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# Structure Please; Continuous Improvement and Employee Consequences in a Dynamic Task Environment

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**Abstract:** Whilst continuous improvement (CI) programs have had an enduring appeal for several decades, their sustainability has been a concern for almost as long. Sustaining a CI program requires permanent support of all its stakeholders, particularly of the most important ones—employees. Some authors argue that continuous improvement programs are beneficial for employee wellbeing, while others contest this. We contribute to the small empirical basis for such claims by presenting results from research among care workers in Flemish nursing homes. Questionnaires from 553 care workers in a nursing home applying continuous improvement and in a reference group of nine comparable homes were analyzed to study differences in job demands, job resources, burnout risk, and work engagement. In addition, we have drawn on interviews, site visits, and other qualitative data to assess the extent to which the differences found may be attributed to the CI program used. Overall, the care workers in the nursing home with the CI program evaluated their jobs as better than their colleagues in the reference group. These differences are at least partly caused by the continuous improvement program. We argue that the main effect is that over time, daily work processes become more structured. The work pressure decreases as work becomes less hectic.

**Keywords:** continuous improvement; sustainability; job demands; job resources; work pressure; burnout; work engagement; lean; nursing home; task environment

## 1. Introduction

As Bessant et al. concluded a quarter of a century ago, 'Despite its apparent simplicity, making continuous improvement work is a complex, organization-wide task; it requires [ . . . ] a high level of commitment and a supportive organizational context. Progress along the road to CI may appear slow and demanding of considerable efforts but, as an increasing number of organizations are discovering, learning to mobilize and manage change in this way may go beyond the mobilization of a continuing stream of problem-solving incremental innovations. Insofar as it requires an evolving and adaptive organization based upon high levels of participation and the ability to cope with continuous change, it may represent the key capability necessary for effectively dealing with the uncertainty of the 1990s environment' [1].

Although addressed at 'the 1990s environment', their observations and concerns about the sustainability of continuous improvement (CI) programs have increased in importance [2]. Continuous improvement (CI) has come to be applied in many countries, often as part of the persistent embrace of 'lean thinking' [3,4]. Continuous improvement in this sense can be defined as a systematic and continuous approach to challenge and improve existing ways of working by formulating and revising

operational standards. Employees are expected to identify issues for improvement, investigate these issues, and design novel working standards. Once established, these working standards are the subject of continued scrutiny as yet better ways of working are likely to be developed.

Continuous improvement programs demand active support of all organization members, particularly of those performing the daily work processes [5]. It is quintessential that employees are deeply engaged and committed as they are the ones who have to suggest and develop alternative ways of working. Employee engagement and commitment can only be expected to be sustained if employees feel that they benefit from participating in a CI program. However, the impact of continuous improvement (CI) programs on staff has been contested for a long time [6–10]. On the one hand, Conti and Warner [6] argued over 25 years ago that CI meant that workers were given two minutes per month of discretion in designing their jobs but had to work harder for the rest of the month. In their view, the negative impact of working harder is larger than the positive impact of employee participation. On the other hand, proponents of CI have stressed the increased decision-making power granted to employees, arguing that such enhanced autonomy in designing one's own job is a substantial gain and that it makes employees reflect on their own work [11]. Both viewpoints are compatible if seen as a paradox: the positive effect of enhanced autonomy in co-designing one's tasks is offset by the potentially negative effect of constrained autonomy because of new standard working procedures to be observed.

Another take on the advantages and disadvantages for employees is to consider how frequently they participate in CI and are subject to standard ways of working. These frequencies vary depending on the task environment in which CI is applied. Conti and Warner´s statement [6] is quite understandable in the context in which CI was applied and researched at the time they published their work—predominantly in repetitive manufacturing, often in the final assembly lines of passenger car plants. Working in such a task environment usually means repeating the same task within a short time span (generally less than two minutes) according to tightly observed standard operating procedures. In this highly regimented and thoroughly organized working system, room for continuous improvement tends to be limited.

However, CI may work out differently in other, more hectic, task environments, as classic contingency theory would predict [12,13]. In dynamic task environments, a host of different products and services is provided, and few if any daily working processes lend themselves to be standardized. If many unforeseeable events are likely to occur, the work does not lend itself to be planned in minute detail. Here, there is likely to be a lack of managerial attention for standardized ways of working as the overall task environment does not lend itself to standardization, so that no standardization takes place even in processes where that might be possible. The result is that employees are faced with a constantly hectic environment. Where over-structuration becomes an issue for the quality of working life in stable task environments, under-structuration likely hampers employees in dynamic task environments.

A suitable sector to investigate the impact of CI programs on employees' jobs is health care. With few exceptions, working in health care settings is characterized by a considerable degree of dynamism. In addition, medical practitioners may take pride in improvising to solve issues [14], which sits at odds with finding structural solutions for those issues. Thus, many health care processes are left relatively unstructured leaving considerable room for autonomy yet also leading to high job demands. Implementing CI in a typical health care environment may thus have positive effects for care workers. Jimmerson [15] pointed out that confusion due to poor organization is a form of waste (with potentially detrimental effects for the quality of care), and applying CI is likely to improve the quality of organizing and therewith predictability and role clarity for care workers [16] (p. 244). To put it bluntly, CI might, and from a normative perspective should, put more order into the chaos.

Given that active employee participation is quintessential for CI to function properly, and that employees are unlikely to participate when expecting a negative impact on their jobs, research on how CI (rather than the broader notion of 'lean') impacts care workers is badly needed. Such research is scarce and contradictory. In a study at two hospital departments in Denmark, Hasle [17] found contrasting effects depending on the type of changes proposed in the CI program. In a longitudinal

study in a Dutch hospital department, Benders et al. [18] found only minor changes, although those found were improvements. In this case, only a limited number of employees had taken the lead in the improvement efforts and the measurements were just three months apart, which may explain that the changes were minor.

In line with earlier work [18], we used the job demands–resources model [19] as the framework to map job characteristics. 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 (job resources) reduce the effect of job demands or stimulate personal growth and development resulting in work engagement (see further below). We aim to add to the emerging literature on CI's impact on workers, by studying reported differences in employees' scores on job demands, job resources, burnout risk, and work engagement in a Flemish nursing home with a CI program and nine comparable Flemish homes and assessing to what extent these differences may be attributed to the CI program in use.

*Job Demands–Job Resources (JDR) Model*

We used the job demands–job resources (JDR) model [19]. This model states that a number of job demands and resources cause feelings of burnout and work engagement to occur. This model is widely used to assess employee outcomes both within and outside health care [18,20,21].

More specifically, we expect that CI leads to a more structured task environment, and thus in work that has less variability, higher predictability, and is possibly more repetitive (due to a more structured organization). Being allowed to suggest and/or develop changes is a way of organizing tasks and makes jobs more complete and autonomous, so higher scores are hypothesized on these items. As work is done more efficiently, time (and work) pressure will decrease. As more time may be available for contact with residents, the emotional workload may increase. In addition, cooperating to find new ways of working requires the provision of high-quality data and mutual support (both from peers and superiors). Regarding outcomes, the combined effect of the hypothesized differences in job demands and resources is that the burnout risk is lower and work engagement is higher. Over time, we should thus expect similar differences between nursing homes with and without CI, and we hypothesize such differences to exist, as summarized in Table 1.

**Table 1.** Hypotheses about the expected differences between nursing homes using continuous improvement (CI) and nursing homes without CI.

| | | **Without CI** |
|---|---|---|
| Job demands | Task repetitiveness | ↑ |
| | Predictability | ↑ |
| | Variability | ↓ |
| | Completeness | ↑ |
| | Time pressure | ↓ |
| | Emotional workload | ↑ |
| Job resources | Autonomy | ↑ |
| | Data provision | ↑ |
| | Social support | ↑ |
| | Organizing tasks | ↑ |
| Employee outcomes | Burnout risk | ↓ |
| | Engagement | ↓ |

Legend: "↑"/"↓" means that the variable is expected to be higher/lower in nursing homes with CI than in comparable homes without CI.

As shown in Table 1, these differences mean that overall job demands are expected to decrease, and job resources are expected to increase. Both developments are positive for employees; as Schaufeli and Bakker [22] would predict, we expect the burnout risk to decrease and work engagement to increase in a chaotic and unstructured organization.

## 2. Materials and Methods

### *2.1. Research Design*

Our study consisted of two major components. First, questionnaires were distributed in the focal nursing home, and the results were compared to data from nine equivalent homes. This cross-sectional set-up allowed us to analyze quantitatively the scores of the focal home and the reference group.

As cross-sectional studies do not allow for causal inferences, we also collected qualitative data. The qualitative data had two purposes. On the one hand, this helped to assess whether the quantitative differences were effectively attributable to the CI program or to context variables in the empirical setting [23]. On the other hand, qualitative data helped to deepen the understanding of the CI program and its sustainability. Both parts are described in more detail in Sections 2.3 and 2.4, respectively.

No ethics statement was deemed necessary as no residents were involved in the study and because all interviewees and respondents were well informed about the study and participated voluntarily. Interviewees signed an informed consent form.

### *2.2. Empirical Setting*

The nursing home applying CI, De Vierde Wand in Winterslag, is the only known organization in the sector applying CI intensively in Flanders (the Dutch speaking part of Belgium). It is privately owned, and it is managed by a couple with extensive nursing experience. They founded the home and had a new building constructed, which opened in 2012. It houses about 80 senior residents with varying care demands. This size is somewhat below the average of 142 residents and 92 care workers in Flanders. The nursing home employed 58 staff members at the time of our research. The CI program started in 2015. The staff are encouraged to assemble daily around the so-called improvement boards. These whiteboards facilitate the iterative process of continuous improvement. For ten to fifteen minutes per day, care workers gather around the improvement board to discuss and write down their suggestions. Such an improvement suggestion includes a description of the issue at hand, those responsible for following up the improvement process, (ultimately) the proposed solution, and the start and proposed end dates for every proposal. Once agreed upon, the solution is implemented in the form of a new standard operating procedure.

The data of De Vierde Wand were compared to those of employees in a reference group consisting of nine comparable care homes in Flanders. Two-tailed t-tests for continuous variables and chi-square tests for categorical variables (age, gender, educational level, function, seniority, contract type) showed that there were no significant differences (Table 2). However, a small difference was noticed with regard to age and a considerable difference in seniority. The latter is caused by the fact that De Vierde Wand only opened in 2012. Even though the absolute numbers of both residents and care workers were higher in the comparable care homes, there were no considerably relative care load differences per care worker ($\frac{number\ of\ residents}{number\ of\ care\ workers}$) (Table 3).

**Table 2.** Characteristics of care workers in both settings.

| | Without CI | With CI | T-/$\chi^2$-value | P-value |
|---|---|---|---|---|
| Age [M, (SD)] | 39,55 (13,57) | 35,53 (11,01) | T = −1,78 | * |
| Gender [N, (%)] | | | | |
| • Women | 452 (89,00) | 38 (95,00) | $\chi^2$ = 1,44 | |
| • Men | 55 (11,00) | 2 (5,00 ) | | |
| Education [N, (%)] | | | | |
| • Low skilled | 76 (15,00) | 4 (11,00) | $\chi^2$ = 10,87 | |
| • Medium skilled | 400 (78,00) | 31 (84,00) | | |
| • High skilled | 35 (7,00) | 2 (5,00) | | |
| Function type [N, (%)] | | | | |
| • Care takers | 303 (61,00) | 21 (51,00) | $\chi^2$ = 1,737 | |
| • Nurses | 76 (15,00) | 9 (22,00) | | |
| • Supporting staff | 23 (25,00) | 11 (23,00) | | |
| Seniority [M, (SD)] | 12,12 (10,10) | 3,53 (1,50) | T = −16,89 | *** |
| Contract type [N, (%)] | | | | |
| • Full time (+34h) | 155 (31,00) | 9 (22,00) | $\chi^2$= 1,40 | |
| • Part time (-34h) | 349 (69,00) | 32 (78,00) | | |

[1] *Note:* 'M' and 'SD' stand for 'mean' and 'standard deviation', respectively.* $p < 0.05$; **$p < 0.01$; *** $p < 0.001$.

**Table 3.** Care load in both settings.

| | Without CI | With CI |
|---|---|---|
| Number of residents [N] | 142 | 84 |
| Number of care workers [N] | 92 | 58 |
| Relative care load | 1,54 | 1,45 |

[1] *Note:* The $(\frac{number\ of\ residents}{number\ of\ care\ workers})$ indicates the relative care load per worker.

### 2.3. Survey Data

In total, 553 questionnaires were analyzed. In June 2017, 57 questionnaires were distributed in the nursing home applying CI and 41 were returned, yielding a response rate of 72 percent. The scores were compared to a reference group of nine other Flemish nursing homes that did not apply CI programs. The data for the reference group were extracted from an existing database using the same survey instrument. The homes in the reference group aimed to improve both performance and quality of working life by changing their organizational structures. To adequately test the scores, we compared the home applying CI with the zero measurement situation of the nine nursing homes, at the stage where they were about to change their organizational structure.

In this group, 891 surveys were sent out, and 512 employees filled out these surveys. A nonresponse analysis of the respondents in the nursing home in focus showed that there were no significant differences between the respondents and non-respondents in terms of education level, sex, contract type (fixed or temporary), and contract hours (full-time or part-time).

The scales of the NOVA-WEBA-FLASY survey [24] were used for measuring job demands and job resources with one exception [25]. The following job demands were included: task repetitiveness (two items, $\alpha = 0.61$), predictability (five items, $\alpha = 0.62$), variability (five items, $\alpha = 0.62$), completeness (five items; $\alpha = 0.68$), time pressure (four items, $\alpha = 0.70$), and emotional workload (three items, $\alpha = 0.63$). The included job resources were autonomy (nine items, $\alpha = 0.82$), data provision (four items, $\alpha = 0.85$), and organizing tasks (four items, $\alpha = 0.77$). The Leiden Quality of Work Questionnaire was used to assess the job resource 'social support' (eleven items, $\alpha = 0.70$) [25]. Two employee outcomes were measured: work engagement and burnout risk. Work engagement was measured with the shortened UBES-questionnaire [26]. Burnout risk was measured with four items ($\alpha = 0.83$) [27]. Apart from the work engagement scale, the responses for the scales were recorded on five-point scales (seven

items, $\alpha = 0.92$) with anchors ranging from 1, "completely disagree" to 5, "completely agree". The scale anchors for work engagement ranged from 1, "never" to 7, "always".

As we formulated unidirectional hypotheses (see Table 1), the data were analyzed by one-tailed t-tests. *p*-values under 0.05 were considered as significant. SAS version 9.4 was used to conduct the analyses.

### 2.4. Qualitative Data

Thirteen semi-structured interviews were held on site and numerous internal documents, including a CI evaluation report, were consulted [28]. Less formally, our interpretation was informed by the first author's regular visits to the focal home since December 2016.

In May 2017, six care takers, three nurses, and four supporting staff members voluntarily shared their thoughts about CI in relation to their job. The average interview duration was about 45 minutes. First, the care workers were asked an explorative open question (*"What are your experiences with CI in the nursing home?"*). This question meant to clarify the aspects that were spontaneously related to the quality of working life. Afterwards, more specific in-depth follow-up questions were asked concerning (the aspects of) the quality of working life (the respondent had not touched upon). During the interviews, care workers reflected both on (the correspondence of CI on) their current work situation and the work situation before the CI program/implementation. The transcripts of the interviews were coded and analyzed together with the report of an internal evaluation session of CI on October 19, 2016. On October 25, 2017, the results were presented in a public meeting at the nursing home in the presence of the staff, including many interviewees. This was meant to provide feedback to the staff and also to verify our interpretation of the results. This did not lead to changes in our findings.

## 3. Results

### 3.1. Survey Results

Table 4 summarizes our empirical findings.

**Table 4.** Differences between nursing homes without CI and De Vierde Wand.

| | | Without CI (SD) | With CI (SD) | P-value |
|---|---|---|---|---|
| Job demands | Task repetitiveness | 2,37 (0.88) | 2,48 (1.04) | |
| | Predictability | **2,91 (0.64)** | **3,14 (0.57)** | ** |
| | Variability | **2,93 (0.57)** | **2,73 (0.58)** | * |
| | Completeness | 3.25 (0.63) | 3,24 (0.77) | |
| | Time pressure | **3,32 (0.74)** | **2,70 (0.57)** | *** |
| | Emotional workload | 3,72 (0.73) | 3,55 (0,74) | |
| Job resources | Autonomy | **2.91 (0.77)** | **3,28 (0.63)** | ** |
| | Data provision | 3,44 (0.55) | 3,41 (0.41) | |
| | Social support | **3,11 (0.51)** | **2,80 (0.41)** | *** |
| | Organizing tasks | **3,29 (0.74)** | **3,76 (0.52)** | *** |
| Employee outcomes | Burnout risk | 2,88 (0.94) | 2,65 (1.17) | |
| | Work engagement | **4,06 (0.76)** | **5,31 (1.08)** | *** |

Legend: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Compared to their peers in the reference group, the care workers at CI nursing home had a significantly higher mean score for predictability and a significantly lower mean score for variability. In addition, they perceived significantly less time pressure. All these differences are as hypothesized. There were no significant changes in the remaining job demands, although the score on repetitiveness was in the hypothesized direction (higher in CI). Contrary to our hypothesis, the emotional workload was slightly lower in CI than in the reference group, although the difference was not statistically significant.

The picture for job resources is mixed: the mean scores for autonomy and organizing tasks were significantly higher in the CI nursing home than in the reference group, as hypothesized. The mean of data provision did not differ between the reference group and the CI nursing home. Social support was lower in CI than in the reference group, which is in contrast to the outlined hypothesis.

In terms of the work and health outcomes, both indicators developed in the expected direction, yet the difference was only significant for work engagement. The mean of burnout risk was slightly lower in CI than in the reference group. For work engagement, the mean was significantly higher in CI than in the reference group.

### *3.2. Qualitative Results*

In this section, we use the qualitative data to interpret the scores of the De Vierde Wand (DVW) staff if and where these differed significantly from those of employees in the reference group. In addition, the interviewees pointed at some phenomena that were relevant for CI's sustainability. These emergent phenomena are discussed separately. As shown in Table 4, the care workers in the focal home scored higher on predictability and lower on variability and time pressure. Predictability and variability are closely related. A good illustration is the 'wheelchair parking lot' (Figure 1).


**Figure 1.** Wheelchair parking area.

Care workers signaled that they often had to look for a resident's wheelchair when needed. There used to be no fixed spot for wheelchairs, so that nurses and visitors had to spend quite some time to search for the proper wheelchair. Especially visitors, who are relatively unfamiliar with the proper ways of working, might, intentionally or unintentionally, take the wrong wheelchair and leave it wherever last used, which reinforced the problem. When signaled, the care workers developed the parking area as shown in Figure 1, with clearly visualized and sufficiently large parking places that are personalized with number plates. This makes immediately clear, even to newcomers, whose wheelchair is, and more importantly: should be, left where. This substantially reduces searching time, and annoyance among care workers and visitors. This is but one out of numerous examples where more structured ways of working lead to more predictability and less variability.

Figure 2 shows the newly organized racks for incontinence diapers. They were grouped systematically so that caretakers quickly find the diapers they need, and do not needlessly loose time searching for the correct ones. In addition, lines mark when the stock is low, and when any particular type of diaper needs to be replenished. Again, predictability increased and variability (as a job demand) decreased. At the same time, there is a considerable variety of diapers available. In terms of job demands, the challenge is to reduce unwanted variation to be able to deal with the wanted variation

(see Reference [29]).Whilst overall care workers appreciate the more structured ways of working, it should also be noted that some individuals are critical about it. One issue is that the CI program itself involves additional work and thus increases variability, as a nurse with supervisory duties noted:

**Figure 2.** Reorganized storage for continence diapers.

> *Sometimes I find it's quite a lot what is written down. It is sometimes a chaos of ever changing things [ . . . ]. You have to remember many things about many persons (nurse, interview 2).*

Yet the following quote appears illustrative for how most care workers felt:

> *I feel I now have time for additional tasks. For instance, I just had time to talk to a resident for ten minutes. That's important to that person. If the work pressure is too high, I do not have time for that (care worker, interview 4).*

However, there are also concerns that the time gained by reducing unwanted variation is spent on indirect tasks, including CI activities, rather than on the residents themselves. This may explain why the emotional workload in the CI home was not higher than in the reference group, as hypothesized (see previous section). As far as job resources are concerned, autonomy and organizing tasks scored higher in the CI nursing home. This matched the findings from the interviews very well. Overall, the interviewees valued the opportunity to resolve issues they faced and to design working procedures themselves. They expressed appreciation that management entrusted them to do so and thought this lead to a reduction of stress and higher work engagement.

> *It is nice that management allows us to solve problems ourselves They pass the daily operations to us [..]. We know that issues will be resolved by CI and that we are not left with things to cope with. CI did increase my motivation somewhat, as it used to be the case that we simply had to deal with such matters (care worker, interview 4).*

In contrast to our hypothesis, data provision and social support did not differ significantly. The opinions about these dimensions differed. A nurse and proponent of CI declared that there now is an improved overview of issues at hand. However, a few care workers never attend the improvement sessions. More importantly, the newly devised ways of working are not always followed up and may easily dilute. Both issues frustrate proponents and may explain the low score for social support. CI in itself intensifies internal contacts, yet these contacts may be appreciated in completely opposite ways:

*I think particular colleagues get along with each other less well now, because issues are now being signaled and some [colleagues] feel addressed personally. But with others your relationship becomes closer, exactly because you can discuss with them directly (care worker, interview 7).*

*The only problem is, I find, that colleagues do not conform to the agreements that have been made [...] You get discouraged when other colleagues do not join as your efforts are not rewarded [ . . . ]. I enjoy putting in efforts, but one day more than the other [day], solely because some colleagues do not cooperate. Sometimes I think: 'Did I put in so much work for that?' (care worker, interview 1).*

A sensitive topic remains giving feedback, for instance about nonconformance to the agreed standard ways of working. Hesitance to give feedback, in order to preserve the apparent harmony, works nonconformance into the hands, leading to further frustration among CI proponents. Nevertheless, there is a consensus that the CI program made giving constructive feedback easier than was previously the case.

*In the past, you solved that issue by yourself but that was not always possible [ . . . ] In fact you need somebody to solve that with you, you need cooperation to resolve issues (care worker, interview 6).*

In line with this, it was pointed out that more issues were addressed and resolved amongst the care workers themselves than was previously the case. In addition, the issue at hand is more and more discussed, abstracting from the persons involved, following the adage 'naming, not blaming'. In sum, CI leads to more intensive peer-to-peer interaction, but this form of social support may be perceived negatively or positively. Regarding outcomes, the employees of the CI-using nursing home scored significantly higher in work engagement than their peers in the reference group. Whereas it seems unlikely that this difference may be attributed to CI alone, it does play a role:

*With my previous employer I was less motivated anyway, as I was member of a team that was not so supportive, where you could not communicate as well, or bring issues to the table [ . . . ]. So you were constantly confronted with the same issues and frustrations, because nothing was done about it. Here you can put those things on the agenda, tell what's on your mind and what might be done with that. This way we try to find a solution [ . . . ]. You learn from colleagues. They really help you. You're taken seriously. People flourish because of that (care worker, interview 3).*

## 4. Discussion

Our analysis showed some significant differences in the job demands, job resources, and work engagement between the home with CI and the nine homes in the reference group. The job demand predictability was higher, whereas the job demand task variation, time pressure, and work pressure were lower. Regarding job resources, autonomy and organizing tasks were higher, yet social support was lower. Finally, work engagement turned out to be substantially higher. All these findings are in line with our hypotheses, with the exception of social support. In addition, on five variables no significant differences were found for five hypotheses, although in two cases the change was in the expected direction.

We used qualitative data to interpret these quantitative findings, and more specifically to determine to what extent they can be attributed to the CI program in use. Although it has to be kept in mind that the results of any organization concept or practice depends on how it is used in its specific application context [30], the qualitative data lend support to the interpretation that the differences are indeed, to a significant extent, caused by the CI program. The scores on the job demands may be explained because over time, the accumulated effect of the implemented improvements is that working in the nursing home becomes more structured and predictable, and thus less hectic. Most interviewees appreciated the additional autonomy granted to them. The interviews also indicated an explanation for the lower score on social support found in the quantitative part: CI intensifies peer-to-peer communication and may bring issues into the open that were previously covered up. That may lead to tensions between

staff members. Overall, the interviewees are positive about the CI program. However, these data also disclosed part of the underlying mechanisms: the CI program itself can also be the cause of annoyance, not because employees find it problematic in itself, but because not all peers conform to the new working methods agreed upon. The limited adherence to standards may undermine a CI program's sustainability when its supporters become frustrated [31]. Different reactions of employees also turned out to be crucial for the success of CI in a Spanish manufacturing firm [2].

Seen in a broader perspective, our study's contribution to the literature is to stress the importance of looking at the task environment in which a CI program functions. So far, most research has been conducted in repetitive and often discrete manufacturing [2,9,32–34]. In such relatively stable task environments, the already relatively low job demands are likely to become even lower, thus making repetitive work even more repetitive. The increased autonomy may still have a motivational effect [3,9], yet it is an empirical effect on how both combine and impact work engagement and the risk on burnouts. In the more hectic task environment we researched, autonomy still scores higher and is valued positively by the staff involved, as are the lower job demands in the form of more structured, less hectic working processes. This positive effect has to our knowledge not yet been pointed out in the literature. Thus, we argue that the type of task environment is crucially important for how a CI program affects job demands. In stable task environments, the effect is negative, while in hectic environments, the opposite is the case. Arguably, many if not most task environments are very hectic, for instance in many health care settings. Here, CI programs may be beneficial to employees as was the case in the focal home of our study. In such task environments, 'structure please' holds. Taking that into account may improve the quality of working life and thus an employer's attractiveness on the labour market. In healthcare, the importance of the quality of working life can also be seen as a goal in itself as Bodenheimer and Sinsky [35] stressed, which helps to make jobs workable and sustainable. Positive consequences for the quality of working life may also be a third factor stimulating employees to participate in CI, next to the ease of participating and usefulness of participation [36]. Such positive effects can also be expected when CI is implemented with the explicit aim to improve employees' working conditions [34,37]. Lower job demands, and in this dynamic task environment, lower stress, as well as related higher work engagement, are of particular importance given the contemporary concerns about the consequences of nurses' high workloads [38–44].

Future research in dynamic task environments in and outside health care and manufacturing, can help to negate or support our findings. Such research should also address the potentially negative outcomes of a CI program and how to mitigate those. In our case, the lower score on social support, which we relate to more intensive peer-to-peer communication bringing sensitive topics into the open, calls for measures to improve the 'feedback environment' [45,46]. Whilst an improvement board is meant to identify issues without blaming individuals personally and as such serve as a neutral means of providing feedback, in practice particular employees may nevertheless feel attacked [47]. This too is a potential threat for the sustainability of a CI program.

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