

**The role of the human dimension in organizational agility: an empirical study in
intensive care units**

Lucía Melián-Alzola

Universidad de Las Palmas de Gran Canaria

lucia.melian@ulpgc.es

Carmen Domínguez-Falcón

Universidad de Las Palmas de Gran Canaria

carmen-dominguez@ulpgc.es

Josefa D. Martín-Santana

Universidad de Las Palmas de Gran Canaria

josefa.martin@ulpgc.es

© 2020. This manuscript version is made available under the CC-BY-NC-ND 4.0 license
<http://creativecommons.org/licenses/by-nc-nd/4.0/>.

This document is the Accepted Manuscript version of a Published Work that appeared
in final form in *Personnel Review* access the final edited and published work see
<https://doi.org/10.1108/PR-08-2019-0456>

The role of the human dimension in organizational agility: an empirical study in intensive care units

Abstract

Purpose: The purpose of this paper is to analyze the role of hospital leaders and high-performance work practices (HPWPs) in intensive care units (ICUs) on organizational agility and its impact on healthcare personnel satisfaction.

Design/methodology/approach: This study was carried out in three ICUs of an important Spanish public hospital, one for adults, one paediatric and one neonatal. The unit of analysis was ICUs personnel (324 individuals: 14.5%, 48.8%, and 36.7% from the categories of doctors, nurses, and nurses' aides, respectively) who were invited to participate in the study. The sample had 248 individuals, with a sampling distribution by categories that was quite similar to that of the population. To test the hypotheses proposed, SEM models were used as the maximum likelihood estimation method.

Findings: The results confirm the proposed model and reveal the importance of the human dimension in ICUs on hospital agility and on its performance in terms of satisfaction of the clinical staff working in this area.

Originality/value: This paper is original because it analyzes units of great complexity such as ICUs from a management and not clinical perspective. In addition, it studies the role of hospital managers and HPWPs on employee outcomes, as well as in hospital responsiveness in a very dynamic context that demands agility on the management approach.

Keywords: agility, leadership, human resources practices, healthcare personnel satisfaction, Hospital, ICU.

Article classification: Research paper

Introduction

Settings where organizations currently carry out their activities are increasingly changeable, turbulent, and complex (Uhl-Bien and Arena, 2017). In light of this fact, organizations must act in a dynamic way from a systemic, long-term perspective. Thus, today's context calls for a new management paradigm oriented towards agility (Labaf and Bigdelli, 2015). Based on this paradigm, the organizational activity must respond rapidly and flexibly to changes in the environment and have the capacity to manage situations of uncertainty (Sharifi and Zhang, 1999; Sherehiy *et al.*, 2007). In this regard, more studies are necessary to analyze the factors that determine organizational agility in the health sector (Suresh and Patri, 2017).

In particular, the role of the personnel on organizational agility is a requisite to successful performance, given that individuals in organizations must be committed to and prepared for change, as stated by Nijssen and Paauwe (2012). Therefore, it is easy to understand why the role of the human factor on organizational agility has been addressed in the literature (e.g., Harraf *et al.*, 2015; Mooghali *et al.*, 2016). Specifically, Walsh *et al.* (2002) analyzed the role of human resources management (HRM) on organizational agility in public and private sector. In this regard, hospitals, as organizations, is not exempt from the role played by the human dimension in organizational agility. Hospitals are complex institutions that offer multiple services where the employees and the relationship between departments and units are critical factors for successfully providing health services (Chang *et al.*, 2013; Lee, 2016). In this sense, Nembhard and Tucker (2011) point out that healthcare professionals face great complexity, uncertainty and dynamism in their daily work due, among other things, to advances in medicine and technology and the variability of patient response to treatments. In this context, the agility is key, hence the growing interest in studying the

elements that contribute to increase hospital units' agility, including the role of the human component, as shown in Pipe *et al.* (2012).

Specifically, the study of ICUs as complex work areas that present a high level of uncertainty is of special interest (Backes *et al.*, 2012). ICUs are highly specialized units that offer 24-hour clinical care to critical patients whose evolution is changing and unpredictable. They also demand high-qualified professionals with high environmental dependence on resources and services from other hospitals and out-of-hospital sources (Valentin and Ferdinande, 2011; Van der Sluijs *et al.*, 2017). Thus, ICUs are dynamic, complex, and interdependent systems of internal and external hospital personnel that require agility, and where professional performance is the key to the service's success (Nascimento *et al.*, 2013; Massaroli *et al.*, 2015). Therefore, it is important to analyse the relationship between the human dimension in ICU and agility in hospitals, providing solutions from the services literature. Thus, this research analyses ICUs from a service management perspective and helps to close the gap in the literature on the management of ICUs. Another contribution to academic literature in general is the empirical validation of theoretical proposals about the novel concept of organizational agility.

Based on the above, the objective of this study is to validate a model in which the human dimension influences both the organizational agility and the employee satisfaction. In this model, the human dimension is analysed from the perspective of HPWPs, considering as an antecedent of them, the leadership exercised by the hospital's top management. From this point on, the article begins by explaining organizational agility as a management criterion for hospital units in dealing with both external changes and internal needs. Next, the model is proposed, hypotheses are justified, and then the methodology and analysis of the results are presented. Finally, conclusions stemming from the study carried out in this article are described.

Literature review

Organizational agility as a management criterion in hospital units

Agility is an organization's capacity to adapt to dynamic and turbulent environments, reducing threats and maximizing opportunities that can take place in new scenarios that arise (Appelbaum *et al.*, 2017; Baškarada and Koronios, 2018). Therefore, agility is associated with concepts related to the organization's stability in the presence of changes, such as speed, flexibility, or the organization's capacity to respond (Santos Bernardes and Hanna, 2009; Roberts and Grover, 2012).

The healthcare system is composed of a network of interrelated parts (primary care centres, hospitals, rehabilitation units...) that interact in a non-linear way at different levels (patient, family, medical centres, government), and they often produce undesired consequences (adverse reactions to treatments, re-hospitalizations...) (Lipsitz, 2012). This complexity justifies the need to implement organizational agility as a management criterion in hospital units, as state Pipe *et al.* (2012). Effectively, healthcare systems are human organizations that mix different professionals and disciplines, where cooperation and interdependence take precedence over individuality, and flexibility and adaptation over rigidity (Martínez-García and Hernández-Lemus, 2013).

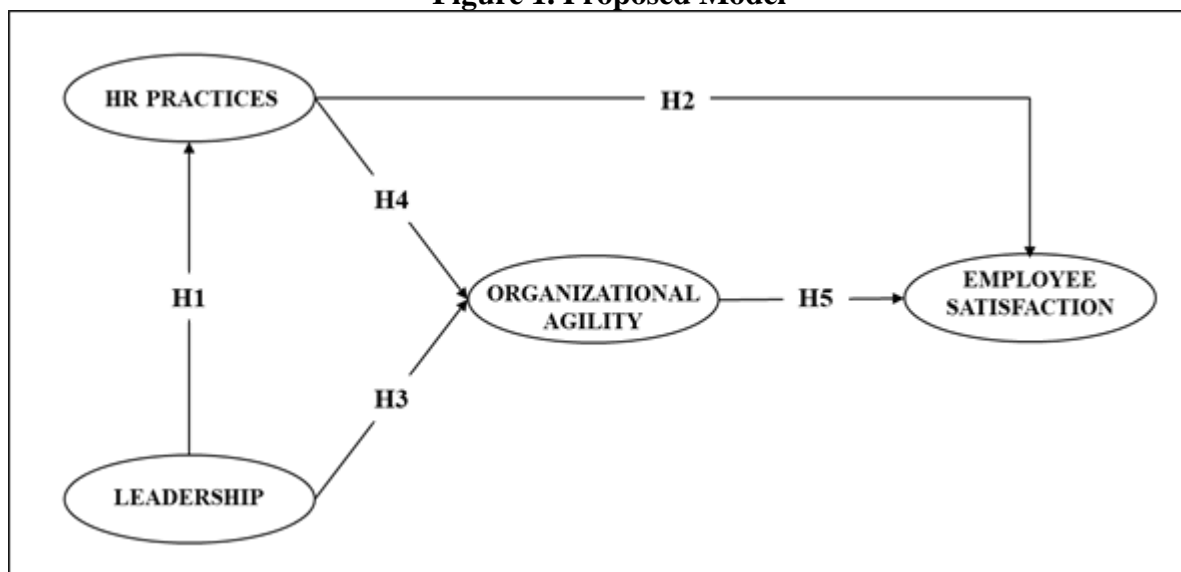
ICUs represent areas of the hospital that offer integral care, seeking to improve patients' health with life-sustaining treatments, as well as providing palliative care at the end of life for a dignified death (Cook and Rocker, 2014). This situation needs the teamwork of highly qualified professionals from different disciplines within the unit or from other units (pharmacies, x-rays, analytical, emergency ...) and/or out-of-hospital (other hospitals, service providers...) (Marshall *et al.*, 2017; Van der Sluijs *et al.*, 2017). Moreover, ICUs make intensive use of highly complex technology (Wikström *et al.*, 2007) and so they are constantly dependent on technological innovations in order to improve the quality of the

service. Thus, the study of ICUs to agile hospitals is justified by their complexity, dynamic nature, and dependence on internal and external resources.

The role of the human dimension in hospital agility

The active role of the human dimension in achieving organizational agility at the level of both management and the rest of the staff is widely mentioned in the literature (e.g., Crocitto and Yousef, 2003). Organizational agility produces important results in terms of economic and non-economic performance, including its impact on the attitudes of employees (Sanadgol, 2014; Nafei, 2016). This effect is even more relevant in ICUs, which typically involve a high level of human contact with considerable interaction among patients, relatives, and healthcare staff, especially physicians and nurses. Thus, due to the importance of healthcare personnel in the success of the ICU (Nascimento *et al.*, 2013; Massaroli *et al.*, 2015), it is necessary to study how the human dimension – leadership and HPWPs- influences the hospital’s agility, as both an antecedent and an outcome of performance linked to the employee.

Figure 1. Proposed Model



Hospital leadership and HPWPs

Leadership is management's skill in providing guidance and vision, recognizing and encouraging individual abilities, and inspiring employees to make a commitment to achieving the organizational objectives (Idris and Ali, 2008). In this regard, Al Harbi *et al.* (2019) state that leadership performs a key role on employees' attitudes toward the organizational goals. Moreover, leadership formulates future visions, promotes their followers' innovation and creativity and improves employee motivation. McAlerney (2006) recognizes the importance of leadership development in the context of inherently complex healthcare organizations where leaders must respond to multiple stakeholders and different performance goals.

HPWPs describe a group of different but interrelated practices that select, develop, retain, and motivate employees, with the capacity to generate added value for the organization (e.g. Luna-Arocas and Camps, 2007; Guthrie *et al.*, 2011; Mihail and Kloutsiniotis, 2016). Thus, Selden and Sowa (2015) state that HPWPs reduce voluntary turnover and thereby increase service quality. Regarding the key aspects or dimensions demanded by current HRM, the HPWPs proposals are, for example, extensive continuous training, employees' participation and multidirectional communication (Guthrie *et al.*, 2011; Lee *et al.*, 2012). The adoption of HPWPs in the healthcare sector is recognized in literature (e.g., Fan *et al.*, 2014; Mihail and Kloutsiniotis, 2016). In this regard, the literature emphasizes the importance of effective management of healthcare personnel working in ICUs through training (Sandahl *et al.*, 2013), participation and decision-making (Dorgham and Mahmoud, 2013), and rewards (James *et al.*, 2015), among others. Gittell *et al.* (2010) state that HPWPs influence on quality and efficiency outcomes for patients by relational coordination. They suggest that these practices are predictors of relational coordination in order to achieve better clinical results in interdependent work contexts.

The study of how the effective leadership of hospital managers contributes positively to the HRM in ICUs constitutes a topic of research of growing interest in literature. In this regard, senior management should be committed to service quality and work collaboratively with all members of the organization. For example, Hopkins *et al.* (2007) developed a respiratory ICU based on an improvement culture, which required substantial changes in patient care in ICU. In spite of being an innovative system for patients and hospital management, the unit received the necessary managerial support. In addition, hospital management could encourage innovation and improvement in ICUs. Thus, Bai *et al.* (2018) highlight the role of operational research/management science (OR/MS) in identifying efficient methods to manage the ICU to ensure quality of service. Consequently, hospital management must promote innovation culture and foster continuous training of new methods to improve ICU patient care (Hackner, 2010; Reader and Cuthbertson, 2011; Silva *et al.*, 2018). Likewise, hospital managers as effective leaders could influence employees and the work they perform in the UCI by increasing their participation in management. Thus, Oerlemans *et al.* (2018) propose the use of the Delphi method, as a useful tool for hospital management, to identify critical attributes for care quality to patients in any hospital unit and especially in ICU. For example, meeting the needs of patients' families requires the capacity to listen to and support them. To this end, authors propose a sustained dialogue between ICU and hospital management on care quality provided to patients and relatives. Furthermore, hospital management could encourage staff participation in organizational plans and goals setting by developing working teams or committees, among others. From this perspective, Parand *et al.* (2014) note that achieving quality outcomes in hospitals demands continuous management and intensive staff relationships. For example, hospital managers could promote ongoing coordination efforts between the Board and medical staff in establishing the organizational quality strategy. ICU is a service with special and complex needs and hospital

managers need ICU personnel participation to determine plans, objectives and resources of this unit, as well as basic demands on other units to which they are directly related (e.g., pharmacy, laboratories). Recently, Clay-Williams *et al.* (2019) advocate this idea and highlight the need to have a team of clinically influential leaders in hospital and ICU executive members to discuss the implementation of a new system in hospital. This system aimed to determine a set of rules to help make decisions in ICU, as well as to improve relations between patients, the surgery department and ICU. To achieve this goal, authors state that is necessary to enhance cohesion by using a multidisciplinary meeting to evaluate the status of ICU according to the plan.

In respect to the influence of leadership on the design of human resources practices (HRPs), the management literature provides some evidence. Pons-Verdú and Ramos-López (2012) point out that, these two concepts are closely related because the organization management has the responsibility to design the HRP. In this sense, Knies *et al.* (2018) show that frontline managers can make an important contribution to mission achievement by supporting implementation of HRPs. Smith *et al.* (2015) emphasize the need for an effective leader in dynamic contexts to foster improvement and continuous change, and empower talent, motivate staff, and listen actively. In this regard, Hodgetts (2011) states that effective leaders in hospital management should promote ongoing relationships with other organization members, thus encouraging staff participation. Moreover, Stockwell and Slonim (2006) argue the need for ICUs to have effective leaders in order to foster teamwork and engage health workers through strategies and goal achievement to improve the quality of patients' care and safety. In addition, Martin *et al.* (2014), in a study involving healthcare staff of ICUs, determine the need to have effective leaders who make a commitment to communicating and have a shared vision, contributing to greater collaboration and improvements in the quality of patients' care and safety. In this regard, Lee *et al.* (2016) also

refer to effective leadership when they allude to leadership capable of dealing with the environment and commitment to innovation and continuous improvement. They analyse the role of effective leadership in the hospital environment and use the term "hospital leadership", which we adopted in this research. From the above discussion, this study proposes in hypothesis H1 that hospital leadership influences on HPWPs design applied in ICUs.

H1 Hospital leadership positively and directly influences HPWPs.

HPWPs and employee satisfaction

The next hypothesis (H2) proposes a positive effect of HPWPs on employee satisfaction. As a conceptual basis for this premise, Macky and Boxall (2007) find that if the organization puts more HPWPs into effect, the employees are more satisfied. Nazneen *et al.* (2018) empirically demonstrate that employees' personal satisfaction is positively correlated with HRPs like training, performance appraisal, team working, employee participation and compensation. In this regard, Li *et al.* (2019) point out that organizations must create a work environment that conveys to employees that they are valuable to the organization and taken into account by senior management. Thus, authors identify some HRPs such as continuous training, the employee's participation in work commissions and receiving performance evaluations, among others, to improve employee wellbeing. From Zhang *et al.* (2018), it can be explained that when the organization invests in HRPs that benefit employees, they respond positively with positive behaviors and attitudes, such as employee satisfaction and organizational commitment. This reasoning finds theoretical support in Social Exchange Theory (SET) (e.g., Birtch *et al.*, 2016; Zoller and Muldoon, 2019), which states that employees will show a positive attitude towards the organization if he/she finds that the

organization is beneficial to him/her. Brink *et al.* (2019) also theoretically and statistically confirm the influence of HPWPs on employee satisfaction. Thus, these authors find that higher employee involvement, higher promotion and career development, and more autonomy result in higher employees' personal satisfaction. Moreover, they establish that the relationships between HPWPs and organizational performance can be mediated by employee outcomes. The positive influence of HRPs on employees has also been justified in the literature on healthcare, based on the reciprocity of employee-employer relations (e.g., Fan *et al.*, 2014; Almaaitah *et al.*, 2017). Hence, the influence of HRP on employee attitudes in healthcare organizations finds meaningful academic support (Lee *et al.*, 2012; Zhang *et al.*, 2013, Fan *et al.*, 2014). Thus, Ogbonnaya and Validaze (2018) confirm the positive influence of HRPs on employee outcomes, such as personal satisfaction and employee engagement in healthcare. In the same vein, Vermeeren *et al.* (2014) empirically demonstrate the positive relationship between HRPs and organizational performance in healthcare sector, finding that employee satisfaction plays a fundamental role as a mediator variable in this relationship. However, the lack of studies about the effects of HPWPs on healthcare' personal satisfaction on ICUs justifies their analysis in this research. Moreover, when different studies highlight the role of ICU personnel in the service quality (e.g., Oerlemans *et al.*, 2018). Taking the aforementioned studies as a reference, hypothesis H2 is formulated as follows:

H2 HPWPs positively and directly influence employees' personal satisfaction.

Hospital leadership and organizational agility

Today's organizations require proactive and sensitive managers with strong technical and relational capabilities. Thus, Harraf *et al.* (2015) indicate that in agile structures, the leaders have a defined business vision and direction that the members of the organization are excited

by and share. In the configuration of agile organizations, Crocitto and Youssef (2003) point out that, leaders are essential in promoting organizational learning and acceptance of change. Vinodh *et al.* (2012) add to this thesis that the type of management stimulates organizational agility. More specifically, they establish, for example, the need for a participative management style and the importance of employee awareness of management's objectives. In this regard, the latest version of the EFQM Excellence Model 2013 (EFQM, 2012) defends leadership as a key factor in the capacity to deal with situations of change and uncertainty (EFQM, 2012). Therefore, ICUs need effective leaders who are engaged and motivate others to act on changes and adverse environmental conditions (Smith *et al.*, 2015). Moreover, because ICUs are interconnected areas in hospitals, they need overall effective support and cooperation (Marshall *et al.*, 2017). Therefore, effective hospital leaders, as members of middle and top management and clinical professionals (Rotar *et al.*, 2016), play an important role in improving organizational agility to facilitate the work in ICUs. Hence, the hypothesis H3 is formulated as:

H3 Hospital leadership positively and directly influences organizational agility.

HPWPs and organizational agility

Regarding the positive impact of HRM in contexts that require agility, Sumukadas and Sawhney (2004) recommend several formulas, such as fostering employee training to deal with enriched and redesigned jobs and using systems of monetary and non-monetary incentives. Harraf *et al.* (2015) indicate that employees involved in decision-making show less resistance to the changes demanded of agile organizations. Likewise, Mooghali, *et al.* (2016) recognize that hospitals need to be agile in order to respond to dynamic environments, and they show that HRP favour employees' agility. Patri and Suresh (2017) state that

motivated employees, flexible workforce, cooperation between management and employees, training and implementation of employee's suggestion influence healthcare organization agility. In this regard, the complexity and dynamism of ICUs require organizational agility in order to ensure quality and patient safety. The ICU professional must always work quickly and effectively and make the right decisions in changing circumstances, as suggested by Nascimento *et al.* (2013) and Massaroli *et al.* (2015). Hence, we propose H4:

H4 HPWPs positively and directly influence organizational agility.

Organizational agility and employee satisfaction

In general, employees feel more satisfied when the organization has the processes and methods to develop the products and services that satisfy the clients' changing needs. In this regard, the agility must satisfy not only the clients, but also the employees (Melnik and Maurer, 2006; Mohammadi *et al.*, 2015). Thus, Mohammadi *et al.* (2015) point out that agile organizations increase employees' productivity and motivation. Likewise, Melnik and Maurer (2006) observe that in software development teams, among other factors, agile methods increase employees' personal satisfaction by improving communication among team members and with the customer, promoting continuous feedback and allowing developers to make decisions that affect them. In addition, Labaf and Bigdelli (2015) state that there is a positive and significant impact of organizational agility on employee efficiency and satisfaction. Similarly, Sanadgol (2014) finds a strong correlation between organizational agility (response capacity, competence, flexibility, and speed) and employee satisfaction, in the educational context. The lack of studies on the effects of organizational agility on UCI' personal satisfaction justifies their study in this work. If the results of these studies are extrapolated to our context, hypothesis H4 can be formulated in this way:

H5 Organizational agility positively and directly influences employee satisfaction.

Research Methodology

Sample and participants

This study was carried out in three ICUs of a Spanish public hospital, one for adults, one paediatric and one neonatal. In 2018, this Hospital had around 4,850 employees and 27,800 patients, and more than 22,600 surgical interventions were performed. The Intensive Care Service of the analysed hospital follows international quality standards and is accredited with ISO 9001. It has also received national and regional awards and recognition of the quality of its service. All of this confirms the suitability of the unit of analysis chosen. Following valid and accepted performance criteria, it represents a model to follow. The unit of analysis was ICUs personnel and the size of the population consisted of 324 individuals (14.5%, 48.8%, and 36.7% from the categories of doctors, nurses, and nurses' aides, respectively) who were invited to participate in the research. The sample had 248 individuals, with a sampling distribution by categories that was quite similar to that of the population (see Table 1), which guarantees its representativeness and assumes a sampling error of +3.08% at a 95.5% confidence interval. This sample size represents a response rate of 76.54%.

Table 1. Distribution of the population and the sample by category

CATEGORY	POPULATION		SAMPLE	
	N	%	n	%
Doctors	47	14.51	32	12.90
Nurses	158	48.77	122	49.19
Nurses' Aides	119	36.73	94	37.90
TOTAL	324	100.00	248	100.00

The sample is characterized by being composed mainly of women (76.6%) between 36 and 50 years old (60.5%), with more than 10 years of experience in the profession (83.5%) and five years in ICU (75%).

Measures

To collect the information, a self-administered personal survey was used, with 7-point Likert scales (from 1 strongly disagree to 7 strongly agree). A Delphi study was previously carried out with experts from the sector to assess the suitability of the scales proposed, and that a rigorous and comprehensive pre-test had been completed. The surveys were conducted in the workplace of the participants. In order to achieve the highest possible response rate, the members of the research team took responsibility for the fieldwork.

The items on the measurement scales are based on literature review and reflections of expert professionals. First, regarding the evaluation of the leader's role, she/he must firmly implement the corporative philosophy so that it is valued and followed by the entire hospital organization. In doing so, it is ideal for the personnel to participate in designing plans and setting objectives. Likewise, hospital managers have to be committed to service quality and a culture of innovation, encouraging continuous improvement and creativity in their employees in order to be prepared for change (Lakshman, 2006; Idris and Ali, 2008; Lee *et al.*, 2016). Moreover, the attributes included in this dimension are coherent with and based on the leadership philosophy and practices from the EFQM Excellence Model (2012), and they have recognized importance in the healthcare sector (e.g., West *et al.*, 2015). The HRM scale is composed of four types of practices (training, participation, recognition, and communication). Training is identified as an intensive system of formal training that collaborates in the employees' development process and covers technical and social skills (e.g., Guthrie *et al.*, 2011). Employees' participation evaluates their involvement in the

company's information process, decision-making, and/or problem-solving activities and is based on authors as Gallie (2013) and Mihail and Kloutsiniotis (2016), among others. Recognition is related to a stimulation and compensation scheme for the effort of the individual or group (Elmadağ and Ellinger, 2017). Finally, communication analyses if the organization share business information (plans, objectives, mission...) across different structural levels, as stated Guthrie *et al.* (2011).

In the organizational agility scale, it was considered advisable to include aspects such as the organizational capacity to predict and respond quickly to changes (patient evolution, technological development, demand peaks...). To develop this scale, proposals by different authors were considered, such as those by Sharifi and Zhang (1999), Sherehiy *et al.* (2007), and Roberts and Grover (2012). In addition, studies were reviewed that analyse agility in hospitals and ICUs, although it is a relatively unexplored area, especially the studies by Bottani (2010) and Pipe *et al.* (2012).

Employee satisfaction measures doctors, nurses' aides and nurses' attitudes and wellbeing in relation to their activities, and the scale used was based on authors as O'Neill (2005) and Vermeeren *et al.* (2014). Thus, items were included related to the satisfaction of personnel with their own jobs in ICUs and the degree to which they think their bosses and co-workers positively value their work. This scale aimed to measure ICUs personnel's feelings about their work and performance.

Analysis

Before testing the hypotheses, it is necessary to analyse the dimensionality and psychometric properties of the measurement scales used to evaluate the constructs in the proposed model: (1) the application of HPWPs (HR), (2) the leadership by Hospital management (LEADER), (3) the Hospital's agility as an organization (AGIL), and (4) the healthcare personnel's

satisfaction with the job (EMPSATIS). To do so, confirmatory factorial analyses (CFA) were performed using the maximum likelihood estimation method.

To test the hypotheses, SEM models were used as the maximum likelihood estimation method.

Results

Analysis of the dimensionality and validity of the measurement scales

The final HR measurement model is a second-order construct composed of four dimensions called “Training”, “Participation”, “Recognition”, and “Communication”, which are the classic dimensions included in the literature on HPWPs. However, to analyse the discriminant validity of this scale, a new model was estimated where all the items were linked to one factor. The results of this new model [$\chi^2(90)=981.47$, $p=0.000$, CFI=0.68, NFI=0.66, TLI=0.57, RMSEA=0.20] show the suitability of the second-order model [$\chi^2(86)=229.21$, $p=0.000$, CFI=0.95, NFI=0.92, TLI=0.93, RMSEA=0.08] because it presents higher significance levels and fit indexes, confirming that the scale is not one-dimensional. In fact, the chi-squared analysis of differences reveals significant differences (Dif. $\chi^2=752.26$, Dif. df=4, $p=0.000$).

Even though this model is statistically significant [$\chi^2(86)=229.21$, $p=0.000$], it should be pointed out that the chi-squared statistic depends on sample size, and so it is necessary to analyse other fit indicators. In this regard, the results show that other global fit indexes of the model fall within the values recommended by the literature (CFI=0.95, NFI=0.92, TLI=0.93, RMSEA=0.08), leading to the conclusion that the specified model adequately reproduces the observed covariance matrix. This model shows a satisfactory fit because the CFI lies between 0.90 and 0.95, and the RMSEA value does not exceed the maximum recommended value of 0.08 (Mathieu and Taylor, 2006). Based on Anderson and Gerbing (1988), as Table 2 shows,

the model has acceptable individual reliability because the relationship between each item and its respective dimension is statistically significant, and most of the standardized regression weights are above 0.70. With regard to the internal consistency measures of each dimension and the global construct, the composite reliability (CR) indicator reaches values above 0.70, and the average variance extracted (AVE) values are above 0.50. The Cronbach's alpha values corroborate those obtained with composite reliability. These results indicate, therefore, that the model is reliable.

The final measurement models for LEADER, AGIL, and EMPSATIS are one-dimensional and composed of 3, 4, and 4 items, respectively. The results of the three models indicate that they are not statistically significant ($p=0.136$, $p=0.038$ and $p=0.091$, respectively) and that the other global fit indicators present quite satisfactory values (see Table 2). Therefore, it can be concluded that the specified models adequately reproduce the observed covariance matrix. Moreover, the individual reliabilities, the composite reliabilities, the variances extracted, and the Cronbach's alphas are satisfactory (see Table 2).

Table 2. Results of the Confirmatory Factorial Analyses of the measurement models

Causal relationships		Standardized estimators	<i>t</i>	<i>p</i>	Internal Consistency
HR PRACTICES [$\chi^2(86)=229.21$, $p=0.000$, CFI=0.95, NFI=0.92, TLI=0.93, RMSEA=0.08]					
Training	←HR	0.751			
Participation	←HR	0.885	9.000	0.000	
Recognition	←HR	0.776	6.533	0.000	
Communication	←HR	0.730	8.586	0.000	
T1	←Training	0.823			
T2	←Training	0.916	17.645	0.000	FC = 0.908
T3	←Training	0.773	13.854	0.000	AVE = 0.713
T4	←Training	0.859	16.610	0.000	$\alpha=0.908$
P1	←Participation	0.759			FC = 0.913
P2	←Participation	0.847	13.938	0.000	AVE = 0.678
P3	←Participation	0.883	14.629	0.000	$\alpha=0.915$

P4	←Participation	0.776	12.584	0.000	
P5	←Participation	0.844	13.887	0.000	
R1	←Recognition	0.622			FC = 0.786
R2	←Recognition	0.964	8.458	0.000	AVE = 0.658 $\alpha=0.749$
C1	←Communication	0.832			
C2	←Communication	0.830	15.593	0.000	FC = 0.923
C3	←Communication	0.891	17.342	0.000	AVE = 0.751 $\alpha=0.922$
C4	←Communication	0.910	17.968	0.000	
LEADERSHIP [$\chi^2(8)=2.22, p=0.136, CFI=0.99, NFI=0.99, TLI=0.99, RMSEA=0.07$]					
L1	←LEADERSHIP	0.917	21.912	0.000	FC = 0.940
L2	←LEADERSHIP	0.939	23.080	0.000	AVE = 0.838
L3	←LEADERSHIP	0.890			$\alpha=0.936$
ORGANIZATIONAL AGILITY [$\chi^2(12)=6.53, p=0.038, CFI=0.99, NFI=0.99, TLI=0.98, RMSEA=0.09$]					
OA1	←ORGANIZATIONAL AGILITY	0.883			
OA2	←ORGANIZATIONAL AGILITY	0.952	24.121	0.000	FC = 0.957
OA3	←ORGANIZATIONAL AGILITY	0.957	24.384	0.000	AVE = 0.848 $\alpha=0.955$
OA4	←ORGANIZATIONAL AGILITY	0.890	20.476	0.000	
EMPLOYEE SATISFACTION [$\chi^2(12)=4.80, p=0.091, CFI=0.99, NFI=0.98, TLI=0.95, RMSEA=0.07$]					
PS1	←EMPLOYEE SATISFACTION	0.524			
PS2	←EMPLOYEE SATISFACTION	0.733	7.366	0.000	FC = 0.805
PS3	←EMPLOYEE SATISFACTION	0.763	7.493	0.000	AVE = 0.514 $\alpha=0.779$
PS4	←EMPLOYEE SATISFACTION	0.814	7.626	0.000	

Appendix 1 shows all the variables and final items for each of the scales.

Hypothesis testing

To test the hypotheses, the sample size restrictions recommended treating the dimensions of the HR construct as observed variables, and so four new variables were created based on the results of the CFA. These variables correspond to the weighted means of the items that make up each dimension, weighted by the regression weights for each of them in the CFA.

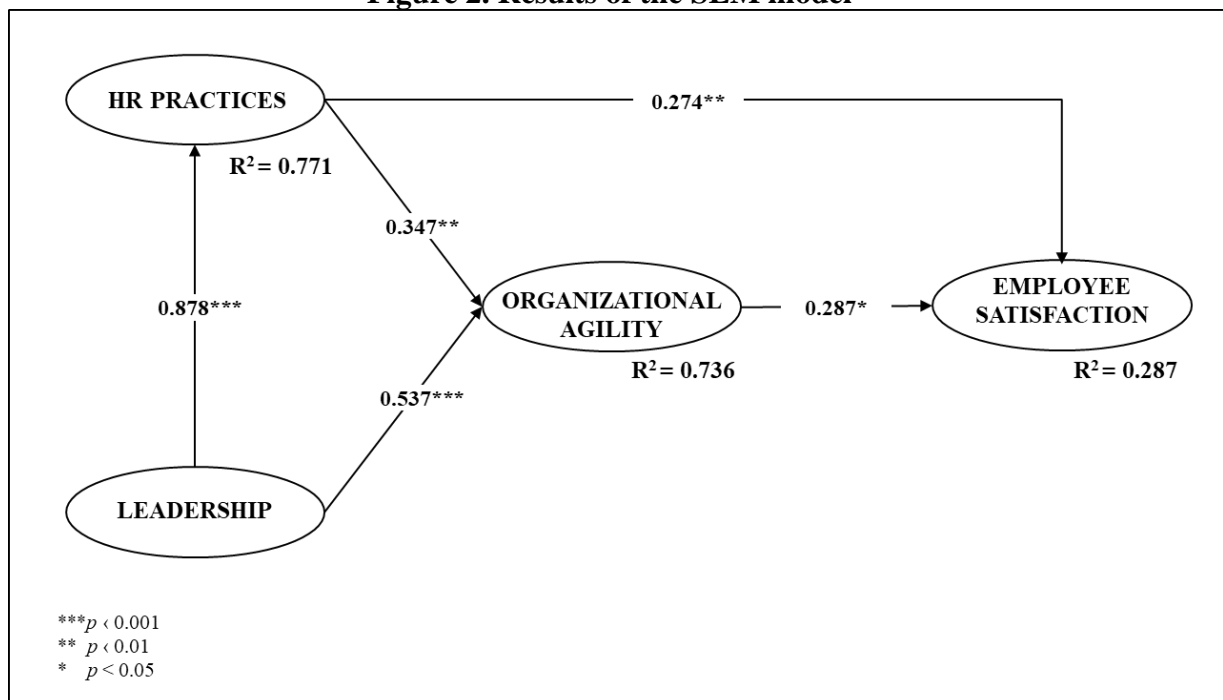
The results of the SEM model, included in Figure 2, indicate that the model is

excellent [$\chi^2(50)=211.56, p=0.000; CFI=0.96; NFI=0.93; TLI=0.94; RMSEA=0.08$] because the CFI value is above 0.95, and RMSEA does not exceed 0.08 (Mathieu and Taylor 2006).

These results allow us to draw the following conclusions:

- Hospital management’s leadership positively and significantly influences the application of HPWPs ($\beta=0.878, p=0.000$), explaining 77.1% of the variability in the application of these practices in the ICU. Therefore, hypothesis H1 can be supported.
- Both hospital leadership and the application of HPWPs bring agility to the organization ($\beta=0.537, p=0.000$ and $\beta=0.347, p=0.003$, respectively), explaining 73.6% of its variability. Therefore, hypotheses H3 and H4 can be supported.
- Finally, the application of both HPWPs and organizational agility positively and significantly influences the healthcare personnel’s satisfaction with their work ($\beta=0.274, p=0.050$ and $\beta=0.287, p=0.033$, respectively), explaining 28.7% of the variability. Therefore, hypotheses H2 and H5 are supported.

Figure 2. Results of the SEM model



Once the influence of HPWPs on organizational agility and employee satisfaction has

been confirmed, the multidimensional nature of these practices recommends hierarchizing them according to their level of impact in each of these two constructs. In order to do so, the degree of correlation between each of its dimensions with both constructs was determined through Pearson's correlation coefficient r (see Table 3). The results clearly indicate that all the practices have a positive relationship with both constructs. However, these results reveal that, related to organizational agility, communication has the highest correlation ($r = 0.682$), followed by the other three dimensions with similar levels, ranging from 0.545-0.577. In this regard, these data reveal the importance of knowing and sharing the strategic direction, objectives, and values of both the hospital and its specific work area for ICUs personnel at all times. On the one hand, in ICUs it is important to be continuously informed about organizational priorities, especially when working in contexts of uncertainty in patient care (Smith *et al.*, 2015; Marshall *et al.*, 2017). On the other hand, related to employee satisfaction, the participation and training dimensions have the highest correlation ($r=0.442$ and $r=0.415$, respectively), compared to the communication and recognition dimensions ($r=0.371$ y $r=0.264$, respectively). Therefore, findings support the importance of having high-qualified healthcare personnel in ICUs as stated Valentin and Ferdinande (2011) and the need for teamwork and joint decision-making as explained by Marshall *et al.* (2017).

Table 3. Correlations of human resources practices with organizational agility and employee satisfaction

DIMENSIONS OF HUMAN RESOURCES PRACTICES	ORGANIZATIONAL AGILITY		EMPLOYEE SATISFACTION	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Training	0.577	0.000	0.415	0.000
Participation	0.561	0.000	0.442	0.000
Recognition	0.545	0.000	0.264	0.000
Communication	0.682	0.000	0.371	0.000

*** $p < 0.001$

Discussion

Theoretical implications

The main contribution of this study was to measure the role of the human dimension - leadership and HPWPs- on organizational agility of hospital management in complex, uncertain environments, which is of particular importance in ICUs. The results obtained in this study support the importance of the human dimension in organizational agility, validating the proposed model. Thus, this research supports Liang *et al.* (2018)'s premise on the role of the human dimension on organizational agility in public sector.

First, results show that, in hospital units, hospital leaders play an important role in the design of HRP in ICUs. This confirms the findings of similar studies in other contexts (e.g., Tarí *et al.*, 2007). As a recommendation, a medical chief of staff can and must propose certain training courses for the members of his/her team. Second, there is also a positive and direct impact of HPWPs on the satisfaction of ICU personnel. This hypothesis, confirmed specifically in ICUs, supports the results from previous studies in hospitals (e.g., Ang *et al.*, 2013) and healthcare service (e.g., Vermeeren *et al.*, 2014) from a global perspective.

Third, the relationship between leadership and organizational agility has been shown. This research shows the need for enthusiastic, effective, and proactive leaders who are committed to quality, continuous improvement, and innovation. In addition, hospital managers should engage personnel in the establishment of hospital objectives and plans. Thus, innovation culture promotes a proactive management attitude and a greater capacity to predict and adapt to future changes in environment.

Fourth, results also recognize the effect of HPWPs on organizational agility (e.g., Nijssen and Paauwe, 2012). In other words, HRPs such as training, participation, recognition, and communication, it positively contributes to improving hospital agility. For example, staff members who receive training to deal with critical situations, are involved in decision-

making, and feel valued become intangible assets and contribute to effective hospital management in changing and uncertain contexts. This result constitutes an original and significant contribution to literature due to it analyses a clinically very complex unit that affects hospital management. Indeed, ICUs are key organizational units within the hospital system so that if care quality in ICU is deficient it affects other departments (Oerlemans *et al.*, 2018). Moreover, the high interdependence of the ICU with other units may generate a poor interdepartmental coordination, problems with hospital functioning and, therefore, poor resilience to changing conditions (e.g., problems between ICUs and emergency areas) (Clay-Williams *et al.*, 2019). Thus, enhancing HRPs which train, empower and motivate ICU personnel contribute to improve unit performance and hospital system. Finally, it is important to highlight the impact of organizational agility on healthcare personnel satisfaction in ICUs. This effect is relevant because, although it has not been broadly studied at an academic level, it helps to explain the fact that workers feel more satisfied with their work when they perceive that the hospital is agile and responds quickly and flexibly to dynamic contexts.

Managerial implications

Regarding the practical implications of the results obtained, hospital leaders should show intense concern and a positive attitude towards quality, ongoing improvement, and innovation. However, it is essential the development of HPWPs that are coherent with the organizational philosophy that management defends. Specifically, hospital leaders must orient training, participation, recognition, and communication towards excellence as a goal for everyone. As a result, hospital management will be able to increase organizational agility, that is, its capacity to adapt to the challenges and opportunities of the environment and respond better to the demands and needs of the healthcare system and society in general. This agility is especially relevant for ICUs, where it is important to act quickly in situations of

constant change (unpredictability in the patients' evolution, making clinical decisions that require handling data from the unit and other units, scientific advances...). It should be noted that all the practices analysed influence organizational agility, but communication, acceptance, and understanding of organizational objectives and values are fundamental to the daily work of ICU personnel. In turn, implementing HRPs and greater organizational agility will lead to making healthcare professionals more satisfied with the work they do. Although all HRPs influence the satisfaction of ICU personnel, the ones with the most positive correlations are training and participation. For this reason, hospital management is advised to promote the development of the technical and social skills and competencies required by healthcare personnel and foster teamwork and multidisciplinary collaboration in the ICU work system.

Conclusions and limitations

The present study shows that the human dimension in hospitals, and specifically in ICU, contributes to organizational agility. Thus, the leader's effort to have a proactive and participative organization, fostering quality, ongoing improvement, and innovation in processes and services, is decisive in increasing the hospital's capacity when facing contexts of change. In addition, from the perspective of ICU personnel, HPWPs positively influenced by the leader's role also favour organizational agility. Likewise, organizational agility influences the attitudes of ICU personnel -doctors and nursing-, exerting a positive impact on employee satisfaction. These results contribute to addressing the argument by Ramanujan and Rousseau (2006) that the new challenges in hospital management are organizational rather than just clinical. The main limitation is that the data were collected from three ICUs in one public hospital. Although it would be necessary to replicate this study in other organizational and geographical contexts in order to consolidate the observations made, conclusions

obtained can be extrapolated to organizations that provide similar services, that is, services where highly qualified professionals work together in situations of uncertainty and demand a dynamic attitude from their organization to facilitate their daily work.

References

- Al Harbi, J.A., Alarifi, S. and Mosbah, A. (2019), "Transformation leadership and creativity: Effects of employees psychological empowerment and intrinsic motivation", *Personnel Review*, Vol. 48, No.5, pp.1082-1099.
- Almaaitah, M.F., Harada, Y. and Sakdan, M.F. (2017), "Integrating Herzberg and Social Exchange Theories to Underpinned Human Resource Practices, Leadership Style and Employee Retention in Health Sector", *World Journal of Business and Management*, Vol.3, No.1, pp.16-34.
- Anderson, J.C. and Gerbing, D.W. (1988), "Structural equation modeling in practice: a review and recommended two-step approach", *Psychological Bulletin*, Vol.103, No. 3, pp.411-423.
- Ang, S.H., Bartram, T., McNeil, N., Legat, S.G. and Stanton, P. (2013), "The effects of high-performance work systems on hospital employees' work attitudes and intention to leave: a multi-level and occupational group analysis", *The International Journal of Human Resource Management*, Vol. 24, No. 16, pp. 3086-3114.
- Appelbaum, S.H., Calla, R., Desautels, D. and Hasan, L.N. (2017), "The challenges of organizational agility: part 2", *Industrial and Commercial Training*, Vol. 49, No.2, pp.69-74.

- Backes, M.T.S., Backes, D.S. and Lorenzini, A.E. (2012), “Relationships and interactions in the Intensive Care Unit environment of care”, *Acta Paulista de Enfermagem*, Vol. 25, No. 5, pp.679-685.
- Bai, J., Fügner, A., Schoenfelder, J. and Brunner, J.O. (2018), “Operations research in intensive care unit management: a literature review”, *Health Care Management Science*, Vol. 21, pp.1-24.
- Baškarada, S. and Koronios, A. (2018), “The 5S organizational agility framework: a dynamic capabilities perspective”, *International Journal of Organizational Analysis*, Vol.26, pp.331-342.
- Birtch, T.A., Chiang, F.F.T. and Van Esch, E. (2016), “A social exchange theory framework for understanding the job characteristics–job outcomes relationship: the mediating role of psychological contract fulfilment”, *The International Journal of Human Resource Management*, Vol.27, No.11, pp. 1217-1236.
- Bottani, E. (2010), “Profile and enablers of agile companies: an empirical investigation”, *International Journal of Production Economics*, Vol. 125, No. 2, pp. 251-261.
- Brink, K., Otten, S. and Hauff, S. (2019), “High-Performance Work Practices and Job Satisfaction: Gender’s Moderating Role”, *European Management Review*, Vol.16, pp.333-345.
- Chang, H.T., Jen, H.Y. and Dahlgaard-Park, S.M. (2013), “Using service simulation to analyse the satisfaction with the processes of intensive care unit in the hospital: the perspective of the patient and the family”, *Total Quality Management and Business Excellence*, Vol. 24, No.7-8, pp. 869-885.

- Clay-Williams R., Blakely, B., Lane, P., Senthuran, S. and Johnson, A. (2018), “Improving decision making in acute healthcare through implementation of an intensive care unit (ICU) intervention in Australia: a multimethod study. *BMJ Open*, 9: e025041.
- Cook, D. and Rucker, G. (2014), “Dying with dignity in the intensive care unit”, *The New England Journal of Medicine*, Vol. 370, No. 26, pp. 2506-2514.
- Crocitto, M. and Youseff, M. (2003), “The human side of organizational agility”, *Industrial Management & Data Systems*, Vol. 103, No. 6, pp. 388-397.
- Dorgham, S.R. and Mahmoud, S.A. (2013), “Leadership Styles and Clinical Decision Making Autonomy among Critical Care Nurses: A Comparative Study”, *IOSR Journal of Nursing and Health Science*, Vol. 1, No. 4, pp.71-83.
- EFQM (2012), *Modelo EFQM de Excelencia*. EFQM Publications.
- Elmadağ, A.B. and Ellinger, A.E. (2017), “Alleviating job stress to improve service employee work affect: the influence of rewarding”, *Service Business*, Vol.12, No.1, pp. 121-141.
- Fan, D., Cui, L., Zhang, M.M., Zhu, C.J., Härtel, C.E.J. and Nyland, C. (2014), “Influence of high performance work systems on employee subjective well-being and job burnout: empirical evidence from the Chinese healthcare sector”, *The International Journal of Human Resource Management*, Vol. 25, No. 7, pp. 931-950.
- Gallie, D. (2013), “Direct participation and the quality of work”, *Human Relations*, Vol. 66, No. 4, pp.453-473.
- Gittell, J.H., Seidner, R. and Wimbush, J. (2010), “A relational model of how high-performance work systems work”, *Organization Science*, Vol. 21, No.2, 490-506.

- Guthrie, J.P., Flood, P.C., Liu, W., MacCurtain, S. and Armstrong, C. (2011), "Big hat, no cattle? The relationship between use of high-performance work systems and managerial perceptions of HR departments", *The International Journal of Human Resource Management*, Vol. 22, No. 8, pp. 1672-1685.
- Hackner, D. (2010), "Staffing the ICU for Performance", *ICU Director*, Vol.1, No.2, pp.106-115.
- Harraf, A., Wanasika, I., Tate, K. and Talbott, K. (2015), "Organizational agility", *Journal of Applied Business Research*, Vol.31, No. 2, pp. 675-686.
- Hodgetts, S. (2011), "Effective Leadership: The Key to Successful Hospital Management", *HealthManagement.org: Promoting Management and Leadership*, Vol.13, No.5, pp.1-3.
- Hopkins, R.O., Spuhler, V.J. and Thomsen, G.E. (2007), "Transforming ICU Culture to Facilitate Early Mobility", *Critical Care Clinics*, Vol.23, pp.81-96.
- Idris, F. and Ali, K.A.M. (2008), "The impacts of leadership style and best practices on company performances: Empirical evidence from business firms in Malaysia", *Total Quality Management and Business Excellence*, Vol. 19, No. 1-2, pp.165-173.
- James, O. E., Ella, R., Nkamare, S. E., Lukpata, F. E., Uwa, S. L. and Mbum, P. A. (2015), "Effect of reward system among health care workers' performance: a case study of university of Calabar teaching hospital Calabar, Nigeria", *Journal of Hospital Administration*, Vol. 4, No. 3, pp. 45-53.
- Knies, E., Leisink, P. and Kraus-Hoogeveen, S. (2018), "Frontline managers' contribution to mission achievement: A study of how people management affects thoughtful care", *Human Service Organizations: Management, Leadership & Governance*, Vol. 42, No.2, pp. 166-184.

- Labaf, H. and Bigdelli, E. (2015), “The Impact of Organizational Agility on Efficiency and Job Satisfaction”, *Journal UMP Social Sciences and Technology Management*, Vol. 3, No. 3, pp. 153-160.
- Lakshman, C. (2006), “A theory of leadership for quality: Lessons from TQM for leadership theory”, *Total Quality Management and Business Excellence*, Vol. 17, No. 1, pp. 41-60.
- Lee, D. (2016), “HEALTHQUAL: a multi-item scale for assessing healthcare service quality”, *Service Business*, Vol. 11, No.3, pp. 491-516.
- Lee, D., Hong, K.S. and Kim, N.Y. (2016), “Effects of hospital leadership, organizational systems, and ESWS on medical error reduction”, *Service Business*, Vol.10, No.1, pp. 159-177.
- Lee, S.M., Lee, D. and Kang, C-Y. (2012), “The impact of high performance work systems in the health-care industry: employee reactions, service quality, customer satisfaction, and customer loyalty”, *Service Industries Journal*, Vol. 32, No.1, pp. 17-36.
- Li, C., Naz, S., Khan, M., Kusi, B., and Murad, M. (2019), “An empirical investigation on the relationship between a high-performance work system and employee performance: measuring a mediation model through partial least squares-structural equation modelling”, *Psychology Research and Behavior Management*, Vol.12, pp.397–416.
- Liang, L., Kuusisto, A. and Kuusisto, J. (2018), “Building strategic agility through user-driven innovation: the case of the Finnish public service sector”, *Theoretical Issues in Ergonomics Science*, Vol. 19, No.1, pp. 74-100.
- Lipsitz, L.A. (2012), “Understanding health care as a complex system: the foundation for unintended consequences”, *JAMA The Journal of the American Medical Association*, Vol. 308, No.3, pp. 243-244.

- Luna-Arocas, R. and Camps, J. (2007), "A model of high performance work practices and turnover Intentions", *Personnel Review*, Vol. 37, No.1, pp.26-46.
- Macky, K. and Boxall, P. (2007), "The relationship between 'high-performance work practices' and employee attitudes: an investigation of additive and interaction effects", *The International Journal of Human Resource Management*, Vol. 18, No.4, pp. 537-567.
- Marshall, J.C., Bosco, L., Adhikari, N.K., Connolly, B., Díaz, J.L., Dorman, D., Fowler, R.A., Meyfroidt, G., Nagakawa, S., Pelosi, P., Vincent, J.L., Vollman, K. and Zimmerman, J. (2017), "What is an intensive care? A report of the task force of the World Federation of Societies of Intensive and Critical Care Medicine", *Journal of Critical Care*, Vol. 37, pp. 270-276.
- Martin, J., McCormack, B., Fitzsimons, D. and Spirig, R. (2014), "The importance of inspiring a shared vision", *International Practice Development Journal*, Vol.4, No.2, pp. 1-15. Retrieved from: <http://www.fons.org/library/journal.aspx>
- Martínez-García, M and Hernández-Lemus, E. (2013), "Health systems as complex systems", *American Journal of Operations Research*, Vol. 3(1A), pp. 113-126.
- Massaroli, R., Martini, J.G., Massaroli, A., Lazzari, D.D., de Oliveira, S.N. and Canever, B.P. (2015), "Nursing work in the intensive care unit and its interface with care systematization", *Escola Anna Nery Revista de Enfermagem*, Vol.19, No. 2, pp. 252-258.
- Mathieu, J.E. and Taylor, S.R. (2006), "Clarifying conditions and decision points for mediational type inferences in Organizational Behavior", *Journal of Organizational Behavior*, Vol. 27, pp. 1031-1056.

- McAlerney, A.S. (2006), "Leadership development in healthcare: a qualitative study", *Journal of Organizational Behavior*, Vol. 27, No.8, pp. 967-982.
- Melnik, G. and Maurer, F. (2006), *Comparative analysis of job satisfaction in agile and non-agile software development teams*. In International Conference on Extreme Programming and Agile Processes in Software Engineering. Springer, Berlin Heidelberg, 32-42.
- Mihail, D.M. and Kloutsiniotis, P.V. (2016), "Modeling patient care quality: an empirical high-performance work system approach", *Personnel Review*, Vol.45, No.6, pp.1176-1199.
- Mohammadi, M., Nikpour, A. and Chamanifard, R. (2015), "The Relationship between Organizational Agility and Employee's Productivity (Case Study: Ministry of Youth Affairs and Sports, Iran)". Retrieved from: http://www.psp-ltd.com/JIEB_24_3_2015.pdf
- Mooghali, A., Ghorbani, E. and Emami, M. (2016), "The impact of HRM practices on agility of Kosar hospital staff in Shiraz", *International Journal of Humanities and Cultural Studies*, march (16), 2442-2457. Retrieved from: <https://www.ijhcs.com/index.php/ijhcs/article/view/2952>
- Nafei, W.A. (2016), "Organizational agility: the key to organizational success", *International Journal of Business and Management*, Vol. 11, No.5, pp. 296-309.
- Nascimento, K.C. Gomes, A.M.T. and Erdmann, A.L. (2013), "Representational structure of intensive care for professionals working on mobile intensive care units", *Revista da Escola de Enfermagem da USP*, Vol. 47, No.1, pp. 173-181.

- Nazneen, A., Mann, P.K. and Mishra, S.K. (2018), “Impact of Human Resource Management Practices on Job Satisfaction among the Employees of Private Banks”, *British Journal of Economics, Finance and Management Sciences*, Vol.15, No.1, pp.19-31.
- Nembhard, I.M. and Tucker, A.L. (2011), “Deliberate learning to improve performance in dynamic service settings: Evidence from hospital intensive care units”, *Organization Science*, Vol. 22, No.4, pp.907-922.
- Nijssen, M. and Paauwe, J. (2012), “HRM in turbulent times: how to achieve organizational agility”, *The International Journal of Human Resource Management*, Vol. 23, No.16, pp. 3315-3335.
- Oerlemans, A.J.M., De Jonge, E., Van der Hoeven, J. and Zegers, M. (2018), “A systematic approach to develop a core set of parameters for boards of directors to govern quality of care in the ICU”, *International Journal for Quality in Health Care*, Vol.30, No.7, pp.545–550.
- Ogbonnaya, C. and Valizade, D. (2018), “High performance work practices, employee outcomes and organizational performance: a 2-1-2 multilevel mediation analysis”, *The International Journal of Human Resource Management*, Vol.29, No.2, pp.239-259.
- O'Neill, M. (2005), “Employee care, a vital antecedent to customer care in the health care industry. An exploratory investigation of the employee satisfaction construct at North East Alabama Regional Medical Center”, *International Journal of Health Care Quality Assurance*, Vol.18, No. 2, pp. 131-151.
- Parand, A., Dopson, S., Renz, A. and Vicent, C. (2014), “The role of hospital managers in quality and patient safety: a systematic review”, *BMJ Open*, 4: e005055.

- Patri, R. and Suresh, M. (2017), "Modelling the enablers of agile performance in healthcare organization: A TISM approach", *Global Journal of Flexible Systems Management*, Vol. 18, No.3, pp. 251-272.
- Pipe, T.B., Buchda, V.L., Launder, S., Hudak, B., Hulvey, L., Karns, K.E. and Pendergast, D. (2012), "Building personal and professional resources of resilience and agility in the healthcare workplace", *Stress Health*, Vo. 28, No. 1, pp. 1-22.
- Pons-Verdú, F. and Ramos-López, J. (2012), "Influencia de los Estilos de Liderazgo y las Prácticas de Gestión de RRHH sobre el Clima Organizacional de Innovación", *Revista de Psicología del Trabajo y de las Organizaciones*, Vol. 28, No. 2, pp. 81-98.
- Ramanujan, R. and Rousseau, D.M. (2006), "The challenges are organizational not just clinical", *Journal of Organizational Behavior*, Vol. 27, pp. 811-827.
- Reader, T.W. and Cuthbertson, B.H. (2011), "Teamwork and team training in the ICU: Where do the similarities with aviation end?", *Critical Care*, Vol.15, Article 313.
- Roberts, N. and Grover, V. (2012), "Investigating firm's customer agility and firm performance: The importance of aligning sense and respond capabilities", *Journal of Business Research*, Vol. 65, No. 5, pp. 579-585.
- Rotar, A.M., Botje, D., Klazinga, N.S., Lombarts, K.M., Groene, O., Sunol, R. and Ploch, T. (2016), "The involvement of medical doctors in hospital governance and implications for quality management: a quick scan in 19 and an in depth study in 7 OECD countries", *BMC Health Services Research*, Vol. 16, No.2, pp. 99-109.
- Sanadgol, M. (2014), "The survey of relationship between organizational agility and principals job satisfaction", *International Journal of Basic Sciences Applied Research*, Vol.3, pp. 317-319.

- Sandahl, C., Gustafsson, H., Wallin, C.J., Meurling, L., Øvretveit, J., Brommels, M. and Hansson, J. (2013), "Simulation team training for improved teamwork in an intensive care unit", *International Journal of Health Care Quality Assurance*, Vol. 26, No.2, pp. 174-188.
- Santos Bernardes, E. and Hanna, M.D. (2009), "A theoretical review of flexibility, agility and responsiveness in the operations management literature: Toward a conceptual definition of customer responsiveness", *International Journal of Operations & Production Management*, Vol. 29, No.1, pp.30-53.
- Selden, S.C. and Sowa, J.E. (2015), "Voluntary Turnover in Nonprofit Human Service Organizations: The Impact of High Performance Work Practices", *Human Service Organizations: Management, Leadership & Governance*, Vol. 39, No. 3, pp. 182-207.
- Sharifi, H. and Zhang, Z. (1999) "A methodology for achieving agility in manufacturing organisations: An introduction", *International Journal of Production Economics*, Vol.62, No.1-2, pp. 7-22.
- Sherehiy, B., Karwowski, W. and Layer, J.K. (2007), "A review of enterprise agility: Concepts, frameworks, and attributes", *International Journal of Industrial Ergonomics*, Vol. 37, No. 1-2, pp.445-460.
- Silva, L.J., Leite, J.L., Silva, T.P., Silva, I.R., Mourão, P.P. and Gomes T.M. (2018), "Management challenges for best practices of the Kangaroo Method", *Revista Brasileira de Enfermagem (REBEn)*, Vol.71, No.6, pp.2783-2791.
- Smith, D., Silverstone, Y., Brecher, D. and Upadhyaya, P. (2015). *Leadership imperatives for an agile business*. Accenture.
- Stockwell, D.C. and Slonim, A.D. (2006), "Quality and safety in the intensive care unit", *Journal of Intensive Care Medicine*, Vol. 21, No. 4, pp. 199-210.

- Sumukadas, N. and Sawhney, R. (2004), “Workforce agility through employee involvement”, *Acta Paulista de Enfermagem*, Vol. 36, No. 10, pp. 1011-1021.
- Suresh, M. and Patri, R. (2017), “Agility assessment using fuzzy logic approach: a case of healthcare dispensary”, *BMC health services research*, Vol. 17, No.1, 394.
- Tarí, J.J., Molina, J.F. and Castejón, J.L. (2007), “The relationship between quality management practices and their effects on quality outcomes”, *European Journal of Operational Research*, Vol.183, No.2, pp. 483-501.
- Uhl-Bien, M. and Arena, M. (2017), “Complexity leadership: enabling people and organizations for adaptability”, *Organizational Dynamics*, Vol.46, No.1, pp.9-20.
- Valentin, A and Ferdinande, P. (2011), “Recommendations on basic requirements for intensive care units: structural and organizational aspects”, *Intensive Care Medicine*, Vol.37, pp. 1575-1587.
- Van der Sluijs, A.F., van Slobbe-Bylsma, E.R., Chick, S.E., Vroom, M.B. and Dongelmans, D.A. (2017), “The impact of changes in intensive care organization on patient outcome and cost-effectiveness –a narrative view”, *Journal of Intensive Care*, Vol. 5, p. 3.
- Vermeeren, B., Steijen, B., Tummers, L., Lankhaar, M., Poerstamper, R.J. and Van Beek, S. (2014), “HRM and its effect on employee, organizational and financial outcomes in health care organizations”, *Human Resources for Health*, Vol. 12, No. 35, pp. 1-9.
- Vinodh, S., Aravindraj, S., Pushkar, B. and Kishore, S. (2012), “Estimation of reliability and validity of agility constructs using structural equation modelling”, *International Journal of Production Research*, Vol. 50, No.23, pp. 6737-6745.

- Walsh, P., Bryson, J. and Lonti, Z. (2002), “‘Jack be nimble, Jill be quick’: HR capability and organizational agility in the New Zealand public and private sectors”, *Asia Pacific Journal of Human Resources*, Vol.40, No.2, pp. 177-192.
- West, M., Armit, K., Loewenthal, L., Eckert, R., West, T. and Lee, A. (2015), *Leadership and leadership development in healthcare: the evidence base*. Faculty of Medical Leadership and Management.
- Wikström, A.C., Cederborg, A.C. and Johanson, M. (2007), “The meaning of technology in an intensive care unit –an interview study”, *Intensive and Critical Care Nursing*, Vol. 23, No. 4, pp. 187-195.
- Zhang, J., Akhtar, M.N., Bal, P.M., Zhang, Y. and Talat, U. (2018), “How do high-performance work system affect individual outcomes? A multilevel perspective”, *Frontiers in Psychology*, Vol.9, Article 586.
- Zhang, M., Zhu, C.J., Dowling, P.J. and Bartram, T. (2013), “Exploring the effects of high-performance work systems (HPWS) on the work-related well-being of Chinese hospital employees”, *The International Journal of Human Resource Management*, Vol. 24, No.16, pp. 3196-3212.
- Zoller, Y.J. and Muldoon, J. (2019), “Illuminating the principles of social exchange theory with Hawthorne studies”, *Journal of Management History*, Vol. 25 No. 1, pp. 47-66.

Appendix 1:

Definitive items on the measurement scales

CONSTRUCT/ DIMENSIONS	ITEMS
Training	T1 The training plan contemplates training activities that prepare the healthcare personnel to deal with critical situations (psychological training, managing stressful situations, conflict resolution, etc.).
	T2 The training plan contemplates activities that prepare the healthcare personnel in the care and management of relationships with the patient.
	T3 The training contemplates activities that improve the technical skills of the healthcare personnel for optimal performance of their job.
	T4 The training plan contemplates training activities in quality management (knowledge of ISO norms, functioning of quality improvement tools, etc.).
Participation	P1 Teamwork, collaboration, and a group feeling are fomented.
	P2 Meetings and conferences are organized to debate and exchange experiences and proposals to resolve problems and improve the ICU service.
	P3 Healthcare personnel are encouraged to participate in the design and improvement of the procedures and processes that affect the correct performance of their jobs.

CONSTRUCT/ DIMENSIONS	ITEMS	
P4	Healthcare personnel are encouraged to make proposals and suggestions about improvements in the ICU (suggestion box, directly to supervisors, etc.).	
P5	Healthcare personnel are encouraged to participate in activities and projects that improve the ICU.	
Recognition	R1	The economic reward/salary corresponds to the effort and work done by the healthcare personnel.
	R2	The recognition of individual work by people with management responsibilities in the ICU encourages greater effort and involvement
Communication	C1	The management team of the Hospital has made an effort to communicate its mission, vision, and values.
	C2	I have a lot of knowledge about the mission, vision, and values of the Hospital.
	C3	The management team of the Hospital communicates its plans and objectives.
	C4	I know what the plans and objectives of the Hospital are.
LEADERSHIP	L1	The management team of the Hospital is involved in and committed to the quality of the service.
	L2	The management team of the Hospital foments continuous improvement and innovation.

**CONSTRUCT/
DIMENSIONS**

ITEMS

L3 The management team of the Hospital foments the participation of the members of the organization in designing its plans and setting its objectives.

**ORGANIZATION
AL AGILITY**

OA1 The Hospital is an agile organization capable of adapting to changes.

OA2 The Hospital has the capacity to predict and identify changes.

OA3 The Hospital has the capacity to respond quickly to changes.

OA4 The Hospital has the capacity to respond flexibly to new demands for services that arise, adapting them to the resources and means available.

**EMPLOYEE
SATISFACTION**

PS1 I am satisfied with my work.

PS2 I feel like the people with management responsibilities are satisfied with my work.

PS3 I feel like my co-workers are satisfied with my work.

PS4 I feel like the families/patients are satisfied with my work.
