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Hospital centre performance dimensions and internal stakeholder valuation: a case study

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Abstract

Purpose – Hospital centres (HCs) are the result of a horizontal integration of two or more hospital units. The benefits of this integration have been presented in the literature. The purpose of this paper is to define the hospital performance dimensions most valued by HC internal stakeholders, and to evaluate if the importance given to each dimension is different when comparing professional groups.

Design/methodology/approach – An in-depth HC case study using a quantitative survey based on the Parsons' social system action theory to achieve this goal was conducted which embraces the four major models of organizational performance. In the final version of the survey, 37 items were retained for analysis. An exploratory factor analysis was conducted for a final sample of 365 participants, through principal component analysis, with oblique rotation and the Kaiser criterion.

Findings – Four factors were retained: "Human resources development and Internal Processes", "Attractiveness/Openness", "Public service mission" and "Interpersonal relationships". The means factor scores only reveal statistical differences between the attractiveness/openness factor and the remaining three factors. A shared view was found in this study among the three groups of internal stakeholders: physicians, caregivers and administrative staff.

Originality/value – The results of this study suggest that the HC performance concept should be expanded and performance measurement frameworks with a greater scope should be used. Interpersonal relationships, the human resources development and the public service are considered important dimensions for the performance measurement of the HC. Additionally, a consensual view regarding the most valued performance dimension could contribute to a beneficial and healthy working environment and improvements in HC performance.

Keywords Hospital centre, Internal stakeholders, Performance dimensions

Paper type Research paper

Introduction

A network of public and private organizations characterizes the Portuguese health system. All of these organizations are connected through the Ministry of Health. The Ministry of Health coordinates all healthcare provisions and finances the public healthcare organizations. The Portuguese healthcare organizations in general, and the public hospitals in particular, have been undergoing structural reform since 1990 with the introduction of alternative management models and the implementation of a prospective financing scheme.

The guidelines for hospital centres (HCs) were established by a decree law in 1999 (Assembleia da Republica, 1999). These are horizontal integration models. In 2011, there were 25 HCs in Portugal (Portuguese Health Regulation Authority, 2012). Therefore, we have seen in Portugal a reduction in the number of hospitals, as individual organizations, over the last two decades as a result of this horizontal integration process. This process consists of the integration of two, or more, single hospital units into one independent hospital with only one board and management team. Each HC creation should be preceded

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by a proposal made to the Regional Health Authority. This proposal must give the reasons for integrating the hospital units, based on public interest, namely optimization of the delivery of healthcare services by the hospital units when integrated and the reinforcement of articulation and the complementarity of hospital services. In practice, an integration plan had to be defined for each HC to be created. This plan should set out the specific objectives to be achieved with the integration. This process has been interpreted as a restructuring of services, with the consolidation of clinical services (Azevedo and Mateus, 2014). The reduction in the number of hospitals did not mean that this process resulted in hospital units' closure. The integrated hospital units (corresponding to an HC) are actually geographically separated production units managed as a single organization. The aim of this centralization process was to bring all activities under the full control of the integrated entity in order to benefit from economies of scale by reducing costs and resource sharing (physical and human) (Azevedo and Mateus, 2014). This centralization trend can also be found in England, Denmark, Norway and Sweden (Kristensen *et al.*, 2008).

Few studies on the Portuguese HC experience have been published, and no study was published regarding the performance domains of hospital care, and HCs in particular. Thus, this study aims to define the most important performance domains for HC internal stakeholders in the Portuguese context.

The research questions addressed in this study are:

RQ1. What are the most important performance dimensions in the Portuguese HC context?

RQ2. Are the performance dimensions preferences different between stakeholder groups?

An in-depth HC case study using a quantitative survey was conducted to identify the performance dimensions in the selected HC using an adapted version of the Minvielle *et al.* (2008) questionnaire.

The results of this study strongly contribute to the development of a subsequent evaluation framework for the HC. Furthermore, they provide important insights for the political decision-making process regarding organizational changes in the hospital care.

The structure of the paper is as follows. First the problem is introduced and the research questions are presented. In the second section the performance measurement in healthcare as a critical aspect for both managerial and research purposes is reviewed. The Sicotte *et al.* (1998) framework which is based on the Parsons' social system action theory (Parsons, 2005) is introduced and previous papers that applied the survey, which were based on this analytical framework, are presented. The methodology is described in the third section. The analysis and results are presented in the fourth section and the discussion and conclusions appear in the fifth section.

Literature review

The definition and measurement of organizational performance have long intrigued scholars and management practitioners. This has led to the conclusion that performance means different things to different people (Robbins, 1983; Adair *et al.*, 2003; Yavas and Romanova, 2005). Three main domains are commonly included on the debate on healthcare management: quality of healthcare delivery, effectiveness in healthcare delivery and financing and accountability of health organizations (Adair *et al.*, 2003, 2006; Costa and Lopes, 2007). These themes are strictly related with the definition and measuring of hospital production and the evaluation of hospital performance (Costa and Lopes, 2007).

Performance measurement is crucial from a management perspective, since without a performance benchmark, managers cannot objectively or consistently assess the quality of their strategic decisions (Van Der Geer *et al.*, 2009) . From a research perspective, performance is often a variable that depends on a desire to understand why some organizations are more

successful than others (Yavas and Romanova, 2005). Consequently, valid and reliable performance measurements are critical for both managerial and research purposes.

Healthcare organizations are different from other organizations and these differences must be taken into account when a performance measurement framework is developed. One of the particularities of the Portuguese healthcare organizations is that they are public service organizations (as in other European countries). Their social purpose is to preserve and improve the health status of the individuals they serve. However, the definition and measurement of outcomes in this kind of organization is still difficult (Leggat *et al.*, 1998; Sicotte *et al.*, 1998; Adair *et al.*, 2003). The political, legal and financial hospital environments, with greater state control, are very complex, requiring the development and maintenance of complicated intra- and inter-linked systems. However, the introduction of some business management models helps to bring professionals of different areas of action closer creating more contingent relationships in work organization and management (Doolin, 2002; Mauro *et al.*, 2014).

Healthcare organizations also have some unique human resources-related characteristics. Souliotis *et al.* (2014) refer to healthcare organizations as social systems where human resources are the most important factors affecting the quality of care, and effectiveness and efficiency of the organization. The organization's orientation and operations are strongly influenced by the activities of the professional groups, who are those uniquely qualified to determine how the operations should be carried out (Sicotte *et al.*, 1998). Thus, the workforce is large, diverse and comprises separate occupations, often represented by powerful professional associations or trade unions. Some have sector-specific skills, while others can readily move from the health sector to employment in other sectors. The avowed first loyalty of those with sector-specific skills and qualifications (physicians, nurses, etc.) tends to be to their profession and their patients rather than their employer (Buchan, 2004). Physicians having autonomous clinical decisions and nurses acting as an organized group with a professional agenda influence what the hospital does. Another important professional group with influence in what the hospital does are the managers, especially in the financial dimensions. According to WHO (Edwards *et al.*, 2004), the major challenge in human resources policy for this century is to break down the traditional barriers between the different professional groups. According to this organization these barriers are more often related with history than logic and, as a result, there is an inappropriate use of health professionals and the fragmentation of patient care. Additionally, one of the aims of integrating healthcare is to avoid the fragmentation of patient care and have a more patient-centred focus (Sobczak, 2002; Armitage *et al.*, 2009; Dias and Queirós, 2010).

The variety of models of healthcare performance reflects different and fragmented aspects of performance (Neely *et al.*, 2000; Adair *et al.*, 2003). Consensus regarding the best model to assess performance is impossible to obtain. Individuals' values and preferences within a certain organization are the main contributions to performance judgements. These values and preferences vary between, and are often are contradictory among, the different stakeholders (Cameron, 1986). Some authors have developed models where they have tried to integrate the different performance dimensions (Cameron and Whetten, 1983; Quinn and Rohrbaugh, 1983; Sicotte *et al.*, 1998). Nonetheless, these dimensions are of different value among the stakeholder groups, because they each have their own values and preferences (Connolly *et al.*, 1980; Groene *et al.*, 2008).

According to Adair *et al.* (2003) performance measurement activities are more advanced in the USA and UK, with a growing presence in other countries. The origins of health are rooted in a more generic context, where the emphasis was on accountability in public sector policy and service delivery. In the 1990s, more specific and direct performance measurement initiatives were undertaken. An emphasis on the quality of care was added in the late 1990s in the USA, but was also visible in other countries such as the UK and Canada (Adair *et al.*, 2003). Many view quality as the overall objective,

which must be addressed by performance measurement, while others still present quality as one among several dimensions of hospital services' performance to be addressed. Other dimensions include cost, access and satisfaction (Lied and Kazandjian, 1999; Mcintyre *et al.*, 2001; Brand *et al.*, 2012). The emphasis on quality was followed by safety, as a component of quality of care within the continuing context of broader performance measurement (Adair *et al.*, 2003).

Portuguese citizens' healthcare needs are guaranteed by the Portuguese Constitution as a fundamental right to be provided by the State. Therefore, Portugal has a public healthcare sector. The public healthcare organizations operate in three main domains: the political, the administrative and the medical-professional spheres of the healthcare organization; and they have different goals, success factors and work methods (Aidemark and Funck, 2009). When designing performance measurement systems for public healthcare it is very complex to achieve an equilibrium between the outcomes of services and efficiency in their delivery (Giovanelli *et al.*, 2015). The relationship between efficiency and quality seems to be weak (Navarro-Espigares and Torres, 2011). However, better understanding of performance measures will promote productivity in the healthcare sector by encouraging managerial focus on performance outcomes that lead to better managed healthcare systems (Love *et al.*, 2008).

The success of a full integration of performance evaluation in the public sector is related to the commitment of top management and involvement of the whole organization, creating consensus among the internal stakeholders and encouraging their participation in the development and implementation of such a performance assessment system (Giovanelli *et al.*, 2015).

The traditional performance measurement systems in business and in healthcare focus mainly on accounting and financial measures (Tangen, 2004; Mauro *et al.*, 2014). However, each stakeholder group has different preferences, purposes and values (Sicotte *et al.*, 1998). A multidimensional system of performance measurement is appropriate for HCs.

However, few researchers have investigated performance measurement frameworks in the context of organization theory, in which organizations are battlegrounds for stakeholders who seek to influence the criteria for effectiveness to advance their own differing interests (Guisset *et al.*, 2002; Mauro *et al.*, 2014).

According to the multiple constituent model of organizational performance, the stakeholders' perspectives must be considered in an integrated way for the purposes of evaluation (Zammuto, 1984; Mauro *et al.*, 2014).

Sicotte *et al.* (1998) developed a comprehensive theoretical-based framework that overcomes the fragmented approach to assess the healthcare organizations' performance. This framework is based on the Parsons' social system action theory (Parsons, 2005) which combines the four dominant models for the assessment of organizational performance:

(1) The rational model: this model is based on the accomplishment of objectives; an effective organization is the one that achieves its objectives. Or in other words the organization exists to accomplish its objectives. These organizational objectives could be defined in terms of production volume, quality level or services delivered. According to Sicotte *et al.* (1998), performance assessment for this kind of organization consists of the strength of the relationship between organization means-ends chain. The focus is on the outputs of an organization – the closer the organization's outputs come to meeting its goals, the more effective it is (Cameron, 1980). The major difficulties of this performance model are the identification and measuring of outputs and outcomes and the evolution of the organization concept.

(2) The open system model: this model was introduced by Yuchtman and Seashore (1967). Its emphasis is on the interaction between the organization and its environment. The organization is viewed as dependent on its environment (customers,

employees, providers). The organization must comply with the laws and regulations. According to this model, one of the organizational key processes is an adequate supply of resources, both human and technical. Good performance is measured by a great flexibility and the adaptability needed to acquire the scare and valued resources for growth (Cameron, 1978; Sicotte *et al.*, 1998; Guisset *et al.*, 2002; Minvielle *et al.*, 2008).

(3) The internal process model: in this model the internal processes (information management, communication and optimized decision making) and operations of the organization are the main points of interest. The stability, predictability and control are valued. Thus, the emphasis is on the internal production process. It is not only the amount and quality of the product/services that is important but also the products/ services management production process (Cameron, 1978; Sicotte *et al.*, 1998; Guisset *et al.*, 2002; Minvielle *et al.*, 2008).

(4) The human relations model: in this model, performance is viewed as the organization's internal health using fields such as morale, climate, cohesion, conflict, human development and survival (Sicotte *et al.*, 1998). An organization performs well if it responds to the demands and expectations of its stakeholders, or achieves a balance between them (Cameron, 1978; Quinn and Rohrbaugh, 1983; Sicotte *et al.*, 1998). The emphasis is placed on the stakeholders becoming committed to the success of the organization (Connolly *et al.*, 1980; Adler and Borys, 1996).

This framework makes it possible to comprehensively consider performance dimensions in order to express the values used by stakeholders in their choices. This framework includes the four functions that an organization needs to balance in order to perform well: goal attainment, production, adaptation to the environment, and culture and value maintenance (Sicotte *et al.*, 1998; Mauro *et al.*, 2014).

A survey was developed by Guisset *et al.* (2002) to define hospital performance among key stakeholders in hospitals, based on the Sicotte *et al.*'s (1998) analytical framework. This tool was applied to Belgian hospital leaders focusing on their conceptualization of hospital performance (Guisset *et al.*, 2002). More recently, Minvielle *et al.* (2008) applied an adapted version of this survey to a teaching hospital in France. The aim of this study was to find emerging views on hospital performance. Subsequently, the adapted version of the Minvielle *et al.* (2008) survey was used by Bravi *et al.* (2013) to examine and compare the views on the performance of internal stakeholders in an Italian oncological care network. Yet more recently, Mauro *et al.* (2014) applied the adapted version of the Minvielle *et al.* (2008) survey to an Italian teaching hospital located in the Calabria region. Table I presents a comparison of the results obtained in these works.

Methodology
Case selection
The HC considered in this case is a multisite hospital that resulted from the integration of two hospital units, which will be called A and B, in 2007. They were both acute hospitals. The distance between these two hospital units is about 30 km (20 minutes by car when using the highway or 40 minutes when using national roads). This HC is part of the Portuguese network of public hospital and serves a population of over 500,000 inhabitants. It is an acute hospital with 480 in-patient beds (416 in hospital unit A and 64 in hospital unit B). The HC employs 1,597 professionals for its activity.

Survey
An in-depth HC case study was conducted using a quantitative survey to identify the most important performance dimensions in the Portuguese HC context and to evaluate how these

Table I.
Comparison of results obtained from previous works

Authors	Place	Aim	Sample	Variables	Dimensions	Results
Guisset et al. (2002)	Belgian hospitals	Confirm that performance was viewed as a multidimensional construct	Belgian hospital leaders	73 items	14 factors: 1. internal cohesion, 2. Coordination, 3. Flow/volume of patients; 4. Societal recognition, 5. Patient satisfaction, 6. Response to population needs, 7. Efficiency, 8. Socio-economic responsibility, 9. Updating of knowledge, 10. Public resources, 11. Quality of outcomes, 12. Structural adaptation (integration), 13. Constant search for quality, 14. Entrepreneurial spirit	Empirical factors were consistent with theoretical dimensions Diverging opinions among professional groups about the characteristics of hospitals operating at a high level of performance
Minvielle et al. (2008)	Teaching French hospital	Find out which are the emerging dimensions on hospital performance Analyse how these views vary among hospital stakeholders	Physicians, caregivers, and administrative staff (46.6% response rate)	66 items	13 factors (sub-dimensions): professional values, personal achievement values, efficacy/effectiveness, public service values, work climate, patient satisfaction, internal organization, costs/efficiency, organizational values, openness, productivity, attractiveness, goal attainment/output	Hospital stakeholders assign greatest importance to the human relations dimension, i.e., organizational climate (professional and public service values) and quality of work life High degree of consensus among stakeholders
Bravi et al. (2013)	Five hospitals of an Italian network for oncological care	To examine the extent to which the conceptualization of hospital performance observed by Minvielle et al. (2008) can be applied to the Italian healthcare systems and specifically to a hospital network context	Physicians, nurses and the administrative staff (RR = 65.8%)	42 items	4 factors: centrality of relationships, quality of care, attractiveness/reputation and staff empowerment and Protection of workers' rights	Stakeholders attach a higher importance to relational and healthcare aspect Broadly shared view on hospital network performance
Mauro et al. (2014)	Italian teaching hospitals	To identify emerging views on the performance of teaching hospitals and to analyse how these views vary among hospital stakeholders	physicians, caregivers and administrative staff (RR = 72%)	66 items	13 factors (sub-dimensions): personal achievement values, efficacy/effectiveness, Public service values, patient satisfaction, cost control/efficiency, professional values, organizational values, internal organization, work climate, goal attainment, productivity, openness, attractiveness/capacity to acquire resources	Hospital performance is multifaceted and includes the dimensions of efficiency, effectiveness and quality of care, as well as organizational and human features High degree of consensus among all observed stakeholder groups about these values, and a shared view of performance is emerging

views vary among the HC internal stakeholders. The survey uses a questionnaire based on the Parsons' social system action theory, which includes the four major models of organizational performance mentioned above.

Minvielle *et al.* (2008) developed a questionnaire to find emerging views on hospital performance. They applied this questionnaire, which was an adaption of a previous one (Guisset *et al.*, 2002), to a French hospital. The survey used in this study was an adaptation of the Minvielle *et al.* (2008), Guisset *et al.* (2002) and Bravi *et al.* (2013) surveys. However, adaptations have to be made to validate the contents of each performance dimension.

Prior to content validity, the first step was to translate the survey items. The items used were those found in the surveys by Guisset *et al.* (2002), Minvielle *et al.* (2008) and Bravi *et al.* (2013). The translation process used was an adaptation of the Translation Review Adjudication Pretesting and Documentation model process developed by Harkness *et al.* (2010). The translation process was developed in five phases: first, a single research team member made the first translation. In the second phase, three bilingual specialists made a revision. In the third phase, an expert in research survey and health management issues and with an English-language background made a second revision. The survey was submitted to a pre-test with two experts in health management and with English-language background. Finally, all these revisions were documented (Harkness *et al.*, 2010; Willis *et al.*, 2008).

After translating the items, they were organized according to theoretical performance dimensions. To adapt the questionnaire to the Portuguese context some items were eliminated because they did not apply to a Portuguese environment, mainly due to legal rules and professional requirements, while other items were aggregated/merged when they related to the same subject.

An expert group of seven people in the academic and healthcare management area participated in the item selection and validation of the contents in the survey. Improvements in the survey were made based on content validation process. This process defined a final set of 67 item to measure hospital performance.

The item scale used in this study was the same as that used in the previous studies, as suggested by Hair *et al.* (2006). Therefore, to measure the answers an interval scale from 0 to 10 was used, where "0" indicates not important at all and "10" indicates extremely important (Guisset *et al.*, 2002; Minvielle *et al.*, 2008; Bravi *et al.*, 2013; Mauro *et al.*, 2014).

The final version of the questionnaire was divided into three parts: the first part comprised general information about the respondent, such as gender, age and educational level; the second part was composed of questions related to professional information, such as the hospital unit where the respondent worked prior to integration, number of years he/she worked in that hospital unit, hospital unit where he/she works today, year he/she started working in the HC, service where he/she works today, and professional group; the third part includes the previously developed 67-item measurement of hospital performance.

Survey researchers have been concerned with data collection methods and procedures to ensure valid and reliable results. Therefore, these aspects imply assumptions that the respondents are able to understand the questions that are being asked, that the questions are well understood in the same way by all respondents and that respondents are willing and able to answer such questions. The cognitive question testing methods rely on these assumptions (Collins, 2003). These methods identify where and how the questions fail to achieve their measurement purpose. These procedures enable some of the limitations of the "traditional" piloting to be overcome, though not providing evidence of the causes that disrupt the response elicitation process. The question-and-answer model is a useful representation of how respondents answer survey questions. According to Collins (2003), this simple model, derived from cognitive psychology, suggests there are four actions that respondents have to perform in order to answer a question: first, they must comprehend the question

(the respondent must understand the question in the same way as the researcher intended); second, retrieve the necessary information from long-term memory; third, make a judgement about the information needed to answer the question. The same author states that in the case of attitude or opinion questions, the questions being asked of the respondent to express a view or opinion on something that they may not have thought about or in that context. In the final action, fourth, the respondent answers the question. Cognitive interviewing was selected as a cognitive method for testing the survey. The interviews were conducted with four HC professionals selected from clinical and support areas.

The pre-test was conducted in two phases: a pre-test with cognitive methods and a pilot test. The results of these pre-tests led to small adjustments in the survey. The Portuguese version of the questionnaire is available upon request.

The research methodology was based on a survey of a population composed of three internal stakeholder groups (physicians, caregivers and administrative staff) at one Portuguese HC. Caregivers are the healthcare professionals that deal directly with the patient in the process of care (examples: nurses, physiotherapists, nurses-aids, etc.), physicians were considered in a separate group. The identification of these three groups was justified by previous studies that identified them as the core groups that affect the process of care (Garman *et al.*, 2006; Blake *et al.*, 2010). Using the same internal stakeholders groups used in the previous studies enables comparisons and consistency with the previous studies that used the Minvielle *et al.* (2008) survey.

After the validation and adaptation process previously described, a cover letter was sent by e-mail to all HC professionals, with the exception of operational assistants (OAs), inviting them to participate in the study. For the OAs professional group the cover letter was sent by internal mail. In this letter the research project, the research team, and the research objectives were presented, guaranteeing total confidentiality and anonymity for the answers and respondents. The cover letter sent by e-mail had a link to a website where the questionnaire could be filled out and returned electronically. For OAs, the paper survey was attached to the cover letter.

A census survey was conducted between January and March 2015. Using a census survey the possibility of a sampling error issue arising is minimized. The delivery method used in this study minimized the possibility of non-targeted individuals responding (Braunsberger *et al.*, 2005). The option to use a census survey instead of a sample survey was to achieve as great a number of responses as possible. Table II presents the total staff in each professional category and the number of responses collected in each category. The overall response rate was 23 per cent. The response rate of the physicians was 14.1 per cent, 23.4 per cent for caregivers and 30.4 per cent for administrative staff. This response rate is relatively low compared to similar studies, 46.6 per cent in the Minvielle *et al.* (2008) study, 68.2 per cent in the Bravi *et al.* (2013) study and 72 per cent in the Mauro *et al.* (2014) study. However, the Guisset *et al.* (2002) study had a lower response rate of 34 per cent, compared to the mentioned studies.

Two main actions were conducted to improve the response rate: five reminder e-mails were sent to those individuals who had not responded during the three-month period; mixed

	Eligible population		Respondents	Analysable	Response rate (%)
	n	%			
Caregivers (except physicians)	1,014	63.5	240	237	23.4
Physicians	327	20.5	46	46	14.1
Administrative staff	256	16.0	78	78	30.5
Missing professional category			4	4	
Total	1,597		368	365	23.0

Table II.
Total staff in each professional category and the number of responses collected in each category

modes of data collection were used (online and paper). Whether the low response rate reflects a low priority for HC professionals' opinion on performance, lack of time or survey overload is unknown. The number of responses obtained was nevertheless sufficient to conduct a valid statistical analysis.

Questionnaires with more than 25 per cent of missing values were not included in the sample. The remaining but scarce missing values were estimated according to the options provided by the estimation procedures. In the principal component analysis (PCA), the values were estimated by the procedure of replacement with the mean (Hair *et al.*, 2006; Pestana and Gageiro, 2008).

A PCA was conducted to identify the empirical structure of the questionnaire. Since the correlation between factors was taken into account, a direct oblique rotation was used. The Kaiser criterion was used to establish the number of factors extracted (factors extracted with an eigenvalue > 1).

All items with loadings below 0.4 or cross-loadings above 0.4 were excluded from the final model to ensure factor convergence and discrimination.

To compare the relative importance of the four dimensions (factors), a paired sample *t*-test was conducted for each pair of dimensions (factors) with a significance level of 0.05.

Additionally, an analysis to compare the results between the internal stakeholder groups was performed, using a one-way analysis of variance for the equality of means with a significance level of 0.05. The statistical analyses were performed using the IBM SPSS software v.22.

Analysis and results
An exploratory factor analysis (EFA) was performed on the final sample, using the PCA, with oblique rotation and the Kaiser criterion (eigenvalues > 1), to determine the number of factors to retain. A valid EFA required a minimum of five participants per variable (a minimum sample size of 335 participants for the 67 items). The sample had 365 valid questionnaires, which proved to be adequate. This first EFA identified eight factors that explained 73.52 per cent of the total variance. This factor structure contained many items with loadings below 0.4 and also many items with high cross-loadings.

Subsequent PCAs, with oblique rotation and Kaiser criterion, were performed after eliminating all the items with loadings < 0.4. A four-factor structure with 37 items was reached. The overall explained variance was still satisfactory at 67.79 per cent. For this model the KMO test was 0.964 denoting a very good correlation between variables.

Table III contains EFA item loadings higher than 0.40 and the communalities of each item. Despite the presence of some cross-loadings, all items had the acceptable conditions to be retained (Hair *et al.*, 2006) as they all loaded 0.40 or more on one factor, or no item loaded more than 0.40 on two or more factors.

A split random sample analysis and a confirmatory factor analysis were used to validate this factor structure.

The first factor, called human resources development and internal processes, explained 52.7 per cent of item variance. It includes 13 items related to development, well-being, work conditions of the HC professionals, and the coordination among HC services. The second factor, attractiveness/openness, accounts for 6.4 per cent of variance and contains six items. This factor explores the capacity of the HC to attract resources and to adapt to environmental conditions. The third factor is public service mission (ten items, 5.2 per cent of variance) and includes items related to the ability of the HC to use its resources to serve the patient and the community in the best way possible. Finally, the fourth factor, interpersonal relations (eight items, 3.5 per cent variance), includes items related to staff expertise to deal with the patients and their peers.

Table III.
EFA item loadings and communalities of each item

	Mean	SD	Communality	HR development and internal processes	Attractiveness/open-ness	Public service mission	Interpersonal relations
Staff's stress levels and exhaustion are taken into account	8.55	2.33	0.81	0.94			
Supports the development of training programmes and encourages the participation of the HC staff	8.53	2.10	0.84	0.89			
Encourages/promotes teamwork	8.52	1.98	0.82	0.84			
There is a strong cohesion and solidarity among team members	8.60	1.94	0.84	0.83			
Ensures the best work condition and methods for their staff	8.64	1.95	0.85	0.83			
Encourages staff involvement in finding the best solution to their problems	8.67	2.03	0.86	0.81			
Each staff member recognizes and respects the competencies and the work of peers	8.73	1.82	0.77	0.69			
Recognizes and rewards innovation and learning	8.21	2.23	0.72	0.60			
Seeks to optimize the internal processes to improve management (for instance, reducing the internal bureaucracy for staff)	8.38	1.83	0.76	0.59			
Internal communication is a usual practice	8.41	1.91	0.79	0.57			
Management provides information regarding the HC performance	7.79	2.18	0.60	0.56			
Has the necessary means to deliver healthcare to patients under the best physical conditions (for instance, patient transportation between hospital units)	8.45	1.92	0.66	0.52			
Engages with the local government to improve patient access to and utilization of the HC (e.g. by improving the public transportation network in order to serve the HC catchment area with connection to hospital units)	8.22	2.06	0.62	0.49			
Tries not to exceed the budget estimates	7.59	1.83	0.56		0.73		
Interns and other healthcare professionals in training compete for internships in clinical departments	6.97	2.31	0.55		0.71		
Is concerned with its relations with private healthcare providers outside the HC	7.13	2.15	0.64		0.65		
Develops strong ties with the community (for instance, local government, associations, cultural centres)	7.57	1.97	0.67		0.60		
Care unit managers are widely renowned	7.80	1.85	0.54		0.59		
Seeks to implement institutional projects successfully (accreditation, for example)	7.77	1.96	0.53		0.55		
Aims at improving the population's health	8.83	1.61	0.71			−0.82	

	Mean	SD	Communality	HR development and internal processes	Attractiveness/open-ness	Public service mission	Interpersonal relations
Provides appropriate information to patients on their health and care	8.44	1.90	0.73			−0.80	
Minimizes its costs without impairing the quality and safety of care	8.33	1.97	0.60			−0.80	
Assesses the impact of the services/care provided	8.63	1.73	0.74			−0.79	
Strives to improve both curative and preventive care	8.57	1.84	0.66			−0.75	
Produces the best possible health outcomes given the resources available	8.19	1.84	0.52			−0.68	
Takes into account the patients' points of view on organizational changes	8.08	1.95	0.60			−0.65	
Patients recommend the HC to other patients	8.25	1.86	0.61			−0.62	
Avoids waste of all kinds (such as unnecessary auxiliary diagnostic and therapeutic means)	8.06	1.96	0.58			−0.60	
Strives to manage labour by reorganizing projects efficiently (for instance, by implementing better operational practices)	8.55	1.69	0.68			−0.50	
Does not sacrifice the relational dimension of care for a larger volume of service	8.51	1.84	0.78				0.89
Staff gives priority to collective over personal interest	8.07	1.95	0.58				0.69
Increases its volume of services provided if the activity is justified and relevant	7.90	1.87	0.66				0.63
Continuously tries to improve the quality and safety of care, even though the volume of service is high	8.34	1.86	0.76				0.61
Staff preserves patient dignity	9.09	1.48	0.70				0.57
Offers services not available elsewhere (highly specialised)	7.88	1.93	0.58				0.53
Staff is proud to belong to an organization such as the HC	8.39	1.97	0.48				0.49
Staff is aware of the importance and usefulness of their work	8.85	1.59	0.70				0.48
Variance Explained (before rotation)				52.7	6.4	5.2	3.5
Cronbach's α				0.97	0.85	0.93	0.91
Number of items in each factor				13	6	10	8

Note: Loadings below 0.35 are not shown in the table

Table III.

The correlations among the four factors ranged between 0.326 and 0.584, which justified an oblique rotation.

The Cronbach's αs estimated values, presented in Table III, ranged between 0.85 and 0.97, suggesting excellent internal consistency in each dimension (Hair *et al.*, 2006; Pestana and Gageiro, 2008). Additionally, αs were computed in each dimension for every possible version with a single item removed. Coefficient α values were well above the minimum acceptable value of 0.70 (Hair *et al.*, 2006). No item increased its sub-scale α when removed. Item-to-total correlations always exceeded the recommended minimum of 0.40 (Hair *et al.*, 2006).

The fourth factor, interpersonal relations, contains the items with the highest mean scores: "Staff preserves patient dignity" ($\pm$SD) (9.09 ± 1.48) and "Staff is aware of the importance and usefulness of their work" (8.85 ± 1.59). This factor, along with the first and third factors, obtained the highest mean scores 8.46 ± 1.39, 8.44 ± 1.74 and 8.41 ± 1.39, respectively. The mean scores were calculated using an unweighted average of the items comprising the factor.

The mean score of the second factor, attractiveness/openness, was significantly different from the means of the three other factors (7.47 ± 1.54) at $p < 0.001$. This factor contained the two items with the lowest mean scores: "Interns and other healthcare professionals in training compete for internships in clinical departments" (6.97 ± 2.31) and "Is concerned with its relations with private healthcare providers outside the HC" (7.13 ± 2.5). The mean scores of the other three factors were not significantly different from one another ($p < 0.05$).

Additionally, the analysis of the responses by internal stakeholder groups (physicians, caregivers and administrative staff) did not show any difference between the mean factor scores, confirming that these three groups share same views on HC performance (Test F: $p = 0,158$ (HRD&IP); $p = 0,836$ (A&O); $p = 0,639$ (PSM); $p = 0,405$ (IR)). The Brown-Forsythe tests were conducted to confirm these results. The comparison of the mean scores among internal stakeholder groups is shown in Figure 1.

Discussion and conclusions

This study's aims were to define the most important performance dimensions in the Portuguese HC context and to evaluate if these performance dimensions preferences were different between the three groups of hospital stakeholders.

The results/performance dimensions obtained in this study were conceptually different from the hospital performance model of the original Belgian study (Guisset *et al.*, 2002), the French study (Minvielle *et al.*, 2008) and the subsequent studies (Bravi *et al.*, 2013; Mauro *et al.*, 2014). The factor structure obtained in these results and the one proposed by Minvielle *et al.* (2008) only agree in part for the "attractiveness/openness" dimension and the
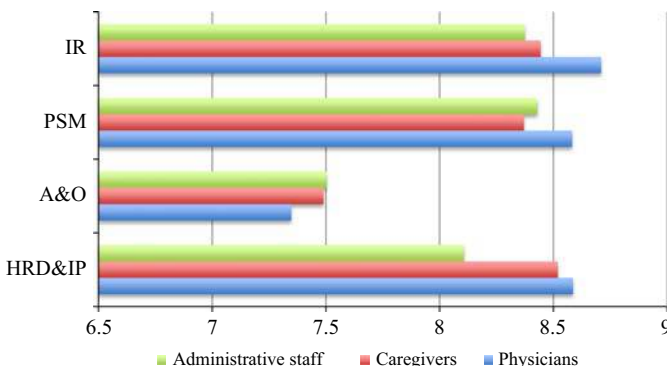
Figure 1.
Mean factor scores by internal stakeholder group

original "open system" dimension. However, there are more points of congruence between these dimensions and the ones obtained by the Bravi *et al.*'s (2013) study. There is an agreement between the "attractiveness/openness" dimension and their "attractiveness/ reputation factor" and between the "interpersonal relationships" and their "centrality of relations" dimension. The other two dimensions, "human resources development and internal processes" and "public service mission" are apparently not related with any study.

Therefore, the PCA extracted four empirical components to describe the HC performance. The first factor, "human resources development and internal processes", did not differ significantly from the third factor, "public service mission" and the fourth factor "interpersonal relationships". The first dimension, "Human resources development and internal processes", referred to aspects related to the HC internal conditions that enable the development of the human resources and to the organization of internal processes of the HC. These are very important aspects for achieving better performance levels, according to internal stakeholders. The involvement of the human resources in finding solutions to HC performance problems and a good and healthy work environment is considered an important aspect for excellent HC performance by respondents.

These results could be the consequences of an HC context, where human resources management and the management of the remaining resources are more demanding in this integration context. Giving these resources the best conditions and using them in the best way could contribute to improved HC performance.

"Attractiveness/openness" is the factor ranking second in terms of variance explained, but the one with the lowest mean score. The study revealed that the HC's capacity to attract resources (human and financial) and its adaptation to the external environment is not viewed as important in influencing the performance of the HC. Internal stakeholders also considered that internal professional competition, the HC's reputation and the need to keep the budget on track are less important to HC performance compared with other performance aspects. This could reveal even less concern (a kind of saturation) with aspects related to the austerity environment experienced by the Portuguese NHS over the last few years. The HC internal stakeholders are more concerned with better use of HC resources than with keeping to the budget, which reveals greater flexibility in resource utilization and greater concern for community needs.

The "public service mission" dimension is also one of the most valued by internal stakeholders. This dimension is mainly patient-oriented. This dimension reflects the concerns of the internal stakeholders with the HC mission and its impact on HC performance. According to internal stakeholders' aspects related to responding to the real needs of patients and to guaranteeing the medical specialties that the community needs have a great influence on the HC performance. The evaluation of the quality of care provided and its continuous improvement are also viewed as important aspects for an HC to have an excellent performance. Additionally, many stakeholders were sensitive to relations between them and their patients and the community, considering this an important aspect to achieve high performance levels.

The fourth factor, "interpersonal relationships", is also one of the most valued, refers to the relationships among the HC professional, and between them and the patient and their families. Relationships among staff based on cordiality, teamwork, recognition and collaboration would have a positive impact on HC performance. This finding is consistent with recent studies on the impact of human resources satisfaction in the healthcare sector (Souliotis *et al.*, 2014). This dimension also reflects the relationships among the professionals and with the patient and their families. A person-centred approach is highlighted in this dimension. This finding is also supported in two studies about the influence of human resources competences in their relations with patients and the impact on health system performance (Buchan, 2004; Lega and Depietro, 2005).

Additionally, this dimension reflects some concerns related to the size increase resulting from the HC creation. With the integration the number of healthcare professionals increases and some patients have problems related to missing contact with healthcare professionals, namely physicians and nurses. On the other hand, the integration of healthcare professionals in new teams can have consequences in the relationships among them, increasing problems related to objectives alignment. Additionally, they may not have the feeling "that you are one of them".

These findings suggest that HC performance concept should be expanded and performance measurement frameworks with a large scope should be used. Thus, the HC comprises the internal units (services, departments) that add value to patients as they progress through an integrated organization. Like other organizations, the success of a HC depends on the integration, coordination, communication and cooperation between healthcare professionals in different departments/services and the appropriate performance measurement, and management is essential if the HC is to attain a better use of resources, better care delivery, satisfied patients, better quality and access to patient and community and motivated staff.

These results confirmed that the performance dimensions for the HC include other fields besides the traditional dimensions of quality and effectiveness in healthcare delivery and financing and accountability of healthcare organizations (Minvielle *et al.*, 2008; Bravi *et al.*, 2013; Mauro *et al.*, 2014). Interpersonal relationships, human resources development and the public service are important dimensions to consider in the performance measurement of the HC by stakeholders. These results challenge the traditional performance measurement frameworks.

The three professional groups shared a common opinion regarding the four performance dimensions. This shared view was also found in the French and Italian studies (Minvielle *et al.*, 2008; Bravi *et al.*, 2013). None of the three professional groups revealed statistical differences when rating the four dimensions, showing a consensus view on the importance that each dimension has on HC performance. It seems that the austerity environment, with big financial constraints, which can induce competitive views between administrative staff and physicians, causes in this case major consensus among them. This fact may have contributed to this shared view. These results are in consonance with Lega and Depietro (2005) that recent hospital restructuring has led to the adoption of a competency-based model for the human resources, based on the competence integration principles and consequently on the shared values.

Therefore, the authors concluded that a consensual view regarding the most valued performance dimension and shared organizational values could contribute to a beneficial and healthy work environment and HC performance.

Another aspect worth mentioning is that the difference found in the factor structure between this study and the studies by Minvielle *et al.* (2008) and Bravi *et al.* (2013) could be related to the application context. This happens because this study was applied to an HC (multisite hospital), whereas the Minvielle *et al.*'s (2008) study was applied to a single teaching hospital and Bravi *et al.*'s (2013) study to a specialised network of hospitals. Because this survey was applied to a multisite hospital, it could have consequences on the results. It could show that issues such as work environment, resources utilization, value creation and quality of care are considered extremely important to achieve high performance levels.

Finally, the small number of items in the final model (37 items) was used to define the most valued performance dimensions in the HC. The original model (67 variables) had a larger number of items related to more than one dimension (cross-loadings) and variables with low loadings. Using this original model could lead to collinearity problems, making it more difficult to interpret the factors. The final smaller model structure used was advantageous because it eliminated redundant items without loss of information.

The results of this study face some limitations. The first is the risk of social desirability bias when high ratings are given to survey items. The internal stakeholder respondents may not always feel able to answer questions openly and honestly, and instead give the answers they think the research team want to hear (Roberts, 2007). The current Portuguese economic-financial environment, characterized by strong external pressures, especially in terms of cost limitations, had a strong influence on the healthcare environment in Portugal, which has become more unstable and demanding to manage. This environment could influence the respondents' opinion. However, this risk is minimized and the answers will be more honest when respondents feel assured that they will remain anonymous and their answers will be confidential (Roberts, 2007).

According to Yin (2009), an exploratory analysis can be based on a single case study if the research purpose is to represent a unique situation providing in-depth analysis and multiple sources of information. However, limitations related to the generalization of the findings can be identified, depending on the particular characteristics of the organizational and national socio-economic context investigated (Giovanelli *et al.*, 2015). Thus, one limitation of this research is related to the possibility of generalizing the results beyond the original sample. Since only one HC in Portugal was selected, for reasons related to time and financial constraints, it would be impossible to generalize the study results for all HCs in Portugal. For the same reason, in the use of exploratory research based on a single case the authors are also aware of the risk of misjudging a single event and of exaggerating available data. However, this research was orientated to the specific context of integrated hospital units, in which the main characteristics (size and complexity) of this HC are similar to others. The extensive experience of senior executives and managers of the HC involved was a significant advantage when attempting to interpret and understand the real facts. Additionally, their experience in the healthcare sector has indicated that the issues examined in this particular case study are not unique and it was considered acceptable to use a single case study for data collection and analysis – and to make some limited generalized assumptions about such organizations. Whyte (1989) noted that these circumstances enable a better interpretation of real world situations than would otherwise be possible. Nevertheless, it is clear that further research is needed to better understand the complexities of this integrated hospital care sector and to validate findings in subsequent studies.

The low response rate is also another limitation of this study (23 per cent). The motivation to participate in this study could be low for two reasons: the time when data were collected (between January and February) was a period where the rate of the influenza virus was abnormally high. As a consequence, the number of in-patient and emergency admissions increased tremendously, and the healthcare professionals were very busy; workers do not feel professionally motivated because of the Portuguese economic and financial austerity environment, which led to the reduction of incomes of almost all professionals in the HC. The relatively long questionnaire might have discouraged many of the respondents, but a small questionnaire would have limited the information collected and comparability to data from other surveys. Finally, the generalizability of the study's results may be limited due to the low response rate to the survey. Non-respondents may have had different perceptions of the issues examined. The use of alternative data collection procedures, such as a telephone survey or face-to-face interviews, in combination with the online survey, or the use of a smaller sample with incentives for completion might have yielded a better response rate and should be considered in future research.

Additionally, the distribution of individuals by professional category was not similar in the sample and in the population. In fact, the proportion of physicians is lower when compared with the population's proportion. Moreover, the lower response rate for the physicians professional group was expected, since it was been observed in other similar studies (Dobrow *et al.*, 2009; Bravi *et al.*, 2013). On the other hand, the administrative staff's

proportion is higher than the one found in the population. Once again this is also observed in similar studies (Bravi *et al.*, 2013). Therefore, there was a limitation on the interpretation of the results regarding these professional groups.

The four dimensions resulting from factorial analyses are highly correlated, which reveals that these dimensions are greatly dependent on each other (Pestana and Gageiro, 2008). The comparison of results between dimensions must be interpreted with caution.

Most of the answers were collected in this study using self-administered questionnaires, in which respondents – internal stakeholders – are invited to fill out a questionnaire on the internet (sometimes referred to as web-based, computer-assisted self-interviewing or web-CASI). A specific sub-professional group was given a paper questionnaire. The goal with these two ways of collecting data was to increase access to the questionnaire (access to the internet) and to reduce the coverage error (all members of a target population have an equal chance of being selected in the survey sample), and therefore improve the response rate (Roberts, 2007). The goal was also to reduce the costs and non-sampling errors. This method can have some effects on measurement errors. However, since both the types of questionnaires were self-administrated, these errors were minimized.

In addition to the above-mentioned contributions and limitations, it is important to highlight one of the strong aspects of this study – the development of a simplified factorial model to define the most valued dimensions by internal stakeholders in a Portuguese HC context. This study involves all professional groups inside the HC, thus making it possible to explore a broad internal perspective of the performance dimensions most valued by the HC's internal stakeholders. Some dimensions found in this study are not usually available in hospital care units. Another great advantage of this study is the voluntary participation of internal stakeholders, since no compensation was given to participants, nor was participation mandatory. In fact, participation in the survey was only intrinsically linked to the survey's topic and the level of interest in the topic among the HC internal stakeholders.

The results of this study, namely the performance dimensions, will be a valuable input in the development of a performance measurement framework for the HCs. A performance measurement framework designed with internal stakeholders contributions is better accepted, since all professionals were asked to be involved in its definition. Moreover, all the domains reflect the different concerns of the internal stakeholders regarding the different aspects of performance. Additionally, one aspect that should also be considered in the design of a PM framework is the possibility that different stakeholders share a different view regarding the importance given to the different performance domains. Thus, the results revealed that the three professional groups shared a common opinion regarding the four domains, showing consensus on the importance that each domain has on HC performance. A performance measurement framework that contains a shared view regarding the HC performance domains will be more likely to be successful. In the future, this framework can help decision makers to define major objectives in each dimension in order to achieve better performance levels.

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