

**Human Capital Questionnaire (PHCQ): Assessment of European nurses' perceptions
as indicators of human capital quality**

Short title: Nurses' perceptions as indicators of Human Capital

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Abstract

In general terms, healthcare accreditation models include indicators related to healthcare employees' perceptions (satisfaction, career development, health-safety...). During the accreditation process, organizations are asked to demonstrate the methods with which assessments are being made. However, none of the models provide standardized systems for the assessment of employees. The aim of this study is to analyze the psychometric properties of an instrument for the assessment of nurses' perceptions as indicators of human capital quality in health care organizations. The Human Capital Questionnaire (HCQ) was applied to a sample of 902 nurses, in four European countries (Spain, Portugal, Poland and the United Kingdom). Exploratory factor analysis identified six factors: Satisfaction with leadership, Identification-Commitment, Satisfaction with participation, Staff well-being, Career development opportunities and Motivation. Results show the validity and reliability of the questionnaire which, when applied to health care organizations, provides a better understanding of nurses' perceptions, and is a parsimonious instrument for assessment and organizational accreditation. From a practical point of view, improving the quality of human capital, by analyzing nurses and other healthcare employees' perceptions, is related to workforce empowerment.

Keywords (max 6): Factor analysis, Healthcare, Human capital, Nurses' Satisfaction, Psychometric.

Nurses' perceptions as indicators of Human Capital

INTRODUCTION

The accreditation of healthcare centres is today an integral part of health care system quality in over 70 countries (Greenfield & Braithwaite, 2009). In order to obtain this accreditation there exist different models for quality assessment. All these models include a section referring human capital in healthcare organizations (Generalitat de Catalunya, 2007; Joint Comission International, 2010; Veillard et al, 2005).

In this context, the interest in human capital is related to providing the best care of patients, due to the relationship between healthcare employees' perceptions and their work behavior (Mitchell et al, 2001; Ying et al, 2007). Different studies have suggested that employees' perceptions of their jobs are related to quality indicators such as positive individual and organizational level performance outcomes (e. g. Crook et al, 2011; Ying et al., 2007).

The aim of the present work is to develop a valid, reliable, and parsimonius assessment instrument for measuring nurses' perceptions as indicators of human capital quality in healthcare organizations in order to provide them with standardized instruments during accreditation processes.

Background

In Europe, the first accreditation programs based on the North American models of the Joint Commission on Hospital Accreditation grew in the 1990's (Shaw, 2006; Shaw et al, 2010). In 2011, there exist different active accreditation organizations in Europe, including Spain, the United Kingdom, Portugal and Poland. Some of them (e.g. in some regions of Spain such as Catalonia or Andalusia) follow the European Foundation for Quality Management model (EFQM, 2007; 2010) adapted to healthcare organizations, while others (e.g. Poland) are based on the World Health Organization (WHO) Regional Office for Europe Performance Assessment Tool for quality improvement in Hospitals (PATH) (Veillard et al., 2005), the International Society for Quality in Healthcare (ISQua, 2007) (United Kingdom and Portugal) or the Joint Commission International (Portugal and Spain) (Joint Commission International, 2010).

In general terms, all the referred models include indicators related to employee satisfaction, career development, and health-safety perceptions. Nonetheless, these core indicators have been conceptualized from different perspectives and measured in different ways. In this sense, the EFQM model includes employees satisfaction in the *Perception measures* (called "*Perceptions*" in the model 2010). This dimension includes employees satisfaction in relation to aspects such as motivation, sense of belonging, communication, personal relationships, training, career development, equal opportunities, or health and safety.

The PATH model, even though it brings the EFQM fundamental concepts of excellence closer to health care (Vallejo et al, 2006) includes staff satisfaction in the *Staff*

orientation dimension, but is related exclusively to work satisfaction. Additionally, the PATH model assesses climate, opportunities for continued learning and training, work implication and values, and health promotion activities and safety initiatives.

The ISQua model includes satisfaction, career development, and health-safety as indicators of human capital quality on the *Function B: Support Services, Standard 4, Human Resources Management*. It also includes dimensions related to engagement, participation and supervision, and staff well-being. Finally, the Joint Commission International model includes staff satisfaction monitoring and staff health and safety program measurements.

Summing up, in general terms all these models include different aspects regarding employees satisfaction, career development, and health-safety perceptions to evaluate human capital quality. During the accreditation process, organizations are asked to demonstrate that this assessment has been made and with what methods. However, none of the models provide standardized systems for employees' assessment. According to Shaw (2000), it is really important for organizations to have standardized instruments to measure employees' perceptions during accreditation processes because this is crucial to the consistency of reports within programs.

STUDY AIM

The aim of this study is to develop the Human Capital Questionnaire (HCQ), a standardized, valid, reliable, and parsimonius assessment instrument for measuring nurses' perceptions as indicators of human capital quality in healthcare organizations.

METHOD

Instrument development

Indicators related to peoples' perceptions have to be measurable, meaningful, and quantifiable (Kim et al, 2010). The underlying theoretical basis for item generation was an analysis of the most used accreditation models (EFQM, 2007, 2010; ISQua, 2007; Veillard et al, 2005; Joint Commission International, 2010) and the employees' perception dimensions most commonly included in them related to nurses' satisfaction, career development, and health-safety perceptions.

Twenty-six item statements were generated. The content validity of the items was supported by the literature and consultation with healthcare professionals. All items were scored on a 5-points-Likert scale ranging from 1 = *Strongly disagree* to 5 = *Strongly Agree*.

Additionally, the twenty-six statements were evaluated by a panel of ten judges. All of them were specialists in human resource assessment in healthcare organizations. The judges were asked to evaluate, on a 5-point scale, the adequacy of each of the statements, being 1 = *inadequate* and 5 = *highly adequate* (Osterlind, 1989). The statements which obtained an average score less than or equal to 3 were eliminated. None of the judges recommended further items to be deleted, but they suggested additional items related to commitment and identification (Romeo, Yepes et al, 2011; Romeo, Berger et al, 2011), and motivation (Navarro et al, 2011), considered as fundamental concepts related to Human Capital by the European Network of Work & Organizational Psychologists (ENOP, 2005). Finally, the questionnaire had thirty-nine items.

The original version of the HCQ questionnaire was in Spanish (HCQ-S). The items were translated and back translated and adapted to Catalan (HCQ-C), English (HCQ-E), Polish (HCQ-PL) and Portuguese (HCQ-PT) languages. The objective of the translation process was to keep the instrument as near as possible to the original, maintaining the direction of each question and the same structure presented by the authors. Therefore, a back-translation method (Carlson, 2000) and the guidelines of the International Test Commission (International Test Commission ITC, 2010) to obtain a linguistically equivalent instrument in all languages were used: first with the collaboration of expert consultants the translation into Catalan, English, Polish and Portuguese was done and then it was back translated from Catalan, English, Polish and Portuguese into Spanish. All discrepancies were cleared up and a common version was derived.

Participants

The questionnaire thus created was applied to a sample of 902 nurses working in public hospitals in four European countries (Portugal: 57.6%, Spain: 32%, Poland: 6.2%, and the United Kingdom: 4.1%). Participants in all cases were volunteers. Of the total, 10.9% identified themselves as managers. No response was received from 7.98%. 65.6% worked on rotatory shifts. Samples description by country can be seen in Table 1.

Ethical considerations

Prior to the data collection, approval to conduct the study was obtained from the Research and Training Committee at the participant hospitals. Additionally, all participant nurses received a cover letter explaining the purposes and procedures of the study; that their confidentiality and anonymity would be maintained; and of their right to withdraw from the study at any time without negative impact. Confidentiality of responses was ensured.

Data collection

The Human Capital Questionnaire (PHCQ) was administered to nurses over a three-week period, with the help of an internal collaborator. After a briefing given by a member of the research team, the questionnaire was distributed around different units and general buildings of the hospitals and completed anonymously by volunteers who were able to respond during their work time, but did not receive any compensation for their participation.

Data analysis

Exploratory factor analysis (EFA) was performed to establish the internal structure of the instrument. EFA was used in validity testing when the factor structure is unknown a priori (Nunnally & Bernstein, 1994). Principal components extraction with Varimax rotation was calculated using all of the variance of the manifest variables, and all of that variance appears in the solution (Ford et al, 1986).

To assess the adequacy of the sample the Kaiser-Meyer-Olkin index (KMO) and Bartlett's Test of Sphericity (BTS) were calculated. The factor loadings ($>.40$) and communalities ($>.30$) were used to assess the adequacy of individual items (Pett et al, 2003).

Internal consistency was evaluated as a measure of the reliability of the HCQ. This was done by calculating Cronbach's alpha, which was considered to be the optimal method for determining internal consistency, as it takes into account the degree of covariance between the test items. As a criterion, the value of Cronbach's alpha should be at least 0.6.

RESULTS

KMO (.947) and BTS (16330.7; $p < .001$) showed the sample adequacy for factorial analysis. Two items, related to nurses' satisfaction ("I don't like how this organization functions; I will go to a better one as soon as I can") and career development ("I feel satisfied with the possibilities for me to learn and to develop professionally"), were eliminated from the scale due to their ambiguous factor loadings. The first item had a factor loading greater than .4 in two components while the second item was a single-item factor.

The final thirty-seven items loaded onto six factors and explain an amount of 60.71% of the variance. The first factor explains 34.05% of the variance. This factor included ten items, all of them related to nurses' satisfaction with their managers. Consequently, it was titled "Satisfaction with managers". An example of items is "I feel satisfied with the support I receive from my immediate superiors".

Factor 2, explaining 8.87% of the variance, involved items related to engagement, commitment and identification ("I feel emotionally linked to this hospital"). Following Romeo, Berger et al. (2011) and Romeo, Yepes et al (2011), this factor was titled "Identification and commitment" and it included ten items.

Factor 3, explaining 7.42% of the variance, put together items related with nurses' satisfaction with participation and decision making (e. g. "I believe that the level of participation that exists is effective"). Consequently, and following Yepes (2010), we named the factor "Satisfaction with participation". It included five items.

Factor 4 explained 3.88% of the variance. It included items related to staff well-being, health and safety (e. g. "In this Trust management is concerned with finding

solutions to fatigue, work-related illness and accidents”). This factor was titled “Staff well-being” and it included five items.

Factor 5 explained 3.76% of the variance and concerns the possibility to develop professionally in the organization (e. g. “There are interesting opportunities to progress in this Trust”). This factor was titled “Career development opportunities”. It included four items.

The last factor, Factor 6, explaining 2.78% of the total variance, includes items related with the degree of effort that people are willing to exert in their work (e.g. “I feel like I want to make an effort with my work”). Following Navarro et al. (2011), this factor was titled “Motivation” and included three items.

All factors had alpha scores greater than .6. Correlations between factors and alpha scores can be seen in Table 2.

DISCUSSION

Results obtained in the exploratory analysis show that the questionnaire is structured into six factors, four of them related to the above mentioned dimensions of the main quality models previously described, and two, commitment and motivation, related to experts’ advice.

Related to the components of the scale, the analysis of the items contained within the first factor reveals that they all refer to aspects of nurses’ satisfaction with their managers. This result is in accordance with the majority of the before mentioned accreditation models, which included a dimension related to leaders’ role and skills in their assessment (Collaborative management on the Joint Commission International model; supervisor support on the ISQua model; satisfaction with leaders on the EFQM and PATH models).

Analyzing the factors' items, and following Berger et al (2012), we can define this dimension as the degree of employees' satisfaction with their managers.

The second factor includes items related with the relationship between nurses and their organizations. It includes those items referring to commitment and identification, and following Romeo, Berger et al. (2011) and Romeo, Yepes et al. (2011), we decided to name this factor "Identification and commitment". Organizational commitment has been defined as "the psychological link that employees develop towards the organization for different reasons. As an attitude it is based on beliefs, evaluation processes, feelings and behaviors" (Romeo, Berger et al., 2011, p. 2) Identification is defined as a type of link with the organization that implies cognition, affection and desire, and it is composed of three dimensions: pride, categorization and cohesion (Quijano et al, 2000; Romeo, Yepes et al, 2011; Romeo, Berger et al, 2011). These two first factors explain together 42.92% of the variance.

The third factor included items related with participation and decision making. All the items refer to aspects of nurses' satisfaction with the levels of participation that the organization allows, and its adequacy (Yepes, 2010). This result is in accordance with the ISQua model which includes the need for seeking the views of professionals and other stakeholders, in order to ensure staff participation on standards development (ISQua, 2007, Principle 5, Standards development).

The fourth, related to staff well-being, and the fifth factor, related to career development opportunities, are in the line of all the accreditation models above mentioned. They include these aspects as part of the quality of human capital (Competent and Capable Workforce on the Joint Commission International model; Promote staff well-being and

Relevant training and development opportunities on the ISQua model; Health promotion activities and safety initiatives and Training career development on the EFQM; and Positively enabling conditions and Opportunities for continued learning and training on PATH model). Several studies have shown the importance of staff well-being as related with individual and organizational performance (e. g. Aldana, 2001; Burke et al, 2009; Dugan et al, 1996; Lundstrom et al, 2002; United States Agency for Health Care Research and Quality, 2003). Finally, career and competencies development opportunities are important topics on quality literature (e. g. Cooper, 2009; Preheim et al, 2009; Watts, 2010; Werner & Konetzka, 2010).

The last factor included items related to motivation as defined by Quijano and Navarro “the degree of effort that people are willing to exert in their work” (Quijano & Navarro, 1998, p. 195).

Limitations and future research

Some limitations were found. It should be noted that the samples of the present study were restricted to large and medium-size hospitals, and therefore the questionnaire should be tested both with other samples and in other contexts. This would entail testing the extent to which the model is applicable across different healthcare organizations, and would provide further assurances as to its conceptual robustness.

Finally, future research with the questionnaire should use convergent and discriminating validation and organizational effectiveness criteria in order to avoid the risk of generating spurious correlations through common method variance (Podsakoff & Organ, 1986).

CONCLUSION

The questionnaire obtained is a clear, parsimonious and synthetic tool that is theoretically well founded on quality assessment models, based on empirical data and comprehensible to employees and managers. The main advantage of the questionnaire is its usefulness for the evaluation of nurses and other healthcare employees' perceptions as indicators of human capital and to assess people results with respect to the EFQM model (EFQM, 2007, 2010), ISQua model (ISQua, 2007), WHO-PATH model (Veillard et al, 2005), and Joint Commission International model (Joint Commission International, 2010). Accordingly, it would be useful for healthcare organizations to evaluate their human capital in order to get an official accreditation.

Additionally, from the intervention point of view, results show that dimensions "satisfaction with managers" and "Identification and commitment" explain the main part of variance of HCQ. In this sense, any plan which aims to improve the quality of human capital in the healthcare sector, should take into account both dimensions.

Finally, from a practical point of view, it is important to note that improving the quality of human capital, by analyzing nurses and other healthcare employees' perceptions, is related to workforce empowerment (ISQua, 2007). Specifically it allows to provide the best care of patients, due to the relationship between nurses' perceptions and their work behavior (Ying et al, 2007) or their intention to stay on their organization (Mitchell et al, 2001).

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Table 1.

Samples Description by Country

Variables	Portugal	Spain	Poland	United Kingdom	TOTAL
n (%)	520 (57.6%)	289 (32%)	56 (6.2%)	37 (4.1%)	902 (100%)
Managers	56 (10.8%)	16 (5.5%)	4 (7.1%)	22 (59.5%)	98 (10.9%)
Rotatory shifts	403 (77.5%)	138 (47.8%)	35 (62.5%)	16 (43.2%)	592 (65.6%)
A&E (UCI)	89 (17.1%)	35 (12.1%)	0 (0%)	3 (8.1%)	127 (14.1%)
Surgery	55 (10.6%)	37 (12.8%)	0 (0%)	0 (0%)	92 (10.2%)
Outpatients' consultations	35 (6.7%)	32 (11.1%)	7 (12.5%)	0 (0%)	74 (8.2%)
Administration	5 (0.9%)	4 (1.4%)	0 (0%)	0 (0%)	9 (1%)
Ward nurses	309 (59.4%)	142 (49.1%)	48 (85.7%)	23 (62.2%)	522 (57.9%)
Others	5 (0.9%)	18 (6.2%)	0 (0%)	9 (24.3%)	32 (3.6%)
N/A	22 (4.2%)	21 (7.3%)	1 (1.8%)	2 (5.4%)	46 (5.1%)

Table 2.

Correlations between Factors and Alpha Scores

Variables	N of items	1	2	3	4	5	6
1. Satisfaction with managers	(.943)						
2. Identification and commitment	.419*	(.905)					
3. Satisfaction with participation	.464*	.408*	(.877)				
4. Staff well-being	.522*	.414*	.550*	(.740)			
5. Career development opportunities	.452*	.404*	.552*	.594*	(.771)		
6. Motivation	.339*	.340*	.204*	.232*	.204*	(.624)	

Note: Alpha scores are in parentheses; *p < .001.