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ABSTRACT

Throughout the world hospitals are under pressure to achieve high performance. In this study, we test the extent to which a newly developed High Performance Work Systems (HPWS) Model influences a firm performance outcome (continuum of patient care) in acute hospital settings. Utilizing rigorous multi-rated, industry-based hospital accreditation data relating to 462 acute hospitals, we found that the four workplace systems (management systems, HRM systems, information systems and safe work environment systems) all significantly influenced the continuum of patient care. Based on these data, we argue that conceptualisations of HPWS should be multi-dimensional in nature.

Keywords: Human Resource Development; Strategic Human Resource Management; Organisational Performance; Health.

High performance work systems (HPWS) is an area which has generated a wealth of published research in the last two decades (Becker & Huselid, 1998; Becker & Huselid, 2006). While there is no commonly accepted definition of HPWS in either the conceptual or empirical literature (Datta et al., 2005), it is commonly accepted that there are clusters or bundles of human resource (HR) practices which lie at the core of the HPWS (Godard, 2004). In the extant literature, the notion of HPWS seems theoretically entrenched in a HR focus. We argue that taking a systems approach to HPWS necessarily involves identifying a broader range of systems that lead to high firm performance.

Certainly, bundles of HR practices have been associated with performance levels above those associated with more traditional, command and control workplace and employment relations practices (Godard, 2004). This literature has permeated through a range of disciplines including industrial relations, labour economics, human resource management (HRM) and organizational behaviour. Although HPWS research traverses a number of fields and a number of perspectives, these perspectives do share some fundamental commonalities of purpose. HPWS are complex and, while the extant literature is not in total agreement, it is commonly accepted that HPWS are those which use complementary HR policies successfully to develop employee skills, commitment, reward and labor productivity as a means of enhancing an organizations' performance outcomes or competitive advantage. We propose that other organizational systems should be incorporated, along with HRM systems, into multi-dimensional HPWS models, when assessing the impact of HPWS on performance outcomes.

Performance in Hospitals

When focussing just on the HRM aspect of HPWS, it has been suggested previously that an organization's capacity to capitalise on HRM systems will depend on particular industry characteristic (Datta et al., 2005; Jackson and Schular, 1995). Performance measures which are and should be used in hospitals, are unique to that type of organization, for example, staff per bed, workloads, number of patients treated, and patient mortality (Buchan, 2004). Others, less often used but equally as valid in measuring performance are, for example, re-admission rates, waiting times, complaints, and financial outcomes. Hospital accreditation processes commonly measure what is referred to as 'continuum of patient care'. This is the systems that are in place which track and measure the performance of the hospital in providing a sound, and seamless process of care from when a patient enters a hospital, through their care and treatment until their discharge. While the continuum of patient care does not equate to patient health outcomes, it is a valuable systems outcome measure for acute hospitals.

Throughout the world hospitals are facing many challenges including strain on particular funding models, shifts in population demographics, and technological developments. Identifying the factors that influence firm performance outcomes in hospitals provides a timely examination of what might lead to better outcomes for employees, patients and, as a consequence, the organization. Based on the extant literature and responding to the deficits of past research (e.g., Boxall & Mackey, 2009), we argue that high performance in four workplace systems constitutes the concept of high performance work systems: HRM systems, management systems, information systems, and safe work environment systems. We intend that this multi-dimensional conceptualisation of HPWS is theoretically generalizable, such that presence of these four systems within HPWS is likely to be consistent across industries and sectors. Secondly, we propose that an overall HPWS made up of these four systems would collectively have a positive effect on firm performance within acute hospitals. As such, we directly question the traditional focus of HRM systems within HPWS (see Boxall & Mackey, 2009) by investigating whether the three systems we propose that should be a part of HPWS explain additional incremental variance in our firm performance outcome, over and above that explain by HRM systems alone. We analyse a unique dataset – nationally collected, *industry based* hospital accreditation data - to understand the degree to which these *workplace systems* lead to higher firm

performance which, in this context, is assessed in terms of *continuum of patient care systems*. The following sections further outline and provide justification for the theoretical arguments highlighted above.

Human Resource Management and Firm Performance

In many organizations, performance can be seen in simple terms such as throughput. This is problematic in the hospital sector where increased throughput can undermine the quality of service (Duckett, 1995). In this sector, decreased quality of service not only means lower levels of customer satisfaction, but indeed jeopardises the lives of people. Hence, it is essential to understand how the HR system is linked to the continuum of patient care, that is, a sound and seamless process of care from when a patient enters a hospital, through their care and treatment until their discharge. We suggest that high performing HR systems which focus on recruitment, training and development, and other bundles of HR practices should provide a higher continuum of care in a highly labour intensive workplace such as an acute hospital. We therefore hypothesize:

Hypothesis 1: Effective Human Resource Management within a hospital will have a significant positive influence on the Continuum of Patient Care.

If we take hospitals as concerned with producing outcomes for patients and take as a performance measure the continuum of patient care, it is important to appreciate that the nature of patient interaction is not usually confined to one episode (i.e. a single interaction with hospital staff nor to one specific staffing or disciplinary group). Most patients will have several interactions and not always with the same group of employees. This puts a major stress on the organizational systems (management, HR, IS and Safety Management systems) as patients are moved between different units. The actual health care they receive may be excellent but their lived experience may be very poor if the system is poorly designed or is ineffective in practice. So within this type of organization there are various sub-systems which also fit into an overall system. This is the continuum of patient care.

Management Systems and Performance

The importance of senior management's commitment to the successful implementation of quality systems programs can also be seen in the attention given internationally to it in many quality awards. In simple terms senior managers create the organizational systems that determine how products and services are designed and produced (Hackman & Wageman, 1995). A standard quality approach is to see systems change via continuous improvement as driving performance. Typically, the responsibility for systems lies with senior management. Workers only operate within the system set by the organization and cannot overcome poor systems.

There is evidence that in the acute hospital sector, highly committed workers may not deliver good results. The example provided by Vogus (2007) demonstrates the necessity of a systems approach. In this study, committed nurses are associated with worse patient outcomes in areas like patient falls and the delivery of accurate medication. This is because of a process where poor management systems created high workloads and poorly designed quality assurance systems which, in turn lead to incorrect medication dosages. As a by-product, the 'heroic' nurses make matters worse by striving to deal imperfections in the system. Ultimately, what is required are better systems. People 'doing their best' is not the answer especially in large organizations such as hospitals which by definition are complex sets of systems operating together. The systems approach puts the emphasis on senior leaders to create, maintain and improve the organizational system. The system holds together the processes and functions of the organization. Management systems are about good management practice. Based on evidence in hospitals and other sectors, we hypothesize that:

Hypothesis 2: After controlling for the effect of HRM Systems, Effective Management Systems within a hospital will have a significant positive influence on the Continuum of Patient Care.

Information Systems and Performance

In the early stages of the modern era of information technologies (throughout the mid 1980s and into the early 1990s) authors claimed that IS could create a competitive advantage for those organizations that utilised them (Kettinger et al., 1994). However, Carr (2003) claimed that the decreasing cost of technology means that IS have become ubiquitous, and consequently, can no longer provide the scarcity that is often claimed to be necessary for developing a competitive advantage. This

fails to recognise the distinction between having IS and managing this system in such a way that an organization develops a competitive advantage. The mere presence of IS infrastructure will not lead to competitive advantage, rather it is the relationship infrastructure between the information systems and other aspects of the organization that is going to influence organizational performance (Bhatt & Grover, 2005). So it seems that, as with other areas of this study, more important than the presence of a system, is the effective use of that system.

Understanding how the information system is linked to the continuum of patient care in hospitals is essential. We suggest that in a workplace like an acute hospital where accurate and timely information is essential to patient care, high performance in information systems provide higher performance in the continuum of patient care. Thus we hypothesize the following:

Hypothesis 3: After controlling for the effect of HRM Systems, Effective Information Systems within a hospital will have a significant positive influence on the Continuum of Patient Care.

Safe Work Environment Systems and Performance

Systems ensuring a safe work environment relies upon a fundamental human role in ensuring safe performance (Attwood et al., 2006). Unsafe work practices are frequently the result of systems developed within organizations which predispose workers to act unsafely (Hughes & Kornowa-Weichel, 2004). Some examples of such factors include a lack of instruction and training (Attwood et al., 2006), or low management commitment to safety (Rundmo, 1996). The negative impact that a lack of attention to safety can have appears to be quite clear. There is evidence that low levels of attention to a safe work environment can have a detrimental effect on a wide range of employment matters, which in turn have an effect on firm performance. These matters include staff morale, industrial disputations, costs related to insurance claims, loss of reputation, and costs associated with staff replacement (Archer et al., 2005; Danna & Griffith, 1999). Furthermore, a risk minimisation approach to the safe work environment simply aims to reduce negative factors through lost time and accidents, and fails to capture what has been argued as positive opportunities to contribute to reducing absenteeism and turnover and increasing employee skills, performance and satisfaction (Archer et al., 2005).

In the hospital context, there is a clear body of evidence that suggests that systems of managing a safe work environment and safe practice have a positive effect on reducing medical errors, patient safety, infection control, and staff perceptions of health and wellbeing (Janney & Landrigan, 2008). However, we have no evidence of the impact that safe work environment systems have on the continuum of patient care. Based on the theoretical arguments and weight of empirical evidence, we hypothesize that:

Hypothesis 4: After controlling for the effect of HRM Systems, Effective Safe Work Environment Systems within a hospital will have a significant positive influence on the Continuum of Patient Care.

METHODS

Research Design and Data Collection Procedure

Our de-indentified data came from the healthcare accreditation market leader in Australia, the Australian Council on Healthcare Standards (ACHS). The ACHS Evaluation and Quality Improvement Program (EQuIP) is designed to guide decision-makers within Australian healthcare organizations through a four-year process of self-assessment, external survey and periodic review by expert industry peers, against a set of EQuIP standards (ACHS, 2007; Banks, 2007). The EQuIP3 standard items were developed by: 1). reviewing the international academic literature, 2). an extensive process of consultation with ACHS member organizations and industry stakeholders, and 3). pre-testing and pilot testing standards items prior to the commencement of the four-year accreditation cycle. This process took approximately two years of iterations and development.

The standards data that we present represents the third iteration of the EQuIP3 process performed in between 2003 and 2007 (inclusive), which involved using a team of 350 external surveyors to assess Australian healthcare organizations against the EQuIP3 standards. Organizational assessment by multiple external raters is significantly more methodologically rigorous than the current practice within the HPHR literature to obtain self-report data from a single source HR or Senior Manager (Wood & Wall, 2005). These surveyor teams were a combination of clinicians (medical doctors, nurses, and allied health professionals) who had at least five years hospital managerial experience, and who had successfully completed an extensive three day surveyor training

course and mentoring program of their first five accreditation survey processes. At least two surveyors attend each external hospital review, however the number varied with hospital size. For example, a rural hospital with fewer than 20 beds would have two surveyors for two days whilst a large teaching hospital of more than 600 beds would have a team of up to ten surveyors for at least five days (ACHS Survey Scoping Document, accessed 17 November 2008). The process employed ensured a high level of inter-rater reliability.

Sample

The sample consisted of 464 acute Australian hospitals although the *n* was reduced to 462 due to missing data. Our data represent the majority of all acute hospitals in Australia, almost 50 per cent of hospitals generally, and 95 per cent of beds. All major teaching and referral hospitals in Australia undergo accreditation with ACHS (ACHS, 2007). Of the useable acute hospital sample, 81% were public and 19% private, and hospital size was distributed as follows: 1-49 beds (28%), 50-99 beds (27%), 100-199 beds (23%), 200-499 beds (16%) and more than 500 beds (6%). Hospitals were located across all States (including Territories): NSW (31%), Vic (29%), SA (12%), Tas (2%), WA (8%), NT (1%), Qld (15%), ACT (1%).

Measures

We used 40 healthcare standard items from EQuIP 3 to assess the five constructs of interest: Continuum of Patient Care (5 items); Human Resource Management Systems (6 items); Management Systems (10 items); Information Management Systems (10 items); and Safe Work Environment Systems (9 items). Each individual standard item was rated by the surveyors on the following five-point scale: Little Achievement (LA; Awareness/knowledge of systems for fundamental requirements, e.g., legislation is in place), Some Achievement (SA; All of LA plus SA elements; Systems have been developed and are implemented), Moderate Achievement (MA; All of LA + SA plus MA elements; Data are collected, evaluation of systems occurs, improvements are made resulting in developed systems), Extensive Achievement (EA; All of LA + SA + MA plus EA elements; Benchmarking occurs through comparison of systems and results; This is done internally and externally, resulting in superior systems), and Outstanding Achievement (OA; All of LA + SA + MA + EA plus OA elements; The organization is an industry leader in systems and outcomes).

The EQuIP3 Guide (available to ACHS members and surveyors) details extensive additional sub-measures for each individual standard item. For example, standard 3.1.3 ("The performance management system ensures the competency of staff supports safe practice and the provision of quality care and service") has three points of measurement for reaching LA level, and additional four points of measurement to attain SA, three more for a MA rating and one each to achieve EA and OA ratings. These detailed standards are designed to remove the subjectivity of determining standard item ratings and, along with training and review, increased inter-rater reliability between expert raters.

To aid statistical analysis in this study, we converted the five-point alpha scale (e.g LA, SA, etc) given to hospitals by expert raters to a five-point numeric scale. Our dataset contained some hospital demographic details and we used three of these as control variables in the analysis. We expected in Australia's acute hospital system that the most likely differences would be through the hospital sector ownership (1 = public, 2 = private), the decentralised state run system[1], and through the size of the hospital. States were binary coded (0 = hospital not in this state, 1 = hospital in this state) and listed in the regression analyses (Table 4) as follows: NSW = State 1; Vic = State 2; SA = State 3; Tas = State 4; WA = State 5; NT = State 6; QLD = State 7; ACT = State 8. Size could be determined with a range of measures, for example, financial turnover or number of procedures. We had available in our data the number of beds in the hospital which is an appropriate measure of size (1 = 1-49 beds, 2 = 50-99 beds, 3 = 100-199 beds, 4 = 200-499 beds, 5 = more than 500 beds).

RESULTS

Measurement Model Analyses

Construct and reliability analyses for each of the five EQuIP variables have not been previously conducted by the ACHS. Briefly, to assess the construct validity of the EQuIP variables in this study, confirmatory factor analyses were conducted separately for continuum of patient care variable and each of the independent variables, and then an analysis was performed where the four independent variable factors were co-varied with one another within the one measurement model (see Anderson & Gerbing, 1988). Item deletion was required to improve factor model fit for most

[1] Australia has six states and two territories. For the sake of simplicity, we use the term state to denote both states and territories.

structural models (see Anderson & Gerbing, 1988). The deletion decisions were based both on content (face) validity and statistical considerations (standardized residuals, Cronbach's alpha statistics). As can be seen in Table 1, the final structural models had adequate normed chi-square values and fit statistics. Additionally, the factor loadings and Cronbach alpha reliabilities for the constructs were moderate (see Table 2). The combined HPWS four systems factor model also showed evidence of discriminant validity when compared to a corresponding one factor model. Given the combined supportive indexes, all measurement models were deemed to have achieved adequate to good fit (see Hu & Bentler, 1999).

Insert Tables 1 and 2

Regression Analyses

Variables were formed by creating unit-weighted mean composites of the factor items from the modified combined four-factor model solution and the continuum of patient care factor. The mean, standard deviation, alpha reliability and bi-variate correlations between each of the variables of interest (with the exception of States) are presented in Table 3.

Insert Table 3

We conducted multiple regression to examine the relationship between the four independent variables (HRM systems, management systems, information systems, safe work environment systems) and the dependent variable (continuum of patient care). Control variables (hospital size, sector, state) were considered in Step 1 and our predictors were entered in Step 2. None of the control variables were statistically significant in influencing continuum of care scores at Step 2.

Insert Table 4

The results of the hypotheses tests are shown in Table 4. Evidence was found to support all four hypotheses. The combination of independent and control variables in Model 2 significantly accounts for 48% of the variance of the continuum of patient care, with the systems independent

variables significantly explaining 42% of the variance, above that of the control variables alone. Consistent to our expectations the results indicate that all four independent variables have a significant and positive influence on the continuum of patient care. Importantly, these results indicate that even in the presence of the influence of HRM systems on the dependent variable, the other three systems variables still significantly influenced levels of continuum of patient care. Specifically, HRM Systems (b = .22, $p < .001$) were not as important as Management Systems (b = .31, $p < .001$) in influencing levels of the continuum of patient care ratings. This is contrary to traditional perceptions of HPWS which emphasise the importance of HRM systems in shaping firm performance outcomes (e.g., Datta et al., 2005; Guthrie, 2001; West et al., 2006). Information Systems (b = .20, $p < .001$) appeared to be just as important as HRM Systems in explaining changes in the dependent variable, whilst Safe Work Environment Systems had less of an impact (b = .14, $p < .01$).

DISCUSSION

Theoretical Implications

The results provide important theoretical implications, particularly for the management of people, and organizations. The relationship between HRM systems and performance remains controversial, but nevertheless there are clear links. We have demonstrated a link between HRM systems and the continuum of patient care in the acute hospitals sector. This supports the notion that if HR systems are operating adequately, there are positive implications for organizational outcomes. Additionally, our analysis of the accreditation data taken from 462 Australian acute hospitals, reveals that when organizations have high accreditation ratings in other system areas, they will have high ratings in the most critical area for hospitals, the continuum of patient care. High performance in the areas of management systems, HRM systems, information systems and safe work environment systems all positively influence the continuum of patient care within an acute hospital setting and account for 42% of the variance of this variable.

Moreover, we provided evidence that HPWS should not consist of HRM systems alone, as is often the case, but be multi-dimensional and consist of additional effectiveness of workplace systems factors such as management systems, information systems and safe work environment systems. We provided initial evidence for the construct validity of four distinct systems factors in our CFA. By

examining the influence of these influence of these systems simultaneously, we were able to show that the three added factors explained significant amounts of variance in the firm performance outcome, in addition to that of HRM systems. Indeed, in the acute hospital context, management systems appear to have a greater impact on the Continuum of Patient Care, and information systems a similar impact, as compared to that of HRM systems. Management is often promoted as an essential ingredient in the complex mixture that is firm performance. Hospitals are large and complex units and clearly systems are needed, not ad hoc approaches. Systems need to be designed for the specific goals of the organization and thus at the apex of the organization systems are a component of strategic management. These results reiterate the importance of considering these other systems factors when examining HPWS and the link between it and performance.

Our data has demonstrated that four systems have some relationship with our outcome variable. While there may be differences, our study has generalizability to other sectors. Human resource management systems, management systems, information systems and safe work environment systems are present in all industries, although some sectors would codify and operationalize these systems differentially (and more clearly) than other sectors might. We would expect that high performance in these four systems areas would lead to high performance when measured against appropriate outcome variables, regardless of industry type.

Finally, this research is the first to analyse an industry specific dataset of information developed, and collected by industry experts. Following a rigorous methodology, the accreditation measurement scales were carefully developed and refined over time and the data collected from each hospital was cross-validated using multiple trained assessors. As such, we have provided a significant contribution to the literature on firm performance, through demonstrating that industry practitioners can make a significant contribution to our understanding of the workplace systems factors that influence performance within their industry.

Managerial Implications

Combining our results with four distinct bodies of research – human resource systems, management systems, information management, and safety management systems – we can draw clear

conclusions about organizational performance. This research indicates that all of our four areas of interest significantly and positively influence the continuum of patient care in acute hospitals.

Whilst the ACHS accreditation data measures 40 relevant standards on a five point scale, our confirmatory factor analyses led us to focus on only 32 of these standards in order to construct both the independent and dependent variable composites. Importantly, this is not to say that the remaining standards are not relevant or do not have an impact on performance. A nuanced understanding of contextual factors is required for informed judgements to be made. We propose that industry leaders, managers and practitioners more widely can use our findings to assist in ascertaining what 'standards' or measures can be used within their particular context to develop positive, and relevant performance outcomes.

The importance of context aside, this data makes it clear that decision-makers within organizations who are focussed on delivering high organizational performance, must ensure that their management systems are appropriate; they deliver adequate resources to ensure HRM performance is high; information systems are developed and integrated appropriately; and their safe work environment policies are designed to ensure low rates of health and safety incidents.

Limitations and Future Research

Whilst this data offers much, it has some limitations. Firstly, we have cross-sectional data collected nation-wide at one point in time. The possible use of future EQuIP datasets will allow an important longitudinal aspect of this study. Also, the measures for our dependent variable (Continuum of Patient Care) performance are systems-related and as such are an appropriate proxy for the quality of care a patient may receive. Certainly, while high functioning systems throughout the continuum of patient care standards are more likely to reduce the possibility of quality care failings, the two measures are not identical. We have not been able to collect data at this stage on what this means relative to quantifiable adverse health outcomes for patients and staff, or more broad measures like the financial performance of the hospitals. What we must do from this point is develop a means of adequately measuring quality of care at a hospital level and link this to the accreditation performance measure of continuum of patient care. From here we can work further to develop our understanding about what factors really influence the quality of care that patients are receiving on a day-to-day basis.

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TABLE 1

Goodness of Fit Summary for the Measurement Model Analyses[a b]

Model		χ^2	*df*	*p*	$\Delta\chi^2$	Δdf	CFI	IFI	NNFI	RMSEA	SRMR
HRM Systems	A priori	54.67	9	< .001	---	---	.92	.92	.87	.11	.05
	Modified	5.96	5	.311	48.71***	4	1.00	1.00	1.00	.02	.02
Management Systems	A priori	82.38	35	< .001	---	---	.95	.95	.93	.06	.04
Information Systems	A priori	162.07	35	< .001	---	---	.85	.85	.81	.10	.06
	Modified	47.72	20	< .001	79.69***	15	.95	.95	.93	.06	.04
Safe Work Environment Systems	A priori	42.32	27	.031	---	---	.97	.97	.97	.04	.04
HPWS – Combined Four Systems Factors	A priori	904.44	458	< .001	---	---	.88	.88	.87	.05	.05
	Modified	553.75	319	< .001	350.69***	139	.92	.92	.91	.04	.05
	1-factor	783.07	324	< .001	229.32***	5	.83	.84	.82	.06	.06
Continuum of Patient Care	A priori	12.39	5	.030	---	---	.99	.99	.97	.06	.03

[a] n = 395. [b] Robust statistics reported for χ^2 and CFI.

TABLE 2

Standardized Confirmatory Factor Analysis Coefficients and Cronbach's Alpha Coefficients for ACHS EQuIP 3 Standards

Factors and Items		Standardized Coefficient Factor Loadings	Cronbach's Alpha Coefficients
Continuum of Patient Care Systems			**.80**
1.	Access to the system of care is prioritised according to clinical need.	.48	
2.	The assessment system ensures consumer/patient needs are identified by competent professionals.	.79	
3.	Care is planned and delivered in partnership with the consumer/patient and when relevant, the carer, to achieve the best possible results.	.66	
4.	Care is evaluated by health care providers together with the consumer/patient and, when appropriate, with the carer.	.69	
5.	Processes for discharge/transfer address the needs of the consumer/patient for ongoing care.	.70	
HRM Systems			**.76**
1.	Human resource planning supports the organization's current and future ability to provide quality and safe care and service.	.60	
2.	The recruitment, selection, appointment and continuing employment system ensures that the skill mix and competency of staff support safe practice and the provision of quality care and service.	.68	
3.	The performance management system ensures the competency of staff supports safe practice and the provision of quality care and service.	.64	
4.	The learning and development system ensures the skill and competency of staff support safe practice and the provision of quality care and service.	.63	
6.	The organization provides services that support staff to provide quality and safe care and service.	.55	
Management Systems			**.80**
1.	The organization provides quality, safe care through the planning and development of services and its pro-active response to internal and external challenges.	.55	
2.	Care and service are provided in accordance with legislative requirements.	.60	
3.	Credible and transparent governance is assisted by formal structures within the governing body, and an operational framework within the organization.	.54	
4.	A system of delegation of authority and the management of external service providers supports safe and efficient business practices.	.51	
5.	Documented corporate, operational and clinical policies assist the organization to provide quality, safe and efficient care and service.	.60	

7.	A risk management system ensures that risks are minimised in all activities.	.67	
8.	The organization develops a continuous quality improvement system to demonstrate its commitment to improving performance in care and service delivery.	.67	
9.	The organization establishes mechanisms for involving consumers in planning, provision, monitoring and evaluation of the health service to support improvement.	.44	
Information Systems			**.74**
2.	Unique identification of consumers/patients ensures comprehensive and accurate information is used in care delivery.	.40	
3.	Non-clinical information sources are maintained and monitored to enable safe management and for the organization's goals to be met.	.50	
4.	There are systems for records management that support the collection of Information and that meet the organization's needs.	.45	
6.	Data are organised to ensure availability, analysis and the creation of information.	.62	
7.	Clinical classification provides health information to support internal and external service requirements.	.45	
8.	Data are analysed and used to support quality and safe care and service.	.72	
9.	The organization uses an integrated approach to plan, and appropriately use, information technology (IT).	.62	
Safe Work Environment Systems			**.73**
2.	Buildings, plant, equipment, utilities, consumables and supplies are managed and operated to support safe practice and a safe environment.	.64	
3.	The infection control system supports safe practice and a safe environment.	.42	
4.	The emergency management system supports safe practice and a safe environment.	.70	
5.	The management of manual handling risks supports safe practice and a safe environment.	.41	
6.	Security management supports safe practice and a safe environment.	.52	
7.	The management of dangerous goods and hazardous substances supports safe practice and a safe environment.	.54	
9.	The waste management system supports safe practice and a safe environment.	.50	

Note: All factor coefficients significant at $p < 0.001$. Loadings and coefficients for the independent variables are based on the results from the modified combined four factor model.

TABLE 3

Means, Standard Deviations, Correlations and Reliabilities of ACHS Standards

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Continuum of Patient Care	2.98	.28	(.79)						
2. HRM Systems	2.90	.30	.58***	(.76)					
3. Management Systems	2.90	.27	.60***	.64***	(.80)				
4. Information Systems	2.95	.22	.54***	.58***	.61***	(.73)			
5. Safe work Environment Systems	2.98	.22	.50***	.53***	.61***	.49***	(.74)		
6. Hospital Size [a]	2.47	1.23	.08	.14**	.12**	.14**	.12**	---	
7. Sector [b]	1.46	.50	.16***	.24***	.16***	.19***	.14**	-.17***	---

N= 462. Figures in parentheses indicate inter-item reliabilities.

[a] 1 = 1-49 beds, 2 = 50-99 beds, 3 = 100-199 beds, 4 = 200-499 beds, 5 = more than 500 beds)

[b] 1 = public, 2 = private

*p <.05

**p <.01

***p <.001

TABLE 4

Results of Regression Analysis of Influence on Continuum of Patient Care

Variable	Model 1		Model 2	
	b	s.e.	b	s.e.
Step 1				
Hospital Size (Number of Beds)	.03*	.01	-.01	.01
Sector (Public/Private)	.10***	.03	.00	.02
State 1	-.02	.04	-.04	.03
State 2	.07	.04	.04	.03
State 3	-.01	.05	-.02	.04
State 4	-.01	.09	.07	.07
State 5	.03	.06	-.01	.04
State 6	-.11	.12	-.02	.09
State 8	-.06	.14	.02	.11
Step 2				
HRM Systems			.22***	.05
Management Systems			.31***	.05
Information Systems			.20***	.06
Safe Work Environment Systems			.14**	.06
R^2	.06***		.48***	
ΔR^2			.42	
F for Δ^2			89.45***	
N	462		462	

Unstandardized coefficients reported.
*p <.05
**p <.01
***p <.001