

**Modeling patient care quality: An empirical high-performance work
system approach**

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Abstract

Purpose: Following a social identity approach focused in the Greek healthcare sector, this study investigates the mediating effects of social identification on the relationship between High Performance Work Systems (HPWS) and psychological empowerment, and the mediating role of psychological empowerment between HPWS and quality of patient care.

Design/methodology/approach: Partial Least Squares Structural Equation Modeling (PLS-SEM) was used in a sample of 297 nurses, doctors and allied health professionals across 7 hospitals in Greece.

Findings: The findings suggest that HPWS has a strong effect on health-care professionals' social identification, which in turn partially mediates the relationship between HPWS and psychological empowerment. In addition, psychological empowerment indirectly mediates the relationship between HPWS and quality of patient care.

Practical implications: The findings not only validate previous studies' conclusions, but also provide evidence for the potential fruitfulness of the HPWS approach from a social identity perspective. In addition, it also confirms that without the presence of psychological empowerment, HPWS may have limited impact on the quality of patient care.

Originality/value: Although HPWS has been generally connected with positive employee attitudes and behaviors, and improved patient outcomes, few studies choose to follow a social identity approach in examining these relationships. Finally, this study confirms the argument that HPWS can be a fruitful approach even in a country severely affected by Europe's debt crisis over the last five years.

Keywords: *High-performance work systems, HPWS, social identification, psychological empowerment, quality of patient care*

Paper type – Research paper

Introduction

During the past 20 years, there has been a great deal of debate regarding the appropriate human resource practices that should be used in an organization in order to lead to workers' prosperity and well-being and consequently to greater efficiency and increased financial performance for the organization. The most common term characterizing such a relationship is known as High Performance Work Systems (HPWS), also referred to as High Performing Work Practices (HPWPs), High Involvement Management (HIM) and High Commitment Management (HCM). Despite the fact that many researchers use the latter notions (HIM and HCM) as being the same and identical terms with the HPWS approach, these are not equivalent to HPWS (Boxall and Macky 2009). In contrast, HPWS encompasses both the high-commitment and involvement elements, and is thus broader in scope (Zacharatos et al., 2005, p. 77). Although across the Human Resource Management (HRM) literature HPWS has been generally examined in the manufacturing sector (e.g. Data et al., 2005; Delery and Doty, 1996; Huselid, 1995; Messersmith and Guthrie, 2010; Torre and Solari, 2012), recent empirical studies have extended to the service sector as well, and especially in regard to healthcare.

Indeed, there is mounting evidence relating aspects of HPWS and improved patient outcomes in numerous healthcare studies. For instance, HPWS has been connected with cost efficiency through enhancing employee satisfaction and service quality (Scotti et al., 2007), positive perceptions of quality of patient care and delivery of health care services (Bartram et al., 2014; Leggat et al., 2010, 2011), and improved employee reaction and service quality (Lee et al., 2012; Robbins et al., 2012). Moreover, it has been reported that the introduction of HPWS is positively related to employee experiences of work (Harley et al., 2007, 2010) and benefits to employees' well-being (Fan et al., 2014), while HPWPs focused on career development and extensive training are positively related to career mobility, which in turn is a significant predictor of job satisfaction and employment intentions (Dill et al., 2014). In

addition, some researchers have suggested a negative association of HPWS with employee burnout (Ang et al., 2013; Bartram et al., 2012; Fan et al., 2014; Zhang et al., 2013) and, consequently, on intention to leave (Ang et al., 2013; Bartram et al., 2012).

Despite the HPWS positive contribution, however, one fact that should not be neglected is that HRM research is often predicted from an individual rather than on a group perspective, whereas the HRM impact on employee attitudes and performance can be described as a social process. For the healthcare sector especially, where different occupational and professional groups work in multidisciplinary teams, it is extremely important to follow a social identity approach (Bartram et al., 2014, pp. 2401–2402). Social identification refers to the inclination of a particular individual to perceive himself or herself as representative of a particular group, which makes the individual perceive characteristic group features as self-descriptive and leads him or her to adopt distinctive group norms as guidelines for his or her own behavior (Ellemers et al. 2004, p. 462). Thus, in this study we extend previous research and propose that HPWS will have a strong impact on the health care practitioners' social identity, which in turn will enhance their psychological empowerment and ultimately lead to higher clinician perceptions of the quality of patient care. Hence, social identification will act as a mediator on the relationship between HPWS and psychological empowerment, while the latter is expected to mediate the relationship between HPWS and quality of care.

Finally, one significant issue prohibiting generalizations of the positive findings among healthcare studies concerns the existing differences between different contexts and countries. The context in which organizations operate may indeed limit or enhance the HPWS usefulness and success due to differences in the culture, the legislative frames, and other cultural and institutional factors that are considered country-contingent, and which shape employment relationships and HR decision-making in organizations. Therefore, practices which seem to be appropriate in one culture may be less appropriate in another (Boxall and Macky, 2009; Den

Hartog and Verburg, 2004). Thus, what makes this specific research unique is the focus on the Greek healthcare sector. Greece has been overshadowed by a deep economic crisis since 2008. Although the unprecedented downswing of economic activity has had devastating consequences on the overall labor market, affecting both employment levels and the number of enterprises operating in the country, the healthcare sector taken together with the leisure industry form the two most promising service sectors for the country's future development. Hence, focusing explicitly on the healthcare sector, the main goal is to examine the contribution of the HPWS approach in the Greek social context, given the current economic turmoil.

The Greek Healthcare System

The Greek Healthcare system can be described as a unique and challenging case. Overall, healthcare in Greece can be provided by either public or private hospitals. Although many issues emerge largely attributed to the structure of the health care system but even more to its problematic administration, the most significant ones can be located among public hospitals. Many of the public hospitals are highly bureaucratic, showing no real concern for service quality and ignoring cost-efficiency, and organizational effectiveness. In addition, central authorities tend to intervene, leaving limited space for managerial decisions, not to mention the interference of political parties, and the political discrimination even in selecting hospital managers and members of governing boards (Bellou, 2008, pp. 497–498).

Although there is a bleak picture regarding public hospitals, there are exceptions. Among them, there are some exemplary public hospitals, which share similar characteristics with modern private ones. In these leading private and public hospitals, management is free to hire employees according to their own criteria, which typically revolve around profit-making for the organization. The main sources of income are payments from private insurance and out-of-pocket payments by the patients. Finally, health care professionals are recruited on the basis of

their commitment to increasing hospital revenue and can be motivated accordingly to adhere to this goal by appropriate HRM policies which are set by hospital management (Kontodimopoulos et al., 2009).

To our knowledge, there are no empirical studies examining the HPWS (or HRM practices) effects on employees' well-being and quality of care in the Greek healthcare sector. Of the few existing empirical studies, however, the majority focus on the motivational factors among health-care professionals (Kontodimopoulos et al., 2009; Lambrou et al., 2010; Peleologou et al., 2006). Hence, following the suggestion of Paleologou et al. (2006), it is important to understand what exactly satisfies Greek health professionals in their workplace and motivates them to improve performance.

Theory and Conceptual Framework

High-Performance Work Systems (HPWS)

High Performance Work Systems (HPWS) have been defined as '*a specific combination of HR practices, work structures, and processes that maximizes employee knowledge, skill, commitment, and flexibility*' (Bohlander and Snell, 2007, p. 690). One significant aspect of this definition is the reference on the 'system' approach or 'bundles of practices' and not on isolated individual practices, since HPWS is composed of many interrelated parts that complement one another to align with the goals of an organization.

Although across the Human Resource Management (HRM) literature HPWS has been generally related with increased productivity, organizational performance, and reduced turnover (e.g., Datta et al., 2005; Delaney and Huselid, 1996; Delery and Doty, 1996; Huselid, 1995; Ichniowski and Shaw, 1999; Messersmith and Guthrie, 2010; Torre and Solari, 2012), there is still a gap in the literature as to what practices and in what patterns they can promote performance, and, additionally, what is the mechanism through which HRM practices (such as

HPWS) influence performance (Takeuchi et al., 2007, p. 1069; Zhang and Morris, 2014, p. 69)?

Regarding the latter question, the mechanism driving the HRM—organizational performance relationship is still in need of further exploration, and is often referred to as the ‘black box’ (Becker and Huselid, 2006; Kinnie et al., 2005; Messersmith et al., 2011; Sels et al., 2006). Overall, the basic concept behind these systems is that organizational performance does not stem from the HR practices themselves but rather from the contribution that these HR practices make regarding employees’ attitudes and behaviors (Delery, 1998; Messersmith et al., 2011), which in turn serve as mediators in the HPWS—organizational performance relationship (Purcell and Kinnie, 2007; Takeuchi et al., 2007, p. 1069).

Last but not least, one major drawback regarding the HPWS approach concerns the little agreement as to the exact ‘best’ practices that constitute a HPWS (Boxall, 2012; Delery, 1998, p. 296), although some researchers have tried to overcome this issue. For instance, Appelbaum et al. (2000) proposed the *Ability, Motivation, and Opportunities* (AMO) framework, and argued that performance should be a function of three factors known as Ability (skills, experience, knowledge), Motivation (to apply abilities – both financial and intrinsic), and Opportunities (to engage in discretionary behavior). Similarly, Lepak et al. (2006) summarized the HRM practices used in previous empirical studies into three groups of activities, namely employee skills, motivation and empowerment.

Nevertheless, there is still no specific list of HR practices forming the HPWS construct. For this study, however, after considering the HR practices confirmed by Zacharatos et al. (2005) as representative of HPWS and following some of the most significant studies in the healthcare industry examining the HPWS approach (Ang et al., 2013; Bartram et al., 2012, 2014; Bonias et al., 2010; Leggat et al., 2010, 2011; Zhang et al., 2013), we considered the following HRM practices as critical and representative within the Greek healthcare context. They comprise

recruitment and selection, training and development, participation in decision-making, employment security, performance management, job clarity, and employee autonomy. Finally, these practices were presented to academic and health services researchers who confirmed their validity as well as their application to the Greek health care system.

The Social Identity Theory

According to the central assumption of the Social Identity Theory people wish ‘to belong to a group they perceive to be distinct from other groups in order to raise their self-esteem’ and it is this perception of the group which forms the basis of the individual’s social identity (Tajfel and Turner, 1986). Indeed, the group context and the shared understanding of the nature and characteristics of the group are believed to have a strong impact on cohesion, leadership, and on the relationship between attitudes and behaviors (Abrams and Hogg, 2004, p. 103). In other words, social identification leads individuals to perceive themselves in terms of the characteristics they share with other members of their in-groups, their shared social identity - rather than in terms of the idiosyncratic characteristics that differentiate them from other individuals, their personal identity (Turner et al., 1987, cited in Van Knippenberg, 2000, p. 358). Thus, when group identification is weak or absent, people view themselves primarily as unique individuals. In contrast, when people identify highly with their group, they see themselves primarily as group members, belongingness to the collective is strengthened and hence, social identification acts as a ‘social glue’ (Van Vugt and Hart, 2004, p. 587).

Although research has demonstrated that many HPWS practices are associated with social cohesion (Bartram et al., 2014, p. 2404), there is a dearth of empirical studies examining the HPWS effect on social identification. Thus, the present study attempts to show that the HR practices comprising a HPWS can have a positive effect on employees’ social identity. For instance, ***employment security*** which encompasses policies and practices that support stable

employment for staff who are performing acceptably (e.g., Macky and Boxall, 2007; Wood and Albanese, 1995) encourages people to take a longer-term perspective on their jobs and organizational performance (Pfeffer, 1998) and represents an investment of time and resources in employees, which would be reciprocated in terms of loyalty to the organization (Zacharatos et al., 2005), producing greater identification with the team. **Training** at the team level, provides employees with the appropriate knowledge, skills, and abilities and has been associated with self-efficacy (Axtell and Parker, 2003). Rigorous training represents organizational investment in and commitment to the employee, and it signals that they are considered important to the survival and success of the organization (Takeuchi et al., 2007, p. 1071). In addition, it allows employees to acquire greater competencies to control their work and constitute an incentive for them to remain with the organization and perform at a high level (e.g., Barling et al., 2003; Guthrie, 2001; Way, 2002), influencing thus organizational performance (e.g., Barling et al., 2003; Katou et al., 2014). Further, it enables team members to coordinate their activities and develop a shared understanding of tasks (Postmes, 2003) and make sure that the identity of the team is consistent with the broader organizational goals. **Selective hiring** describes practices associated with ensuring that open positions are filled with the highest quality candidates available from the applicant pool (Garman et al., 2011; Sels et al., 2006). In addition, it focuses on the fit between employees and their work environment (Zacharatos et al., 2005), and it is this fit that can lead to the greater social identity of employees who share similar characteristics. Overall, the emphasis in selective staffing and comprehensive training contributes to a high level of collective human capital for the workforce (e.g., Huselid, 1995; Way, 2002) and might also serve as socialization tactics that help develop social capital by attracting employees who hold similar values (Takeuchi et al., 2007, p. 1071). In addition, **self-managed teams and decentralized decision-making** help in promoting social cohesion while influencing employees' social identification. Specifically,

these practices help teams promote the sharing of ideas that result in better solutions to problems, enable individuals to feel more responsible for their own and each other's, and thus benefit overall employee performance (Pfeffer, 1998; Zacharatos et al., 2005) and productivity (Birdi et al., 2008). Moreover, *performance management*, such as contingent compensation, contributes to employees' feeling valued by the organization when their behaviors are rewarded (Pfeffer, 1998; Zacharatos et al., 2005). Specifically for team incentives, these can lead to enhanced group loyalty and cohesion influencing employees' social identification. Finally, *high-quality work* (which includes job clarity and employee autonomy), a critical component of HPWS as described by Zacharatos et al. (2005), ensures that employees are engaged intellectually and emotionally and can thus create a greater sense of loyalty.

To our knowledge, only Young et al. (2010) and Bartram et al. (2014) followed a social identity approach and found a strong positive relationship between HPWS and social identification. Taking all of the above into consideration, we propose the following hypothesis.

Hypothesis 1: HPWS will be positively related to social identity.

Psychological Empowerment

Empowerment can be defined as a process of enhancing feelings of self-efficacy among organizational participants (Conger and Karungo, 1988). Overall, there are two basic theories of empowerment, namely structural and psychological. Workplace / structural empowerment is defined by Kanter's (1977) theory as having the power to access the structural factors within the work environment that enable the employee to get work done. In contrast, Spreitzer (1995) defined psychological empowerment as a psychological state that employees must experience for managerial interventions to be successful. In other words, it is not the conditions of the work context or the perception of the presence or absence of empowering conditions in the workplace but the employees' psychological interpretation or reactions to these conditions that

influence their organizational behavior (Knol and Van Linge, 2009, p. 361). According to Spreitzer (1995), psychological empowerment can be categorized into four components, namely: meaning (a fit between the requirements of the job tasks and the subject's own values); competence (the subject's belief that he or she possesses the skills and abilities necessary to perform a job or task well); self-determination (the subject's feeling of having control over his or her own work); and impact (the belief that the subject has a significant influence over strategic, administrative, or operational outcomes at work).

Even though the HPWS—psychological empowerment relationship has not been examined extensively through the literature, there is evidence proving a direct significant effect between the two. For instance, in the Australian healthcare sector it was found that among nurses (Leggat et al., 2010) and clinicians, including doctors, nurses, and allied health professionals (Bartram et al., 2014; Bonias et al., 2010) HPWS had a significant positive correlation with psychological empowerment. Hence, we propose that HPWS can have a positive impact on psychological empowerment.

Hypothesis 2: HPWS will be positively related to psychological empowerment.

In addition, since teamwork among healthcare professionals is critical for increased quality of patient care, we propose that social identification could be regarded as an important antecedent between HPWS and psychological empowerment, while having the potential to mediate this relationship. Indeed, HPWS components can influence employees' values, attitudes and behaviors through creating a shared sense of belonging, especially when working in teams. The unity among team members enables them to exercise additional discretionary effort, while, at the same time, it enhances their interpersonal relationships, which altogether can lead to solving any potential problems and differences that may arise in a collective manner. Thus, people feel empowered to contribute to the organizations' goals and perceive themselves as an

important part of the team, leading to greater feelings of psychological empowerment (Bartram et al., 2014, p. 2406).

Hypothesis 3: Social identity will mediate the relationship between HPWS and psychological empowerment.

Quality of Care

In the healthcare industry, researchers place particular emphasis on clinical performance, which consists of both patient quality of care and patient safety (Townsend et al., 2013). Specifically, quality of care is commonly- and widely-seen in studies in health care, and is defined as the ‘degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge’ (Lohr and Schroeder, 1990, p. 707). Quality of care has been measured as patient mortality, reduction in adverse events, waiting times and infections, quality patient care continuity, and patient satisfaction. Overall, patient satisfaction (Bonias et al., 2010; Leggat et al., 2010, 2011) has been confirmed as a valid measure of clinical patient outcomes (Kane et al., 1997) and therefore an appropriate measure of quality of care.

Nonetheless, the question remains in the literature regarding the most efficient way of measuring quality of patient care, whether from the perceptions of clinicians, patients or with clinical outcomes. Donabedian (1980) distinguished two aspects of quality of care, namely technical and interpersonal. The former refers to the appropriate application of professional knowledge and skills to promote healthcare, while the latter involves both the relationships between patients and healthcare professionals as well as the contextual aspects of care. Research indicates that, although patients are able to judge the interpersonal aspects, they do not feel qualified to assess the technical quality. This finding, coupled with the evidence that process measures of quality are most effective, suggests the need for clinician measures of

quality of care (Bartram et al., 2014, p. 2407). Clinician perceptions of patient care is a widely-used and accepted indicator of quality of patient care within the health-care industry (Rubin et al., 2001), while clinical quality measures and patient experience are expected to correlate at the level of health professionals (Sequist et al., 2008). Thus, health professionals' self-report measure of clinical care has been used by various researchers to measure the quality of care delivered (Bartram et al., 2014; Bonias et al., 2010; Leggat et al., 2010, 2011).

Within the health care sector, research has indicated that psychological empowerment is directly related to perceptions of quality of patient care among clinicians (Bartram et al., 2014; Leggat et al., 2010, 2011) and can act as a mediator in the HPWS–quality of care relationship (Bonias et al., 2010). In other words, the presence of psychological empowerment can be fundamental in the quality of patient care delivery. Thus, we propose the following hypotheses.

Hypothesis 4: Psychological empowerment will be positively related to perceived quality of patient care.

Hypothesis 5: Psychological empowerment will mediate the relationship between HPWS and the perception of the quality of care.

Method

For the purposes of our research, we developed both a handwritten and an on-line questionnaire. We surveyed clinicians' (doctors, nurses and allied health professionals) responses in seven (five private and two public) regional hospitals, located in Athens and Thessaloniki, Greece. All private hospitals are well-known and reputed for their high health-care quality. Specifically for public hospitals, the first one is newly established, the second one is in part privately funded, and both are recognized as leaders in the health care industry. The questionnaire was delivered by hand in the two public hospitals, while for private ones we chose the on-line method by sending it to the clinicians' personal e-mail addresses, obtained by hospitals.

Overall, the survey was sent to 741 employees in the seven hospitals, in spring 2014. Cases that had missing data for more than one item for any of the subscales were deleted. For those cases that had missing data for an item in a subscale, the respondent's average over the other items in the subscale was used as the response to the missing item because each subscale is assumed to consist of reflective indicators. We received 297 usable responses, a response rate of 40%. Our sample is comprised of 178 doctors and allied health professionals, and 119 nurses. About 71% of the doctors were male while 83% of the nurses were female. The average age of respondents was 44. In addition, 55% of employees held a bachelor degree, while 41% held postgraduate qualifications (e.g. postgraduate diploma, masters degree, PhD). Finally, 71% of the respondents were working full-time, 18% part-time, and an additional 11% were working under a short-term employment contract.

Measures

All survey items, were measured using a 5 point likert scale ranging from 1 = strongly disagree, to 5 = strongly agree.

High-performance work systems

Items on HR practices were adapted from established scales or existing measures of HR systems (Ang et al., 2013; Delery and Doty, 1996; Zacharatos et al., 2005). Overall, 31 items were used, encompassing seven sub-scales. A separate principal component analysis was conducted for each of the seven constructs in the HPWS scale, while a cutoff value of 0.50 was used to indicate satisfactory loading. The number of items that met the loading criterion and the Cronbach's alphas for the seven sub-scales are as follows: Recruitment and selection (four

of five items included, $\alpha = 0.788$), training and development (six of seven items included, $\alpha = 0.863$), employee autonomy (all five items included, $\alpha = 0.807$), participation in decision-making (all four items included, $\alpha = 0.786$), employment security (all four items included, $\alpha = 0.831$), job clarity (three of four items included, $\alpha = 0.884$), and performance management (all five items included, $\alpha = 0.898$). The Cronbach's alpha for the HPWS measure was 0.877. The complete list of the HPWS practices used can be found in the appendix, along with their loadings.

Social identification

Following the suggestion of Hinkle et al. (1989, p. 314), social identification was measured using the emotional and cognitive components of the social identification scale. Principal Component Analysis with a cutoff value of 0.50 was used to indicate satisfactory loading. Finally, six items were used, loaded into a single factor. Sample items include: 'I identify with this group'; 'I think this group worked well together'; and 'I feel strong ties to this group'. The Cronbach's alpha for the 6-item scale was 0.829.

Psychological Empowerment

Psychological empowerment was measured using Spreitzer's (1995) 12-item scale. Separate principal component analysis with a cutoff value of 0.50 showed that these 12 empowerment items loaded satisfactorily on their respective components as specified by Spreitzer (1995), namely meaning ($\alpha = 0.791$), competence ($\alpha = 0.799$), autonomy ($\alpha = 0.853$), and impact ($\alpha = 0.881$). Sample items include: 'The work I do is very important to me' (meaning); 'I am confident about my ability to do my job' (competence); 'I have significant autonomy in determining how I do my job' (autonomy); and 'My impact on what happens in my department

is large' (impact). The Cronbach's alpha for the single-index Psychological Empowerment measure was 0.850.

Quality of care

Perceptions of the quality of patient care delivered were measured by using the Victorian Patient Satisfaction questionnaire (VPSM) as guidance, following Bartram et al. (2014), Bonias et al. (2010) and Leggat et al. (2010) studies. In addition, we were very careful so that the quality of care questionnaire would be in accordance with the Greek healthcare context, based on academics' and health services researchers' suggestions. Surprisingly enough, an almost identical questionnaire for measuring patients' perceptions of quality of care was administered by two of the hospitals under study which helped our selection of the appropriate items. Thus, items which were deemed as non-essential to the Greek healthcare context were removed from the VPSM scale. The removed items include: 'I try to explain extensively to patients the purposes of medicines'; 'I try to explain extensively to patients the possible side-effects of medicines'; and 'I encourage patients to participate in decisions about their care'. Principal Component Analysis with a cutoff value of 0.50 was used to indicate satisfactory loading. Our final scale consisted of 11 items, loaded into a single factor. Sample items include 'I'm courteous to patients', 'I try to communicate comprehensively with the doctors, nurses and hospital staff regarding my patients' treatment', and 'I am willing to listen to patients' health care problems'. The Cronbach's alpha for the 11-item scale was 0.914.

Statistical Model

SPSS v.22 was used to conduct descriptive statistical analysis and exploratory factor analysis. To empirically test the model, we used Partial Least Squares (PLS) Structural Equation Modeling (SEM) with the help of SmartPLS 3.2 software (Ringle et al., 2014). Overall, PLS-

SEM has several advantages when compared to the covariance based structural equation modeling (SEM) techniques. For instance, it is free from distributional assumptions of normality, while it can be used to analyze data from small samples. Of particular relevance to this study, PLS-SEM incorporates both formative and reflective constructs as well as Hierarchical Component Models (HCMs). In HCMs a general construct is defined that consists of several sub-dimensions. Thus, while the more general construct becomes part of the structural model, additional information can be found on the sub-dimensions by using a second-order model. By using HCMs, we are able to reduce the number of relationships in the structural model, making the PLS path model more parsimonious and easier to grasp (Hair et al., 2014, p. 229).

In our structural model, HPWS and Psychological Empowerment were operationalized as ‘reflective–formative’ higher-order components. Specifically, HPWS consisted of the 7 individual HR Practices. Each HR Practice was measured by its reflective indicators, while their relationship with the HPWS construct was indicated as formative. A similar procedure was followed for Psychological Empowerment. These reflective-formative HCMs and the proposed model are depicted in figure 1.

FIGURE 1 here

Finally, in establishing the final HCM measurement model, we followed the ‘repeated indicators approach’ combined with the ‘two-step approach’. Additional information in performing these procedures can be found in Hair et al. (2014, pp. 230, 233) ‘*Higher-Order models/hierarchical component models*’ and Lowry and Gaskin (2014, pp. 133) ‘*Lesson 3: Use this empirical demonstration of PLS and video supplement to see PLS in use*’. The final model (two-step approach) is depicted in Figure 2.

FIGURE 2 here

Validity and Reliability

Before running the PLS analysis, we had to configure the model's reliability and validity. Since all first-order constructs used in the model were reflective, we evaluated *individual indicator reliability*, the *composite reliability* to evaluate internal consistency, the *convergent validity* of the measures associated with each construct and their *discriminant validity* (Hair et al., 2014, p. 95). Regarding the *individual indicator reliability* for the reflective constructs, only four items (two in social identification and two in quality of care factors) were slightly below the threshold of 0.7. However, since all of the examined t-values of the outer model loadings were significant at the 0.05 α level, we retained them in the model. *Composite reliability*, was greater than 0.7, and thus was confirmed. In addition, the Average Variance Extracted (AVE) extracted was above the threshold of 0.5, thus confirming *convergent validity*. All measures are reported in table 1.

TABLE 1 here

To determine the *discriminant validity* of our indicators, we used two established techniques. First, we checked for cross-loadings. Secondly, we used the Fornell-Lacker criterion which compares the AVE values with the latent variable correlations. Since the square root of each construct's AVE was greater than its highest correlation with any other construct (table 2), discriminant validity was confirmed for all sub-constructs. Finally, although these two approaches are the dominant methods for evaluating discriminant validity in variance-based structural equation modeling such as partial least squares, they do not reliably detect the lack

of discriminant validity in common research situations due to their unacceptably low sensitivity (Henseler et al., 2015, p. 128). As a solution for this critical issue, Henseler et al. (2015) propose an alternative approach for discriminant validity assessment in variance-based SEM, namely the Heterotrait-Monotrait ratio of correlations (HTMT). In our model, the maximum HTMT value was below 0.85, which is the most conservative critical HTMT value. In addition, we checked the $HTMT_{inference}$ criterion, where the upper confidence intervals were below the 1 value. Therefore, we conclude that discriminant validity has been established for our model.

TABLE 2 here

Next, the validity and reliability of the formative scales (HPWS and Psychological Empowerment) was checked by following the procedures described in Petter et al. (2007). For instance, face- and content-validity of the formative construct is derived from theory, while the construct under investigation is considered abstract and complex. In addition, following Cenfetelli and Bassellier (2009), we tested the formative factors for multicollinearity by calculating the Variance Inflation Factors (VIFs) of the items in the formative construct. In our case, all of the VIFs of the indicators were below 3.3, indicating sufficient construct validity for our formative indicators.

Finally, we evaluated the quality of the structural model by using the R-square of the dependent variable (Chin, 1998), and the Stone-Geisser Q-square test for predictive relevance (Hair et al., 2014, p. 167). In our case, although the R^2 value for the endogenous construct (quality of care) was not very strong (0.064), all path coefficients were substantial and significant. Last but not least, two separate analyses with 7 and 25 omission distances were undertaken (blindfolding technique in SmartPLS) to test the stability of the findings. As the values were stable for both omission distances and all of the Q-squares were greater than zero,

we were confident that the model was stable and the predictive relevance requirement was satisfied. We chose not to include the goodness-of-fit (GoF) as a criterion for PLS-SEM, since it is believed that is not able to separate valid models from invalid ones, while it is not applicable to formatively measurement models (Hair et al., 2014, p. 185; Henseler and Sarstedt, 2012, p. 577).

Results

To analyze the hypotheses in the structural model, we ran the full model (figure 2) with a bootstrapping procedure that used 500 randomly drawn samples with replacement. The algorithm converged in 10 iterations, while the model was controlled for age, gender, and occupation. Since there were no significant effects for the control variables, we excluded them from the analysis. A summary of the path coefficients and their significance levels are summarized in table 3.

TABLE 3 here

The results (table 3) support hypotheses 1, 2, and 4. Thus, HPWS is positively related to social identity (H1), and psychological empowerment (H2). In addition, psychological empowerment is positively related to perceived quality of patient care (H4).

Finally, we checked the mediating role of Social Identity and Psychological Empowerment by using Baron and Kenny (1986) three-step approach adapted for PLS regression (Lowry and Gaskin 2014, p. 139). The summary of path coefficients and significance levels for the mediation hypotheses are shown in table 4.

TABLE 4 here

First, the independent variable must be related to the dependent variable without the presence of the mediator. Our findings showed that HPWS had a significant effect on Psychological Empowerment ($\beta = 12.149$, path coefficient = 0.539, $R^2 = 0.258$). Second, the independent variable must be related to the mediator, and third the mediator must be related to the dependent variable. When adding the mediator in the model, our findings showed that HPWS had a significant effect on Social Identity ($\beta = 8.117$, path coefficient = 0.415, $R^2 = 0.192$), while Social Identity had a significant effect on Psychological Empowerment ($\beta = 3.866$, path coefficient = 0.241, $R^2 = 0.282$). Finally (fourth step), the effect of the independent variable (HPWS) on the dependent variable (Psychological empowerment) was lower (path coefficient = 0.419) but still significant ($\beta = 6.002$) when the mediator was included in the model. Thus, it can be concluded that Social Identification **partially** mediates the relationship between HPWS and Psychological Empowerment. We further verified the mediator effect through the use of the Sobel test (Lowry and Gaskin, 2014, pp. 139, 140). The Sobel test produces a test statistic (Z), along with accompanying significance levels. The calculated Sobel test statistic was $Z = 3.691$, $p < 0.05$. Since $Z > 1.96$, the mediation was confirmed. Thus, hypothesis 3 was supported.

Following the same procedure we checked the mediating role of Psychological Empowerment in the relationship between HPWS and quality of care. As table 4 suggests, although the direct effect of HPWS to quality of care was not statistically significant, which violates the first step of Baron and Kenny (1986) three-step approach, this is not a necessary condition for mediation to exist (Hair et al., 2014, p. 223; Zhao et al., 2010). Indeed, Zhao et al. (2010, p. 200) argued that '*a significant direct path does not necessarily indicate mediation, and a non-significant direct path does not necessarily indicate lack of mediation*'. In addition, they recommend that '*to establish mediation the Baron-Kenny "three sets + Sobel" steps be*

replaced with the bootstrap of the indirect effect while *'all that matters is that the indirect effect is significant'* (Zhao et al., 2010, p. 204). Hence, and since the indirect effect was significant as table 4 suggests, we conclude that psychological empowerment **indirectly** mediates the relationship between HPWS and quality of patient care, providing support for hypothesis 5.

Before continuing to the conclusions and implications, two final points should be noted. First of all, we used Harmon's single-factor test to exclude the possibility of Common Method Variance (CMV). Thus, we chose one fixed number of factors to be extracted for all measured variables. According to the results, this factor explained only 19% of the variance approximately. Therefore, common method variance is not likely to be an issue in our analysis. Finally, although the use of SEM-PLS is quite appropriate in our research since we included formative factors as well as hierarchical component models (HCM), we also conducted the same analysis following a CB-SEM technique (AMOS) to cross-validate our findings, by treating the HPWS and Psychological Empowerment as single-indices (e.g., Ang et al., 2013; Bartram et al., 2014; Leggat et al., 2010). The findings were almost identical, supporting Hair et al. (2014, p. 18) argument that *'the results for CB-SEM and PLS-SEM typically do not differ much, and PLS-SEM estimates can therefore be good proxies of CB-SEM results'*. However, we omit presenting the corresponding results to avoid any confusion that may arise due to the many and differently interpretable numbers.

Discussion

The findings of this article indicated that HPWS has a strong effect on health-care professionals' social identification, which in turn mediates (partially) the relationship between HPWS and psychological empowerment. These findings provide support for hypotheses 1 and 3. Hence, our research not only validates the findings of previous studies (Bartram et al., 2014; Young et

al., 2010), but also provides evidence for the potential fruitfulness of the HPWS approach from a social identity perspective. Indeed, in the healthcare sector, characterized by highly complex and interdependent clinical work, social identification can be valuable as it can create unity among disparate team members and break down professional and clinical ‘silos’ (Bartram et al., 2014, p. 2404). However, one thing that should not be neglected is that, despite the benefits, social identification can have a range of consequences, since individuals who identify with a group don’t always act in accordance with the social identity based in that group membership, leading thus to lowered performance.

In addition, our study extended the Young et al. (2010) and Bartram et al. (2014) research by examining the mediating effect of psychological empowerment on the relationship between HPWS and quality of care. Indeed, our findings suggested that clinicians who feel psychologically empowered are more likely to perceive that they provide better patient care, while psychological empowerment indirectly mediates the relationship between HPWS and quality of patient care, providing support for hypotheses 2, 4, and 5 and confirming Bonias et al. (2010) findings. Overall, our findings are in accordance with past research focusing on the relationship between HPWS and psychological empowerment on the Australian healthcare sector (Bartram et al., 2014; Bonias et al., 2010; Leggat et al., 2010, 2011). Furthermore, it was also demonstrated that HPWS has no statistically significant direct effect with quality of care. Hence, our results confirm the argument of Leggat et al. (2010, p. 360) and Bartram et al. (2014, p. 2413) that ‘without the presence of psychological empowerment, HPWS has limited impact on the quality of patient care’.

Moreover, and since the majority of previous studies have not examined the individual HPWS practices effects on employee outcomes and performance but have treated HPWS as a single index, Takeuchi et al. (2009, p. 1080) argued that some sub-components of HPWS may have differential effects on mediators and dependent variables. Taking this into consideration,

some HR practices might hurt the degree of social identity felt by the unit's employees, although the overall effect can be positive on an aggregate level. For instance, Leggat et al. (2008, p. 35) reported that the healthcare organizations under study were less positive in enabling and encouraging staff to take an active role in decision-making. Hence, and following Takeuchi et al. (2009), although in our study all HR practices (sub-bundles) had a significant bivariate relationship to the HPWS construct we also suggest that special attention should be given to the individual HR practices' effects on mediators and dependent variables by future studies.

Overall, our research adds to the broader SHRM literature, since it not only validates the significant contribution of HPWS on social identification, psychological empowerment and quality of patient care, but it also takes place in the first European Union country that has been severely affected by Europe's financial crisis since 2008. Thus, although we make no attempt to generalize our findings, it seems reasonable to argue that HPWS can be a fruitful and effective approach even in turbulent times. Last but not least, our findings might be of particular interest to health-care researchers and practitioners of other countries with similar economic traits.

Limitations

In this study, there are some limitations. First of all, as in all cross-sectional studies, although we tested for Common Method Variance (CMV) and found none, there is the potential that CMV did influence the results. For instance, in the case that the health-care practitioners have the perception that they provide patients with increased quality of care, this might influence their responses regarding social identification, making them feel empowered. In addition, the cross-sectional nature of the study makes it impossible to rule out the issue of reverse causality (Paauwe and Boselie, 2005; Takeuchi et al., 2007, 2009). In general, as organizational

performance increases, organizational slack typically grows. Consequently, previous financial performance determines the level of slack resources that an organization can invest in social domains. Although slack resources can remain unabsorbed as retained earnings, they can also be absorbed by increasing investments, enabling organizations to invest in HPWS (Shin and Konrad, 2014). Taking this into consideration, it is possible that establishment performance influences the level of HPWS implementation in that establishment (reverse causality), or that past performance influences the level of HPWS in place, which, in turn, might affect current establishment performance (Takeuchi et al., 2007). In addition, high firm performance outcomes (high profits, market growth) usually translate into organizational health, which might have a positive effect on employee satisfaction and commitment, and thus onto employment security (Paauwe and Boselie, 2005). Hence, and since performance outcomes seem to determine the continuity, expansion or reconsideration of HPWS, the possibility of reverse causality has to be taken seriously into account not only to generate a realistic estimate of the size of the HPWS effect on performance but also to explain why the diffusion of HPWS is still limited despite academic assertions of effectiveness (Shin and Konrad, 2014). Hence, a longitudinal study would be preferable not only to eliminate common method bias, but to uncover the dynamic influence of HPWS on overall performance (Takeuchi et al., 2007) and to limit inferences about causality, which would suggest that the relationships in the study could be recursive (Bartram et al., 2014, p. 2414). Indeed, longitudinal studies are in a better position to make causal statements and provide a stronger test of the hypothesized relationships.

In addition, although we measured the perceptions of nurses, doctors and allied health-care professionals across seven exemplary hospitals operating in Greece, we were not able to collect data from HR managers. This could be a potential issue though, for two main reasons. First of all, organizations may adopt different HPWS practices towards different employee groups (Zhang et al., 2013, p. 3199). In addition, employees have different perceptions of the nature

and extent of the HR practices used (Ramsay et al., 2000), while managers' perceptions might not bear any relationship to what actually occurs (Boxall and Macky, 2007). Moreover, in complex organizations, there are potentially problems of agreement within the management hierarchy and between management and operating employees. Thus, the adoption of a multi-level approach that uses multiple raters of HRM practices to elucidate the perspectives of managers and employees and the roles they play in the use of HRM are required (Ang et al., 2013, p. 3089).

Finally, although nurses' and doctors' views of the quality of care they deliver correspond closely to patients' views and the reasoning for choosing their perceptions is justified, it would be preferable for future research to measure the actual care delivered from the patients' point of view.

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Figure 1 – The proposed model of quality of patient care

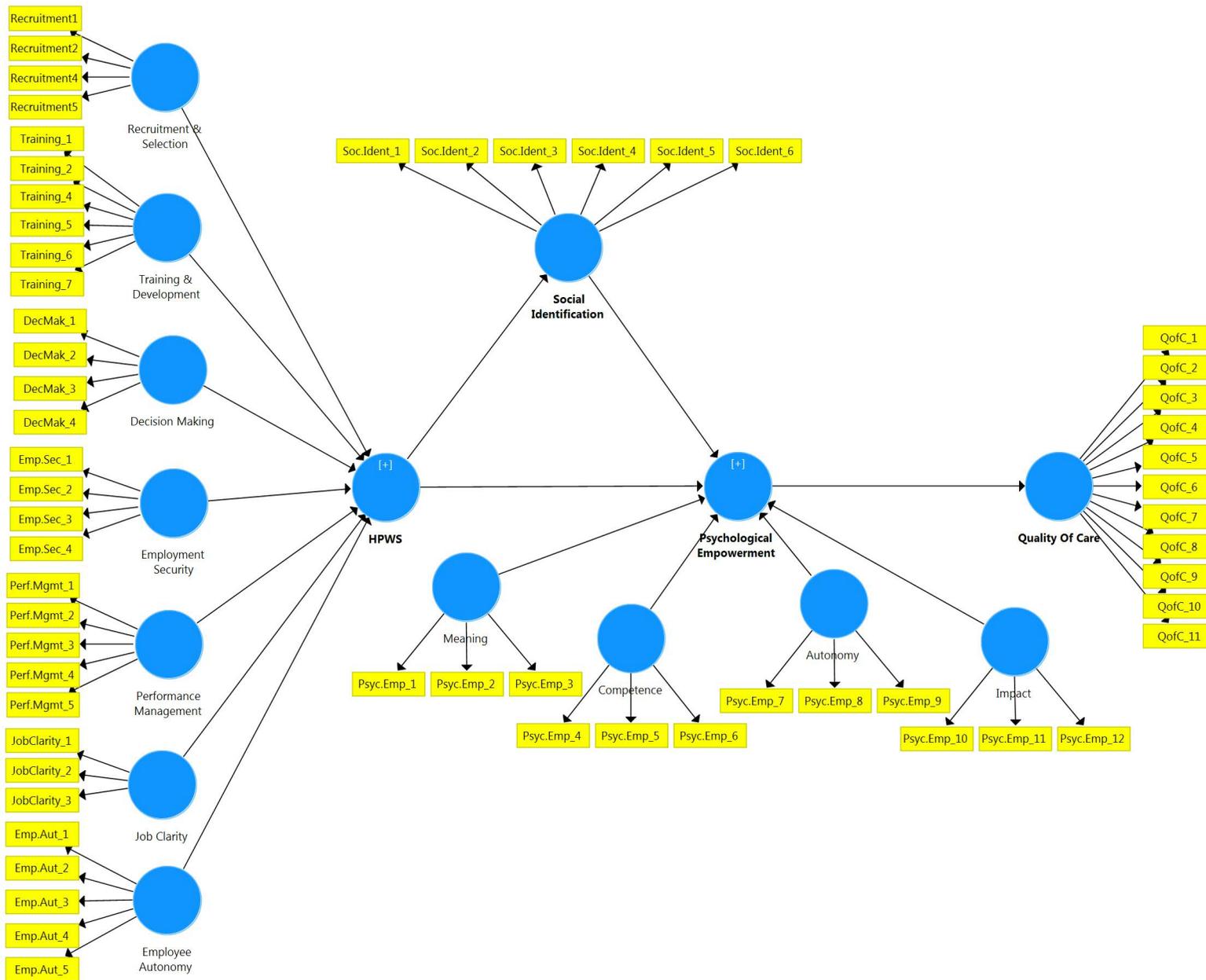


Figure 2 – The Two-step approach model

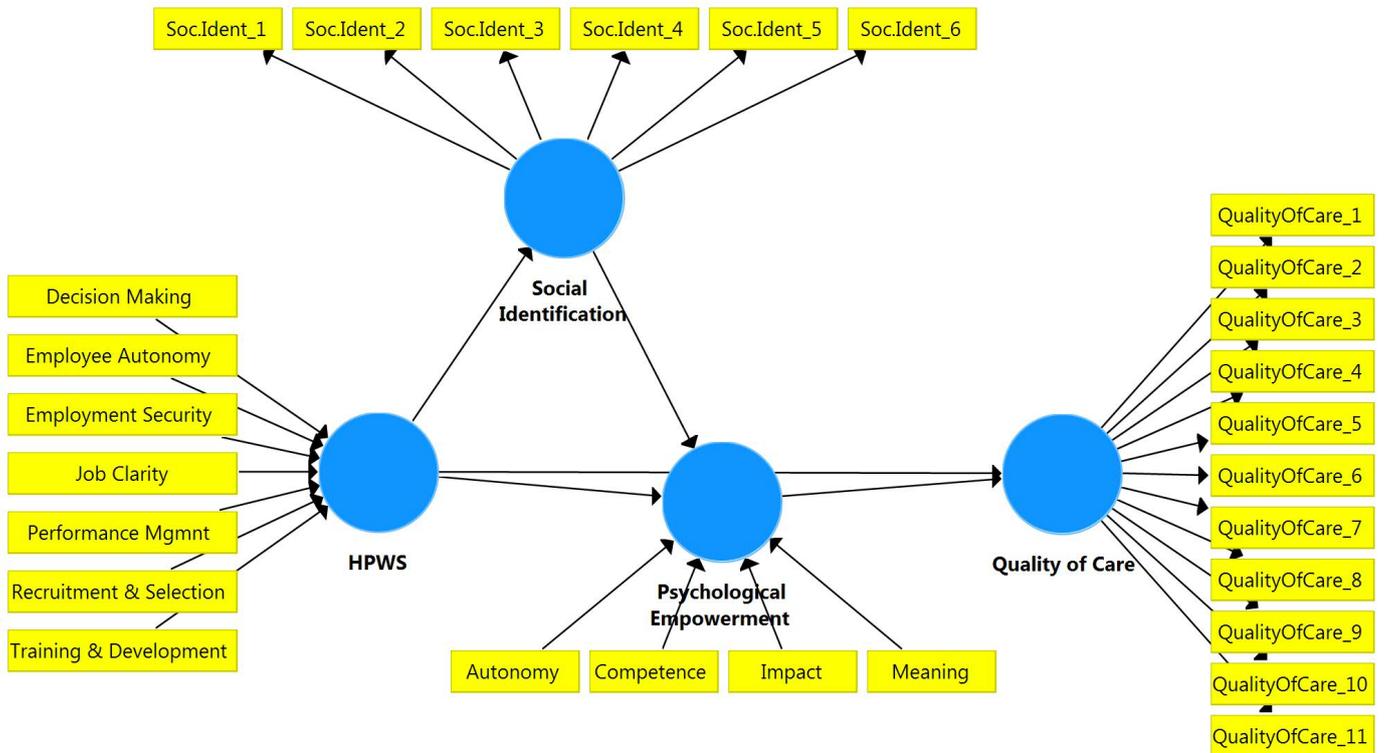


Table 1 Composite reliability, Average Variance Extracted (AVE) and convergent validity

Construct (latent variable)	Composite reliability	Loadings	T-Statistics	Average Variance Extracted (AVE)	Convergent & Discriminant Validity
Recruitment & Selection	0.864	Min: 0.724 Max: 0.837	***	0.614	Yes
Training & Development	0.898	Min: 0.725 Max: 0.837	***	0.596	Yes
Decision Making	0.861	Min: 0.712 Max: 0.882	***	0.610	Yes
Employment Security	0.880	Min: 0.748 Max: 0.847	***	0.648	Yes
Performance Mgmnt	0.925	Min: 0.772 Max: 0.911	***	0.713	Yes
Job Clarity	0.928	Min: 0.871 Max: 0.920	***	0.812	Yes
Employee Autonomy	0.864	Min: 0.712 Max: 0.794	***	0.560	Yes
Meaning	0.878	Min: 0.781 Max: 0.875	***	0.706	Yes
Competence	0.891	Min: 0.845 Max: 0.865	***	0.731	Yes
Autonomy	0.911	Min: 0.845 Max: 0.896	***	0.773	Yes
Impact	0.927	Min: 0.843 Max: 0.931	***	0.808	Yes
Social Identification	0.876	Min: 0.647 Max: 0.844	***	0.543	Yes
Quality of Care	0.928	Min: 0.677 Max: 0.786	***	0.542	Yes

*indicates significant paths: *p<0.05, **p<0.01, ***p<0.001, ns (not significant)

Table 2 Discriminant validity through the Fornell-Lacker criterion (Square Root of AVE on diagonal)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Autonomy (1)	<u>0.879</u>												
Competence (2)	0.425	<u>0.855</u>											
Dec. Making (3)	0.029	-0.050	<u>0.781</u>										
Employee Autonomy (4)	0.339	0.250	0.276	<u>0.748</u>									
Employment Security (5)	0.057	0.019	0.326	0.213	<u>0.805</u>								
Impact (6)	0.447	0.211	0.173	0.462	0.251	<u>0.899</u>							
Job Clarity (7)	0.247	0.081	0.373	0.236	0.072	0.207	<u>0.901</u>						
Meaning (8)	0.302	0.425	0.104	0.214	0.078	0.258	0.092	<u>0.840</u>					
Performance Mgmt (9)	0.113	-0.012	0.564	0.300	0.303	0.204	0.553	0.092	<u>0.844</u>				
Quality Of Care (10)	0.209	0.201	-0.006	0.176	0.048	0.152	0.059	0.229	-0.008	<u>0.736</u>			
Recruitment (11)	0.207	0.014	0.257	0.305	0.141	0.259	0.333	0.122	0.508	-0.038	<u>0.784</u>		
Social Identification (12)	0.247	0.155	0.143	0.321	0.089	0.366	0.244	0.302	0.338	0.157	0.362	<u>0.737</u>	
Training (13)	0.077	-0.038	0.556	0.267	0.174	0.180	0.495	0.070	0.661	-0.018	0.565	0.327	<u>0.772</u>

Table 3. Summary of Path Coefficients and Significance levels

Hypotheses and corresponding paths	Path Coefficient	T-Statistics	Hypothesis Support
HPWS → Social Identification	0.415	8.117***	H1 supported
HPWS → Psychological Empowerment	0.419	6.851***	H2 supported
Psychological Empowerment → Quality of Care	0.236	3.468***	H4 supported

*indicates significant paths: *p<0.05, **p<0.01, ***p<0.001, ns = not significant

Table 4. Summary of Path Coefficients and Significance levels for mediation hypotheses

Mediation hypotheses and corresponding paths	Path Coefficient	T-Statistics	Mediation Type	Hypothesis Support
HPWS → Psyc. Empowerment (without mediator)	0.539	12.149***	Partial	H3 supported
HPWS → Social Identity	0.415	8.117***		
Social Identity → Psyc. Empowerment	0.241	3.866***		
HPWS → Psyc. Empowerment (with mediator)	0.419	6.002***		
HPWS → Quality of Care (without med)	0.141	ns	Indirect	H5 supported
HPWS → Psychological Empowerment	0.419	6.851***		
Psychological Empowerment → Quality of Care	0.236	3.468***		
HPWS → Quality of Care (with mediator)	0.019	ns		

*indicates significant paths: *p<0.05, **p<0.01, ***p<0.001, ns = not significant

APPENDIX A HPWS Measures

Dimension	Item	Loading
Recruitment & Selection	The recruitment and selection processes in this hospital are impartial	0.845
	Favoritism is not evident in any of the recruitment decisions made in this hospital	0.750
	All appointments in this hospital are based on merit (i.e. the best person for the job is selected regardless of his/her personal characteristics)	0.824
	Only the best people are hired to work in this hospital	0.711
Training & Development	Providing employees with training beyond that mandated by government regulations is a priority in this hospital	0.738
	This hospital subsidizes, assists or reimburses employees for training or courses taken outside of the workplace	0.747
	Employees of this hospital are encouraged to extend their abilities	0.773
	Employees are provided with training opportunities enabling them to extend their range of skills and abilities	0.812
	Employees in this hospital get the opportunity to discuss their training and development requirements with their immediate manager	0.727
	This hospital is committed to the training and development of its employees	0.832
Participation in Decision Making	Employees in this job are allowed to make many decisions	0.733
	Employees in this job are often asked by their supervisor to participate in decisions	0.814
	Employees are provided with the opportunity to suggest improvements in the way things are done	0.864
	Superiors keep open communications with employees in this hospital	0.707
Employment Security	Employees can expect to stay in the hospital for as long as they wish	0.784
	It is very difficult to dismiss an employee in this hospital	0.836
	Job security is almost guaranteed to employees in this hospital	0.900
	If the hospital were facing economic problems, employees would be the last to get cut	0.739

Performance Management	In this hospital, the performance management policy document is readily available to all staff	0.775
	In this hospital, staff performance is reviewed in accordance with agreed annual goals and organization-wide requirements and informal feedback is given	0.802
	In this hospital, there is a performance management system to ensure that staff are competent and accountable for their work	0.911
	In this hospital, there is a performance management system to ensure that future growth and development needs are identified	0.899
	In this hospital, the statements of accountabilities and responsibilities are regularly reviewed to ensure that they are relevant to current organizational needs and goals	0.826
Job Clarity	The duties of this job are clearly defined	0.872
	This job has an up-to-date job description	0.918
	The job description for this job contains all of the duties performed by individual employees	0.913
Employee Autonomy	<i>In general, how influence or input do you have about</i>	
	The type of work you do	0.779
	How you do your work	0.775
	When you start and finish work	0.766
	The pace at which you do your job, and	0.814
	Decisions which affect you at this workplace	0.656
