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Towards a better understanding of the relationship between feedback and nurses' work engagement and burnout: A convergent mixed-methods study on nurses' attributions about the 'why' of feedback

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ABSTRACT

Background: Previous studies on the effects of providing feedback about quality improvement measures to nurses show mixed results and the factors explaining the variance in effects are not yet well-understood. One of the factors that could explain the variance in outcomes is how nurses perceive the feedback. It is not the feedback per se that influences nurses, and consequently their performance, but rather the way the feedback is perceived.
Objectives: This article aims to enhance our understanding of Human Resource attributions and employee engagement and burnout in a feedback environment. An in-depth study of nurses' attributions about the 'why' of feedback on quality measurements, and its relation to engagement and burnout, was performed.
Design and Methods: A convergent mixed-methods, multiple case study design was used. Evidence was drawn from four comparable surgical wards within three teaching hospitals in the Netherlands that volunteered to participate in this study. Nurses on each ward were provided with oral and written feedback on quality measurements every two weeks, over a four month period. After this period, an online survey was distributed to all the nurses (n = 184) on the four participating wards. Data were collected from 91 nurses. Parallel to the survey, individual, semi-structured face-to-face interviews were conducted with eight nurses and their ward manager in each ward, resulting in interview data from 32 nurses and four ward managers.
Results: Results show that nurses – both as a group and individually – make varying attributions about their managers' purpose in providing feedback on quality measurements. The feedback environment is associated to nurses' attributions and these attributions are related to nurses' burnout.
Conclusions: By showing that feedback on quality measurements can be attributed differently by nurses and that the feedback environment plays a role in this, the study provides an interesting mechanism for explaining how feedback is related to performance. Implications for theory, practice and future research are discussed.

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What is already known about the topic?

- Previous studies show variation in the association between feedback provision to nurses and outcomes including nurses' engagement and burnout and quality of care.
- Factors explaining this variation are not yet well-understood.

What this paper adds

- For outcomes of feedback it is important to consider the process of *how* feedback on quality measurements to nursing teams working in a hospital setting is experienced by the nurses.
- Nurses appear to have different attributions for the *same* (type of) feedback, which result in different associations with their engagement and burnout.
- A supportive feedback environment is positively related to nurses' attributions about the *why* of feedback provision.

1. Introduction

1.1. Background

Providing feedback to nursing teams is an important and frequently used strategy for improving clinical performance after quality measurements in hospital care (De Vos et al., 2009). Feedback on performance is generally used to draw healthcare workers attention to gaps between desired and actual practice in patient care, and can be defined as "*delivering information about clinical performance provided to patient populations over a specified period of time to professionals, practices or institutions, for the purpose of improving the team's or clinician's insight into the quality of care they provide and improving it when possible*" (Ivers et al., 2020). The mechanisms of how providing feedback on performance would lead to improved performance are too often ignored in the literature on healthcare quality improvement (Tuti et al., 2017). However, from behaviour change literature we know that feedback is a basic change method that relates to several theories on learning and goal setting (Kok et al., 2016), with the most likely mechanisms being: 1) that feedback on performance triggers positive change through creating *awareness* of suboptimal performance; and 2) that positive feedback in case of improved performance over time can be *rewarding* and thus stimulate further improvement.

Studies on the effects of feedback on performance generally indicate that this type of feedback renders small to moderate improvements, and that effects can be highly variable (Ivers et al., 2014, Tuti et al., 2017). However, factors explaining the variance in effects are not yet well-understood (Christina et al., 2016; Giesbers et al., 2016; Sykes et al., 2018). For instance, whereas Mead et al. (1997) gathered structured evidence that feedback is strongly associated to improved clinical practice, research by McCann et al. (2015) highlighted that professional discretion has been increasingly sundered by a narrow focus on "making the numbers" (ibid., p. 787), resulting in dysfunctional outcomes for workforce morale.

Such variation in findings may result from a lack of strong guiding theoretical frameworks to study the effects of feedback (Christina et al., 2016). In a systematic review of qualitative research on feedback in healthcare, Brown et al. (2019) developed a theory for explaining factors that influence feedback success. From this theory, it is evident that feedback is complex and that many variables and their mutual connections might play important roles. In particular, Brown et al. (2019) distinguished three main kinds of variables: feedback variables (content of feedback and way of delivery), recipient variables (healthcare professional characteristics and behavioural response) and context variables (organization characteristics, team characteristics, and implementation process). Within Brown et al.'s (2019) theoretical framework, this study focuses on feedback on quality measurements, like the rates of falls and the incidence of pressure ulcers (feedback variable), how this feedback is perceived by nurses (recipient variable) and the role of the feedback environment (context variable).

In order to provide structure and direction for the study (Christina et al., 2016), we posit that perceptions of feedback can be considered to affect nurses' behaviour and performance. In particular, it is not the feedback per se that influences nurses, and consequently their performance, but rather the way the feedback is perceived (e.g., Bowen and Ostroff, 2004; Wright and Nishii, 2013). Especially important for nurses' perceptions of feedback is the idea that nurses themselves have regarding the *why* of the feedback, *i.e.,* the attributions nurses make about their manager's purpose in providing feedback (Nishii et al., 2008). Although previously scholars already underlined the importance of attributions to understand the impact of such practices on employee outcomes (e.g., Peccei et al., 2013; Woodrow and Guest, 2014; Wright and Nishii, 2013), so far, little empirical research has been undertaken on the impact of attributions of managers' reasons for feedback practices on employee outcomes.

A second factor explaining nurses' perceptions of feedback on quality measurements is the feedback environment. The feedback environment, also called feedback culture (London and Smither, 2002), refers to the overall supportiveness for feedback in the workplace (Steelman et al., 2004). Previous research showed that the feedback environment influences how employees perceive feedback interventions (Dahling et al., 2012; Wells et al., 2007). A feedback environment wherein feedback is properly framed may impact how employees perceive the motivation for providing feedback (see also Ilgen and Davis, 2000; Wells et al., 2007). A focus on feedback environment entails including the relationship between (ward) managers and nurses as an important element of the feedback environment, because managers are considered to play a significant role influencing nurses' experiences and behaviour, and, therefore, on the quality of safety and care (Adriaenssens et al., 2017).

The aim of this study is to provide a better understanding of nurses' attributions about the reasons for providing them with feedback and the role of ward managers in creating a supportive feedback environment, in order to explain how providing feedback on quality measurements to nursing teams in a hospital setting is related to nurses' engagement and burnout. Following the reasoning underlying the Job Demands–Resources framework (Bakker and Demerouti, 2017; Bakker et al., 2014; Demerouti et al., 2001), the effects of the feedback intervention are measured in terms of two specific outcomes that are important in the light of nurses' performance; work engagement and burnout. Research emphasized the importance of the possible mediating role of engagement and burnout in the relationship between nursing work environments and outcomes (Laschinger and Leiter, 2006; Van Bogaert et al., 2013). Hence, our research question is: What is the impact of nurses' attributions of the manager's reasons for providing them with feedback on their engagement and burnout, and what is the role of feedback environment in this relationship?

1.2. Nurses' attributions about the 'why' of feedback

In times of change, employees will engage in explicit efforts of sense making (Weick et al., 2005). Since an intervention, such as implementing feedback on quality measurements to nursing teams, comprises a change process, we expect nurses to attempt to make sense of why this feedback is provided to them. This process of sense making is not about the truth and getting it right, but about the development of plausible 'stories'

(Weick et al., 2005). We expect that nurses may have different 'stories' or explanations regarding the reasons for providing them with feedback on quality measurements, depending upon their interpretations of the purpose of the manager who provided the feedback. Wells et al. (2007) recognize a similar difference between the intended and perceived purpose of performance monitoring to nurses, resulting in differing explanations for the purpose of the feedback. To better understand nurses' different explanations, this article builds on attribution theory and, more specifically, on the model of HR attributions developed by Nishii et al. (2008). We argue that this model is relevant, because it is applicable to all kinds of interventions for which employee perceptions (i.e., attributions) connote an important mechanism for explaining employee behavior. Specifically, the model by Nishii et al. (2008) provides a useful lens for mapping various attributions employees can make regarding interventions in a work context and explaining employees' reactions to those interventions (Alfes et al., 2020).

Research on attributions examines the causal explanations people make for their own and others' behaviours (Kelley, 1973). Inspired by the principles of attribution theory, Nishii et al. (2008) introduced their theoretical model of HR attributions. HR attributions are defined as causal explanations that employees make regarding management's purposes in using particular practices. Building on Koys' (1991) work, the model of Nishii et al. (2008) distinguishes between internal and external HR attributions. *Internal HR attributions* refer to the perception that HR practices are adopted due to factors for which management is responsible, or factors over which management has control. *External HR attributions* refer to the perception that HR practices are adopted because management *has* to, due to external constraints. Additionally, Nishii et al. (2008) drew a distinction between *internal commitment-focused* HR attributions that connote positive consequences for employees and *internal control-focused* HR attributions that connote negative consequences for employees.

The question that follows is: Which different internal commitment-focused, internal control-focused and external attributions do nurses make about their ward manager's purpose in providing feedback on quality measurements? First, nurses may believe that their manager's purpose is to support the nursing team in its quality improvement endeavour, to monitor the quality of care on the ward, and/or to improve quality-related outcomes for patients. This attribution is consistent with the broadly based idea that feedback allows professionals to become aware of their – potentially suboptimal - performance, which may encourage them to adjust their behaviour (Flottorp et al., 2010). Second, nurses may believe that it is their manager's purpose to make nurses' work more attractive and challenging. By informing nursing teams on the results from quality measurements, the nurses may become more involved in quality improvement possibly resulting into a more professional work environment. The above attributions are all related to internal, commitment-focused factors and we label them as *'Quality and nurse enhancement attributions'*.

Nurses can also attribute feedback provision on quality measurements to different internal, control-focused factors. For instance, nurses may believe that their manager's purpose is to make the nurses work harder or to give them extra work, herewith pushing them towards quality improvement objectives and/or cost reduction. We label this type of attributions as *'Cost reduction and nurse exploitation attributions'*.

Finally, nurses may attribute feedback provision on quality measurements to different external factors (e.g., healthcare inspectorates, budget, and pay for performance arrangements etc.) because the introduction of feedback on quality measurements within hospitals is often driven by healthcare reform programs, based on New Public Management ideology – a range of emerging social policy ideas that generally sought to combine the dynamism and customer orientation of the private sector with the service ethic that is traditionally inherent in the public sector (Hood, 1991). First, nurses may believe that their manager's purpose in providing feedback is to adhere to societal norms on transparency. Second, nurses may believe that their manager's purpose is to better adhere to the quality standards imposed on the hospital by organizations like the healthcare inspectorate or health insurers. We label these kinds of external attributions as *'Compliance attributions'*.

1.3. Nurses' attributions and their effects on nurses' engagement and burnout

In the Job Demands–Resources theoretical framework (Bakker and Demerouti, 2017; Bakker et al., 2014; Demerouti et al., 2001), work engagement and burnout are central variables explaining job performance. Work engagement and burnout are two individual outcome variables that represent possible positive and negative effects one's work and work organization can have on employees. Work engagement is characterized by a high level of energy and strong identification with one's job (Bakker et al., 2014). Burnout, on the other hand, is characterized by low levels of energy and poor identification with one's job (Bakker et al., 2014). These individual-level outcomes may have important consequences for individual employees as well as for organizations, such as health outcomes (e.g., depression), motivational outcomes (e.g., happiness), and job performance (e.g., customer or patient satisfaction or organizational citizenship behaviour) (Bakker et al., 2014).

Research on HR attributions has demonstrated that employees may make varying attributions for the same HR practices (Alfes et al., 2020), and that these attributions are differentially associated with employee outcomes, such as commitment, satisfaction, job strain and engagement (Alfes et al., 2020; Koys, 1991; Nishii et al., 2008, Van de Voorde and Beijer, 2015). Both Nishii et al. (2008) and Van de Voorde and Beijer (2015) found empirical support for a positive relationship between internal, commitment-focused attributions and employee outcomes, and for a negative relationship between internal, control-focused attributions and employee outcomes. Similarly, Alfes et al. (2020) found evidence for a positive relationship between HR well-being attributions, being employees' interpretation that the organization cares about them, and employee engagement. They also found a negative relationship between HR performance attributions, that is employees' interpretation that the organization focuses on highly efficient work, and employee engagement. Koys (1991) and Nishii et al. (2008), in their research on the effects of external HR attributions on commitment and satisfaction reported no significant results. According to Nishii et al. (2008), external attributions are unrelated to employee commitment and satisfaction because employees do not attribute meaningful dispositional explanations (*i.e.,* explanations in terms of internal factors which are specific to the management) to management's effort to comply with external constraints. However, employees may feel pressured by external requirements, without having any influence on these, and this may lead to a negative effect on employee attitudes and outcomes. However, the meta-study by Harvey et al. (2014) shows that external attributions are less influential for employees' attitudes and behaviours than internal attributions.

Relying on the above, we expect to find: (1) a positive relationship between 'Quality and nurse enhancement attributions of the why of feedback' and nurses' work engagement, and (2) a negative relationship between 'Cost reduction and nurse exploitation attributions' and nurses' work engagement. For burnout, these expectations are mirrored, i.e., a negative relationship with 'Quality and nurse enhancement attributions' and a positive relationship with

'Cost reduction and nurse exploitation attributions'. Our expectations regarding (3) the association between 'Compliance attributions' and nurses' engagement and burnout, is initially indifferent.

1.4. The influence of the feedback environment on nurses' attributions

Several scholars have underlined the importance of the organizational context to better understand differences in HR attributions (Nishii et al., 2008; Van de Voorde and Beijer, 2015). Accordingly, research about sense making has indicated that 'stories' tend to be seen as plausible when they tap into an existing organizational context (Weick et al., 2005). In this article, we investigate how the feedback environment set by the ward manager (the supervisor feedback environment, hereafter referred to as 'feedback environment') influences nurses' attributions about the manager's reasons for providing feedback on quality measurements. Following Steelman et al. (2004), the feedback environment is characterized by the perceived credibility of the supervisor as feedback source, the quality of the feedback, the tactfulness with which the feedback is provided, the extent to which favourable and unfavourable feedback is provided, the availability of feedback, and the extent to which feedback-seeking behaviour is promoted. A supportive feedback environment is one in which high-quality feedback is provided by the supervisor in a tactful and constructive manner. Dahling et al. (2012) found empirical support for the proposition that within a supportive feedback environment, employees will develop, among other things, a positive view of feedback, a lack of apprehension toward feedback, a belief that feedback is valuable, and a sense of accountability to act on the feedback that is provided.

We expect to find: (1) a positive relationship between a supportive feedback environment and attributions that connote positive consequences for nurses, being 'Quality and nurse enhancement attributions'. In addition, we assume: (2) a negative relationship between a supportive feedback environment and attributions that connote negative consequences for nurses, being 'Cost reduction and nurse exploitation attributions'. Lastly, we have no expectations regarding the direction of the relationship between feedback environment and compliance attributions.

Feedback environment may also be a moderator for the relationship between attributions that nurses make and their engagement and burnout. A positive feedback environment may enhance the positive effect of 'quality and nurse enhancement attributions' on work engagement, while it may decrease the positive effect of 'cost reduction and nurse exploitation attributions' on burnout. Fig. 1 depicts the conceptual framework, summarizing the expectations in this study.

2. Method

Our study employed a convergent mixed-methods, multiple case study design (Creswell, 2015), in which the qualitative data are used for interpreting the quantitative data (according to the convention of reporting of mixed-methods studies, this study is a 'QUANT-qual' study where qualitative data is used to interpret the results of the quantitative study (Creswell et al., 2011; Fetters and Freshwater, 2015). This design provided us with a more complete understanding than using either a quantitative or a qualitative design (Creswell, 2015; Östlund et al., 2011) and is increasingly recognized for improving our understanding of the HRM process (Woodrow and Guest, 2014). First, the design provided us with the opportunity to establish whether relationships between nurses' attributions, their engagement and burnout, and the feedback environment were statistically significant, and helped us to find an explanation of why such relationships occurred. Second, the design revealed the complexity of nurses' attributions and enabled a deeper understanding of them. Third, the design enabled us to cross-check our data about nurses' attributions about the reasons for providing them with feedback on quality measurements, enhancing our confidence in the validity and reliability of the outcomes.

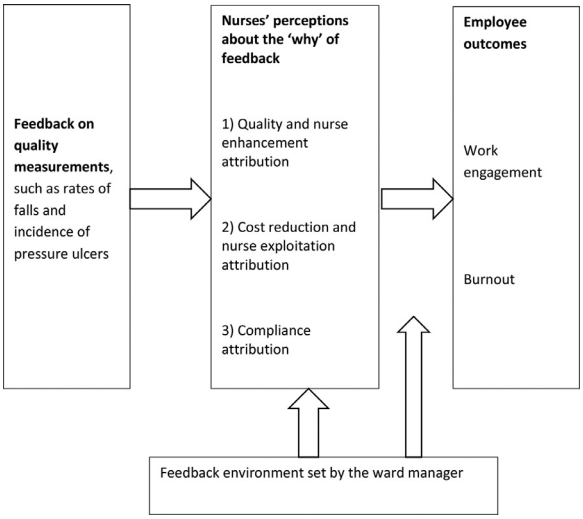

Fig. 1. Conceptual framework underlying the study.

Our study draws on evidence from four comparable hospital wards. The nurses on each ward were, regularly provided with feedback on quality measurements during a four months' period. In the following paragraphs, we will address the steps taken with regard to the ward selection, the feedback intervention, the quantitative and qualitative data collection and the data analyses.

2.1. Ward selection

For reasons of comparability, we included only surgical wards from one type of hospital, i.e., general, teaching hospitals in the Netherlands. To be able to properly study our feedback intervention, we included only wards where nurses were not provided with regular feedback on quality measurements before. Based on convenience sampling, we found four wards within three different hospitals that volunteered to participate in this study. These hospitals are all associated in a cooperation network to develop similar initiatives for improving the quality of health care they deliver. The feedback intervention that we studied was the result of a cooperative initiative in this network. The hospitals in our study were institutions with the number of beds ranging from 643 to 1070 and with the number of staff (fte) ranging from 2640 to 2915. The number of nurses working on the participating wards ranged from 29 to 69. The participating wards housed patients from different surgical, medical specialties. The first ward housed patients from neurosurgery and orthopaedics, the second ward housed patients from lung surgery, the third ward housed patients from general surgery, and the fourth ward housed patients from urology, plastic surgery and gynaecology.

2.2. Feedback intervention

Based on existing literature that evaluates the effects of different feedback characteristics, the first author developed a framework for the design of feedback on each participating ward. The framework implied that during a four months' period, the nurses on each ward were at least once every two weeks provided with oral and written feedback on quality measurements at team level,

linked to a clearly communicated target. The ward manager subsequently determined which quality measurements were selected, which target was set, how the quality measurements were carried out, and exactly when and how feedback was provided to the nurses. Examples of the selected quality measurements are the percentage of patients screened for the risk or existence of pressure ulcers at admission and the percentage of patients with self-reported pain scores greater than seven (on a scale of zero to ten). All quality measurements were established in the wards, but had not been used for providing feedback to nurses before. The nurses on the participating wards were informed about the feedback characteristics (quality measurements, source, format, frequency) by their ward manager, who also explained that the feedback was aimed at changing their work behaviour. Additionally, the manager informed the nurses about the scientific study into the effects of providing this kind of feedback. The feedback on quality measurements, as intended by the ward managers at the beginning of the four months' period, was comparable for the different wards.

To ensure that the feedback on quality measurements as intended matched the feedback as implemented (Woodrow and Guest, 2014; Wright and Nishii, 2013), the first author conducted several on-site observations during the four months' period of feedback provision. As intended, in all wards, the feedback was provided by the ward manager or a senior nurse. The written feedback was provided in the form of a poster in the team room (two wards) and/or as an attachment to a weekly or bi-weekly e-mail (three wards). In all wards, the content of the feedback contained the scores regarding the incidence of pressure ulcers and the percentages of patients who experienced severe pain. Other scores, included in the written feedback, include the percentage of patients screened for risk of malnutrition (three wards), frailty in elderly (two wards), delirium (one ward), or acute illness (one ward). With respect to the frequency of oral feedback, inconsistencies with the feedback as intended were found on two of the wards. The intention was to provide oral feedback on a bi-weekly basis. However, in two wards, oral feedback to the nurses on these wards, in the form of presentation and discussion during team meetings or debriefings, only happened occasionally, whereas in the other two wards this kind of oral feedback took place at least every two weeks.

2.3. Quantitative data collection and analysis

After the four months' period during which regular feedback on quality measurements was provided to the nurses, an online *survey* was distributed to all the nurses ($n = 184$) on the four participating wards. The ward managers together with the first author informed the nurses about the purpose of the study and motivated them to fill out the survey. Data were collected from 91 nurses, resulting in a response rate of 49.46%. The average age in our sample was 37.86 years (SD = 11.30) and 89.25% were females. The average tenure in the organization was 12.59 years, and the average tenure as a qualified nurse was 14.35 years. These characteristics of our sample are comparable to the characteristics of the BIG register in which all active qualified nurses in the Netherlands need to be registered (CIBG, 2021). In the BIG register, the average age is 43 years, the male/female ratio is 13/87 and the average tenure as a qualified nurse is 14 years. Therefore, it is assumed that the data set is representative of the sample population in the participating wards.

Measures For all measures, seven-point Likert scales were used, ranging from strongly disagree/never (1) to strongly agree/always (7).

- *Nurses' attributions.* Building on the model of Nishii et al. (2008), we developed a measure on nurses' attributions about their ward manager's purpose in providing feedback on quality measurements. We pilot-tested our measure in two rounds. In a first round, several practitioners and scholars were asked to provide feedback on the content and wording of the items. In a second round, data on the feedback measure was collected from 55 nurses who did not work on the wards included for this article. In the second round, some questions regarding the comprehensibility and completeness of our measure were added. This resulted in a valid and reliable measure that was used for this study[1].

For this study we validated the developed measure and conducted an exploratory factor analysis using varimax rotation for the items related to nurses' attributions. Three factors had Eigenvalues above one (with a total explained variance 61 per cent) and appeared to correspond with the typology of three attribution dimensions. The reliability for all dimensions was above the acceptable limit of 0.60 for exploratory research (Hair et al., 1998); (1) 'Quality and nurse enhancement attributions' ($\alpha = 0.72$; 4 items); (2) 'Cost reduction and nurse exploitation attributions' ($\alpha = 0.72$; 3 items); and (3) 'Compliance attributions' ($\alpha = 0.69$; 4 items). Example items for these dimensions respectively are: "I believe I am provided with feedback on quality measurements, because my ward manager aims to improve the quality of patient care", "I believe I am provided with feedback on quality measurements, because my ward manager wants to make nurses' work more attracting and challenging" (Quality and nurse enhancement attributions), "I believe I am provided with feedback on quality measurements, because my ward manager want to make the nurses work harder", "I believe I am provided with feedback on quality measurements, because my ward manager wants to give nurses extra work" (Cost reduction and nurse exploitation attributions) and "I believe I am provided with feedback on quality measurements because the hospital needs to adhere to quality standards by the healthcare inspectorate" (Compliance attributions). Quality and nurse enhancement attributions, and cost reduction and nurse exploitation attributions are grouped together since the distinction between these attributions was not supported by empirical data in previous research (Giesbers et al., 2014; Nishii et al., 2008).

- *Work engagement* comprises a positive, fulfilling work-related state of mind that is characterized by vigour, dedication, and absorption (Schaufeli and Bakker, 2003). In this study, work engagement was measured with the short version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli and Bakker, 2003). An item example was: "I am enthusiastic about my work". Cronbach's alpha for the UWES data in our study was 0.87.
- *Burnout* is described as a state of mental weariness that is characterized by cynicism, exhaustion and low professional efficacy (Schaufeli and Bakker, 2004). Burnout was measured with the Utrecht Burnout Scale (UBOS); the Dutch version of the Maslach Burnout Inventory-General Survey. An item example was: "I feel mentally exhausted by my work". Cronbach's alpha for the UBOS was 0.84 in our study.
- *Supervisor feedback environment.* Steelman et al. (2004) developed a measure for the feedback environment set by the supervisor: the Supervisor Feedback Environment Scale (SFES). We used the short version of the SFES by Rosen et al. (2006). This short version was translated into Dutch using the validated Dutch full version of the SFES of Anseel and Lievens (2007). The 18-item short version of the SFES characterizes the feedback environment by source credibility, feedback quality, feedback delivery, providing favourable feedback, providing unfavourable feedback, source availability and promoting feedback seeking. An item example was: "I regularly receive positive feedback

[1] The pilot study was published.

Table 1
Descriptive statistics of main variables.

	Mean	Std. deviation	Minimum	Maximum
Gender (ref. = male)	0.89	0.31	0	1
Age (years)	38.00	11.30	21	64
Tenure as a qualified nurse (years)	14.46	11.29	1	42
Tenure in current hospital (years)	12.72	10.23	1	41
Hours per week	27.81	6.50	10	36
Supervisor Feedback	5.15	0.83	1.18	6.72
Burnout	2.61	0.67	1.25	4.88
Work Engagement	5.53	0.75	3.78	7.00
Compliance attributions	5.79	0.79	3.75	7.00
Cost reduction and nurse exploitation attributions	3.11	1.21	1.00	6.00
Quality and nurse enhancement attributions	4.85	0.88	1.25	6.25

from my ward manager". Cronbach's alpha for the SFES was 0.90 in our study.

2.4. Quantitative analyses

To examine the differences between the different wards with regard to nurses' attributions about their ward manager's purpose in providing feedback, nurses' engagement, burnout and the feedback environment, an Oneway ANOVA test was conducted on all study variables, followed by a Scheffé post-hoc comparison, having the advantage of being conservative. The Scheffé post-hoc comparison between the means of all study variables on the different wards showed that none of the means were significantly different ($p > 0.05$). For this reason, we did not control for wards in further analyses. The relationship between nurses' attributions and nurses' engagement and burnout was examined using linear regression analysis. Linear regression analysis was also used to examine the relationship between the feedback environment and nurses' attributions. In addition, we analysed the possible moderating role of feedback environment in the relationship between nurses' attributions and engagement and burnout. However, none of the interactions were significant and we decided to present only the direct effects.

We used R-square and adjusted R-square to determine the amount of variation explained. The F statistic was used to test the significance of the model. The 5% level of significance was used to determine whether the null hypotheses were accepted or rejected.

We controlled for gender, age, tenure as a qualified nurse (measured in years) and tenure in current hospital (measured in years), as well as working hours per week (measured in the questionnaire as average working hours per week). Table 1 presents descriptive statistics of the main variables.

2.5. Qualitative data collection and analysis

After the four months' period during which regular feedback on quality measurements was provided to the nurses, individual, semi-structured face-to-face *interviews* were conducted by the first author with eight nurses and their ward manager in each ward. The nurses were selected by the ward manager from all the nurses working on one specific day that was indicated by the researcher. The researcher requested the ward manager to take into account the nurses' gender and age at this selection, in order to safeguard a representative sampling strategy. This resulted in a total of 32 nurses and four ward managers being interviewed. Out of the 32 nurses, 27 were females and five were males, and their average age was 32.93 years (SD = 11.66). Out of the four ward managers, three were females and one was male. The interviews were conducted at the workplace and covered three key areas: how respondents experienced the feedback on quality measurements; what they believed to be the effect of feedback; and the causal explanations regarding the ward manager's purpose in using feedback[2]. Interviews lasted between 10 and 40 minutes, with 20 minutes, on average. All participants consented to the interviews being recorded, and all full interviews were transcribed verbatim. Participant data was anonymised using two-digit codes. To analyse the data for this article, content analysis was conducted containing three cycles of coding, using Atlas.ti software package. Phase one focused on identifying attributions regarding nurses' perceptions about why feedback was being provided to them. Phase two focused on categorizing the found attributions via a deductive approach. This implied that the attributions, following Nishii et al. (2008) framework, were categorized as 'Quality and nurse enhancement attributions', 'Cost reduction and nurse exploitation attributions' or 'Compliance attributions'. Phase three consisted of identifying relationships between the different attributions and explanations for the findings from the quantitative data. Additionally, we formulated a grid to compare the data from the different wards and hospitals. For calibration purposes, two interviews were coded independently by the first three authors followed by a thorough discussion of its outcomes.

2.6. Ethical code

No formal ethical approval was needed for this study, because it was not within the scope of the Netherlands' Medical Research Involving Human Subjects Act (Central Committee on Research Involving Human Subjects, 2016). The researchers have consulted the "Ethical Principles of Psychologists and Code of Conduct" (APA, 2002) and have complied with the ethical guidelines of the institutions where the research was conducted. Informed consent from all participants has been obtained.

3. Results

3.1. Nurses' attributions about the 'why' of feedback

We used both the survey and interview data to explore the attributions nurses make about their ward manager's purpose in providing feedback on quality measurements. First, we examined the descriptive statistics and correlations displayed in Table 2. These results revealed that nurses as a group make varying attributions about their ward manager's purpose in providing feedback on quality measurements. The 'Compliance attributions', appeared to be most prevalent. Simultaneously, but to a lesser degree, 'Quality and nurse enhancement attributions' came forward from the survey data. The survey data showed a significant correlation between the 'Compliance attributions' and 'Quality and nurse enhancement attributions' (see Table 2). The 'Cost reduction and nurse exploitation attributions' did not come forward strongly from the survey

[2] This study builds mainly on the third key area. The first two were used for another study (published earlier).

Table 2
Pearson's r correlations based on the survey data ($N = 91$).

		α	Mean	SD	1	2	3	4	5
1	Quality and nurse enhancement attribution	0.72	4.85	0.88					
2	Cost reduction and nurse exploitation attribution	0.72	3.11	1.21	−0.03				
3	Compliance attribution	0.69	5.79	0.79	0.24*	0.13			
4	Feedback environment[a]	0.90	5.15	0.83	0.49**	−0.22*	0.13		
5	Work engagement	0.87	5.53	0.75	0.19*	0.01	0.00	0.15	
6	Burnout	0.84	2.61	0.67	−0.15	0.18*	0.25**	−0.24**	−0.59**

α = Cronbach's alpha.
*$p < 0.05$ ** $p < 0.01$ (1-tailed).
[a] higher scores indicate a more supportive feedback environment.

data. In general, nurses appeared not to believe that they were provided with feedback on quality measurements because their ward manager wanted to reduce costs and/or to make the nurses work harder.

Second, we examined the interview data to explore nurses' attributions about the 'why' of feedback. Comparable to the survey results, the interview data revealed that nurses make both 'Compliance attributions' and 'Quality and nurse enhancement attributions'. However, in contrast to the survey results, 'Quality and nurse enhancement attributions' came forward most strongly during the interviews. When looking more closely at nurses' 'Quality and nurse enhancement attributions', it seems that these nurses emphasized quality enhancement, and not nurse enhancement. Actually, during none of the interviews, the nurses attributed feedback on quality measurements to their manager's purpose to make nurses' work more attractive and challenging. Only a few nurses expressed attributions that could be categorized as 'Cost reduction and nurse exploitation attributions'. The interview excerpts below (including a reference to the participant's code, job and ward) capture the above-mentioned types of different attributions. These excerpts also illustrate how one nurse can make a diversity of attributions covering multiple attribution dimensions. For example, participant 23 described how she believed that feedback on quality measurements is aimed at both quality improvement - a 'Quality and nurse enhancement attribution' - and cost control - a 'Cost reduction and nurse exploitation attribution'.

Quality and nurse enhancement attribution: "I believe the aim was to bring these things [quality measurements] to the team's attention. Like 'guys, pay attention to this and that'. To prevent things. To provide better care." (participant 33, nurse, ward 2)

Cost reduction and nurse exploitation attribution: "The aim is mainly to improve the quality of care. […] It [feedback on quality measurements] is also a way to control your costs. Patients with pressure ulcers or bad malnutrition will cost much more than a patient who walks out the hospital whistling." (participant 23, nurse, ward 1)

Compliance attribution: "These [quality measurements] are important items a hospital is assessed on, so to say. I think that when they looked at how we were performing, it became clear that there is much room for improvement." (participant 02, nurse, ward 3)

During the interviews the majority of the nurses appeared to simultaneously make 'Compliance attributions' and 'Quality and nurse enhancement attributions', which explains the significant correlation from the survey data between these different attributions (see Table 2). The nurses had different explanations of how 'Compliance attributions' and 'Quality and nurse enhancement attributions' are linked. For example, the following nurse explained that she believed that compliance with external requirements is also in the interest of the quality of patient care:

"I believe it is related to each other: it [performing well on quality measurements] is an obligation from the government, but in the end you wouldn't do it if the patient has no interest in the matter." (participant 17, nurse, ward 4)

Another nurse described that the motives for providing feedback on quality measurements are different for hospital level and ward level:

"The aim is to make us aware of how we are performing on these quality measurements and what can be improved. […] This is important for the patients' welfare, but it is also important because hospital-wide we need to meet legal requirements. […] The higher management, who obviously do not work in direct patient care, […] they focus on what the figures are. While for us, it is more important how the patient is doing." (participant 08, nurse, ward 3)

3.2. Nurses' attributions and their association with nurses' engagement and burnout

We mainly used the survey data to examine the relationship between nurses' attributions and their engagement and burnout. The outcomes of the regression analysis (see Table 3) indicated that compliance attributions were associated with burnout ($\beta = 0.27$; $p = 0.013$) . In other words, when nurses believed that they were provided with feedback on quality measurements because the ward manager *had* to, due to external constraints (e.g., quality standards imposed on the hospital by the inspectorate), this is related to higher levels of burnout.

'Quality and nurse enhancement attributions' had very limited meaning for burnout (β = -0.09; $p = 0.46$). Regarding the 'Cost reduction and nurse exploitation attributions', the results showed some effect on burnout, but with a p-value above threshold ($\beta = 0.18$; $p = 0.11$). In general, the attributions have no important association with work engagement; the F-statistic of the model is also not significant (Adjusted R-square = 0.006, F[9,78]=1.06; $p > 0.05$).

The interview data was used to find an explanation for the positive relationship between 'Compliance attributions' and burnout (cynicism and exhaustion). It seems that nurses felt that external requirements put a heavy demand on their jobs. From this, it seems logical that when nurses believed they were provided with feedback on quality measurements due to external constraints, this led to cynicism and exhaustion. For instance, the following nurse described how she felt pressured by governmental requirements, without having any influence on them.

"The requirements of the inspectorate are obviously increasing. It's too bad that we have little influence on that. They insist on making it demonstrable, hence the quality measurements. The requirements are often too high, in my opinion. However that is something from the government, you cannot change that. […]

Table 3
Outcomes of regression analysis based on the survey data ($N = 91$).

	Burnout			Work engagement		
	B	β	95% confidence interval Lower / Upper	B	β	95% confidence interval Lower / Upper
Gender (ref.= male)	0.09	0.04	−0.42 / 0.59	0.43	0.19	−0.17 / 1.02
Age (years)	0.03	0.53	−0.08 / 0.07	−0.01	−0.11	−0.05 / 0.04
Tenure as a qualified nurse (years)	−0.05	−0.88*	−0.10 / −0.01	0.00	0.07	−0.05 / 0.06
Tenure in hospital (years)	0.03	0.50	−0.00 / 0.07	−0.01	−0.11	−0.05 / 0.03
Hours per week	0.01	0.10	−0.02 / 0.04	0.01	0.07	−0.02 / 0.04
Supervisor Feedback Environment	−0.16	−0.20	−0.35 / 0.03	0.02	0.018	−021 / 0.24
Quality and nurse enhancement attributions	−0.07	−0.09	−0.24 / 0.11	0.15	0.19	−0.05 / 0.16
Cost reduction and nurse exploitation attributions	0.10	0.18	−0.02 / 0.21	−0.00	−0.00	−0.14 / 0.14
Compliance attributions	0.22	0.27*	0.05 / 0.40	−0.05	−0.05	−0.25 / 0.16
Measures of model fit						
R^2		0.23			0.11	
Adjusted R^2		0.14			0.01	
F		2.55*			1.06	

B = unstandardised beta, β = standardised beta.
* $p < 0.05$.

Table 4
Outcomes of regression analysis based on the survey data ($N = 91$).

	Quality and nurse enhancement attributions			Cost reduction and nurse exploitation attributions			Compliance attributions		
	B	β	95% confidence interval Lower / Upper	B	β	95% confidence interval Lower / Upper	B	β	95% confidence interval Lower / Upper
Gender (ref. = male)	0.21	0.08	−0.43 / 0.85	−0.44	−0.12	−1.41 / 0.52	0.38	0.15	−0.28 / 1.04
Age (years)	−0.02	−0.25	−0.07 / 0.03	−0.01	−0.09	−0.08 / 0.07	−0.00	−0.01	−0.05 / 0.05
Tenure as a qualified nurse (years)	0.05	0.59	−0.01 / 0.10	0.04	0.37	−0.04 / 0.12	−0.01	−0.07	−0.06 / 0.05
Tenure in hospital (years)	−0.03	−0.28	−0.07 / 0.02	−0.06	−0.47	−0.12 / 0.01	0.01	0.09	−0.04 / 0.05
Hours per week	0.01	0.07	−0.02 / 0.04	−0.05	−0.27*	−0.10 / −0.00	−0.00	−0.01	−0.03 / 0.03
Supervisor Feedback Environment	0.53	0.50***	0.33 / 0.74	−0.29	−0.20	−0.60 / 0.02	0.11	0.11	−0.10 / 0.32
Measures of model fit									
R^2		0.29			0.13			0.05	
Adjusted R^2		0.24			0.07			0.00	
F		5.46***			2.03+			0.64	

B = unstandardised beta, β = standardised beta
* $p < 0.05$ *** $p < 0.001$.

Sometimes I believe they [the inspectorate] are going too far in what they want us to do." (participant 06, nurse, ward 3)

Another nurse reported on how governmental requirements are in conflict with her job satisfaction:

"I believe it [performing well on quality measurements] is partly obligatory by law. It is obligatory, so we have to pay attention to it. The hospital would be crazy to say "the minister can come up with anything, but we are not doing that." So, I believe providing feedback on these quality measurements comes from that direction. I guess it will also improve quality. However, when you look at my work situation, what has to be done on the job, it does not improve my job satisfaction. It is in conflict with that." (participant 24, nurse, ward 1)

3.3. The association between the feedback environment and nurses' attributions

Moreover, we used the survey data to examine the association between the feedback environment and nurses' attributions about the manager's reasons for providing them with feedback. The outcomes of the regression analysis (see Table 4), indicated that the expected relationships between the feedback environment and attributions were confirmed with our data. A supportive feedback environment set by the ward manager was positively related to 'Quality and nurse enhancement attributions' ($\beta = 0.50$, $p < 0.001$) and negatively related to nurses' 'Cost reduction and nurse exploitation attributions' ($\beta = -0.20$, $p = 0.062$), albeit with a p-value above the threshold. Feedback environment had limited meaning for 'Compliance attributions' ($\beta = 0.11$, $p = 0.32$) and the overall model did not explain much of the variation in 'Compliance attributions' (R-square = 0.05, F[6, 81] = 0.64, $p > 0.05$).

Our survey results showed a relationship between the feedback environment and nurses' attributions. However, the data from the interviews with the ward managers indicated that a third variable may be relevant in this relationship: the ward managers' actual purpose in providing feedback on quality measurements. It could be that nurses' attributions will more likely match their ward manager's motivations within a supportive feedback environment. None of the ward managers appeared to explicitly describe a reduction in costs as one of their purposes, in providing feedback on quality measurements. Ward managers' purposes in providing feedback was mainly to improve the quality of nursing care and/or to make nurses' work more attractive ('Quality and nurse enhancement') and as a 'side-effect' adhere to external constraints, as the following quote displays.

"The aim is to improve the quality of care, especially the improvements that are obliged. By providing feedback we can achieve rapid results. I'm in favour of that. I'm in favour of everything that leads to clarification for the nurses, for ourselves and clarifies the possibilities for improvements. […] It [feedback] showed we were performing very well. That's also nice

to hear for a change. That's not why you do this, but it's nice to see we are on the right track. And when you see you are not yet on the right track, to do something with that information. […] With these quality measurements we can say, as a hospital, we are performing well. I'm part of this hospital." (participant 10, ward manager, ward 4)

Another ward manager explained that her purpose in providing feedback on quality measurements was to improve the quality of care by making nurses aware of their low performance on the quality measurements.

"It's my opinion that people remained stuck in the belief that they were performing very well. At times, I got quite sick of that. Really, I think that's very extraordinary. [...] I wanted to make them aware of the fact that they were not performing that well. That this is the future. Providing good care is not only about pampering patients. We should also pay attention to patients in another way [referring to the quality measurements] which is better for the quality of care and for patient safety." (participant 19, ward manager, ward 1)

4. Discussion

The purpose of this study was to enhance our understanding of HR attributions, by exploring the attributions that nurses make about *why* feedback on quality measurements is provided to them, and whether these attributions are related to the nurses' engagement and burnout. Additionally, we explored the role of the feedback environment set by the ward manager on the strength of this relationship. Our study comprised a convergent mixed-methods approach, combining both quantitative and qualitative methods, following a feedback intervention in four hospital wards.

Our findings indicate that nurses as a group and individually, make varying attributions for the same feedback on quality measurements, and that these attributions appear to be differently associated with burnout. 'Quality and nurse enhancement attributions', i.e., nurses' perceptions that feedback is provided to them in order to improve quality of patient care and/or their well-being, are negatively associated with burnout. 'Compliance attributions', i.e., nurses' perceptions that the feedback is provided to them in order to comply with external regulations, are positively associated with burnout. The latter relationship may be explained by the fact that nurses experience governmental requirements as job demands. Many nurses appear to simultaneously make 'Quality and nurse enhancement attributions' and 'Compliance attributions', for which they have different rationales. Additionally, our findings show that a supportive feedback environment is positively associated with 'Quality and nurse enhancement attributions' and negatively with 'Cost reduction and nurse exploitation attributions' (nurses' perceptions that the feedback is provided to them in order to save costs and make them work harder).

4.1. Theoretical implications

Responding to the call for more scholarly knowledge in this field by Tuti et al. (2017), our findings shed light on the importance of the process of *how* feedback on quality measurements to nursing teams working in a hospital setting is experienced by the nurses. More specifically, following Brown et al.'s (2019) framework regarding important factors that influence feedback success, we have studied how feedback on quality measurements (feedback variable) is attributed by nurses (recipient variable) within its feedback environment (context variable), and how this feedback is associated with nurses' engagement and burnout. First, our findings suggest that it is relevant to consider attribution processes in order to better understand the effects of feedback interventions (Christina et al., 2016). Employees can have different attributions for the *same* (type of) feedback, which may result in different associations with their engagement and burnout. Our study also confirms that the distinction between internal commitment-focused, internal control-focused and external attributions is relevant and provides a good starting-point for more elaborate research on attributions about feedback. In contrast to past research done by Koys (1991) and Nishii et al. (2008), our findings indicate that external attributions can be significantly and positively associated with employee burnout. Moreover, the feedback environment does not moderate this effect, i.e., the feedback environment does not weaken the positive relationship between external quality control and burnout. In our view, this external attribution may be mediated by feelings of limited personal control and of helplessness as suggested by the research of Sparr and Sonnentag (2008). This outcome indicates that personal control and limited helplessness at work is an important resource in an advantageous feedback environment. We suggest that future research on attributions should therefore take the important variables of personal control and helplessness into account.

Our study also shows that an individual employee can make multiple attributions related to its different dimensions for the same (type of) feedback. For example, our findings show that an individual nurse, at the same time, believed that she was provided with feedback on quality measurements both because the hospital needed to adhere to quality standards imposed by the healthcare inspectorate, and because her ward manager wanted to improve the quality of patient care. Although the possibility of multiple attributions was left open in previous research on attributions (see for instance, Nishii et al., 2008; Van de Voorde and Beijer, 2015), it has not been explicitly addressed in previous scholarly work. Moreover, the possible effects of multiple attributions may interact. The outcomes of our study confirm that a better understanding of multiple attributions and their associations with employee engagement and burnout provides an interesting avenue for future research.

Second, our findings confirm that the context variable 'feedback environment' is related to employees' attributions about the reasons for providing them with feedback. More specifically, our findings indicate that the relationship between a supportive feedback environment and nurses' attributions may be partially explained by the ward manager's actual purpose in providing feedback on quality measurements. An interesting possibility that should be further examined, is that nurses' attributions are more likely to match their ward manager's purpose within a supportive feedback environment.

By showing that the process of implementing feedback on quality measurements can be attributed differently by (groups of) individual nurses, and that the feedback environment and the manager's role therein, play a role in this, our study sheds more light on the mechanism explaining the effects of feedback on performance (Ivers et al., 2014; Tuti et al., 2017). Future research in this domain should focus on identifying additional individual variables that possibly influence employees' attributions about the motivation for providing them with feedback. More research is needed to better understand the influence of nurses' feedback orientation, or nurses' individual propensity to seek and utilize feedback. Empirical work by Gabriel et al. (2014) has shown that a supportive feedback environment is beneficial for employees that are favourably oriented towards feedback, yet can be harmful for employees that do not necessarily want to receive or use feedback. Additionally, the kind of feedback (delivery) that is used may influence nurses' perceptions, as literature has suggested that supportive feedback, rather than punitive feedback, positively influences the effects of feedback interventions (Christina et al., 2016). Finally, an

interesting avenue for future studies would be to look at individuals' past histories because this can strongly influence their perceptions of a focal phenomenon (Wright and Nishii, 2013). For example, nurses' past experiences with quality measurements can influence the attributions they make about feedback on quality measurements.

4.2. Practical implications

At a general level, our findings imply that nurses' attributions should be taken into account by ward managers. According to our results, ward managers cannot expect that feedback on quality measurements will have a consistent positive impact on nurses' engagement or a consistent negative effect on burnout. We conclude that the attributions nurses make about *why* feedback is provided to them should be taken into account. Although it seems logical that nurses will turn to their ward manager for explanations about why certain feedback is provided to them, our findings show that nurses do not by definition take over their ward manager's purpose in providing feedback on quality measurements. In line with HRM process theory (Bowen and Ostroff, 2004; Wright and Nishii, 2013), we believe that the discrepancy between nurses' and their ward manager's attributions represents a communication challenge. Ward managers should pay more attention to unambiguous and salient communication on their purpose in providing feedback on quality measurements. Besides aligning nurses' and their ward manager's attributions, a more open communication would also unveil nurses' undesired attributions ('Compliance attributions') so that they can subsequently be addressed by management. Moreover, our findings suggest that ward managers can develop a supportive feedback environment that is associated with 'Quality and nurse enhancement attributions'.

4.3. Limitations and future research

This study has several limitations. First, the focus on one very specific type of feedback on quality measurements to nursing teams can be seen as both a strength and a weakness. It can be considered as a strength, because it adds detail and refinement to our understanding of attributions and it allows for a fine-grained analysis of this particular feedback intervention which currently is very relevant within the hospital context. However, it can also be seen as a weakness because the results cannot necessarily be generalized to other types of feedback or feedback in general.

Second, this study does not show whether the feedback on quality measurements, as a means to improve the quality of patient care, is actually related to better quality of patient care. This study only indicates how the feedback is related to the nurses' engagement and burnout. However, engagement and burnout are indicators for nurse well-being, which is considered crucial for effective, efficient and high-quality care (Franco et al., 2002). Future (longitudinal) research can test this mediating role of nurses' engagement and burnout in the relationship between feedback on quality measurements and quality of patient care.

Third, as the measure on nurses' attributions about the reasons for providing them with feedback on quality measurements was newly created there might be some psychometric aspects that deserve further attention. Although we carefully took all the appropriate steps to develop and validate our measure, it is only after repeated use that researchers may be confident that the scale adequately captures nurses' attributions about the 'why' of feedback on quality measurements, and safely conclude about its reliability.

Fourth, all measures were assessed at the same time, making the causal ordering among them ambiguous. Therefore, it would be interesting to repeat this study, using a longitudinal, preferably a multi-wave design, to gain more specific information about the stability/change of the variables and causal relationships between the variables (Taris and Kompier, 2003).

Fifth, a remark regarding the ward selection has to be made. Wards were included if the ward manager volunteered to participate in our study. These ward managers may have more positive feelings, that is to say, may be more prone towards feedback on quality measurements, than other ward managers. This must be borne in mind when considering the results, although, in our opinion, it does not make them less valid.

Finally, in contrast to what we aimed for, our observations showed that the feedback interventions after implementation on the different wards were not entirely the same. Although our results indicate that this variance had no significant effect on the study variables, future research could further explore how differences in the feedback intervention influence nurses' attributions about the manager's reasons for providing feedback on quality measurements. An additional limitation here is that managers' attributes, such as professional background, were not taken into account in this study. For establishing the influence of source credibility on the perception of the feedback (Steelman et al., 2004), this would be an interesting avenue for further research.

Despite these limitations, we believe that the results of this study provide important insights into the underlying process by which feedback on quality measurements to nursing teams affect employee engagement and burnout. This study provides a useful starting point for future efforts in a similar vein to explore the underlying process by which feedback interventions in healthcare become reflected in employee engagement and burnout.

CRediT author statement

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Ethical approval

No formal ethical approval needed.

Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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