

Continuous improvement, burnout and job engagement: a study in a Dutch nursing department

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SUMMARY

Continuous improvement (CI) programs are potentially powerful means to improve the quality of care. The more positive nurses perceive these programs' effects, the better they may be expected to cooperate. Crucial to this perception is how nurses' quality of working life is affected. We studied this in a nursing department, using the job demands-resources model. We found that two job demands improved, and none of the job resources. Job engagement did not change significantly, while the burnout risk decreased slightly. Overall, the nurses felt the impact to be small yet the changes were in a positive direction. CI can thus be used to improve nurses' working lives and, by restructuring the work processes, the quality of care. Copyright © 2016 John Wiley & Sons, Ltd.

KEY WORDS: continuous improvement; burnout; job engagement

INTRODUCTION

In the past decades, 'lean thinking' has emerged and established itself in healthcare as a movement to improve the effectiveness of care delivery, both in terms of the quality and efficiency (Trägård and Lindberg, 2004; Andersen *et al.*, 2014; Benders *et al.*, 2014). Continuous improvement (CI) is a key component of lean thinking. For CI to work active employee cooperation is quintessential as employees are to provide and work out improvement suggestions. Such cooperation is not self-evident. A classic critique on CI is that it makes employees work even harder (Conti and Warner 1993, p. 39), making it a form of self-exploitation. Against this negative view, CI advocates see it as an advanced form of employee participation, giving employees voice and an opportunity to design or at least influence their own jobs.

How CI impacts on employees is in any case of key importance to their behaviors. Active cooperation is only to be expected if CI is seen positively. To assess CI's

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impact on employees, we choose to use the Job Demands—Job Resources (JDR) model (Sterling and Boxall, 2013). This model holds that a number of job demands and job resources cause feelings of burnout and job engagement to occur. Both these constructs nicely represent the extremes posited in the literature: a higher burnout fits the critics' position, while higher job engagement provides support for the advocates.

With the introduction of CI in nursing departments, this issue becomes pertinent in healthcare as well. The differences between manufacturing, where CI originates, and nursing are evident and have led to doubts about CI's applicability. These doubts have been cast aside in many care institutions, making the issue salient what effects the use of CI has on nurses' feelings of burnout and job engagement. We aim to answer this question.

RESEARCH BACKGROUND

There are hardly any quantitative studies on CI's consequences for employees. This holds for all sectors, and for health care in particular (Holden, 2011). We know of only three studies published in English on how healthcare staff experienced the introduction of CI, that is, Hasle (2010); Drotz and Poksinska (2014) and Dellve *et al.* (2015).

Hasle (2010) found that the effects of introducing 'lean' in two departments of a Danish hospital varied sharply, depending on the kind of measures taken. Whereas an accumulation of generally small improvements was experienced positively in one department, in another the change came down to the introduction of a large IT-system. Hasle mentions as possible explanation contrasting effects in employee autonomy: in the first department staff felt their control over their work had increased, whereas in the latter nurses felt the IT-system had taken over part of their autonomy. Drotz and Poksinska (2014) report three case studies, namely two care centers and a hospital unit in Sweden. They also point to considerable variety in the kind of measures taken and the effects, although the latter were not measured quantitatively. All three organizations adopted CI as part of their lean approach. Overall, staff felt that CI increased skill variety. 'Employees appreciated the increased responsibilities and autonomy to perform a wider variety of tasks, and felt respected and valued' (Drotz and Poksinska, 2014 p. 191). Dellve *et al.* (2015) conducted a study on improvement programs in five Swedish hospitals, out of which three were explicitly by lean production. They found a small yet significant effect of the improvement programs on job demands (lowered) and job resources (increased). These were stronger if the changes were supported at the strategic level.

Overall, there is hardly consensus on how CI affects employees. 'Lean production' in general and CI in particular is contested in the classic literature on the theme (e.g., Landsbergis *et al.*, 1999; Conti *et al.*, 2006; De Treville and Antonakis, 2006; Hasle *et al.*, 2012; Ingvaldsen, 2013; Cullinane *et al.*, 2014; Inamizu *et al.*, 2014; Arezes *et al.*, 2015): some herald it claiming superior organizational performance, others criticize the concept as exemplified in the quote 'lean is mean'. The latter refers especially to adversarial consequences for employees, such as redundancies and

repetitive and monotonous work. This appears contradictory: CI requires active employee cooperation by suggesting and working out improvements, but employee interests may be negatively affected by that cooperation. The improvements are laid down in standard operating procedures (SOPs) to which employees are supposed to conform. This may be seen to limit an employee's task autonomy, as antagonists stress. Advocates, however, argue that participating in designing standard operating procedures must be seen as a high level of autonomy.

These sharply opposing views may to some extent be related to the perspective taken. More important, perhaps, is the task environment in which CI is applied. 'Lean' and CI originate in (highly) repetitive and convergent production processes (Young, 1992), that is, a large number of different parts come together into one end product and this takes place with high frequency. The typical example is the production of passenger cars, which can be and generally is orchestrated in great detail. Working in such a task environment is hard, irrespective of the production regime. CI can contribute substantially to an already high level of orchestration in such a task environment by increasing the number of standard operating procedures and tightening them. Given the highly repetitive character of the jobs studied, it is then not surprising that many studies in repetitive manufacturing report adverse effects for employees (Schouteten and Benders, 2004). Yet even if 'lean is mean' were actually true for repetitive manufacturing, the same may not hold in other conditions such as healthcare.

When studying the consequences of nursing work, a commonly used effect measure is nurses' well-being (Pisanti *et al.*, 2011; Chou *et al.*, 2012). Warr's (1990) much-used model of well-being distinguishes three dimensions of well-being, labeled by De Jonge and Schaufeli (1998), respectively, as the 'discontented-contented' axis (covering such factors as satisfaction, motivation, commitment, and engagement), the 'anxious-comfortable' axis (e.g., anxiety, strain and tension) and the 'depressed-pleased' axis (referring to stress, burn-out, fatigue etc.). With respect to nursing work, many studies are available regarding nurses' well-being on all three dimensions. Particularly the first and third dimensions have attracted much research. With respect to the first dimension, insight is available on nurses' job satisfaction (e.g., Laschinger *et al.*, 2011; Pisanti *et al.*, 2011; Chou *et al.*, 2012), work engagement and commitment (e.g., Koivu *et al.*, 2012; Lehmann-Willenbrock *et al.*, 2012; Stimpfel *et al.*, 2012; White *et al.*, 2014) and experienced meaningfulness and fulfillment (e.g., Thomsen *et al.*, 1999). Also stress and burnout in nursing work—the third dimension of well-being—are the subject of many studies (Laschinger *et al.*, 2011; Orly *et al.*, 2012; Schmidt *et al.*, 2012). Following this trend of focusing on the first and third dimension, this study includes work engagement and burnout as indicators of nurses' well-being.

Insight is available on the effects of several factors on these dimensions of nurses' well-being, including interaction with residents (e.g., Utraiainen *et al.*, 2011; Schmidt *et al.*, 2012), leadership (e.g., Laschinger *et al.*, 2011; Koivu *et al.*, 2012), job demands and job characteristics (e.g., Pisanti *et al.*, 2011; Chou *et al.*, 2012). As CI most likely impacts the organization and content of nursing work, job characteristics in terms of job demands and job resources are the most important factors to influence nurses' well-being. The job demands—resources model proposes that demanding

aspects of work (job demands) lead to exhaustion (burnout) and that job aspects that help to achieve work goals, reduce the effect of job demands, or stimulate personal growth and development resulting in work engagement.

The job demands—resources model (Demerouti *et al.*, 2001) maintains that high job demands lead to high rates of burnout and low employee engagement, while high job resources lead to low rates of burnout and high employee engagement. The job demands distinguished are as follows: pace of work, emotional work load, task changes, role ambiguity and work requirements. The job resources are social support, development opportunities and decision latitude.

CI is likely to impact several job demands and resources. Work pace may intensify but also decrease when unnecessary tasks are eliminated. As the latter is the intention of CI, we hypothesize that the work pace decreases. The emotional work load may increase if nurses get to spend more time with patients. Nurses' tasks are likely to change, but how this is experienced depends on the content of the implemented improvements (Hasle, 2010). As with work pace, we hypothesize that the change is in the intended direction namely a decrease. Role ambiguity is likely to decrease, as CI calls for scrutiny in studying work processes and detailing everybody's work. For work requirements the same holds as for task changes, whereas the number of disturbances is likely to decrease due to smoother work processes. We hypothesize that the work requirements decrease.

As far as job resources are concerned, social support is likely to increase in the form of joint decision-making about the common work. Nurses' work may become less varied (or rather: more structured and less hectic), whereas the continuous attention for improving is a learning opportunity. Given that nurses' work tends to have a low degree of standardization, we expect a net positive effect on development opportunities. The effect on decision latitude may be twofold: it decreases due to more standardized procedures, yet increases due to the opportunities to change those procedures. We hypothesize that the change works as intended, that is, increased autonomy.

We hypothesize the net effect of all these changes on job engagement to be positive, and on burnout to be negative.

Table 1 summarizes our hypotheses.

METHODS

Setting: continuous improvement in this department

The department in the study is the oncology and nephrology department of a Dutch top clinical training hospital. The hospital offers 31 medical disciplines, has a capacity of 663 beds, and employs over 4,000 staff. The oncology and nephrology department has 32 beds. The team consists of a business manager, a team leader, several senior nurses and approximately 50 all-round nurses. Other involved disciplines include an internist, a nephrologist, several doctor-assistants and physiotherapists.

In May 2013 CI was introduced at this department. The goal was to involve employees in finding bottlenecks and improvements regarding issues of efficiency and

Table 1. Hypothesized changes in job demands and resources, and in job engagement and burnout

Job characteristic	Hypothesized direction of change
Job demands	
Work pace	–
Emotional work load	–
Task changes	–
Role ambiguity	–
Work requirements	–
Job resources	
Social support	+
Development opportunities	+
Decision latitude	+
Engagement	+
Burnout	–

quality of care. The focus was on developing small and incremental changes to be discovered and implemented by the nurses themselves. A selected and limited group of nurses (the project team) worked out improvement suggestions. To increase nurse involvement, the project team ensured that all other nurses could contribute to the project during the daily work meetings. When approved and implemented, all other nurses took advantage of the revised ways of working. During the period of our study, several improvements were realized. Examples include a new mapping of inventory and medication to avoid unnecessary movements, a new anamneses form to avoid information duplication, a whiteboard to display an overview of all relevant ward information resulting in decreased waiting times and less unnecessary corrections, and a new way of organizing meetings with physicians to improve efficiency and utility of nurses spending time on these meetings. Next, several smaller improvements were implemented that generated quick efficiency wins.

Design and nurse involvement

In order to measure the effects of implementing CI on nurses' job demands, job resources, burnout and engagement we used a one group pretest-posttest design. A survey measuring all constructs in the study, was administered to all nurses of the ward before (March 2013) and after (October 2013) the implementation of CI (April 2013). The ward management approved of the study and participation in the study was voluntary. All ward members were invited to participate by the CI project leader, one of the ward's senior nurses. In the introduction to the survey, the nurses were promised full confidentiality of their data; no individual data would be presented in any form. The completed questionnaires could be handed in using a sealed envelope. These were picked up from the hospital by the second author.

Information regarding the content of CI was gathered from policy documents and during structured observations.

Sample

In total, 52 and 42 respondents participated in the first and second survey, respectively, (response rates are 80% and 65% of all nurses from the ward). For the pretest-posttest analyses, the responses of 35 nurses who responded to both surveys are eligible (54%). These respondents are representative for the ward. Table 2 contains demographic data of the respondents.

Measures

Job demands are the ‘physical, social or organizational aspects of the job that require sustained physical or mental effort and are therefore associated with certain physiological and psychological costs’ (Demerouti *et al.*, 2001: 501). Job demands in the study are derived from the Short Inventory to Monitor Psychosocial Hazards (SIMP; Notelaers *et al.*, 2007) and include pace of work, emotional work load, task changes, role ambiguity and work requirements.

Job resources ‘refer to those physical, psychological, social or organizational aspects of the job that may do any of the following: (i) be functional in achieving work goals; (ii) reduce job demands at the associated physiological and psychological costs; (iii) stimulate personal growth and development’ (Demerouti *et al.*, 2001: 501). Job resources in this study, also taken from SIMP (Notelaers *et al.*, 2007), include decision latitude, social support by colleagues, social support by supervisors and development opportunities.

According to Maslach (1982), burnout is characterized as a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among people who do ‘people work’ of some kind. In this study, we used the emotional exhaustion and depersonalization dimensions of the Utrecht Burnout Scale (UBOS; Schaufeli and van Dierendonck, 2000) that is, based on the Maslach Burnout Inventory.

Engagement is considered to be the antipode of burnout and contains three dimensions: vigor, dedication and absorption. Engaged workers feel vigorous and enthusiastic about their work. We used the short version of the Utrecht Work Engagement Scale (UWES-9, Schaufeli *et al.*, 2006).

In the second (post) measurement, questions about the organization and possible effects of the project were added to measure the respondents’ experiences during the project. We included questions whether the relevance of the project was clear

Table 2. General characteristics of respondents in the study (at T1)

	Mean	SD
Age	42.8	8.7
Tenure in current job	15.1	9.4
Tenure in current department	12.2	8.1
Working hours per week	25.5	8.5
Gender (M/F ratio in %)	17/83	
Employment (fixed/temporary ratio in %)	98/2	
Supervising job (% yes)	5	

and whether the respondents received sufficient information about the project. Additionally, the respondents were asked whether they felt the project had reached its goals of improving efficiency and quality of care.

The items from SIMPH are measured with 4-point Likert scales (Always – Never). The items from Utrecht Burnout Scale and Utrecht Work Engagement Scale are measured with 7-point Likert scales (Never – Always). The items about the project are measured with 5-point Likert scales (Totally disagree – Totally agree).

RESULTS

Reliability tests revealed satisfactory levels of Cronbach's Alpha for all scales in the study (Alpha at least $> .70$, except for Emotional work load and Development opportunities with Cronbach's Alpha's of $.65$ and $.67$, respectively).

Table 3 shows the measured values of the key variables at both points in time, for those respondents who filled out the questionnaires twice.

The first result is that the changes are modest: most variables did not change significantly (taking $p < .05$ as criterion). Secondly, four variables changed significantly, which we discuss subsequently. The most significant change was that the pace of work decreased. Furthermore, the score on task changes also decreased. Finally, the score on burnout decreased as the score on the item depersonalization became lower.

DISCUSSION AND CONCLUSIONS

The impact of CI on the nurses in the studied department is small. Two job demands improved, and none of the job resources. Job engagement did not change significantly, while the burnout risk decreased slightly as the score on depersonalization was lower than before.

Table 3. Paired samples *T*-test of the variables on T1 and T2 ($n = 35$)

Variable	Mean T1	Mean T2	Change	d.f.	T	Sig. (1-tailed)
Pace of work (JD)	2.55	2.36	–	34	2.224	0.016
Emotional work load (JD)	2.33	2.27	–/0	34	0.813	0.211
Task changes (JD)	1.83	1.73	–	34	1.766	0.043
Social support (JR)	3.41	3.33	–/0	32	1.240	0.112
Development opportunities (JR)	3.01	2.92	–/0	31	1.247	0.111
Decision latitude (JR)	2.32	2.36	+/0	33	–0.738	0.233
Role ambiguity (JD)	1.80	1.81	0	34	–0.115	0.454
Work requirements (JD)	2.47	2.40	–/0	31	1.475	0.075
Engagement	4.92	4.87	–/0	31	0.409	0.342
Burnout	2.18	2.07	–	33	1.700	0.049

n.b.: scores on job demands and job resources range from 1 to 4; the higher the mean score, the more of that variable is present in the work situation. Scores on the dependent variables range from 1 to 7; the higher the score, the stronger the respondents experience the measured aspect.

Given the controversy between those who expect doom and those who expect salvation for employees working under lean, our results may be disappointing. ‘Business as usual’ is a better characterization of the changes experienced by the nurses in this study. To the extent that there were changes, however, they were improvements. Dellve *et al.* (2015) report similar findings in their study in Swedish hospitals.

Our findings are at odds with studies reporting adverse working conditions. An important explanation lies in the context or more specifically, the task environment within which CI is applied. The typical task environment studied is characterized by repetitive processes, which is rather different from the considerable variation in most nursing wards. In any case, over cautiousness due to the view that ‘lean is mean’ seems exaggerated from our perspective.

This is not to say that the use of CI, and *in extenso* lean, may not have ‘mean’ results. Lean is an ambiguous concept, which lends itself for various interpretations (Benders and van Bijsterveld, 2000; Langstrand and Drotz, 2016). The same holds for its main component, CI. This may or may not include the use of standardized operating procedures, and the number of staff involved and the ways they are involved may vary. Even more variation is to be expected qua content of the implemented improvements, like in the study by Hasle (2010).

Not just the content of the changes matters, but also the context within which these take place. Every single implementation of CI has its own characteristics and takes place in a specific context (Andersen *et al.*, 2014; Procter and Radnor, 2014; Wilson, 2014; Holden *et al.*, 2015; Langstrand and Drotz, 2016), which bears on the effects. This considerable variety in content and context explains to a large extent why evaluation studies of applying lean in healthcare consistently find inconsistent results (Andersen and Røvik, 2015.; D’Andreamatteo *et al.*, 2015). Considerable variety is subsumed under the generic label ‘lean’, which hampers the view on what worked when and what not. This holds for operational and financial results as well as for the impacts on employees.

Having stated these qualifiers, as the reported changes are by and large in the expected direction, and because, in a relatively hectic task environment such as a nursing ward (Tucker and Edmondson, 2003), employee-initiated changes are likely to impact working conditions positively. As our case shows, employees who face hindrances in performing well are in a key position to suggest changes to remove these obstacles c.q. stressors. De Treville and Antonakis (2006) call this ‘work facilitation’.

Lean-inspired changes such as creating value streams and foremost CI are likely to create more order in the chaos. Less improvization (‘fire-fighting’), less frustration due to unsolvable work dilemmas (Simons, 2012) and more relaxed and smooth operations are the result. In our case, there was a modest effect three months after CI had been launched. If continued, more and larger changes appear likely. If the proposed changes are initiated by first-line employees such as nurses, they are likely to be perceived as meaningful by themselves and their peers. Therefore, we would not be surprised to find similar results in future studies (cf. Dellve *et al.*, 2015).

Implications for nursing management

What holds in general, holds for nursing as well. The discussion earlier is thus also relevant for nursing. More specifically, as far as the context is concerned nursing

wards are characterized by a considerable variety of activities and a relatively small degree of repetition. In fact, too few rather than too much organization appears to be characteristic (Tucker and Edmondson, 2003). Both in highly structured and in relatively unstructured task environments lean leads to routinization, but its effects will work out differently. More routinization is likely to have negative impacts on staff in highly routinized task environments such as final car assembly, but positive effects in relatively unstructured conditions as in nursing. We expect lean to have positive effects there, also in other wards than the one we studied, as work becomes less hectic and more predictable.

The ideal, of course, is to use CI to improve care delivery as well as to improve nurses' quality of working life. The verb 'to use' is key here: as discussed earlier, content and context matter, which means that CI's content must be crafted to the context c.q. task environment. The content could include a specific focus on improving working conditions and even nurses' health (see von Thiele Schwarz *et al.* (2015) for an example). Dellve *et al.* (2015: 250) point to the possibility of using CI for job crafting thereby improving working conditions.

To paraphrase John F. Kennedy: it is not what lean does to you, it is what you do with lean.

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