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Performance management in context: Formative cross-functional performance monitoring for improvement and the mediating role of relational coordination in hospitals

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Performance management in context: Formative cross-functional performance monitoring for improvement and the mediating role of relational coordination in hospitals

Abstract

Recent research suggests that to fully realise its potential, performance management should be bespoke to the social context in which it operates. Here we analyse factors supporting the use of performance data for improvement. The study purposively examines a developmentally oriented performance management system with cross-functional goals. We suggest that these system characteristics are significant in interdependent work contexts, such as healthcare. We propose and test that (a) relational coordination helps employees work effectively to resolve issues identified through formative and cross-functional performance monitoring and (b) that this contributes to better outcomes for both employees and patients. Based on survey data from management and care providers across Irish acute hospitals, the study found that perceptions of relational coordination mediated the link between formative cross-functional performance monitoring and employee outcomes and partially mediated the link between formative cross-functional performance monitoring and patient care respectively. Our findings signal potential for a more contextually driven and interdependent approach to the alignment of management and human resource management practices. While relational coordination is important in healthcare, we also note potential to identify other social drivers supporting productive responses to performance monitoring in different contexts.

Keywords: • performance monitoring • formative • cross-functional • relational coordination • hospital • context •

Performance management in context: Formative cross-functional performance monitoring for improvement and the mediating role of relational coordination in hospitals

Introduction

Hospitals face increasing pressure to contain costs while improving the quality of the care they provide (Townsend, Lawrence, and Wilkinson, 2013). This has led to the widespread adoption of organisational performance monitoring systems (OPMS), premised on the identification and monitoring of key healthcare performance indicators (Bloom, Propper, Seiler, and Van Reenen 2010; Freeman 2002). Nationally, OPMS may be used for evaluating quality and verifying compliance against targets and standards. At the hospital level that is our focus, organisations can use information from OPMS formatively, as a basis for improvement interventions (Freeman 2002). The Quality Indicator (QI) Project is a large scale example of this, supporting more than 1,100 participating hospitals to use indicators of care (such as unscheduled returns to a special care unit) to deliver improvement, by understanding the implications of the data (Kazandjian, Thomson, Law, and Waldron 1996). This is important as, while quality is underpinned by performance monitoring and the routine availability of performance information (McGlynn et al. 2003), performance data can ascertain the potential need for improvement, without identifying the action required to achieve it (Freeman 2002). As Freeman (2002) suggests, this points to a potential vacuum between the identification of performance problems and their resolution.

To bridge this gap, work contexts characterised by interdependent tasks require high-quality communication and problem-solving among stakeholders, to identify solutions to performance problems (Kazandjian et al. 1996). In healthcare, this is

evident in the concept of ‘relational coordination’ (Gittell, Weinberg, Pfefferle, and Bishop 2008). However, there is little understanding of the organisational characteristics that support employees’ coordination activities (McIntosh et al. 2014). This is reflected in calls to broaden the examination of HR practices influencing organisational performance, to encompass wider organisational processes (Guest 2011; Boxall 2012), and the relationship between operational performance management systems (OPMS) and people management practices in particular (Garman et al. 2011). This study addresses a specific call to do so, in the context of organisational-level performance in hospitals (Townsend et al. 2013). It also responds to a call to take account of the context in which management practices are applied (Haines and St-Onge 2012).

The structure of the paper is as follows. The next section details our conceptual framework and hypotheses. We focus on organisational performance monitoring as this provides information about firm-level performance on key indicators. We then identify relational coordination as a contextually relevant mechanism supporting the performance of multidisciplinary healthcare providers in pluralistic hospital environments (c.f. Gittell et al. 2008). Both performance monitoring and relational coordination share the common objective of enhancing service quality. Crucially we propose that the way in which performance monitoring is carried out can either undermine or strengthen the high-quality communication and problem-solving orientation inherent in relational coordination (Gittell 2000a, 2000b; Gittell, Seidner, and Wimbush 2010). First, the logic of performance management can serve either formative (i.e. developmental) or punitive/incentivising (i.e. evaluative) functions (Pollitt 2011; 2013; Townley 1997). Using data formatively can facilitate organisational learning and improvement (Pollitt 2013). Second, a cross-functional orientation can

strengthen coordination in work contexts where tasks are interdependent, while a functional or siloed orientation can weaken coordination (Gittell 2000b). Thus, our over-arching hypothesis is that performance monitoring that is developmental will prompt a problem-solving, improvement orientation. Where performance monitoring is also cross-functional in nature we argue that it will support improvement through its influence on relational coordination, which helps interdependent employees to work effectively to resolve identified issues. The second section of the paper provides an overview of the methods adopted to examine our hypotheses. The third section details our findings, which raise potential theoretical implications regarding the systematic integration of organisational performance practices and people management processes. The final section discusses practice implications within and beyond healthcare, and presents our conclusions.

A Systems Approach to Addressing Performance Problems

The Institute of Medicine's (IOM) seminal report 'To err is human' (1999) explicates that, even in high-quality healthcare environments, mistakes will happen. This led to recognition that the identification and management of performance problems is – and is likely to remain - an inherent part of healthcare delivery. Although ranges vary, approximately 10 percent of hospital inpatients are harmed during treatment (de Vries, Ramrattan, Smorenburg, Gouma, and Boermeester 2008). This can take a variety of forms including diagnostic errors or delays, inappropriate treatment or care delivery, failure to follow-up, or system related harms resulting from equipment or communication failure (IOM 1999). Progress is evident, with a 17% reduction in rates of hospital-acquired conditions between 2010 and 2013 (falling from 145 to 121 per 1,000 hospital discharges), leading to 1.3 million fewer harms to patients in the US

(AHRQ 2015). While there are no such aggregated patient harm estimates for Ireland, a recent report by the Medical Council (2015) notes that there was a 46% increase in complaints about the quality of patient care in 2012 compared to 2008. Evidence suggests that reductions in harm are supported by performance monitoring and the routine availability of performance information to inform improvement (McGlynn et al. 2003).

Organisational performance management systems (OPMS), often referred to as management control systems, aim to measure and manage organisational performance. The cornerstone of these systems is performance monitoring of key indicators at unit, process and/or organisational level. As noted, performance monitoring can serve as a formative mechanism for internal quality improvement or as an evaluative mechanism for public accountability and verification (Freeman 2002). Additional logics for its use include symbolism ('we care about patients'), resourcing ('we are in crisis and need more resources' or 'we have performed extremely well, reward our efforts') and individual career development (Pollitt 2013). Many public sector contexts, particularly since the inception of New Public Management (NPM), have seen the introduction of performance targets, indicators and league tables identified through performance monitoring (Ter Bogt and Scapens 2012). However, with the introduction of performance monitoring in the health service in Ireland, there was no intention to incorporate either public 'naming and shaming' or to link performance assessment to either sanctions or rewards at either the organisational or individual level. This is important as Gittel's (2000b, p. 3-4) findings in an airline context suggest that where penalties arise as a result of organisational performance monitoring systems, then individuals will 'look out for themselves' or engage in 'finger pointing' rather than focusing on the goals of the organisation. This distinction

resonates with tensions within the HR literature regarding the pursuit of ‘control’ and ‘commitment’ HR strategies (e.g. Reed 2010), and calls to separate data for improvement from data for evaluation (Haraden and Leitch 2011). Thus the formative focus of the Irish system is important.

The information generated from performance monitoring is useful to managers and often serves as the basis for operational interventions aimed at enhancing organisational structures and processes, as well as productive patterns of behaviour among employees (Otley 1999). Indeed, rigorous monitoring of performance data to identify opportunities for improvement has been identified as one of the essential elements of good management (Bloom, Sadun, and Van Reenen 2012). Like Kazandjian et al. (1996), Bloom et al. (2012) note particular potential for performance monitoring to enhance outcomes in hospitals and give the example of the Virginia Mason Medical Center in Seattle which, following the introduction of performance monitoring, benefited from reduced waiting times for breast clinic patients, as well as enhanced employee morale. Thus, research regarding performance management practices and their relationship with organisational performance indicators and effectiveness is not a new phenomenon (Biron, Farndale, and Paauwe 2011). However, there is increasing recognition that performance management is affected both by practices, and the context in which they are applied (Haines and St-Onge 2012). This has led some to suggest that for performance management to truly realise its potential it must be bespoke to the context (Mellahi, Frynas, and Collings 2016; Vo and Stanton 2011) or institutional constraints in which it operates (Sekiguchi 2013). In particular, Haines and St-Onge (2012) suggest that performance management operates within a social context, which largely determines its effectiveness, and call for research to investigate this. A key characteristic of the social context of healthcare is its multi-

professional milieu. Professional groups coexist, and may operate in distinct communities of practice, characterised by strong social and cognitive boundaries that impede interaction and innovation (Ferlie, Fitzgerald, Wood, and Hawkins 2005). Indeed, these divisions are reflected in organisational structures, with professions having separate lines of reporting (McDermott, Fitzgerald, VanGestel and Keating 2015) – e.g. with a medical director and medical managers overseeing doctors, and a similar parallel structure for nurses and allied health professionals. As a result, Ferlie et al. (2005) note the importance of interventions that undermine the default condition of unidisciplinary professional practice in healthcare, as work is interdependent and problems often require input from multiple professionals. Previous research has noted potential for functional accountability to weaken coordination between interdependent colleagues (Gittell 2000b). It is for this reason that the cross-functional design of the Irish performance monitoring system is of interest, as it has scope to identify cross-professional responsibilities and prompt coordination.

Bringing together these two streams of literature, we propose that where organisational performance monitoring is formative and cross-functional in nature, interaction between relevant stakeholders, with a problem-solving rather than blame orientation is more likely to occur, and the outcomes for both patients and employees should be mutually beneficial. On this basis, we hypothesise that:

Hypothesis 1: Perceived levels of formative cross-functional performance monitoring will be positively related to perceptions about (a) patient care and (b) employee outcomes.

Relational coordination and improvement

Previous research has noted potential for organisational performance management systems to enhance dialogue among relevant organisational constituencies about important goals, and focus employee behaviour on their attainment (De Haas and Kleingeld 1999). For example, research by Kazandjian et al. (1996) showed that the use of quality indicators can prompt and provide opportunities for cross-professional debate regarding clinical practice (e.g. greater discretion in nurses' decisions to remove unused intravenous cannulae) and ultimately improve patient safety (e.g. less infections) and care (e.g. greater patient comfort). In consequence, we consider the concept of relational coordination as a contextually relevant social driver of performance (see McAlearney, Garman, Song, McHugh, Robbins and Harrison 2011). Coordination refers to the management of interdependencies among tasks. In healthcare, conceptions of coordination have moved from a focus on information processing and sharing, towards a focus on coordination as a relational process, involving shared understandings of work and the work context among those who perform interdependent tasks (Gittell et al. 2008). Specifically, the concept of relational coordination suggests that:

‘The effectiveness of coordination is determined by the quality of communication among participants in a work process (for example its frequency, timeliness, accuracy and focus on problem solving rather than on blaming), which depends on the quality of their underlying relationships, particularly the extent to which they have shared goals, shared knowledge and mutual respect’ (Gittell et al. 2008, p. 155).

Relational coordination is a multilevel (Gittell et al. 2008) and unbounded construct that can be used within and beyond the scope of specific well defined teams, at multiple levels of the organisation (e.g. individual, group and the hospital level

considered here), and across inter-organisational boundaries (Gittell, Beswick, Goldmann, and Wallack 2015). It is regarded as particularly effective in work contexts characterized by uncertainty, interdependency and time-constraints (Gittell et al. 2008). Uncertainty means that the timing of, and manner in which employees need to work with others is subject to change (e.g. due to differences between patients). Task interdependence means that employees need to work in concert with others to achieve service goals. Understanding task interdependence enables employees to act with respect to the overall work process, rather than solely focusing on personal areas of responsibility (Gittell 2002). In turn, shared goals allow employees to respect and value the contributions of others and engage in problem-solving behaviors (Gittell et al. 2008).

Relational coordination has been found to improve patient and employee, as well as quality and efficiency outcomes (Gittell 2012). Patient outcomes linked to higher levels of relational coordination include improved quality of care and reduced length of hospital stay (Gittell et al. 2010); reduced postoperative pain (Gittell et al. 2000c); frequency of medication errors, hospital acquired infections and patient and family complaints (Havens, Vasey, Gittell, and Lin 2010); and improved quality of life in nursing homes (Gittell et al. 2008). Regarding employee outcomes, Gittell et al. (2008) argue that relational coordination is a form of social capital, making it easier to access role-related resources, and supporting personal wellbeing. Reflecting this, relational coordination is positively associated with employee job satisfaction (Gittell et al. 2008). However, employee outcomes have received less attention in the literature than quality and efficiency outcomes – and Gittell (2012, p. 31) calls for research ‘to extend the theorised outcomes of relational coordination beyond outcomes for the organisation and its customers to include outcomes for workers as well’. To address

this gap in the literature, we consider the relationship between performance monitoring, relational coordination and outcomes that incorporate a focus on employee quality, commitment and contribution (Guest, Michie, Sheehan, Conway, and Metochi 2000). This is important because hospital employees represent both a key service cost, and an important driver of service quality (Bartram and Dowling 2013).

Linking performance monitoring, relational coordination and outcomes: Towards a mediated model

In response to Haines and St-Onge (2012) we take account of performance management practices and the social context in which they are applied. Performance management has yielded mixed effects in healthcare (Pollitt, Harrison, Dowswell, Jerak-Zuiderent and Bal, 2010). This has been attributed to its potential to undermine the collective pursuit of shared goals (Walburg, 2006), despite recognised potential for OPMS to support goal-oriented dialogue and behaviour (De Haas and Kleingeld 1999). Recognising the need for fit between system design and social context, we propose that cross functional performance monitoring (bespoke practices) together with the mediating effects of relational coordination (a supportive social context) offer potential to realise the benefits of performance management in hospitals. This approach addresses critique by Posthuma and Campion (2008), who decry emphasis on performance management system design in isolation.

Performance monitoring and relational coordination are distinct processes for improving organisational performance in healthcare. Performance monitoring systems focus on generating information about performance as a basis for operational improvement. Such systems can, however, have unanticipated negative consequences (e.g. failure to discuss and learn; misidentification of the problem; a focus on blaming

others (see Deming 1986), and are not an end in themselves. In particular, Deming's (1986) seminal work recognises the need for clarity regarding what needs improvement, as well as managers and teams giving their best efforts to deliver this. Thus, early on, he drew attention to the interrelationship between performance management processes and the efforts of employees. Relatedly, previous research has established associations between the breakdown of team processes such as coordination and communication and adverse events and patient harm (LePine, Piccolo, Jackson, Mathieu, and Saul 2008; Schmutz and Manser 2013). Yet, little research has considered the organizational reasons why team processes step-up or break down. Accordingly, we consider relational coordination as a mechanism determining the quality of care providers' corrective action, amending relevant aspects of their personal practice and the processes used to deliver care, on the basis of information provided by performance monitoring. However, performance monitoring that has a punitive orientation may serve to undermine rather than enhance relational coordination (Gittell 2000a). This is because relational coordination has an inherently constructive orientation. While frequency, timeliness and accuracy are characteristics of communication, a focus on avoiding blame refers to how communication is applied among participants in a work process. Avoiding blame enables problem-solving and provides the opportunity for stakeholders in a work process to share knowledge and learn from each other (c.f. Gittell 2008). We therefore expect relational coordination to emerge in response to formative cross-functional performance feedback 'designed to diffuse blame for problems and thus to encourage collective efforts to identify and rectify their sources' (Gittell 2000b, p. 11). This is consistent with the Input-Process-Output (McGrath 1964) framework and, in particular resonates with the adapted Input-Mediator-Output-Input (Ilgen, Hollenbeck,

Johnson and Jundt, 2005) framework, which posits that performance feedback can facilitate performance improvement.

The focus on cross-functional mobilisation to ensure coordinated efforts relating to the work process is a sustained theme in relational coordination research (see Gittell et al. 2010). Cross-functional coordination facilitates the alignment of different professional competencies to ensure the achievement of common goals (Emery 2009). It can also function as a mechanism for promoting unity in performance efforts of employees across the various functions (Emery 2009) and will further align their activities to offer more integrated and holistic care for patients (Feo and Kitson 2016).

We propose that perceptions of performance monitoring with a formative cross-functional orientation will be linked to patient care and employee outcomes because it will facilitate more frequent, timely and accurate communication, enhanced learning and knowledge sharing opportunities, greater coordination and better problem solving due to shared meaning, shared knowledge and mutual respect (Gittell et al. 2010). Thus, we hypothesise that:

Hypothesis 2: The relationship between perceived levels of formative cross-functional performance monitoring and perceptions of (a) patient care and (b) employee outcomes will be mediated by relational coordination.

INSERT FIGURE 1 ABOUT HERE

The Research Context

As a research context, Ireland is relatively unique in lacking a substantive body of research exploring people management issues at national level (for notable exceptions

see Heffernan, Harney, Cafferkey, and Dundon 2016; Guthrie, Flood, Liu, and MacCurtain 2009). In particular, there is an identified deficit of sector specific studies incorporating multilevel respondents (Cafferkey and Dundon 2015). While there have been some qualitative studies on people management processes in Irish hospitals (e.g. Conway and Monks 2010) a population study of the Irish hospital sector has not previously been undertaken. Ireland offers a unique opportunity to research the variables of interest particularly in light of its social partnership history which focuses on mutually supportive managerial practices (McCarthy and Teague 2004) whilst also pursuing ‘*social equity outcomes*’ for stakeholders (Collings, Gunnigle and Morley 2008, p.241).

The Health Service Executive is the national body responsible for managing public health services in Ireland. It has faced significant resource challenges with the onset of the economic crisis in Ireland. Budget allocation for the national hospitals office fell by more than 24% from 2010 to 2012 (Department of Health 2013). Staffing levels were also reduced by approximately 10%, as a result of a public sector wide moratorium on recruitment and promotion and the introduction of early retirement schemes (Department of Health 2013). At the same time, there has been increased emphasis on performance monitoring, with the introduction of quality assurance standards and key performance indicators (KPIs) premised on bringing multidisciplinary teams together to deliver service improvements. Specifically, the study was conducted during the delivery of the Department of Health’s 2011-2014 strategy which emphasized the role of performance evaluation in assessing health service performance to support improvement efforts (Department of Health 2013). Similar developments are evident internationally. Yet, in the Irish context at least, such performance monitoring is primarily formative, as well as being cross-functional, and

at the time of the research was not in any way linked to individual performance management.

Method

Research sample and participants

Data were collected using a survey sent to representatives from each of the 48 acute general hospitals in Ireland. In order to capture the perspectives of the diverse staff categories across the sector, the study targeted the following: CEOs, HR directors, clinical directors, directors of nursing, and employees representing direct care providers (nurses and radiographers). Management representatives were identified by lists obtained from the central administration of the Health Service Executive, while the employee representatives were invited to participate via the two largest trade unions in the sector and are the two largest groups represented in each union. Of the 265 surveys distributed, a total of 111 usable responses were returned, yielding an overall response rate of 41%. This is a high response rate for a survey in a health service context (McAvoy and Kaner 1996). Table 1 details the response rates across the respondent groups. These figures represent the actual population for CEO, HR Director, Clinical Director, and Director of Nursing respondents. For the employees representing direct care providers the numbers reflect the employee representative for both designated groups in each hospital (six hospitals had no radiographer representative).

INSERT TABLE 1 ABOUT HERE

Measures

All measures used in the study - with the exception of performance monitoring - were adapted from previously validated scales. The formative cross-functional orientation

was not directly measured, as this was an inherent system characteristic, as previously detailed.

Patient care: We used seven items devised by Shortell, Rousseau, Gillies, Devers and Simons (1991) to measure perceived effectiveness in meeting patient care needs and outcomes. These items include: ‘This hospital almost always meets its patient care treatment goals’ and ‘Our hospital does a good job applying the most recently available technology to patient care needs’. Responses ranged from *strongly disagree* (1) to *strongly agree* (5). The Cronbach’s alpha was .86.

Employee outcomes: We adapted six items developed by Guest et al. (2000) to measure employee outcomes. Respondents were asked to rate their hospital on six outcomes relative to other hospitals including: ‘levels of employee motivation’, ‘employee identification with the hospital’s core values and goals’, ‘the quality of employees’, ‘the level of output achieved by employees’, ‘the extent to which employees come up with innovative ideas in relation to their day to day work’, and ‘the extent to which employees are willing to put in extra effort to help this hospital to be successful’. Responses ranged from *definitely lower* (1) to *definitely higher* (5). A principal components factor analysis indicated that these six items loaded on a single factor and, consistent with Guest et al. (2000), responses were averaged to create the ‘employee outcomes’ scale. The Cronbach’s alpha was .84.

Relational coordination: We used an adapted version of Gittell et al.’s (2010) measure of relational coordination. Gittell (2012) recognises that using a ‘network ties’ approach to the measure of relational coordination is most desirable, but she also endorses the

approach taken in this study and in previous research (Carmeli and Gittell 2009). Further, this approach requires that respondents rate the behaviour of other care providers, as opposed to their own behaviour, which should limit social desirability bias (Gittell 2012). Respondents were asked six questions regarding the extent to which care providers: communicate in a frequent, timely and accurate manner, demonstrate commitment to group goals, share responsibility, and show mutual respect. Respondents were asked to rate the level of interaction between co-workers in their hospital regarding patient care. Responses were based on a 5-point Likert scale ranging from *never* (1) to *always* (5). The Cronbach's alpha was .82.

Performance monitoring: We used seven questions from Bloom et al.'s (2010) interview schedule to guide us in constructing items to capture perceptions of formative performance monitoring in a hospital context. The seven items included: 'Hospital performance is constantly tracked against Key Performance Indicators' and 'Performance against Key Performance Indicators are communicated to all staff'. Response options ranged from *strongly disagree* (1) to *strongly agree* (5). We ran a principal components factor analysis on the items, which formed a single factor. The Cronbach's alpha coefficient was .93.

Control variables: We opted to limit the number of control variables in order to preserve the largest number of degrees of freedom possible given the relatively small sample size. We tested for possible differences in the two outcome variables according to region, nurse-patient ratios, and teaching versus non-teaching hospitals and we found none of these were significant. We therefore included only two control variables in the analysis - hospital size (number of beds) and respondent type - which have been found

to impact the outcome variables in prior research (e.g. Bacon and Mark 2009; Baernholdt and Mark 2009; Havens et al. 2010). We created two dummy variables for management respondents (1= general manager/HR, 0 = Other) and care providers (1 = yes, 0 = Other), using respondents with a clinical management role as the referent group.

Analysis

Given our reliance on self-report measures, we employed the procedural measures recommended by Podsakoff, MacKenzie and Podsakoff (2012) to reduce the likelihood of common method variance. This involved providing assurances about the anonymity of the survey and the confidentiality of the data during the design phase. We also separated sections and used different response anchors and instructions for the predictor and outcome variables in order to reduce respondents' motivation to use previous answers when responding to subsequent ones. Prior to administering the survey, we also tested, revised and re-tested the survey among a representative group of participants across various hospitals. Following data collection, we carried out a Harman's One Factor Test (Podsakoff and Organ, 1986) by means of an exploratory factor analysis, using unrotated principal components factor analysis. Significant common method bias is indicated if one general factor accounts for the majority of covariance in the variables (Podsakoff and Organ, 1986). As expected, a total of four factors emerged from the analysis with eigenvalues greater than one. All items accounted for 65 percent of the total variance, with the first factor accounting for 35 percent of the variance. Since a single factor did not emerge and one general factor did not account for most of the variance, common method variance is unlikely to be a serious concern.

Findings

Table 2 presents the means, standard deviations and correlations between the main variables included in the study. The correlations between the variables were well below .80 (Studenmund and Cassidy 1987), which suggests that multicollinearity was not an issue in our analyses.

INSERT TABLE 2 ABOUT HERE

We used hierarchical regression analyses to test our hypotheses. Specifically, for each of the two dependent variables, we first entered the control variables (hospital size and respondent type), followed by the predictor variable ‘performance monitoring’ and finally the mediator ‘relational coordination’. For mediation to be supported, the direct link between the independent and dependent variables should be weakened (partial mediation) or become non-significant (full mediation) after adding the mediator (Baron and Kenny 1986). To further test for mediation, we used nonparametric bootstrapping analyses based on 5000 samples (see Preacher, Rucker, and Hayes 2007), as recommended for small samples. Table 3 summarises the results.

INSERT TABLE 3 ABOUT HERE

The findings relate to a formative cross-functional performance monitoring system, and we note that we have no expectation of their holding in systems with evaluative or more siloed orientations. The results showed that formative cross-functional performance monitoring was significantly related to relational coordination (Model 1: $\beta = .41$, p

< .001), suggesting that the independent variable is related to the mediator (Baron and Kenny 1986). As predicted in Hypothesis 1, formative cross-functional performance monitoring was significantly related to patient care ($\beta = .40, p < .001$) and employee outcomes ($\beta = .33, p = .001$), such that higher levels of such performance monitoring were associated with perceptions of higher hospital effectiveness in meeting patient care outcomes and more positive employee outcomes (see Models 2.1 and 3.1, Table 3). The inclusion of the performance monitoring variable explained an additional variance of 14% and 9% in patient care and employee outcomes, respectively. Finally, when relational coordination was included in the regression models for patient care (see Model 2.2, Table 3), the effect of formative cross-functional performance monitoring became less significant ($\beta = .26, p = .008$), while the effect of relational coordination was significant ($\beta = .34, p = .002$). The inclusion of relational coordination explained an additional variance of 6% and 7% in patient care and employee outcomes, respectively. For the bootstrapping analysis, mediation is significant if the 95% bias-corrected and accelerated confidence intervals for the indirect effect do not include zero (Preacher et al. 2007). The results show that the 95% confidence interval did not include zero (.03, .19). Thus, relational coordination partially mediated the relationship between formative cross-functional performance monitoring and patient care. Regarding employee outcomes, the effect of formative cross-functional performance monitoring became non-significant ($\beta = .19, p = .076$) when relational coordination was included in the model ($\beta = .34, p = .004$). The bootstrapping results were similar and the 95% confidence interval for the indirect effect did not contain zero (.02, .17). Thus, relational coordination fully mediated the relationship between formative cross-functional performance monitoring and employee outcomes. Taking these findings together, Hypothesis 2 is supported.

Discussion

Ireland, like other national contexts, has lacked research regarding management, HRM processes and firm-level organisational performance in hospitals (c.f. Townsend et al. 2013). In this paper we begin to address calls to examine (i) the relationship between management and HRM processes, and firm-level organisational performance in hospitals (Townsend et al. 2013), and (ii) the relationship between operational performance management systems (OPMS) and people management practices in particular (Garman et al. 2011). Specifically, the present study examined (a) the impact of formative cross-functional performance monitoring on both employee and patient care outcomes and (b) the mediating role of relational coordination in explaining these relationships. We build upon a stream of work emerging in *The International Journal of Human Resource Management* which suggests that in order for performance management to truly realise its potential it must be bespoke to the context (Mellahi et al. 2011) - and particularly the social context (Haines and St-Onge, 2012) - in which it operates (Sekiguchi 2013). Importantly, our analysis suggests that operational and people management practices work together to influence performance. Their impact may be enhanced when they operate in ways appropriate for the specific context in which they are operating. In healthcare we note potential for mutual enhancement between aspects of OPMS and human resource management, and between formative cross-functional performance monitoring and relational coordination in particular. Our findings signal potential to develop a more contextually driven and interdependent approach to the alignment of management and human resource management practices, to support the attainment of organisational goals and objectives.

First, our findings suggest the importance of formative cross-functional performance monitoring in improving both patient care and employee outcomes. They

signal that where such performance monitoring is evident, then outcomes for both patients and employees will be more positive. This is consistent with research suggesting that performance monitoring can enhance productive patterns of behaviour among employees (Otley 1999). Our findings suggest that in a healthcare context, a formative and cross-functional orientation supports this, by encouraging all those involved in a work process to come together to address performance concerns. This finding contributes to addressing mixed evidence regarding the effects of performance management in healthcare (Pollitt, Harrison, Dowswell, Jerak-Zuiderent and Bal, 2010), as well as tensions in the literature between ‘control’ and ‘commitment’ HR practices (Reed 2010). It does so by suggesting that ‘control’ practices can have mutually beneficial outcomes for both individuals and organisations, where applied in a constructive manner, and in an environment that aims to diffuse blame and encourage problem-solving and improvement (c.f. Gittell 2000).

Second, our findings point to the importance of adopting a relational perspective to understanding linkages between management practices and outcomes in contexts where work tasks are interdependent (Gittell et al. 2010). Adding to understanding of the organisational characteristics that facilitate employees’ coordination activities (McIntosh et al., 2014), the mediating role of relational coordination supports previous studies (e.g. Gittell et al. 2010), suggesting that performance monitoring needs to be applied constructively and communicated consistently across functional areas rather than in a way that might encourage competition, ‘finger pointing’ or the pursuit of disparate goals across functions or disciplines. However, where performance monitoring is structured in a way that encourages negative behaviours or the pursuit of diverse goals, then the impact on levels of relational coordination could be quite different and potentially more damaging. Future research should consider systems that

adopt a more ‘hardline’, punitive and/or siloed approach to performance monitoring to establish whether this is the case.

Third, while the relationships hypothesised in our model are supported, the controls included in the analysis reveal noteworthy distinctions in the perceptions of frontline care providers and management/clinical respondents. Our analysis suggests that the care providers surveyed do not perceive that levels of relational coordination are as high as respondents in these other categories. This corresponds with findings from other studies (e.g. Hartgerink et al. 2014; Havens et al. 2010) and supports the viewpoint that perceptions of coordination are weaker across contested boundaries that are also associated with power and status differentials (Abbott 1988). The findings also show that perceptions of patient care are significantly lower among direct care providers. This gives rise to concerns, particularly as these individuals are arguably more proximal to patients and their care. Taken together, these findings suggest the need for further exploration of ‘inflated’ perceptions among senior management about levels of relational coordination, patient care and potentially other outcomes.

Practice implications

Our findings suggest a number of potential implications for practice. First, they signal the importance of OPMS design in interdependent work contexts, and the potential benefits of adopting formative and cross-functional approaches. We also acknowledge that employees require awareness of performance information in order to act upon it. Feedback loops delivering information to employees at relevant levels are therefore central to the success of formative cross-functional OPMS. This is consistent with the IMPI framework (Ilgen et al. 2005). Further, while the system in operation in the Irish context was not linked to performance management at the individual level, the

implementation of individual performance management should reflect a focus that is consistent with the overarching system design. The line manager is a critical conduit in this (Chandra and Frank 2004), ensuring that employees receive consistent signals regarding what behaviours are expected and rewarded (McDermott, Conway, Rousseau and Flood 2013).

Second, taking into account our emphasis on the social context of performance monitoring, our findings highlight the importance of having high levels of relational co-ordination among inter-disciplinary teams. This creates a role for professional education in helping to build links across clinical disciplines, and in developing communication and coordination skills. Further, organisations may wish to invest in supporting relational coordination. This may be helped by the collective development of an overarching vision for an organisation/subunit, the articulation of shared team responsibility for achieving this, and ongoing feedback by line managers. In addition, interdependent employees will require dedicated time to consider appropriate actions to improve performance. Formal and informal meeting and problem-solving forums are therefore required, which may have potential workload/resourcing implications. Organisations may also wish to tailor HR practices in support of relational coordination (see Gittell et al. 2008; 2010). In summary, we suggest that OPMS design should take account of key relevant outcomes, and the people and process factors that are necessary in supporting them. Last, we note that while relational coordination is important in healthcare, other social drivers may be important in supporting productive responses to performance monitoring in different contexts.

Limitations

A number of limitations to the research should be noted. First, the study was cross-sectional in nature and relied on self-report measures, which does not allow us to draw firm conclusions regarding the causal order of the focal variables. While our analysis suggests that common method bias is not a serious concern, we cannot draw firm conclusions in the absence of longitudinal data.

Second, we used subjective measures of patient care and employee outcomes as a matter of necessity. Ideally we would have also utilised objective measures, although these were not publically available at the time of data collection. Despite this concern, previous research has demonstrated that subjective and objective measures of organisational performance are positively associated and have equivalent relationships with a range of independent variables (Wall et al. 2004). Nevertheless, for future research, we encourage researchers to include objective measures and proxies of patient care and employee performance where available.

Third, we anticipate that our findings will only hold in situations where performance monitoring is formative and cross-functional, rather than evaluative and siloed, and where work is interdependent. Thus, future research should consider the operation and outcomes of performance monitoring where system designs differ. In particular, we suggest that future research explore the operation of organisation-wide performance monitoring in alignment with individual, team or functional performance management processes. In addition, while relational coordination is particularly relevant in healthcare, further research should test our model among a wider range of healthcare providers and among other multi-stakeholder organisations and sectors, particularly those contexts premised on task interdependence. Last, we note that different social drivers of productive responses to performance monitoring may be evident in other sectors.

Conclusion

The core contribution of this paper is recognition that operational and human resource management can be mutually reinforcing, particularly when designed in ways that take account of the social context in which work is conducted. In task contexts characterised by interdependence, such as healthcare, formative cross-functional performance monitoring can constructively help to identify service issues requiring attention, and encourage relational coordination among employees working to resolve them. As a result, managers in such environments need to pay strong attention to the design of performance monitoring systems, as well as to supporting relational coordination. Our findings signal the potential to develop a more contextually oriented and interdependent approach to the alignment of management and human resource practices, in order to deliver important organisational outcomes. Performance monitoring is rising in prevalence across sectors. Ensuring that this is managed in a way that enhances rather than undermines the contributions of employees is important.

References

- Abbott, A. (1988), *The system of professions: An essay on the expert division of labor*. Chicago, IL: University of Chicago Press.
- Agency for Healthcare Research and Quality. (2015). *2014 National Healthcare Quality and Disparities Report*. US Department of Health and Human Services: Rockville, MD.
- Bacon, C.T., and Mark, B.A. (2009), 'Organisational effects on patient satisfaction in hospital medical-surgical units', *The Journal of Nursing Administration*, 39, 220-227.
- Baernholdt, M., and Mark, B.A. (2009), 'The nurse work environment, job satisfaction and turnover rates in rural and urban nursing units', *Journal of Nursing Management*, 17, 994-1001.

- Baron, R.M., and Kenny, D.A. (1986), 'The moderator-mediator variable distinction in social psychological research: Conceptual, strategic and statistical considerations', *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bartram, T., and Dowling, P.J. (2013), 'An international perspective on human resource management and performance in the health care sector: Towards a research agenda', *The International Journal of Human Resource Management*, 24, 3031-3037.
- Biron, M., Farndale, E., and Paauwe, J. (2011). Performance management effectiveness: lessons from world-leading firms. *The International Journal of Human Resource Management*, 22, 1294-1311.
- Bloom, N., Propper, C., Seiler, S., and Van Reenen, J. (2010), 'The impact of competition on management quality: Evidence from public hospitals', *NBER Working Paper Series 16032*, Cambridge, MA.
- Bloom, N., Sadun, R., and Van Reenen, J. (2012), 'Does management really work?', *Harvard Business Review*, 90, 76-82.
- Boxall, P. (2012). High-performance work systems: what, why, how and for whom?. *Asia Pacific Journal of Human Resources*, 50, 169-186.
- Cafferkey, K., and Dundon, T. (2015), 'Explaining the black box: HPWS and organisational climate', *Personnel Review*, 44, 666-688.
- Carmeli, A., and Gittell, J.H. (2009), 'High quality relationships, psychological safety and learning from failures in work organisations', *Journal of Organisational Behavior*, 30, 709-729.
- Chandra, A., and Frank, Z. D. (2004). Utilization of performance appraisal systems in health care organisations and improvement strategies for supervisors. *The health care manager*, 23, 25-30.
- Collings, D. G., Gunnigle, P., and Morley, M. J. (2008), 'Between Boston and Berlin: American MNCs and the shifting contours of industrial relations in Ireland'. *The International Journal of Human Resource Management*, 19, 240-261.
- Conway, E., and Monks, K. (2010), 'The devolution of HRM to middle managers in the Irish health service', *Personnel Review*, 39, 361-374.
- De Haas, M., and Kleingeld, A. (1999), 'Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organisation', *Management Accounting Research*, 10, 233-261.
- de Vries, E.N., Ramrattan, M.A., Smorenburg, S.M., Gouma, D.J., and Boermeester, M.A. (2008), 'The incidence and nature of in-hospital adverse events: A systematic review', *Quality and Safety in Health Care*, 17, 216-223.
- Deming, W.E. (1986), *Out of the Crisis*, Cambridge, MA: MIT Press.
- Department of Health (2013), *Health in Ireland: Key trends 2013*, Dublin: Department of Health.
- Emery, C. R. (2009), 'A cause-effect-cause model for sustaining cross-functional integration', *Business Process Management Journal*, 15, 93-108.
- Feo, R., and Kitson, A. (2016), 'Promoting patient-centred fundamental care in acute healthcare systems', *International Journal of Nursing Studies*, 57, 1-11.
- Ferlie, E., Fitzgerald, L., Wood, M., and Hawkins, C. (2005), 'The nonspread of innovations: the mediating role of professionals', *Academy of Management Journal*, 48, 117-134.
- Freeman, T. (2002), 'Using performance indicators to improve health quality in the public sector: A review of the literature', *Health Services Management Research*, 15, 126-137.

- Garman, A.N., McAlearney, A.S., Harrison, M.I., Song, P.H., and McHugh, M. (2011), 'High-performance work systems in health care management, Part 1: Development of an evidence-informed model', *Health Care Management Review*, 36, 201-213.
- Gittell, J. H. (2000a), "Organizing work to support relational coordination", *International Journal of Human Resource Management*, 11, 517-539.
- Gittell, J.H. (2000b), 'Paradox of coordination and control', *California Management Review*, 42, 1-17.
- Gittell, J. H., Fairfield, K. M., Bierbaum, B., Head, W., Jackson, R., Kelly, M., .. & Zuckerman, J. (2000c). Impact of relational coordination on quality of care, postoperative pain and functioning, and length of stay: a nine-hospital study of surgical patients. *Medical care*, 38(8), 807-819.
- Gittell, J. H. (2002), 'Coordinating mechanisms in care provider groups: Relational coordination as a mediator and input uncertainty as a moderator of performance effects', *Management Science*, 48, 1408-1426.
- Gittell, J. H. (2012), *Relational coordination: Guidelines for theory, measurement and analysis*, Waltham, MA: Brandeis University.
- Gittell, J. H., Weinberg, D., Pfefferle, S., and Bishop, C. (2008), 'Impact of relational coordination on job satisfaction and quality outcomes: a study of nursing homes', *Human Resource Management Journal*, 18, 154-170.
- Gittell, J.H, Seidner, R., and Wimbush, J. (2010), 'A relational model of how high-performance work systems work', *Organisation Science*, 21, 490-506.
- Gittell, J.H., Beswick, J., Goldmann, D., and Wallack, S.S. (2015), 'Teamwork methods for accountable care: Relational coordination and Team STEPPS'. *Health Care Management Review*, 40, 116-125.
- Guest, D., Michie, J., Sheehan, M., Conway, N., and Metochi, M. (2000), *Effective People Management: Initial findings of the future of work study*. London: CIPD.
- Guest, D. E. (2011). Human resource management and performance: still searching for some answers. *Human Resource Management Journal*, 21,1, 3-13.
- Guthrie, J. P., Flood, P. C., Liu, W., and MacCurtain, S. (2009), 'High performance work systems in Ireland: human resource and organisational outcomes', *The International Journal of Human Resource Management*, 20, 112-125.
- Haines III, V. Y., and St-Onge, S. (2012). Performance management effectiveness: practices or context?, *The International Journal of Human Resource Management*, 23, 1158-1175.
- Haraden C. and Leitch, J. 2011. Scotland's Successful National Approach to Improving Patient Safety in Acute Care. *Health Affairs*, 30,755-763.
- Hartgerink, J.M., Cramm, J.M., Bakker, T.J.E., Van Eijnsden, A.M., Mackenbach, J.P., and Nieboer, A.P. (2014), 'The importance of relational coordination for integrated care delivery to older patients in the hospital', *Journal of Nursing Management*, 22, 248-256.
- Havens, D.S., Vasey, J., Gittell, J.H., and Lin, W.T. (2010), 'Relational coordination among nurses and other providers: Impact on the quality of patient care', *Journal of Nursing Management*, 18, 926-937.
- Heffernan, M., Harney, B., Cafferkey, K., and Dundon, T. (2016), 'Exploring the HRM-performance relationship: the role of creativity climate and strategy', *Employee Relations*, 38, 438-462.
- Ilgen, D. R., Hollenbeck, J. R., Johnson, M., and Jundt, D. (2005), 'Teams in organisations: From input-process-output models to IMO models', *Annual Review of Psychology*, 56, 517-543.

- Institute of Medicine (IOM) (1999), *To err is human: Building a safer healthcare system*. Washington, DC: National Academies Press.
- Kazandjian, V.A., Thomson, R.G., Law, W.R., and Waldron, K. (1996), 'Do performance indicators make a difference?', *The Joint Commission Journal on Quality Improvement*, 22, 482-491.
- LePine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., and Saul, J. R. (2008), 'A meta-analysis of teamwork processes: Tests of a multidimensional model and relationships with team effectiveness criteria', *Personnel Psychology*, 61, 273-307.
- McAlearney, A.S., Garman, A.N., Song, P.H., McHugh, M., Robbins, J., and Harrison, M.I. (2011), 'High performance work systems in health care management, Part 2: Qualitative evidence from five case studies', *Health Care Management Review*, 36, 214-226.
- McAvoy, B.R., and Kaner, E.F. (1996), 'General practice postal surveys: A questionnaire too far?', *British Medical Journal*, 313, 732-733.
- McCartney, J., and Teague, P. (2004), 'The diffusion of high performance employment practices in the Republic of Ireland', *International Journal of Manpower*, 25, 598-617.
- McDermott, A. M., Fitzgerald, L., Van Gestel, N. M., and Keating, M. A. (2015), 'From bipartite to tripartite devolved HRM in professional service contexts: Evidence from hospitals in three countries', *Human Resource Management*, 54, 813-831.
- McDermott, A.M, Conway, E., Rousseau, D.M., and Flood, P.C. (2013), 'Promoting effective psychological contracts through leadership: the missing link between HR strategy and performance', *Human Resource Management*, 52, 289-310.
- McGrath, J.E. (1964), *Social Psychology: A Brief Introduction*, New York: Holt, Rinehart, and Winston.
- McGlynn, E.A., Asch, S.M., Adams, J., Keesey, J., Hicks, J., DeCristofaro, A., and Kerr, E.A. (2003), 'The quality of health care delivered to adults in the United States', *The New England Journal of Medicine*, 348, 2635-2645.
- McIntosh, N., Meterko, M., Burgess Jr., J.F., Restuccia, J.D., Kartha, A., Kaboli, P., and Charns, M. (2014), 'Organisational predictors of coordination in inpatient medicine', *Health Care Management Review*, 39, 279-292.
- Medical Council (2015), *Listening to complaints: Learning for good professional Practice*. <https://www.medicalcouncil.ie/News-and-Publications/Reports/Listening-to-Complaints-Executive-Summary.pdf> [accessed 10 October 2015].
- Mellahi, K., Frynas, J. G., and Collings, D. G. (2016), 'Performance management practices within emerging market multinational enterprises: the case of Brazilian multinationals', *The International Journal of Human Resource Management*, 27, 876-905.
- Otley, D. (1999), 'Performance management: A framework for management control systems research', *Management Accounting Research*, 10, 363-382.
- Podsakoff, P. M., MacKenzie, S. B., and Podsakoff, N. P. (2012), 'Sources of method bias in social science research and recommendations on how to control it', *Annual review of psychology*, 63, 539-569.
- Podsakoff, P. M., and Organ, D. W. (1986), 'Self-reports in organisational research: Problems and prospects', *Journal of Management*, 12, 531-544.
- Pollitt, C. (2011), 'Performance blight and the tyranny of light? Accountability in advance performance measurement regimes', In M.J. Dubnick and H.G. Frederickson (Eds.), *Accountable governance: Problems and Promises* 81-97. Armonk NY: M.E. Sharpe.

- Pollitt, C. (2013). 'The logics of performance management', *Evaluation*, 19, 346-363.
- Pollitt, C., Harrison, S., Dowswell, G., Jerak-Zuiderent, S. and Bal, R. (2010). 'Performance regimes in health care: institutions, critical junctures and the logic of escalation in England and the Netherlands', *Evaluation*, 16, 13-29.
- Posthuma, R. A., and Campion, M. A. (2008), 'Twenty Best Practices for Just Employee Performance Reviews', *Compensation and Benefits Review*, 40, 47-55.
- Preacher, K.J., Rucker, D.D., and Hayes, A.F. (2007), 'Addressing moderated mediation hypotheses: Theory, methods, and prescriptions', *Multivariate Behavioral Research*, 42, 185-227.
- Reed, M. (2010), 'Control in contemporary work organisations', In P. Blyton, E. Heery and P. Turnbull (Eds.), *Reassessing the Employment Relationship*, Basingstoke: Palgrave.
- Schmutz, J., and Manser, T. (2013), 'Do team processes really have an effect on clinical performance? A systematic literature review', *British Journal of Anaesthesia*, 110, 529-544.
- Sekiguchi, T. (2013), 'Theoretical implications from the case of performance-based human resource management practices in Japan: management fashion, institutionalization and strategic human resource management perspectives', *The International Journal of Human Resource Management*, 24, 471-486.
- Shortell, S.M., Rousseau, D.M., Gillies, R.R., Devers, K.J., and Simons, T.L. (1991). 'Organisational assessment in Intensive Care Units (ICUs): Construct development, reliability, and validity of the ICU Nurse-Physician Questionnaire', *Medical Care*, 29, 709-726.
- Studenmund, A. H., and Cassidy, H. J. (1987). *Using econometrics: A practical guide*. Boston: Little, Brown.
- Ter Bogt, H. J., and Scapens, R. W. (2012), 'Performance management in universities: Effects of the transition to more quantitative measurement systems', *European Accounting Review*, 21, 451-497.
- Townley, B. (1997), 'The institutional logic of performance appraisal', *Organisation studies*, 18, 261-285.
- Townsend, K., Lawrence, S.A., and Wilkinson, A. (2013), 'The role of hospitals' HRM in shaping clinical performance: A holistic approach', *International Journal of Human Resource Management*, 24, 3062-3085.
- Vo, A., and Stanton, P. (2011), 'The transfer of HRM policies and practices to a transitional business system: The case of performance management practices in the US and Japanese MNEs operating in Vietnam', *The International Journal of Human Resource Management*, 22, 3513-3527.
- Walburg, J. (2006). *Performance Management in Health Care: Improving Patient Outcomes: an Integrated Approach*. New York: Psychology Press, Routledge.
- Wall, T.D., Michie, J., Patterson, M., Wood, S.J., Sheehan, M., Clegg, C.W., and West, M. (2004), 'On the validity of subjective measures of company performance', *Personnel Psychology*, 57, 95-118.

Figure 1: The research model

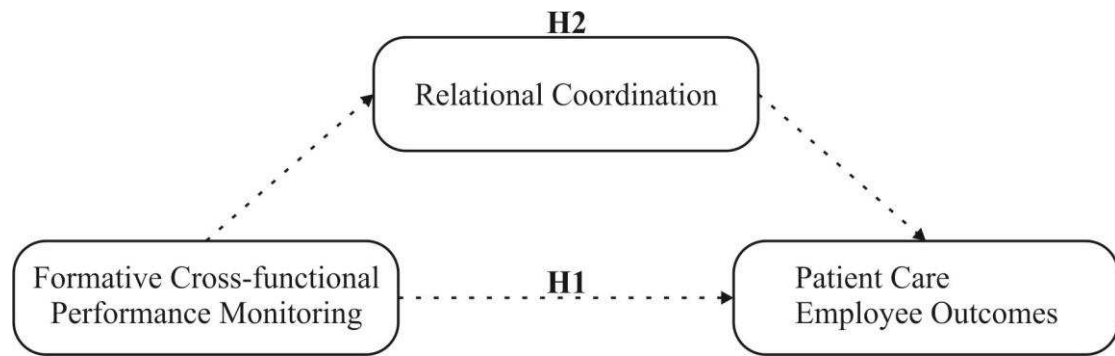


Table 1 Response rates

Respondents	Number of Hospitals	Number of Potential Respondents	Number Received	Percentage response rate
CEO	48	47	12	26%
HR Director	48	41	21	51%
Director of Nursing	48	48	28	58%
Clinical Director	48	38	11	29%
Employees	48	90	39	43%
Total	48	265	111	41%

Notes. $N = 111$. CEO = Chief Executive Officer; HR Director = Human Resources Director. The employee group consists of employees representing direct care providers (nurses and radiographers). Six hospitals had no radiographer representative.

Table 2 Means, Standard Deviations and Correlations

Measures	M	SD	1.	2.	3.	4.	5.	6.
1. PC	3.95	.63						
2. EO	3.55	.63	.32**					
3. PM	3.26	.84	.48***	.38***				
4. RC	3.94	.57	.54***	.44***	.54***			
5. Hospital size	283	184	-.12	-.02	.02	-.16		
6. CEO/HR Director	.30	.46	.18	.18	.25*	.28**	-.06	
7. Employees	.34	.47	-.37**	-.23*	-.36***	-.51***	.01	-.47***

Notes. $N = 111$. *** $p < .001$, ** $p < .01$, * $p < .05$; PC = Patient care; EO = Employee outcomes; PM = Performance monitoring; RC = Relational coordination; CEO = Chief Executive Officer; HR Director = Human Resources Director

Table 3 Results of Regression and Bootstrap Analyses

Variable and Statistics	Relational Coordination	Patient Care		Bootstrap 95% CI	Employee Outcomes		Bootstrap 95% CI
	Model 1	Model 2.1	Model 2.2		Model 3.1	Model 3.2	
<i>Controls</i>							
Hospital Size	-.17*	-.13	-.07		-.03	.03	
CEO/ HR Director	.00-	-.05	-.05		.06	.06	
Employees	-.36***	-.25**	-.13		-.09	.03	
<i>Predictor</i>							
Performance Monitoring	.41***	.40***	.26**	(.03, .19)	.33*	.19	(.02, .17)
<i>Mediator</i>							
Relational Coordination			.34**			.34**	
R ²	.43	.29	.35		.16	.23	
ΔR ²	.14	.14	.06		.09	.07	
ΔF	26.40***	19.74***	10.18**		11.48**	8.83**	
Dfs	(4, 103)	(4, 103)	(5, 102)		(4, 103)	(5, 102)	

Notes. *** $p < .001$, ** $p < .01$, * $p < .05$; PC = Patient care; EO = Employee outcomes; PM = Performance monitoring; RC = Relational coordination; CEO = Chief Executive Officer; HR Director = Human Resources Director CEO = Chief Executive Officer; HR Director = Human Resources Director

