in one setting will, however, easily be transferred to settings where it is not needed and not efficient. According to the principles of maneuver warfare such groups are quite contrary to what is wanted. What is wanted are groups where members have equal influence when contributing to task-solving and are able to understand the superior mission in a way that they are able to take the correct action even if it means disobeying orders in a given situation. The existence of professional stereotypes was most prominent in the health care setting. Differences in stereotypes between nurses and physicians may explain some of the difficulties experienced in interdisciplinary work in hospitals. Even though professions are an effective way of organizing work, it may as well hinder effective interdisciplinary work.



Improvement of team functioning and patient safety at an intensive care unit – A case study

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The intervention was based on the idea that experience from so called High Reliability Organisations (e.g. aviation, fire fighting and oil industry) can be transferred to Intensive Care. It was assumed that the training of health care personnel, in a similar fashion to flight simulator training of pilots, will increase patient security.

The method used was Crew Resource Management (CRM), which offers training on typical ICU patient scenarios with a pre-programmed simulated patient. The goal of the training was to improve team functioning in terms of leadership, mutual performance monitoring, back-up behaviour, communication and accountability.

From the ICU staff perspective the most important expected outcome of this simulator training was improved team functioning at the ward, which was believed to contribute to higher quality of care, better relations to the patients and their relatives, improved psycho-social work environment for the staff and better evaluations from customer departments within the hospital. It seems that one expected a direct relation between the simulator training and outcome in terms of team functioning.

From the research position a number of questions were addressed:

- Apart from simulator training, which other factors are important for team functioning?
- Apart from simulator training, are other interventions needed to reach the goal of effective team functioning?
- What is the role of the simulator training from a change process perspective?
- How do the different professions take their roles in the team?
- How can the process of team development be described?
- How can the participating actors (management and staff) increase their awareness of the continual process of learning in order to influence the development?

An action research and case study approach was used, including document analysis, interviews, participant observation and feedback seminars. The presentation will include a preliminary analysis of the relationship between contextual factors, the implementation process, the contents of the intervention and some outcome data.



Thursday 10.12.2009

Keynote Lecture:

Occupational musculoskeletal and mental health: significance of rationalization and opportunities to create sustainable production systems in health care – a systematic review

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Occupational musculoskeletal and mental health: significance of rationalisation and opportunities to create sustainable production systems in health care – a systematic review

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Background

Work life in general and groups within the health care profession in particular are troubled by a high rate of sick leave, predominantly due to a high level of musculoskeletal and mental disorders. Nurses and nursing assistants in hospitals, care institutions and home care have therefore been subjected to research and also practical interventions, apparently without much positive effect on the most important indicator variables. This development for health care personnel is paralleled by work life in general, with European statistics (extracted every 5 years since 1990) showing increasing performance demands in terms of working at very high speed or to tight deadlines (Parent-Thirion et al 2007 and earlier EU reports).

At societal level, many forces to demand increased work performance. In the public sector and in health care there is a need to reconcile the increased demand for services with restrictions on budgets. Consequently, reorganization of work places, sometimes with job loss, is frequently occurring. The health consequences of rationalisation processes are mostly overlooked by work environment specialists or considered outside their working area, although this may alternatively be viewed as the primary intervention process impacting worker health.

The aim of this review is to establish an overview of the effects of rationalisation interventions on worker health and risk factors to health. The review covers all work life sectors, but for the purpose of this conference the health care sector is particularly highlighted. A further aim is to collect available information on measures that may alleviate potential harmful effects of rationalisation interventions.

Methods

Rationalisation is defined as “... the methods of technique and of organisation designed to secure the minimum waste of either effort or material. ...” (World Economic Conference in Geneva, 1927). In industry the purpose of rationalisation is to maximise the creation of value as perceived and paid for by the customer. In the healthcare sector, value as perceived by the customer, i.e., a patient may not be connected to his or her payment for the specific service. Income through taxation or other means may not be sufficient and services are cut even though the perceived customer value deteriorates. This is by strict criteria a rationalisation only if performance is not reduced to the same extent. However, studies that fulfil inclusion and exclusion criteria are retained in this review regardless of their effect on performance.

Relatively few studies within the ergonomics and occupational health literature report on rationalisation interventions. Literature bases covering economics, management, business, organisational and work sociology literature were therefore additionally searched. Two types of searches were carried out; 1) indicators of rationalisation were combined with indicators of health effects or risk factors and 2) indicators of “organisational change process” were combined with indicators of “change management” (to identify factors favourable for a good result in change processes). Search criteria and keywords in the first search were adjusted to ensure that an initial pool of 20 papers from personal libraries, relevant for inclusion, was identified. Hits in the second search were examined to include studies reporting on worker health or risk factors only. Publication years from 1990 to spring 2009 were included. In addition, titles of studies published the last 5 years in international scientific journals within the subject areas of human and industrial



relations, human resource management and public management were examined, and abstracts and full papers read when appropriate.

A wide range of study designs was allowed in consideration of the many research traditions represented. This included longitudinal designs, examining rationalisation effects in a pre-post manner, case-control studies comparing production systems with different rationalisation strategies but comparable in other respects, and large-scale (often national) surveys subject to correlational analyses. A few studies using qualitative methodology were also included. Included studies were sorted according to work life sector (health care, public, private service, manufacturing, and mixed) and rationalisation strategy (downsizing, restructuring, lean practices, high performance work systems (HPWS), technology level, and parallel-serial), the last two practices only relevant for manufacturing industry. Lean practices include measures such as “Just-in-time”, “Total Quality Management” and “Quality Circles”, although the specific measures could vary considerably while using the same label. Some studies (e.g., Conti et al 2006) presented a list of lean practices that allowed grading of implementation in a comparison of production systems. HPWS rationalisations aim to combine the use of performance incentives with “good” aspects of Human Resource Management. Outcome of the rationalisation studies was scored as positive, negative, mixed or no effect with respect to worker health and/or risk factors. Additional to the traditional risk factors used as indicators of mechanical and psychosocial exposures (e.g., stress), we allowed job satisfaction as risk factor as this variable is highly correlated to musculoskeletal and mental health indicators (e.g., Faragher et al 2005).

Information on measures to alleviate potential harmful effects of rationalisations (“modifiers”) was only allowed when collected in a rationalisation setting, although, supporting information is available from studies in other settings.

Results

Rationalisation: association to health and risk factors

Altogether, 163 studies of rationalisation effects on worker health and risk factors were included, 48 of these took place in the health care sector. The majority of these concerned downsizing (n=14) and restructuring (n=32) rationalisations, carried out in North America, England and Scandinavia. Most studies concerned rationalisations as means to reducing costs. This was also the case with restructuring rationalisations; however, a cluster of studies (n=8) concerned a qualitative change to care given (“Patient-focused care”). Negative outcome dominated for studies aiming at cost cutting (13 downsizing and 23 restructuring studies with negative outcome). In case of patient-focused care, outcome tended to be mixed and with two studies reporting positive outcome. One study classified as lean practices reported on the introduction of total quality management in a Finnish clinic (Kivimäki et al 1997), with no effect on risk factors (job satisfaction unchanged). However, performance in the clinic was significantly improved. An Australian study of the introduction of HPWS practices in an aged care clinic (Harley et al 2007) reported an overall positive effect with higher job satisfaction and reduced psychological strain. In this case, HPWS practices to a considerable extent related to membership in autonomous teams which was perceived positive both by high skilled (nurses) and low skilled (assistants) workers. The study has a cross-sectional, correlational design and the authors emphasise that the results may not be generalised to other aged care institutions or to the general health care sector.

Modifiers

Type of modifier	Health care		Total	
Participation (rat. process)	2	2+	13	13+
Participation (production)	1	1+	6	5+ 1±
Information	4	3+ 1-	9	8+ 1-
Management style (resonant: +)	3	3+	12	11+ 1±
Organizational support	5	5+	7	7+
Social support at work	2	2+	15	12+ 2± 1-
Procedural justice			4	3+ 1±
Group autonomy			3	3+
Total	17	16+ 1-	69	62+ 5± 2-

The table shows a number of studies and outcome of modifier actions intended to improve health and risk factors for workers within the health care sector and the overall results for all work life sectors. A comparison of the two columns shows that results from the health care sector are representative for work life in general.

Positive effects (or less negative effects) result from worker participation in planning the rationalisation process and in production planning. Information about forthcoming events are positive as is an inclusive or resonant (often associated with emotional intelligence) management style. The study reporting negative outcome of information dealt with uncontrolled, negatively flavoured rumours (Bordia et al 2006). Social support at work represents a well-established construct while the variable organisational support is built on a questionnaire mimicking many of the other variables (Eisenberger 1986). We did not find studies of procedural justice and group autonomy in a rationalisation setting within the health care sector, but such measures were generally important also. An overall view is that an inclusive and fair management style is

extremely important to alleviate the negative effects of strain imposed on workers through rationalisation (see also the Key Note by Ahlborg, the present Symposium).

Comments

The material collected presents some generally clear and mostly unsurprising messages. However, it represents an empirical basis that moves beyond subjective opinions. Also, the many research traditions represent study procedures that deviate from epidemiological recommendations, and in many cases cannot be conducted along such lines. Quality criteria have been used as basis for exclusion, but e.g. longitudinal studies without control groups were allowed. Therefore, exclusion was less strict than recommended for epidemiological based reviews. Instead, clusters including both quantitative and qualitative studies were identified and it was considered whether a dominant trend in results was supported by studies of good epidemiological quality.

Studies of high epidemiological quality often lacked detailed information on contextual factors that may explain outcome or serve as modifiers. In particular, several qualitative studies contributed to richer insights supplementing the traditional quantitative investigations.

Conclusions

- The review documents mostly negative effects of rationalisation on musculoskeletal and mental health and corresponding risk factors.
- The review provides an empirical basis to state that the potential to cause health problems is large, contrasting the overall assessment of ergonomic interventions that seem to have limited, if any, positive health effects in a long range perspective. Thus, a contributing factor to the persistent problem of musculoskeletal and mental disorders is identified and a potential to modify the work environment outcome of rationalisation is indicated.



- Modifier results suggest positive effects of good leadership and fair treatment, focusing those aspects that favour worker participation and dialogue between workers and management.

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Employee appraisal of workplace intervention effects. Preliminary results from a study of 6 units within the Home Care Services in Trondheim, Norway.

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Background

From literature we know that efforts made to improve working conditions through organizational interventions often end in failure in that they do not succeed in reaching their stated goals and intentions. A national campaign carried out by the Norwegian Labour Inspectorate (NLI) in 2003-2008 revealed unhealthy time pressure to be the most critical stressor among Home Care Workers (HCWs) employed in the council of Trondheim, Norway. In response to orders given by the NLI, the Municipal Executive for Health and Social Welfare established a workgroup responsible for examining what factors were perceived by the HCWs to result in unhealthy time pressure. HCWs pointed at conditions related to resources, patients, work organization, organizational culture and management to be causes of unhealthy time pressure. Consequently, interventions were carried out locally in each Home Care unit aimed at improving these working conditions in order to reduce unhealthy time pressure. Decreasing a high level of sick leave was also an objective of the interventions as sick leave was reported to be both a cause and a consequence of unhealthy time pressure. The council allocated >10 mill NOK to campaign-related interventions, and NLI was pleased with the council's efforts when closing the campaign in 2008.

Research questions

Given the considerable effort toward improving the working conditions among the HCWs, how do the employees perceive their working conditions to be now compared to the situation before the interventions were carried out? Do records on sick leave show a decrease in sick leave rates? Are there any differences between the units and if so, what may explain the differences?

Method

In spring 2009, questionnaires were distributed to a total of 181 HCWs in 6 different units in the Home Care Services in Trondheim, Norway. 138 questionnaires were returned, resulting in a response rate of 76.2 %. Statistics on annual sick leave rate from 2004-2008 for each unit were collected through the council's records on sick leave.

Results

75.7 % HCWs in all units reported an increase in time pressure, while 13.2% reported a stable condition, 6.6 % reported a decrease in time pressure, and 4.4 % were not sure. Differences were observed between the units ($F(5,124) = 3.62$; $p < .01$). The unit reporting the highest increase in time pressure also evaluated the interventions to be less successful compared to the other units. In addition, this unit had the highest increase in sick leave rate (36.4 % in 2008 vs. 15.2 % in 2004). The actual unit was subjected to a merger in this period, and qualitative responses in the questionnaire point at this being a cause of additional strain and time pressure.

Conclusion

Overall, interventions aimed at decreasing unhealthy time pressure among the HCWs appear to lack a positive effect as the HCWs report an increase in unhealthy time pressure and strain related to it. The effects of workplace interventions carried out on local levels may be nullified by the introduction of larger organizational changes such as, in this case, unit mergers.



Lean Healthcare: opportunities and challenges

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Purpose

The purpose is to provide some insights and discuss opportunities and challenges of applying the Lean principles in healthcare.

Design/methodology/approach

The papers present the experiences gathered during the Swedish national development programme “Lean healthcare”. 60 persons from the management of the 20 county councils participate in the development programme initiated by the Swedish Association of Local Authorities and Regions (SKL). The purpose of the programme is to critically review and discuss how the Lean principles can be applied in healthcare. The results presented in this paper are the compilation of the discussions and work done within the programme.

Findings

“Lean production” represents a fresh way to look at work systems within healthcare. Several key tools and principles have proved to be effective in improving healthcare processes. Lean focuses on removing waste in any form and relentlessly strives to eliminate problems. The current healthcare systems are designed with focus on the doctors, nurses and other clinical staff and are not optimized for the patients. Healthcare services are often ‘batch and queue’ with patients spending most of their time waiting. This approach is contradictory to Lean: it is like designing processes with focus on the employees rather than the product they make.

However, some Lean principles are not easily transferred. With high variations in demand, which many healthcare organisations face, the application of the principles “pull” and “one piece flow” provide a real challenge. To achieve sustainable results with Lean, a paradigm shift has to take place in the minds of people. Lean involves a different way of thinking, communicating, making decisions and managing. Swedish healthcare managers need to make a major shift and development in people management.



Individual assessment or collective standards – lean in a cancer ward

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The Danish public hospital sector faces numerous challenges including a rapid growth in the number of patients, quality expectations and availability of new expensive treatments. At the same time, budgets are restricted and there is a lack of qualified staff. During the last years lean has grown in popularity and lean is now considered to be one of the most important answers to the challenges in the hospital sector. The question is whether lean can be adapted to a hospital setting and what kind of consequences lean will have for employees and patients.

The implementation of lean was studied in a cancer ward at a large university hospital. The goal of lean was to increase efficiency and improve the psychosocial work environment. The project received considerable support from the top management including extensive training and help from consultants. At the ward, the lean project was strongly supported by the management, and a local lean group consisting of nurses, doctors, lab technicians and secretaries was established to initiate the implementation. Participation of the staff concerned was extensive with a number of information meetings, training seminars, small working groups, kaizen seminars, and kaizen boards.

The lean implementation was studied with both quantitative and qualitative methods. The psychosocial work environment was measured before and after the lean project with the COPSOQ questionnaire, and qualitative data was collected about the lean activities including observation of key activities, interviews with key actors and group interviews with employees.

The questionnaire results indicated that the psychosocial work environment had considerably improved for the lab technicians and deteriorated for the nurses. It seems like the lab technicians happily integrated lean in their work and used lean as an opportunity for positive reorganization of their work. The opposite happened for the nurses at the central outpatient clinic for chemo therapy. A new IT-program for booking of patients was introduced partly initiated by the lean project because it was considered necessary for a more systematic planning of the patient flow. The work with implementation of the IT-program was underestimated which created an extra work burden for the nurses, but more importantly it seemed as a large group of the nurses tended to interpret the lean project as an attack on professionalism and they expressed a serious concern about the consideration for the individual patient. They felt that the possibility to accommodate special wishes such as making appointments at a certain time in the day would be weakened by the new standardized booking system. The opposite interpretation was expressed by the lean advocates in the ward. They considered lean as a possibility to create more space for professionalism by using standards to remove unnecessary elements in the daily work practice.

The results from this study suggest that lean is challenging the traditional interpretation of professionalism in hospitals. The lean drive towards standards may have some positive effects on productivity but may, at the same time, be considered a limitation of the professional assessment of the hospital staff.



Obstacles for lean in healthcare: Mindsets and the nature of work

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The ideas and principles from lean management are now widely being adopted within the health care sector. The interest in lean from managers and policy makers, however, appears to contrast the realized benefits.

An analysis of cases reported in literature and three Danish healthcare cases show that organizations within health care most often only implement a limited set of tools and methods from the lean tool-box. This form of lean implementation leads to very limited productivity gains in the health care organizations. Lean implementations focus on peripheral activities in the health care organizations for example laboratory work, logistical issues for patient e.g. emergency room layout, billing processes, and logistics of medical supplies.

At first glance an explanation could be found in the conservative nature of the medical community which needs substantial scientific evidence to change behavior. This is of course not true as new modes of treatment are rapidly implemented when their effect has been documented. The health care sector therefore presents a paradox: Why can changes in treatment be implemented without problems, when lean and thereby changes in work processes are so difficult? This paper will try to answer the paradox and research question by analyzing health care work from two dimensions: 1) The nature of the work and 2) Rationality and validity of healthcare professionals. The two dimensions will then be related to lean.

Firstly, it is observed that the nature of the work in health care, i.e., care for patients, is difficult to standardize thus creating difficulties in creating a stable and predictable flow which is a key prerequisite for lean. Many processes concerning patient treatment are complex and unique depending on the actual condition of the patient and also involving many different professions. Due to this inherent variability in dealing with patients no treatment will be completely alike as many activities within health care are dependent on the professional judgment concerning the optimal treatment by, e.g., doctors and nurses.

Secondly, within our case studies in hospitals we find the existence of different mind-sets or rationality/logic in the different health care professions. Doctors tend to emphasize and focus on successful treatment of whatever condition the patient has. Truth is established through scientific validity such as the double blind experiment. Nurses, on the other hand, tend to focus on patient care and well-being of the patient. Psychology and human understanding are central drivers. Laboratory technicians (and other technicians as well) focus on maintaining a high level of productivity and accuracy in the different analyses being carried out. Secretaries will often focus on supporting doctors and nurses by maintaining an efficient flow within the department. These different rationalities and logics create barriers for a successful implementation of lean, both the lean project and subsequent continuous improvement.



A tool for considering job content in the development of production flow by value stream mapping at hospitals

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At present, Lean Production principles are introduced at an increasing number of hospitals in the Nordic countries. A key tool is Value Stream Mapping (VSM) aiming at minimizing the amount of non-value-adding work. This is defined as the portion of process time that employees spend on actions that do not create value as perceived by the customer (Keyte and Locher 2004). Several reports indicate that this may reduce the amount of opportunities for mental recovery (reduced mental “porosity”) and thus cause “work intensification” (e.g. Green 2004). In order to allow simultaneous consideration of undesirable side effects on work content with potential negative consequences in terms of mental health, a supplementary tool to VSM is now being developed. This paper presents a prototype and preliminary experiences from practical use of the tool at 3 departments of a hospital in Sweden.

VSM is based on a paper-and-pencil procedure and the present supplementary tool (ERGONOVA) aims to facilitate this participatory intervention process.

ERGONOVA in its original form (Jarebrant et al, 2004) gives quantitative measures of important ergonomic indicators, such as postures, forces, porosity and physical job variation. The intention with ERGONOVA is that it can be used by employees at hospitals to assess existing as well as planned flows.

ERGONOVA has been modified aimed to add knowledge to the area of measurement issues of psychosocial work characteristics and job design by using an ‘objective’ methodological approach. The methodological approach focus upon job content and the developed tool is named ERGONOVA-JC (Job Content). The frame of reference for ERGONOVA-JC is the Demand-Control model (Karasek & Theorells, 1990) and the Job Demands-Resources model (JD-R model) (Bakker & Demerouti, 2007). The JD-R model includes various types of job demands (e.g. mental, emotional) and resources (e.g. autonomy, support, feedback) depending on the occupational context under study. The development of ERGONOVA-JC was also influenced by other tools already in use in the field of ergonomics, for example VIDAR/PSIDAR (Johansson Hanse & Forsman, 2001) and ARIA (Waldenström & Härenstam, 2008). But the uniqueness of ERGONOVA-JC is that the tool can be integrated with VSM.

ERGONOVA-JC considers different features on task level, flow level and job level. The features are job demands, resources (job control, communication/social interaction), job content potential, mental porosity and mental/content job variation.

The ERGONOVA-JC has been developed in an iterative process in close co-operation with the end users, i.e. the employees at 3 medical departments. The aim was to obtain good usability by selecting expressions and procedures familiar to the employees within the sector. The aim is to assess if application of the ERGONOVA-JC is adding value for sustainability in health care system solutions, compared to solutions based on VSM only. Sustainability in this context aims at flows that are both efficient and acceptable for the employees regarding job content. The ERGONOVA-JC will be validated along these lines in further research.

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Evaluation and development of an ergonomic complement to the Value Stream Mapping tool – a NOVO multicenter Study plan

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The Nordic healthcare system is under constant pressure to deliver more and better healthcare services. Advances in science continue to offer treatment for new patient groups and improvements to existing groups leading to more patients. At the same time work demands seem to increase; burn-out and physical work load problems are frequently described.

Thus, the healthcare system needs to become more efficient and the principles of lean manufacturing are increasingly being selected by hospitals and wards as the methodology to becoming more efficient. Lean has been around for many years in the form of the Toyota Production System (TPS). But the concept and term surfaced as “lean” following a study of the Japanese car industry that tried to explain its high level of success (Liker, 2004).

Lean is deeply rooted in an industrial manufacturing environment and many of the tools that are being used in connection with lean also have their origin in manufacturing. The fundamental methodology when implementing lean is value stream mapping (VSM).

VSM is a tool to analyze a process by mapping all activities from a specific process in sequence. The time to complete an activity and waiting time between events are registered as well as total lead time, providing the analyst with an overview of the current state of the process. VSM in its current form does not support ergonomic considerations. Using the lean philosophy without considering the specific problems of the healthcare sector may result in work intensification and increasing ergonomic strain leading to more sick days and early retirement.

In order to improve sustainability of suggested system solutions resulting from VSM, a complementary tool, Ergonova, is now developed.

The present planned Nordic investigation aims to evaluate and further develop the Ergonova tool for practical use in the Nordic countries. It is hypothesized that a broader spectrum of suggested solutions will be obtained by using Ergonova and some of these may appear to offer a higher level of sustainability.

The overall research design is a comparative study where both the Ergonova and VSM tools are tested in the same organization on the same process and results are compared. One health care organization in each of the four participating countries will be investigated.

Two types of data are collected: 1) Process data and 2) Outcome data. Process data are information documenting the work process taking place during the events. Outcome data are the suggested future process solutions; drawings and descriptions of the future state and proposed changes to tasks with significant ergonomic implications. Process data are further divided into an analysis of the technical skills in e.g. process mapping, ergonomic analysis and non-technical dimensions, i.e. the social side of the process.

In an international perspective the Nordic countries are presumed to offer the best location for studies on how to integrate work environment issues into process development for improved performance. Our unique roots in this context are illustrated by the Nordic Model for co-operation between the social partners based on mutual trust.



Organizational affiliation and overall job satisfaction among Danish and Swedish dentists

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Objectives

Good work in dentistry concerns the manual skills as well as the patient relation. The ability to provide quality care in dentistry is not only dependent on individual resources but also on work organization which can affect the job satisfaction. This study aims to describe dentists in different organizational settings in Sweden and Denmark and the relation to their overall job satisfaction.

Materials and methods

In 2008, a questionnaire was sent to a random proportionally stratified sample of practicing dentists in Sweden (n=898) and Denmark (n=937). The study was approved by the Swedish regional ethical board. Principal Component Analysis (PCA) was used on three items aiming to measure overall job satisfaction; (1) work fulfilment, (2) satisfaction with the work as a whole, and (3) the perception of having a good working life. Kruskal-Wallis tests were used to compare the overall job satisfaction between Swedish and Danish private and public practitioners.

Results

The response rate was 68%, 51% were Swedes and 49% Danes, 62% were women and 32% men. Further, 61% were private and 39% were public practitioners. PCA on the three items showed a one factor solution with 78% variance explained. The PCA was stable when splitting the sample as to gender and organizational affiliation. An index for overall job satisfaction was established having a Cronbach's alpha 0.86. The overall job satisfaction means (range 3-15) for the four subgroups were; Swedish public (11.0) and private (11.8) practitioners and Danish public (11.9) and private (11.8) practitioners. Statistically significant differences were found between the groups ($P < 0.001$).

Conclusions

The average response rate was reasonably satisfactory. The PCA showed an index of overall job satisfaction as a measure of eudaimonic work life elements as well as more practical contentment with work. The initial results showed that Danish and Swedish dentists have a high overall job satisfaction. The Swedish public practitioners had the lowest overall job satisfaction compared to the other groups. The results are to be further analyzed as to more specific organizational differences.

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Decision Authority among Dentists from Denmark and Sweden

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Objectives

Karasek and Theorell define job control as the worker's control over work tasks and performance during the working day. This study aims to analyze differences in job control as decision authority over aspects of the work, among general dental practitioners from Denmark and Sweden.

Materials and methods

In 2008, a questionnaire was sent to 1835 general dental practitioners, randomly selected from the dental associations in Sweden and Denmark (17% of the eligible population). The response rate was 68% after two reminders. Principal Components Analysis was applied to eight items about influence. Based on the resulting two factors, additive indices were established to measure decision authority: "influence on scheduling appointments" (2 items) and "general influence" (6 items). ANOVA with Tukey's HSD test was used for comparison between groups based on nationality and sector for dentists with/without managerial responsibility. For analyses without equal variances, Kruskal-Wallis test was applied.

Results

Influence on scheduling appointments: In both Denmark and Sweden, dentists from the public sector reported lower influence on scheduling appointments than private practitioners ($p \leq 0.01$). Comparing dentists from the same sector showed no significant differences between the countries, neither after controlling for managerial responsibility. Dentists with managerial responsibility had higher influence than employed dentists ($p \leq 0.001$).

Influence in general

For dentists without leadership tasks, similar patterns were seen. In contrast, Swedish dentists with managerial responsibility reported higher general influence than their Danish colleagues ($p \leq 0.01$). Independently of gender and nationality, private managers had higher general influence than their public counterpart ($p \leq 0.01$). Dentists with managerial responsibility had higher influence than employed dentists ($p \leq 0.001$).

Conclusion and perspective

Differences in decision authority were found between general dental practitioners working in the public and the private sector in both countries. The results may reflect different management cultures as well as different structural organization of the work. In light of changes in demands made on health care professionals it is important to secure decision authority in order to keep work balance as well as quality in care.

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Rationalization in public dental care and its impact on working conditions, productivity and health of dentists – a prospective study

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Background

During the last decade organizational and technical rationalizations have been implemented in public dentistry in Jönköping County/Sweden. Evidence about rationalization effects on the working environment is contradictory.

Aim

The aim was to evaluate how the implemented organizational and technical rationalizations affect the work environment, health and productivity for the dentists during a five-year period.

Materials and methods

The study is a prospective cohort study. Dentists in public dental care responded to web-based questionnaires in 2003 and 2008. A total of 121 dentists responded in 2003 (response rate: 80%) and 114 dentists in 2008 (response rate 74%), 65 dentists responded at both occasions and they are the empirical material in this study. The questionnaire comprised items on work postures, precision demands, work control, musculoskeletal complaints, physical and mental ability and sick leave. Data on number of treated patients and planned treatment time was gathered from existing records at the dental office. Changes over time were analyzed with paired t-test and direct and indirect relations between the different indices with Structural Equation Modeling (SEM).

Results

Organizational and technical rationalizations implemented during the study time period were 1. Computerization of clinical case books and booking of patients, 2. Reorganization into smaller units and introduction of one more management level, 3. Digital X-ray. Descriptive results show significant improvements in terms of reduced precision demands and strenuous work postures ($p < .001$) (cf. Jonker et al, the present Symposium). However, impairments occurred in terms of reduced work control ($p < .01$) and ratings of leadership ($p = .04$). The average number of adults treated per year per dentist increased ($p = .02$). The SEM-analysis shows that both precision demands and sick-leave are related over time. Precision demands increase strenuous work postures, which has negative effects on sick leave, ability and production/dentist in 2003. These relationships are less clear for 2008.

Conclusions

Organizational and technical rationalizations in dentistry during the period 2003-08 increased productivity per dentist. The physical environment improved, presumably due to increased delegation of dental work to other professional groups, while psychosocial conditions deteriorated. Physical work conditions were related to sick-leave and production in year 2003, but this was less clear in 2008



Rationalisation in public dental care and impact on biomechanical exposures for dentists - a prospective study

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Background

During the last decade organizational and technical rationalizations have been implemented in public dentistry in Jönköping County/Sweden. Evidence about rationalization effects on biomechanical risk factors for musculoskeletal disorders (MSD) is contradictory.

Aim

The aim was to evaluate how the implemented organizational and technical rationalizations affect the proportion of “value-added work” (VAW)(Keyte and Locher 2004) and biomechanical exposures during clinical dental work performed by dentists.

Materials and methods

The study is a prospective cohort study. From a sample of 12 dentists in public dental care, data were collected during four hours of an ordinary working day by the means of video recordings and direct technical measurements of biomechanical exposures in year 2003 and 2008. Work activities were analysed during 45 minutes of the video recordings from each subject by means of a computerized video activity analysis system. The categorization of work tasks into VAW and non-VAW was conducted based on a list of coded work activities according to the zero-based analysis (Engström and Medbo 1997).

The biomechanical exposures were assessed by inclinometers recording flexion/extension of head and trunk and elevation of upper arm. For each subject the recordings were made continuously by a data logger at 20 Hz during four hours of work, which included the 45 minutes of video recordings. The exposures were computed for each work activity. Changes over time were analyzed using Wilcoxon signed ranks tests and paired t-test.

Results and discussion

The organizational and technical rationalizations implemented during the 5-year period were 1. Computerization of clinical case books and booking of patients, 2. Reorganization into smaller units and introduction of one more management level, 3. Digital X-ray.

Preliminary results indicate that the duration of VAW decreased from 57% year 2003 to 45% year 2008 ($p=0,09$). In general, the biomechanical exposures during non-VAW were interpreted as less risky compared to VAW. However, the median head inclination during patient treatment (VAW) increased from 40° in year 2003 to 46° in year 2008 ($p=0,008$). But during the same period the duration of patient treatment was reduced from 47% to 34% in average.

In a parallel questionnaire study 65 dentists indicated at job level reduced precision demands and less strenuous postures during the 5-year period (Rolander et al, the present Symposium). These self-assessed exposures may partly be explained by the presented trend towards more time for less risky non-VAW. Further analyses of our technical measurements of the biomechanical exposures may further clarify possible relations with the self-assessed exposures in the study by Rolander et al.





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