



Perceptions of high-involvement work practices and burnout: the mediating role of job demands

Kilroy, S., Flood, P. C., Bosak, J., & Chenevert, D. (2016). Perceptions of high-involvement work practices and burnout: the mediating role of job demands. *Human Resource Management Journal*. DOI: 10.1111/1748-8583.12112

Published in:
Human Resource Management Journal

Document Version:
Early version, also known as pre-print

Queen's University Belfast - Research Portal:
[Link to publication record in Queen's University Belfast Research Portal](#)

Publisher rights

© 2016 The Authors.

This is the pre-peer reviewed version of the following article: Kilroy, S., Flood, P. C., Bosak, J., and Chênevert, D. (2016) Perceptions of high-involvement work practices and burnout: the mediating role of job demands. *Human Resource Management Journal*, which has been published in final form at <http://onlinelibrary.wiley.com/wol1/doi/10.1111/1748-8583.12112/abstract>

This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving.

General rights

Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact openaccess@qub.ac.uk.

Perceptions of High Involvement Work Practices and Burnout: The Mediating Role of Job Demands

Abstract

This study examined the impact of perceived high involvement work practices (HIWPs) on job demands (role conflict, role overload and role ambiguity) and burnout (emotional exhaustion and depersonalisation). The study was conducted in a Canadian general hospital. Findings from structural equation modelling ($N = 545$) revealed that perceived HIWPs were significantly and negatively related to job demands and burnout. Role conflict and role overload have a significant positive association with emotional exhaustion and depersonalisation. Finally, role conflict and role overload partially mediate the relationship between perceived HIWPs and burnout. We discuss the theoretical and managerial implications of these findings for our understanding of how HIWPs influence the job demands and burnout of employees.

Introduction

Over the last decade, significant challenges in health care provision have emerged as a result of policy reforms focusing on the introduction of new technology, cost cutting, and market mechanisms into the health care sector (Townsend and Wilkinson, 2010). The human resource function in public hospitals faced with this difficult situation must simultaneously ensure reasonable workloads and maintain employee wellbeing. Policy makers and academics now recognise that an engaged, healthy and motivated workforce is crucial to the delivery of high quality health care (Buchan, 2004). The well-being of employees has attracted increased attention among researchers in HRM (Harley *et al.*, 2007). Well-being is believed to consist of happiness, relationship and health outcomes (Van de Voorde *et al.*, 2012). In health care, burnout is a health related well-being outcome of particular relevance given its chronic nature and direct link to the quality of patient care delivered (Wood and Killion, 2007).

In the wider HRM literature, there is an ongoing debate regarding the impact of HR practices on employee well-being. No consensus exists as to whether progressive high involvement HR practices (HIWPs) have a positive or negative influence on employee well-being (*e.g.* Wood *et al.*, 2012). Another research gap relates to the lack of clarity regarding the underlying processes that explain how HIWPs influence employee well-being (*e.g.* Peccei *et al.*, 2013). Our paper examines how perceived HIWPs relate to the experience of burnout amongst hospital employees achieved through examination of the underlying role of job demands. This study contributes to existing knowledge in three ways.

First, it investigates the relationship between HIWPs and burnout which is not yet well understood (*e.g.* Van de Voorde *et al.*, 2012). Support for the ‘optimistic’ or ‘pessimistic’ perspective of HRM which refers to the potential positive or negative impact of HIWPs on well-being (Peccei, 2004) is not conclusive in the health care context (Harley *et al.*, 2007). This study contributes to this debate by providing empirical evidence on this relationship garnered

from the hospital context and by focusing on burnout, an important yet contentious health related well-being outcome (Van de Voorde *et al.*, 2012).

Second, this study provides important insights into better understanding the underlying mechanisms through which HIWPs influence burnout. Indeed, drawing on prominent models in the occupational health psychology field, this study empirically examines unexplored job demands as mediators in the link between HIWPs and burnout (*e.g.* Castanheira and Chambel, 2010). Investigating the underlying mechanisms of the HIWPs-well-being outcomes relationship is critical given the lack of theoretical and empirical work dedicated to explaining this relationship in prior research (Peccei *et al.*, 2013). As argued by Boxall and Macky (2009) the path to better research on high involvement is to understand the underpinning processes experienced by workers when they perceive such practices and charting these links to employee outcomes.

Finally, the present study represents a contribution to the HR and burnout literature in the specific setting of health care. Work intensification and deteriorating well-being such as high levels of staff burnout represent major problems in the health care sector (Holland *et al.*, 2013; Townsend and Wilkinson, 2010) and the Canadian health context is no exception (Boudrias *et al.*, 2012). Indeed, Holland *et al.* (2013) argue that improving well-being by alleviating burnout is critical for health care organisations in order to meet the rising demands for their services. Faced with these challenges, academics and practitioners alike have turned their attention to the potential role of their hospitals' HIWPs to bring about improved well-being (Baluch *et al.*, 2013; Townsend and Wilkinson, 2010). Therefore, the present study makes a contribution by focusing on the role of hospitals' HIWPs as one potential solution to the job demands and burnout experienced by health care professionals in the Canadian context.

The Health Care Context

Hospitals are complex organisations subject to numerous internal and external forces and demands. Health care workers face many intense demands on the job which can lead to chronic burnout and ultimately hamper the quality of patient care they deliver (Wood and Killion, 2007). Three of the most common job demands faced by health care workers in their job are role conflict, role overload and role ambiguity and these job demands are a direct correlate of burnout (Dasgupta, 2012). Given that burnout has been shown to be a critical outcome in health care (Felton, 1998), it is surprising how little research has been conducted to counteract this problem. One potential solution to the challenge of managing the well-being of health care personnel may lie in the role of the HR system. However, the role of hospitals' HIWPs in negating burnout has been a neglected avenue of research (Holland *et al.*, 2013). This is surprising as the labour intensive environment of hospitals makes it an ideal context to study the success or otherwise of HIWPs (Townsend and Wilkinson, 2010). Similar to the wider HR literature, the impact of HIWPs on employees' well-being in healthcare is inconclusive. Harley *et al.* (2007) refers to the potential positive or negative effects of HIWPs as the 'mainstream' and 'labour process theory' perspective respectively.

The purpose of the present study is to understand whether HIWPs have a role in overcoming some of the above challenges in health care pertaining to the specific job demands and burnout experienced by employees. Specifically we propose a partial mediation model linking HIWPs to burnout via job demands. Our study was conducted in a large Canadian general hospital. The Canadian health care sector is public with a long standing history of restructuring. This situation, coupled with the growing complexity of treatments and massive re-engineering of work processes, has imposed considerable work overload and stress on all health personnel, in particular caregivers (*e.g.* Boudrias *et al.*, 2012). The hospital examined in the present investigation is a West Island Health and Social Services Centre (HSSC) hospital in Canada.

The West Island HSSC is a member of the Montreal network of health promoting hospitals, which is affiliated with the World Health Organisation (WHO). We carried out a survey among 545 health care personnel to answer a series of theoretically informed research questions. The following sections of the paper will focus initially on the theoretical background and the linkages in the proposed model before discussing the methodology employed, analysis, results and discussion.

Background and Theoretical Perspective

Strategic HRM emphasises the role of a ‘bundle’ of HR practices often labelled high performance work practices (HPWP), high involvement work practices or high commitment work practices in influencing employee and organisational outcomes. HPWP represents the broader term for performance enhancing HR practices. The high involvement and high commitment research stream are seen to represent the conceptual companions of HPWP (Boxall and Macky, 2009). HIWPs are largely concerned with increasing the participation of employees in decision making processes in organisations (Wood et al., 2012). On the other hand, high commitment approaches aim to provide equitable pay and the assurance of job security as a means to gain worker commitment (Walton, 1985). Boxall and Macky (2009) argue that the notion that there is a set list of ‘best practices’ around HPWP is fundamentally flawed because of cultural and institutional variations. The authors argue that HIWPs are an important stream of thought on how to create HPWP as they are much more descriptive of the underlying mechanisms. Managing professionals has always involved high involvement approaches (Boxall and Macky, 2009) and health care professionals are believed to place significant value on HIWPs (*e.g.* Rondeau and Wagar, 2006). On this basis, we focus on the high involvement stream.

According to Lawler (1986) and Vandenberg *et al.* (1999), there are four key dimensions underpinning the HIWPs construct. These are power (P), information (I), rewards (R) and knowledge (K). Taken together these are referred to as the PIRK model (Lawler, 1986). The focus of the HIWPs approach is on empowering workers to make more and better decisions, enhancing the information and knowledge needed, and rewarding them for doing so (Macky and Boxall, 2009). In the PIRK model, empowerment (P), information sharing (I), rewards (R), and training for knowledge and skills acquisition (K) are the core dimensions of high involvement and have been included in most research (Guerrero and Barraud-Didier, 2004). Consistent with this operationalisation of HIWPs and based on previous research in the health care context (*e.g.* Tremblay *et al.*, 2010), we use empowerment, information sharing, non-monetary recognition and training and development practices.

The PIRK model is an influential model used in the high involvement stream of literature to explain how HIWPs improve employee outcomes. The model's core premise is that HIWPs should improve employee well-being through increased morale and via job enrichment which should provide employees with more meaningful jobs that enable greater levels of control and adequate feedback (Vandenberg *et al.*, 1999). Using the PIRK model, a number of authors demonstrated that HIWPs are related to happiness related employee outcomes such as commitment and job satisfaction (*e.g.* Vandenberg *et al.*, 1999). Despite the positive effects associated with the PIRK model, it has been subject to much criticism. Stemming from the labour process theory perspective (Braverman, 1974), some authors argue that high involvement management has negative effects on employee well-being outcomes as it intensifies work for those involved (Wood *et al.*, 2012). This debate has yet to be resolved and in the health care context, authors have called for further research to clarify this issue (Harley *et al.*, 2007).

We propose a model linking HIWPs, job demands and burnout. Based on the existing theoretical frameworks in the occupational health psychology literature and recognising the importance of HIWPs for health care employees, we adopt a positive perspective regarding the influence of HIWPs. Theoretical approaches frequently utilised to explain how HIWPs improve employee well-being in addition to the PIRK model include the Job Demands-Control (JD-C) model (Castanheira and Chambel, 2010), and the Job Demands-Resource Model (JD-R) (Bartram *et al.*, 2012). The JD-C model states that employees will be able to better deal with their job demands and reduce negative health outcomes when they have high levels of control. The JD-R model postulates that job demands influence strain while job resources influence engagement or depersonalisation and that job demands and resources interact resulting in improved employee well-being. One of the central features of HIWPs is that they increase employee autonomy and control which in turn help to alleviate the job demands and burnout they experience (Castanheira and Chambel, 2010; Sun and Pan, 2008).

INSERT FIGURE 1 HERE

HIWPs and Burnout

Burnout describes a state of mental weariness and has been portrayed as a syndrome of emotional exhaustion, depersonalisation and reduced personal accomplishment that usually occurs among people working in emotionally demanding roles (Leiter and Maslach, 1988). Although the multidimensional nature of this construct has been vigorously debated, many leading authors advocate a two-dimensional concept that includes the components of emotional exhaustion and depersonalisation (*e.g.* Demerouti *et al.*, 2001). These authors argue that the specificity of the burnout syndrome lies in the combination of general reactions linked to stress - captured by the emotional exhaustion dimension - and specific attitudinal manifestations that signal a crisis in the individual-work relationship, *e.g.* depersonalisation (Maslach *et al.*, 2001). Reduced personal accomplishment (also known as personal efficacy) reflects a decline in one's feelings of competence on the job and is viewed to be independent of exhaustion and depersonalisation and more reflective of a personality trait similar to self-efficacy (Cordes and Dougherty, 1993). Therefore, we adopted the two-dimensional definition of burnout and excluded the third component from our definition. Emotional exhaustion involves feelings of being emotionally overextended and depleted of one's emotional resources (Maslach *et al.*, 2001). "Depersonalisation (also called cynicism) describes a process whereby employees detach from their job and begin to develop callous or uncaring attitudes towards their job, their performance, and those associated with the job (*e.g.* patients, co-workers)" (Halbesleben and Buckley, 2004: 860). There are a number of factors that cause burnout in health care professionals such as the universal struggle of balancing self-care and other care (Skovholt *et al.*, 2001), high patient-to-staff ratios, and excessive workload (Felton, 1998). Nevertheless, many of the factors that cause burnout are related to the organisation of work (Maslach *et al.*, 2001).

In their review of the burnout literature, Halbesleben and Buckley (2004) suggested that one way of reducing burnout is through appropriate HRM strategies. A number of studies suggest that HIWPs are negatively linked to the emotional exhaustion component of burnout. Vanhala and Tuomi (2006) found that emotional exhaustion was slightly lower in organisations with sophisticated HR practices. However, from a wide range of HR practices, the only ones which had a relationship included health and safety programs, investment in training, and an open communication culture. Moreover, Sun and Pan (2008) found that perceptions of high commitment HR practices are negatively related to emotional exhaustion in a sample of manufacturing workers in China. Although the aforementioned studies found that HIWPs reduced burnout, a noteworthy exception is Kroon *et al.* (2009) who found that HIWPs increased employees emotional exhaustion. This finding is consistent with the critical management-by-stress perspective and other studies which demonstrate that HIWPs can increase job demands and stress (*e.g.* Wood *et al.*, 2012). One explanation for the inconsistent findings is that variations of HR practices and systems are commonly used. For example, Sun and Pan (2008) focus on salary, procedural justice, job stability and training while Vanhala and Tuomi (2006) and Kroon *et al.* (2009) use a large number of practices ranging from selection to training. This variation in the adoption of HR practices is confusing when interpreting their influence on employee and organisational outcomes. Moreover, it is important to bear in mind from a methodological point of view that the results could also vary depending on the source from which the HIWPs are rated (Nishii and Wright, 2008). Indeed, it has been noted by these authors that one explanation for the inconsistent findings in strategic HRM research might be explained by the failure to capture employees' perceptions and experiences of HIWPs. Consistent with the majority of evidence on the negative link between HIWPs and burnout, from the employee perspective, we expect that HIWPs will alleviate burnout. The JD-C model and the JD-R model demonstrate how HIWPs act as a positive resource for employees as they

offer the necessary control and support to deal with their job demands (Bartram *et al.*, 2012; Castanheira and Chambel, 2010). Formally stated, we hypothesise that:

Hypothesis 1: Employees' positive perceptions of HIWPs will be negatively linked to emotional exhaustion

Hypothesis 2: Employees' positive perceptions of HIWPs will be negatively linked to depersonalisation

HIWPs and Job Demands

Research in health care shows that role conflict, role ambiguity and role overload are job demands that employees commonly experience (Dasgupta, 2012). Role overload is experienced when the demands of one's work role exceed the resources available to meet them (Brown *et al.*, 2005). Role overload is often considered as a challenge stressor in jobs where there are high job demands contingently linked to prospects for advancement and achievement (*e.g.* Cavanaugh *et al.*, 2000). When employees experience role overload, they can often expand their efforts to cope with it (Le Pine *et al.*, 2005). However, over time, role overload may drain individuals' resources (Schaufeli *et al.*, 2009) and function as a "hindrance stressor" (*i.e.*, demands that constrain individuals' development and work accomplishment). Consistent with the JD-R model (Demerouti *et al.*, 2001), such exposure to overload may lead to a depletion of one's resources. Role conflict refers to the incompatibility of expectations and demands associated with the role (Rizzo *et al.*, 1970). It involves contradictory requirements, competing demands, and inadequate resources. Role ambiguity refers to the lack of specificity and predictability for an employee's job or role functions and responsibility (Kahn *et al.*, 1964). Individuals experiencing role ambiguity are unsure of what their role consists of and how role performance is measured (Kahn *et al.*, 1964). Role conflict and role ambiguity are considered as hindrance stressors, constraining individual development and work accomplishment (LePine *et al.*, 2005). Generally, employees are less likely to have control over these sources of stress.

In the health care context, HIWPs could be expected to increase job demands due to the added responsibility associated with discretion, accountability and work intensification (Wood *et al.*, 2012). Supporting this perspective, Kroon *et al.* (2009) found that HR practices increase job demands such as psychosocial job conditions. However, Castanheira and Chambel (2010) found that HIWPs are associated with lower job demands (emotional dissonance and quantitative demands) in a study among call centre workers. Their use of the JD-C model

demonstrates how HIWPs can offer a sense of control which enables employees to adjust to their job demands. Indeed, Sun and Pan (2008) argued that it is the responsibility of organisations to provide employees with adequate resources to meet their job demands. The conflicting results demonstrate the need to further investigate this relationship. Wood *et al.* (2012) highlighted that information sharing gives employees a greater understanding of the organisations objectives and their role in achieving these. It therefore may reduce uncertainty in the work environment. Bottom up information sharing together with training could improve workers' capacity to deal with tasks because they provide additional coping options and the time and opportunity to discuss difficulties and share solutions (Castanheira and Chambel, 2010). Overall, the discretion and opportunity for creativity afforded by HIWPs could enable employees to reduce the job demands they experience (Cavanagh *et al.*, 2000). Therefore, we hypothesise as follows:

Hypothesis 3: Employees' positive perceptions of HIWPs are negatively associated with (a) role conflict, (b) role overload, and (c) role ambiguity.

Job Demands and Burnout

It is well known that exposure to job-related demands can lead to burnout. Excessive workload is believed to be the most prominent source of stress for health care professionals (Dasgupta, 2012). Greenglass *et al.* (2001) found in a sample of nurses that work overload was positively related to burnout. They concluded that nurses may be distancing themselves from patients as a reaction to their feelings of being emotionally drained by their job. Gil-Monte *et al.* (1993) and Stordeur *et al.* (2001) demonstrated that role conflict and role ambiguity are positively related to burnout among health care employees. Barber and Iwai (1996) found that role conflict and role ambiguity are significant predictors of burnout among staff caring for elderly dementia patients. Overall, Maslach *et al.* (2001) highlighted that qualitative job demands such as role conflict, role overload and role ambiguity consistently show a moderate to high correlation with burnout. According to the JD-R model and consistent with the ‘primacy of resource loss’ principle in COR theory (Hobfoll, 2002), when employees resources are threatened or lost and they are unable to cope, burnout is the behavioural manifestation that ensues (Stordeur *et al.*, 2001). Job demands are perceived as losses because “meeting such demands requires an investment of valued resources” (Lee and Ashforth, 1996: 129). In other words, attempting to cope with job demands and protect ones resources, other resources have to be invested (e.g. spending more time and effort) which carries the risk of burnout (e.g. Schaufeli *et al.*, 2009). Therefore, consistent with the above empirical evidence and premised on the JD-R model and COR theory, we hypothesise that:

Hypothesis 4: (a) Role conflict, (b) role overload and (c) role ambiguity are positively associated with emotional exhaustion.

Hypothesis 5: (a) Role conflict, (b) role overload and (c) role ambiguity are positively associated with depersonalisation.

Mediating effect of job demands in the relationship between HIWPs and Burnout

Although some propositions have been put forward to explain how HIWPs influence employee well-being outcomes, this link remains under-theorised and requires further empirical research (e.g. Peccei *et al.*, 2013). Wood and de Menezes (2011) note that the JD-C model is the most frequently used perspective in this stream of literature. However, job demands have rarely been considered as potential mediators of the HIWPs-well-being (i.e. burnout) relationship. The findings of Castanheira and Chambel (2010) indicate that HIWPs are negatively related to burnout and this is partially mediated by lower job demands (psychosocial job conditions) and higher autonomy. These authors called for future studies to analyse a broader range of job demands such as role conflict and role ambiguity given their proximal impact on employee burnout. The need for further theoretical exploration of how HRM translates into job demands has also been echoed by Peccei *et al.* (2013). Consistent with Castanheira and Chambel (2010), Wood and de Menezes (2011) further suggest that future theoretical and empirical work is needed, both to determine whether HIWPs may be linked to role ambiguity and role uncertainty and to extend this work by considering other contexts.

This study directly responds to this call by investigating the influence of role conflict, role overload and role ambiguity in the HIWPs-burnout relationship. HIWPs should enable employees' to obtain sufficient resources to meet their job demands (while allowing them to decide for themselves when to respond to demands) and gain an additional spiral of positive resources to alleviate burnout (Sun and Pan, 2008). Although a small number of studies have proposed that HIWPs are related to worker burnout (e.g. Sun and Pan, 2008), most have failed to examine how or why these relationships occur (Castanheira and Chambel, 2010). We propose that job demands represent an important yet partial underlying mechanism through which HIWPs can influence burnout. Given the resource potential of HIWPs to directly reduce

burnout in their own right, we envisage that job demands will partially rather than fully mediate this relationship. Formally stated, we predict that:

Hypothesis 6: Employee perceptions of (a) role conflict, (b) role overload and (c) role ambiguity will partially mediate the relationship between HIWPs and emotional exhaustion.

Hypothesis 7: Employee perceptions of (a) role conflict, (b) role overload and (c) role ambiguity will partially mediate the relationship between HIWPs and depersonalisation.

Methods

Participants and Procedures

This study was conducted in a Canadian general hospital. With the agreement of the HR Director, employees were invited to participate in the survey. The questionnaires were sent to employees' private addresses in hard copy format. From 1802 hospital employees contacted for participation, 545 completed the questionnaire. This represents a response rate of 30%. No significant difference in terms of demographics was found between this final sample of respondents ($N = 545$) and the hospital's general population of employees ($N = 1802$). In this sample 87.2% were women, average age was 44.72 years ($SD = 10.21$) and average tenure was 8.32 years ($SD = 8.1$). In terms of education, 16.7% of respondents held a secondary or vocational school diploma, 29.2% college diploma, 10.6% university degree (certificate for those who have completed 1/3 of a bachelor while working), 32.9% bachelor, and 10.2% master's degree.

38% of employees were nursing and cardiorespiratory staff (e.g. auxiliary nurse, nurse, respiratory therapist). 10.9% of employees were paratechnical staff, auxiliary service and trade personnel. 17.6% of employees were office personnel. 7.7% of employees were health and social services technicians. 16.8% of employees were health and social services professionals and 8.9% of employees were supervisory staff.

Measures

Employees were asked to express their level of agreement with each statement on a Likert scale ranging from strongly disagree (1) to strongly agree (7).

High Involvement Work practices

HIWPs in this study include autonomy representing empowerment (P), information sharing (I), reward (R), and training and development linked to acquiring knowledge and skills (K). The three item measure used for autonomy was adopted from the sub scales of the psychological empowerment scale by Spreitzer (1995). A sample item is “I can decide on my own how I go about doing my work”. To measure information sharing, three items were adopted for each dimension (top-down and bottom-up) from a scale developed by Lawler *et al.*, (1995). A sample item for top down information sharing is “employees are regularly informed about major projects in our organization”. A sample item for bottom up information sharing is “The organization usually asks for employees’ opinion when it considers adopting new rules, procedures or methods related to the organization of work”. To measure non-monetary recognition, three items were adopted from Tremblay *et al.* (2010). A sample item is “exceptional contributions of employees are formally recognized by the organization”. The measure for development practices was also adopted from Tremblay *et al.* (2010). Specifically, six items assessed the level of training and development that employees were exposed to. A sample item is “In our organization, we have access to the resources needed to improve our skills”. All reliabilities pertaining to HIWPs were above .83 and are therefore deemed reliable (see table 1). Following Vandenberg *et al.* (1999) and Guerrero and Barraud-Didier (2004), we treated HIWPs as a second order latent factor.

Role Conflict

We used six high-loading items from House *et al.*'s (1983) measure of role conflict. A typical item is "In my job, I often receive incompatible requests from two or more people at the same time". This scale had an internal consistency reliability of .74 in this study.

Role Overload

Three items from the quantitative overload scale developed by Caplan *et al.* (1980) were used to measure role overload. A typical item is "I regularly feel overloaded by my work". Internal consistency reliability was .79.

Role Ambiguity

We used five items from House *et al.*'s (1983) measure of role ambiguity. A sample item is "My responsibilities at work are clearly defined" (reverse coded). Internal consistency reliability was .69, which is deemed as an acceptable threshold (Clark and Watson, 1995).

Burnout

Items linked to the two dimensions of burnout are taken from the Maslach Burnout Inventory-Human Services Survey (Maslach and Jackson, 1996). Five items each were used to assess emotional exhaustion and depersonalisation. A sample item for emotional exhaustion is "I feel burned out from my work". Internal consistency reliability was .91. A sample item for depersonalisation is "I feel little enthusiasm for the work that I do". Internal consistency reliability was .88.

Analysis

To test our hypotheses we conducted structural equation modelling (SEM) in Mplus version 6.0 (Muthen and Muthen, 1998 – 2010) with Maximum Likelihood (ML) estimation. Mplus produces measures of overall model fit, generates estimates of the hypothesised relationships (unstandardised and standardised coefficients, standard errors and t-tests), calculates total effects, and provides measures of the proportions of variance explained. The goodness of fit of the SEM models was evaluated based on a range of fit indices including the χ^2 value, the Root Means Square Error of Approximation (RMSEA), the Standardised Root Means Square Residuals (SRMR), the Comparative Fit Index (CFI), and the Tucker Lewis Index (TLI). Levels of 0.90 or higher for TLI and CFI and levels of 0.06 or lower for RMSEA, combined with levels of 0.08 or lower for SRMR, indicates that models fit the data reasonably well (Arbuckle, 2003).

In order to confirm the six factor structure (HIWPs, role conflict, role overload, role ambiguity, emotional exhaustion and depersonalisation) for the measurement model, a confirmatory factor analysis using latent variables was carried out in the first step. The theoretical model with structural paths was tested in the second step. The latent exogenous variables job demands and endogenous variable burnout were operationalised by three and two variables respectively. HIWPs were treated as a second order latent factor. In order to test the mediating hypothesis, we compared the fit of a fully mediated model and a partially mediated model which included direct and indirect paths.

Results

Measurement Models

According to Anderson and Gerbing's (1988) recommendations, it is necessary to assess the appropriate factor structure of the measures used in the current study prior to testing the structural model. We used the aforementioned fit indices in examining the distinctiveness of our study variables. Our overall hypothesised CFA model including six factors yielded a good fit to the data ($\chi^2(335) = 835.734$ $p < .001$, CFI = .927, TLI = .918, RMSEA = .052, SRMR = .052). That model yielded a better fit to the data than any more parsimonious model, including a series of five factor models by combining job demands and the dimensions of burnout one by one as well as a one factor model (see Table 2). Models were compared using the chi square difference test (Bentler and Bonett, 1980). As the data was collected using self-reported measures, findings could be affected by common method bias. To test for this issue we computed a confirmatory factor analysis for the six latent variables with and without a same-source first-order factor added test. This unmeasured latent method factor was set to have indicators of all self-report items, therefore controlling for the portion of variance attributable to obtaining all measures from a single source (see Podsakoff *et al.*, 2012). As all factor loadings and intercorrelations were almost identical in both models, common method variance was not believed to be a source of bias in this study's data.

INSERT TABLES 1 AND 2 ABOUT HERE

Structural Model and Hypothesis Testing

In the second model, we tested the structural model. Previous research has highlighted that employee characteristics influence burnout and therefore controlled for gender, marital status, age, education and tenure (Sun and Pan, 2008). We ran a correlation analysis on these variables and the results revealed that education and gender significantly correlated with emotional exhaustion and depersonalisation. Therefore, we controlled for gender and education. The non-significant controls were omitted from further analysis to avoid misinterpretation of the results (Spector and Brannick, 2011).

Hypothesis 1 and 2 proposed that positive perceptions of HIWPs would be negatively related to emotional exhaustion and depersonalisation respectively. The results show that HIWPs were indeed a significant predictor of emotional exhaustion ($\beta = -.223, p < .001$) and depersonalisation ($\beta = -.292, p < .001$). Therefore, Hypothesis 1 and 2 are supported.

Hypotheses 3 proposed that positive perceptions of HIWPs would be negatively related to job demands. HIWPs were a significant predictor of role conflict ($\beta = -.412, p < .001$), role overload ($\beta = -.344, p < .001$), and role ambiguity ($\beta = -.218, p < .001$). Hypotheses 3a-c are thus supported. Hypotheses 4 further predicted that job demands would be positively related to emotional exhaustion. Role conflict ($\beta = .140, p < .01$) and role overload ($\beta = .522, p < .001$) was both positively related to emotional exhaustion while for role ambiguity ($\beta = .050, p > .05$) there was no effect. Hypothesis 4a and 4b are thus supported while Hypothesis 4c is rejected. Hypothesis 5a-c predicted that job demands would be positively related to depersonalisation. Role conflict ($\beta = .302, p < .001$) and role overload ($\beta = .226, p < .001$) was positively related to role ambiguity while there was no effect for role ambiguity ($\beta = .085, p > .05$). Therefore, Hypotheses 5a and 5b are supported while Hypothesis 5c is rejected. Hypotheses 6a-c and 7a-c stated that job demands would mediate the relationship between HIWPs and the two dimensions of burnout. This was tested by comparing a fully indirect and direct structural

model. The SEM model which specified full mediation of HIWPs on burnout through job demands displayed an adequate fit to the data, ($\chi^2(910) = 2076.470, p < .001, CFI = .905, TLI = .898, RMSEA = .049, SRMR = .071$). In the second model, job demands were hypothesised to partially mediate the associations between HIWPs and burnout; that is to say, the model was specified to include direct associations between HIWPs and burnout as well as indirect associations via job demands. Although the difference was modest, the fit statistics for the partially mediated model were better than the fully mediated model ($\chi^2(909) = 2048.626, p < .001, CFI = .907, TLI = .901, RMSEA = .048, SRMR = .065$) and explained 51% of the variance in emotional exhaustion and 41% of the variance in depersonalisation. Therefore, this model formed the basis for analysing the hypotheses. Overall, HIWPs has both a direct and indirect effect on emotional exhaustion through role conflict ($\beta = -.058, p < .01$), and role overload ($\beta = -.179, p < .001$) but there was no significant relationship for role ambiguity ($\beta = -.011, p > .05$). HIWPs also had a direct and indirect effect on depersonalisation through role conflict ($\beta = -.125, p < .001$) and role overload ($\beta = -.078, p < .001$) but there was no significant relationship for role ambiguity ($\beta = -.019, p > .05$). This suggests that role conflict and role overload partially mediated the relationship between HIWPs and burnout.

INSERT FIGURE 2 ABOUT HERE

Discussion

The current study contributes to the HRM and burnout literature by providing empirical evidence linking HIWPs to burnout through the mediating role of job demands. Previous research in a call centre (*e.g.* Castanheira and Chambel, 2010) and construction sector (Sun and Pan, 2008) context revealed a negative association between HIWPs and burnout. However, investigating the role of HIWPs in alleviating burnout in the health care context has largely been neglected in the HR literature (Holland *et al.*, 2013). Addressing this question is especially important amidst the calls from scholars to address challenges pertaining to even higher demands and deteriorating well-being of health care professionals (*e.g.* Boudrias *et al.*, 2012). It is also important within the broader HRM field where questions still remain as to whether HIWPs are good or bad for employees well-being. Consistent with the unitarist perspective, many authors argue that properly designed HRM is beneficial for organisations and their employees (*e.g.* Appelbaum *et al.*, 2000). However, the critical management-by-stress perspective or ‘exploitation hypothesis’ proponents argue that while high involvement management may increase employee performance, it might also intensify their job demands and thus have a negative impact on well-being (*e.g.* Wood *et al.*, 2012). This study finds that HIWPs are associated with lower job demands and lower levels of experienced burnout. Therefore, this study conducted in the health care context rejects the ‘exploitation hypothesis’ and departs from the study of Kroon *et al.* (2009) which found that HIWPs were associated with higher job demands and burnout. Although our results are in line with the ‘mainstream’ (Harley *et al.*, 2007) or ‘optimistic’ perspective (Peccei, 2004) in health care, it is important to highlight that we focus on the high involvement stream. Therefore, it cannot be inferred that the same results will hold for all bundles of HR practices and this should be tested in future research.

In addition to examining the HIWPs-burnout relationship, the present study investigated the underlying mechanisms between HIWPs and burnout thus enabling further insight into how HIWPs actually work. By focusing on the mediating influence of job demands, the present study contributes to knowledge by partially opening the ‘black box’ that exists between HIWPs and the well-being outcome of burnout (Castanheira and Chambel, 2010; Peccei *et al.*, 2013). Castanheira and Chambel (2010) as well as Wood and Menezes (2011) called for researchers to consider how HIWPs relate to negative well-being outcomes by considering the role of job demands such as role conflict and role ambiguity. This study responded to these calls by investigating role conflict, role overload and role ambiguity as mediators of this relationship. These job demands are the most common and among the most stressful for health care professionals (Dasgupta, 2012). Although Castanheira and Chambel (2010) found that HIWPs relate negatively to burnout via emotional dissonance and autonomy, role conflict and role overload represent partial mediators of this relationship in the health care context. Contrary to the notion that HIWPs can increase employees job demands by virtue of the added workload and responsibility (Kroon *et al.*, 2009; Wood *et al.*, 2012), we find that HIWPs enables employees to obtain the necessary resources to meet their job demands which ameliorate their levels of burnout. This is consistent with the JD-R model (Demerouti *et al.*, 2001) and the JD-C (Karasek and Theorell, 1990) which recognises the role of HIWPs as an important resource instrumental to employee well-being.

However, there was no mediating effect of role ambiguity in the relationship between HIWPs and burnout. Indeed, there was no significant relationship between role ambiguity and burnout. It could be the case that health care employees are more stress tolerant to role ambiguity when compared to role overload and role conflict (Idris, 2011). Indeed, the ability to tolerate ambiguity is what often draws those into the helping profession (Skovholt *et al.*, 2001). Also, in the economic climate that has prevailed over the last few years, most employees are required

to be more flexible and tolerate such ambiguity. Although there was no mediating effect found, results still indicated that HIWPs had a significant negative relationship with role ambiguity. Wood and de Menezes (2011) argued that high involvement management may increase role ambiguity because HIWPs which emphasise employees to be proactive often evokes uncertainty for them. There is no evidence for this contention in the current study. Our findings that positive perceptions of HIWPs are associated with lower role overload and role ambiguity is contextually important. Indeed, Leggat *et al.* (2011) found that an appropriate workload and role clarity among employees positively influences organisational performance in health care.

Limitations and Directions for Future Research

This study was cross-sectional thus causal inferences cannot be made. Therefore, a longitudinal research design would be beneficial in future research. Moreover, because the data was self-reported, common method bias issues are a potential source of bias in this study. However, we did test for this possibility using the CFA marker technique and the results suggest that it was not an issue. Another limitation may be that because of organisational restrictions, shortened versions of scales were used to measure the constructs. However, items were strategically selected based on factor analysis results of previous studies, face validity and relevance to the context (*e.g.* Tremblay *et al.*, 2010). As our study finds a partially mediating effect of role conflict and role overload in the relationship between HIWPs and burnout, other factors could account for this relationship. Echoing previous suppositions (*e.g.* Peccei *et al.*, 2013), the inclusion of a broader range of job demands in addition to job resources should receive empirical scrutiny in future research. This study uses burnout to define the health aspect of well-being. While burnout is an outcome particularly relevant in the context of health care (Maslach *et al.*, 2001), it is only one part of the story given that well-being also includes happiness and relationship dimensions. Therefore, studying happiness and the relationship

aspects of well-being in addition to burnout would be an interesting avenue for further research. Moreover, building performance into the equation would provide even more interesting results as it would enable determination of whether support is found for a mutual gains, optimistic or conflicting outcomes perspective (Wood *et al.*, 2012).

Managerial Implications

The various theoretical models proposed and the results found in this study suggest that if we can reduce demands and supplement resources for workers, burnout should decrease. This would suggest that organisations should manage the job demands and resources that employees face (Halbesleben and Buckley, 2004). We note that one important way of reducing job demands and burnout among health care employees is through the use of HIWPs. Of these job demands, role conflict and role overload are significant precursors to burnout. Therefore, for managers to promote positive health for their employees, they should focus on implementing these four HIWPs. As burnout has been directly linked to the quality of patient care (Wood and Killion, 2007), the findings of this study have important ramifications for hospital management in terms of improving organisational performance while maintaining a healthy engaged workforce.

References

- Anderson, J.C. and Gerbing, D.W. (1988). 'Structural equation modeling in practice: A review and recommended two-step approach'. *Psychological Bulletin*, 103:3, 411–423.
- Appelbaum, E., Bailey, T., Berg, P. and Kalleberg, A. (2000). *Manufacturing Advantage: Why High Performance Work Systems Pay off*, New York, NY: Cornell University Press.
- Arbuckle, J.L. (2003). *AMOS 5.0 user's guide*, Chicago, IL: Small Waters.
- Baluch, A.M., Salge, T.O. and Piening, E.P. (2013). 'Untangling the Relationship Between HRM and Hospital Performance: The Mediating Role of Attitudinal and Behavioural HR Outcomes'. *International Journal of Human Resource Management*, 24: 16, 3038-3061.
- Barber, C.E. and Iwai, M. (1996). 'Role conflict and role ambiguity as predictors of burnout among staff caring for elderly dementia patients'. *Journal of Gerontological Social Work*, 26: 1-2, 101-116.
- Bartram, T., Casimir, G., Djurkovic, N., Leggat, S., and Stanton, P. (2012). 'Do High Performance Work Systems influence the relationship between emotional labour, burnout and intention to leave? A study of Australian Nurses'. *Journal of Advanced Nursing*, 681, 567-1578.
- Bentler, P.M. and Bonnett, D.G. (1980). 'Significance tests and goodness of fit in the analysis of covariances structures'. *Psychological Bulletin*, 88: 3, 588-606.
- Boudrias, J.S., Morin, A.J.S. and Brodeur, M.M. (2012). 'Role of psychological empowerment in the reduction of burnout in Canadian healthcare workers'. *Nursing & Health Sciences*, 14: 8-17.

Boxall, P. and Macky, K. (2009). 'Research and theory on high-performance work systems: progressing the high-involvement stream'. *Human Resource Management Journal*, 19:1, 3-23.

Braverman, H. (1974). *Labor and Monopoly Capital*, New York: Monthly Review Press.

Buchan, J. (2004). 'What difference does (" good ") HRM make?' *Human Resources for Health*, 7: 1, 1-7.

Caplan, R.D., Cobb, S., French, J.R.P. Jr., Harrison, R.V. and Pinneau, S.R. Jr. (1980). *Job demands and worker health: Main effects and occupational differences*. University of Michigan, MI: Institute for Social Research.

Castanheira, F. and Chambel, M. (2010). 'Reducing burnout in call centers through HR practices'. *Human Resource Management*, 49: 6, 1047-1065.

Cavanaugh, M.A., Boswell, W.R., Roehling, M.V. and Boudreau, J.W. (2000). 'An Empirical Examination of Self-supported Work Stress among US Managers'. *Journal of Applied Psychology*, 85: 1, 65-74.

Clark, L.A., and Watson, D. (1995). 'Constructing validity: Basic issues in objective scale development'. *Psychological assessment*, 7: 3, 309-319.

Cordes, C.L., and Dougherty, T.W. (1993). A review and integration of research on job burnout. *Academy of Management Review*, 18, 621-656.

Dasgupta, P. (2012). 'Effect of role ambiguity, conflict and overload in private hospitals 'nurses' burnout and mediation through self-efficacy'. *Journal of Health Management*, 14: 4, 513-534.

Demerouti, E., Bakker, A.B., Nachreiner, F. and Schaufeli, W.B. (2001). 'The Job Demands - Resources model of burnout'. *Journal of Applied Psychology*, 86: 3, 499-512.

Felton J.S. (1998). 'Burnout as a clinical entity —its importance in health care workers'. *Occup Med*, 48:4, 237-250.

Gil-Monte, P.R., Valcarcel, P. and Zornoza, A. (1993). 'Role Stress: Burnout antecedent in nursing professionals'. *European Work and Organizational Psychologist*, 3: 3, 217- 227.

Greenglass, E., Burke, R. and Fiksenbaum, L. (2001). 'Workload and burnout in nurses'. *Journal of Community & Applied Social Psychology*, 11: 3, 211-215.

Guerrero, S. and Barraud-Didier, V. (2004). 'High-involvement practices and performance of French firms'. *International Journal of Human Resource Management*, 15: 8, 1408-1423.

Halbesleben, J.R.B. and Buckley, R.M. (2004). 'Burnout in organizational life'. *Journal of Management*, 30: 6, 859-79.

Harley B., Allen, B.C. & Sargent, L.D. (2007). 'High performance work systems and employee experience of work in the service sector: The case of aged care'. *British Journal of Industrial Relations*, 45, 607-33.

Hobfoll, S.E. (2002). 'Social and psychological resources and adaptation'. *Review of General Psychology*, 6: 4, 307-324.

Holland, P.J., Allen, B.C. & Cooper, B.K. (2013). 'Reducing burnout in Australian nurses: the role of employee direct voice and managerial responsiveness'. *The International Journal of Human Resource Management*, 24:16, 3146-3162.

House, R.J., Schuler, R.S. and Levanoni, E. (1983). 'Role conflict and role ambiguity scales: Reality or artifacts?'. *Journal of Applied Psychology*, 68: 2, 334-337.

Idris, M.K. (2011). 'Over Time Effects of Role Stress on Psychological Strain among Malaysian Public University Academics'. *International Journal of Business and Social Science*, 2: 9, 154-161.

Kahn, R., Wolfe, D., Quinn, R., Snoek, J. and Rosenthal, R. (1964). *Organisational Stress: Studies in role conflict and role ambiguity*. New York: Wiley.

Karasek, R. and Theorell, T. (1990). *Healthy work: Stress, productivity, and the reconstruction of working life*. New York: Basic Books.

Kroon, B., Voorde, K.V.D. and Veldhoven, M.V. (2009). 'Cross-level effects of high-performance work practices on burnout: Two counteracting mediating mechanisms compared'. *Personnel Review*, 38: 5, 509-525.

Lawler, E., Mohrman, S. and Ledford, G. (1995). *Creating High Performance Organizations: Practices and Results of Employee Involvement and Total Quality Management in Fortune 1000 Companies*, San Francisco, CA: Jossey-Bass.

Lawler, E.E. (1986). *High-involvement management: Participative strategies for improving organizational performance*. San Francisco, CA: Jossey-Bass.

Lee, R.T. and Ashforth, B.E. (1996). 'A meta-analytic examination of the correlates of the three dimensions of job burnout'. *The Journal of Applied Psychology*, 81: 2, 123-33.

Leggat, S.G., Bartram, T. and Stanton, P. (2011). 'High performance work systems: the gap between policy and practice in health care reform. *Journal of Health Organisation and Management*, 25: 3, 281-297.

Leiter, M.P. and Maslach, C. (1988). 'The impact of interpersonal environment on burnout and organizational commitment'. *Journal of Organizational Behavior*, 9, 297-308.

LePine, J.A., Podsakoff, N.P. and LePine, M.A. (2005). 'A meta-analytic test of the challenge stressor-hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance'. *Academy of Management*, 48: 5, 764-775.

Maslach, C., Schaufeli, W.B. and Leiter, M.P. (2001). 'Job Burnout'. *Annual Review of Psychology*, 52: 1, 397-422.

Maslach, C. and Jackson, S. (1986). *Maslach Burnout Inventory Manual* (2nd ed.), Palo Alto, CA: Consulting Psychologists Press.

Muthen, L.K. and Muthen, B.O. (1998 - 2010). *Mplus – Statistical analysis with latent variables*. User's guide (6th Ed). Los Angeles, CA: Muthen and Muthen

Nishii, L.H. and Wright, P.M. (2008). 'Variability at multiple levels of analysis: Implications for strategic human resource management', in Smith D.B (Ed.), *The people make the place*, Mahwah, N.J: Lawrence Erlbaum Associates.

Peccei, R., Van de Voorde, K. and van Veldhoven, M. (2013). 'HRM, Well-being and Performance: A Theoretical and Empirical Review', in J. Paauwe, D, Guest, and P. Wright. (Eds). *HRM and Performance: Achievements and Challenges*. Chichester: Wiley.

Podsakoff, P.M., MacKenzie, S.B. and Podsakoff, N.P. (2012). 'Source of method bias in social science research and recommendations on how to control it'. *Annual Review of Psychology*, 63: 1, 539-569.

Rizzo, J.R., House, R.J. and Lirtzman, S.I. (1970). 'Role conflict and ambiguity in complex organizations'. *Administrative Science Quarterly*, 15: 2, 150-163.

Rondeau, K. and Wagar, T. (2006). 'Nurse and resident satisfaction in magnet long-term care organizations: do high involvement approaches matter?'. *Journal of Nursing Management*, 14, 244-250.

Schaufeli, W.B., Bakker, A.B. and Van Rhenen, W. (2009). 'How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism'. *Journal of Organizational Behavior*. 30, 893–917.

Spector, P.E. and Brannick, M. (2011). 'Methodological urban legends: The misuse of statistical control variables'. *Organizational Research Methods*, 14, 287-305.

Spreitzer, G.M. (1995). 'Psychological empowerment in the workplace: Dimensions, measurement, and validation'. *Academy of Management Journal*, 38, 1442- 1465.

Skovholt, T.M., Grier, T.L. and Hanson, M.R. (2001). 'Career counseling for longevity: Self-care and burnout prevention strategies for counselor resilience'. *Journal of Career Development*, 27, 167-176.

Stordeur, S., D'Hoore, W. and Vandenberghe, C. (2001). 'Leadership, organizational stress, and emotional exhaustion among hospital nursing staff'. *Journal of Advanced Nursing*, 35: 4, 533-542.

Sun, L.-Yun. and Pan, W. (2008). 'HR Practices Perceptions, Emotional Exhaustion, and Work Outcomes: A Conservation-of-Resources Theory in the Chinese Context'. *Human Resource Development Quarterly*, 19: 1.

Townsend, K. and Wilkinson, A. (2010). 'Managing under pressure: HRM in hospitals'. *Human Resource Management Journal*, 20: 4, 332-338.

Tremblay, M., Cloutier, J., Simard, G., Chênevert, D. and Vandenberghe, C. (2010). 'The role of HRM practices, procedural justice, organisational support and trust in organisational commitment an in-role and extra-role performance'. *The International Journal of Human Resource Management*, 21: 3, 405-433.

Vandenberg, R.J., Richardson, H.A. and Eastman, L.J. (1999). 'The impact of high involvement work processes on organizational effectiveness'. *Group and Organization Management*, 24: 3, 300-339.

Vanhala, S. and Tuomi, K. (2006). 'HRM, company performance and employee well-being'. *Management Revue*, 17: 3, 241-255.

Van de Voorde, K., Paauwe, J. and Van Veldhoven, M. (2012). 'Employee Well-being and the HRM-Organizational Performance Relationship: A Review of Quantitative Studies'. *International Journal of Management Reviews*, 14: 4, 391-407.

Walton, R.E. (1985). 'From control to commitment in the workplace'. *Harvard Business Review*, March-April, 77-84.

Wood, S., Van Veldhoven, M., Croon, M. and de Menezes, L.M. (2012). 'Enriched job design, high involvement management and organizational performance: The mediating roles of job satisfaction and well-being'. *Human Relations*, 65: 4, 419-445.

Wood, S. and de Menezes, L.M. (2011). 'High involvement management, high-performance work systems and well-being'. *The International Journal of Human Resource Management*, 22: 7, 1586-1610.

Wood, B.D. and Killion, J.B. (2007). 'Burnout among healthcare professionals'. *Radiology Management*. 29: 6, 30-34.

Figure 1: Relationships between HIWPs, job demands and burnout

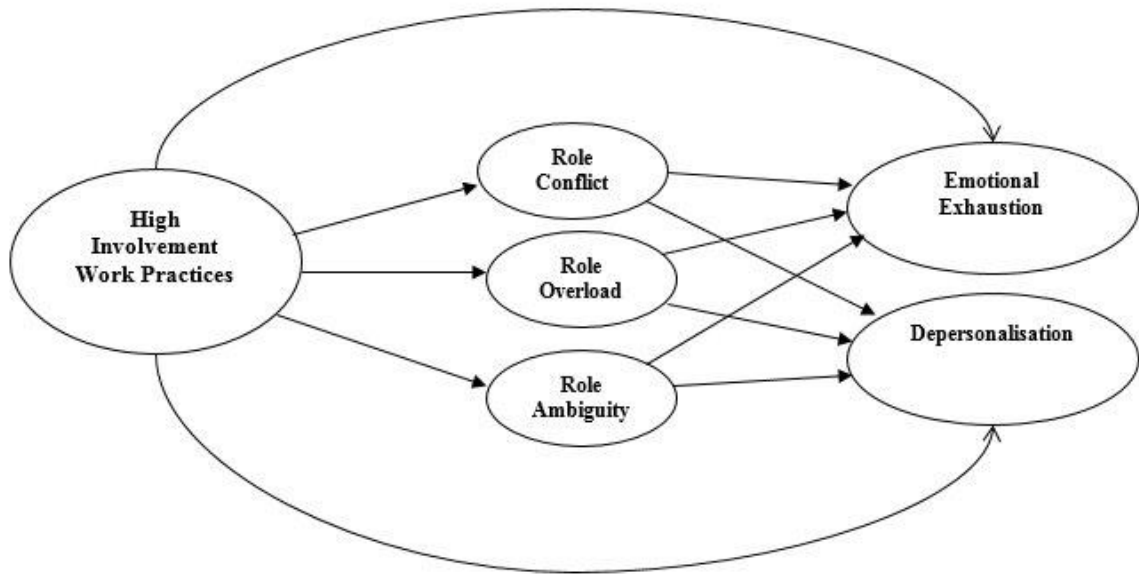


Table 1: Means, standard deviations, reliability coefficients and correlations.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender	.87	.33	-										
2. Education	2.91	1.31	.033	-									
3. Empowerment	5.68	1.22	.015	.078	(.86)								
4. Information	3.81	1.33	-.054	.102*	.276**	(.92)							
5. Reward	4.35	1.45	-.042	.036	.229**	.632**	(.90)						
6. Training	4.05	1.45	-.039	.012	.295**	.557**	.534**	(.83)					
7. Role conflict	3.62	1.12	-.042	.003	-.178**	-.299**	-.231**	-.218**	(.75)				
8. Role overload	4.57	1.42	.025	-.060	-.150**	-.255**	-.231**	-.152**	.525**	(.79)			
9. Role ambiguity	2.67	.90	.019	.148**	-.091**	-.152**	-.135**	-.167**	.145**	-.049	(.69)		
10. Exhaustion	3.77	1.55	.132**	-.134**	-.200**	-.354**	-.332**	-.255**	.460**	.575**	.089*	(.91)	
11. Depersonalisation	3.21	1.46	.090*	-.094*	-.276**	-.377**	-.341**	-.312**	.483**	.417**	.162**	.789**	(.80)

Table 2: *Confirmatory Factor Analysis of Measurement Models: Fit Indices*

Model	χ^2	<i>df</i>	$\Delta \chi^2$	CFI	TLI	RMSEA	SRMR
1. Hypothesised six factor model	1568.701	603	-	.928	.921	.049	.051
2. Five factor models: Job Demands							
Combining role conflict and role overload	1825.733	688	257.032***	.907	.900	.055	.056
Combining role overload and role ambiguity	2039.256	688	470.555***	.889	.881	.060	.069
Combining role conflict and role ambiguity	1995.515	688	426.814***	.893	.885	.059	.061
3. Five Factor model: Burnout							
Combining exhaustion and depersonalisation	1768.179	688	199.478***	.912	.905	.054	.053
4. One Factor Model	2694.293	350	1125.592***	.660	.633	.111	.098

N=543; χ^2 = Chi-square discrepancy, *df* = degrees of freedom; $\Delta \chi^2$ = difference in chi-square; CFI = comparative fit index; TLI = Tucker Lewis Index; RMSEA = root mean-square error of approximation; SRMR = Standardized Root Mean Square Residual.

Figure 2

Relationships between HIWPs, job demands and burnout

