

Work engagement and job performance among nurses in the public healthcare sector in the United Arab Emirates

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Abstract

Purpose – Nurses who are more engaged in their work, and have the right job characteristics and positive organizational factors, are expected to perform better. The purpose of this study is to improve the performance in the healthcare sector in the United Arab Emirates (UAE), thus this study explored the job characteristics and organizational factors that affect work engagement and job performance of nurses.

Design/methodology/approach – Nurses (N = 2,369) working in the public healthcare sector in the UAE were asked to provide their perceptions on work engagement and its antecedents, their performance and how they perceive justice in their workplace.

Findings – Regardless of job demands, nurses' job performance remained unaffected by demographic factors, which was a striking finding: nurses provide quality services and manage to accomplish their tasks, at any level of demand. Justice acted as a moderator of the relationship between job resources and work engagement, which was a new addition to the literature. Nurses with low overall perceptions of justice had stronger links between job resources and work engagement. Even if the level of justice was perceived as low, work engagement remained unaffected.

Originality/value – Work engagement is a critical issue, but has received little attention, with most focusing on its relationship with performance as the outcome variable. This paper has therefore enriched the literature and is significant in both country and sector.

Keywords Work engagement, Job resources, Job demands, Job performance, Perceived overall justice, Job demands–resources model

Paper type Research paper

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1. Introduction

In a business world characterized by accelerated globalization and constant changes, firms face high demand to enhance their performance and boost competitiveness (Stander and Rothmann, 2010). This puts employees under pressure to stay fully engaged in their work, and use their capabilities and competencies to benefit their organization in dealing with a changeable business environment. Guaranteeing the work engagement of employees is challenging for organizations. Understanding work engagement is crucial for organizations, managers and employees, for several reasons. For example, one study estimated that a disengaged workforce can cost an organization 34% of the yearly salary figure (Borysenko, 2019). Other studies have estimated that the majority of the international workforce is not engaged, and this has important consequences organizational performance around the world (Jouany and Mäkipää, 2021). Organizations have therefore developed employee engagement strategies to help them to adapt to today's turbulent business environment (Garrard, 2021). However, motivating employees to become more engaged at work is not easy because only 15% of employees globally are truly work-engagers (Jouany and Mäkipää, 2021).

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Recently, engagement has become a prominent concept in management (Crawford *et al.*, 2014), because of its positive impact and energizing effect (Bakker and Demerouti, 2008; Cole *et al.*, 2012). Bakker *et al.* (2011) noted that firms have become aware of the competitive advantage that can be achieved from having engaged employees (Sia *et al.*, 2015). However, despite the high number of studies exploring the role of work engagement as a fundamental driver of the correlation between job resources and job-related results, few have examined the mediator role of work engagement in the linkage between job resources and job performance (Bhatti *et al.*, 2018). Scholars (Memon *et al.*, 2018; Saari *et al.*, 2017) have also highlighted that most studies on work engagement have drawn on data from Western countries, and the concept has been examined less in Asian countries (Pattnaik and Panda, 2020).

This research has been built principally on the job demands–resources (JD–R) model (Schaufeli and Bakker, 2004). This is regarded as the fundamental model in this field because of its holistic and comprehensive nature. It draws on a wide variety of antecedents and organizational outcomes. Despite growing recognition of the importance of work engagement, there is an odd scarcity of studies on this issue (Agarwal, 2014). The correlation with job performance particularly needs examination, especially in the nursing sector (Bhatti *et al.*, 2018). Improved performance is known to be an outcome of work engagement, inspiring business researchers to explore its role in diverse settings (Bailey *et al.*, 2017). A Gallup report stated that 85% of employees in the United Arab Emirates (UAE) are either not engaged or actively disengaged, meaning that most employees in the UAE are not emotionally committed to their companies and are less likely to be very productive (Maceda, 2017). The nursing workforce is considered a cornerstone of the healthcare sector, and includes the majority of employees in this sector in any country (Al-Khadhuri, 2018). However, regrettably, this workforce is subject to a high level of burnout due to the stressful demands in this sector (Al-Khadhuri, 2018). We therefore explored the perceptions of nurses working in the public healthcare sector in the UAE.

2. Literature review

Keyko (2014) noted that despite extensive studies about work engagement, the concept is still relatively novel in the field of nursing (Bhatti *et al.*, 2018). A talented workforce is undoubtedly very important for firms, but an engaged workforce is essential (Leiter and Bakker, 2010). Engaged employees are considered vital to enable organizations to maintain a competitive advantage (Macey *et al.*, 2011). Globalization, intense competition and changes in economic structure have led to uncertainty in businesses, resulting eventually in a negative influence on work engagement and performance (Chaudhary *et al.*, 2012; Gupta and Pandey, 2018). Much attention has therefore been given to employee engagement because of its connection with high job performance (Rich *et al.*, 2010).

Job characteristics are considered important antecedents of job engagement and related outcomes (Crawford *et al.*, 2010; Demerouti *et al.*, 2001; Nahrgang *et al.*, 2011). There is a positive relationship between job resources and work engagement and/or job performance (Demerouti *et al.*, 2001). The JD–R model states that various job resources promote work engagement (Demerouti *et al.*, 2001). However, the correlation of job demands with work engagement and therefore with job performance is inconsistent. Some studies have found that job demands have a direct negative impact on engagement (Breevaart and Bakker, 2018; Oshio *et al.*, 2018). However, Schaufeli and Bakker (2004) found that job demands did not directly influence work engagement.

Work engagement may also promote competitiveness and prosperity for organizations, because these features are believed to be necessary in the current turbulent business environment (Hoole and Bonnema, 2015). It is essential for organizations to have sustainable performance in a highly changing business environment, to create and sustain a competitive advantage (van der Walt, 2018). Work engagement suggests that employees

will stay focused, loyal and strong, which will result in improving and maintaining performance (Leiter and Bakker, 2010).

The perception of justice also has an impact on the attitudes and reactions of employees (Masterson *et al.*, 2000), and a significant role in influencing conduct and attitudes in the workplace (Cole *et al.*, 2010; Greenberg, 2010). There is considerable variation in the elements considered to make up organizational justice. Most scholars (such as Krings and Facchin, 2009) have used a three-factor model consisting of distributive justice, procedural justice and interactional justice. However, researchers have recently proposed switching from concentrating on a particular dimension of justice to consider overall justice (Ambrose and Schminke, 2009; Patel *et al.*, 2012). The attitudes and results of employees have been better investigated by evaluating perceptions of overall justice instead of different individual types of justice (Priesemuth *et al.*, 2013). Overall justice is considered to reflect experience of justice more accurately (Barclay and Kiefer, 2014). It is also considered the main driver of results (Ambrose and Schminke, 2009; Priesemuth *et al.*, 2013), with employees reacting based on their overall evaluation of justice (Greenberg, 2001). The increasing importance of overall justice is attributed to the fact that focusing on one dimension of organizational justice may not precisely reflect employees' justice experiences. The concentration on overall justice may also overcome the restrictions of previous justice analyses (Ambrose and Schminke, 2009; Barclay and Kiefer, 2014; Priesemuth *et al.*, 2013).

Justice is significant because of its proven relationship with work-related outcomes at all levels (Hosmer and Kiewitz, 2005). Perceptions of justice can therefore affect work engagement and citizenship behaviors, which are considered to be valuable work-related results. Many studies have therefore concentrated on perceptions of justice (Greenberg *et al.*, 2005; Shao *et al.*, 2013).

3. Theory and hypotheses

3.1 Job demands–resources theory

This study builds principally on the JD–R model (Schaufeli and Bakker, 2004), with work engagement added to the model to understand this positive, satisfying psychological state (Schaufeli, 2017). Work engagement was defined as:

A positive, fulfilling, work-related state of mind that is characterized by vigor (that is, high levels of energy and mental resilience while working), dedication (referring to a sense of significance, enthusiasm, and challenge), and absorption (being focused and happily engrossed in one's work). (Schaufeli and Taris, 2014, p. 46)

The core postulation of the JD–R model (Demerouti *et al.*, 2001) is that employees in different firms experience diverse working settings, and that it is therefore helpful to group the features of these working settings into two comprehensive groups, i.e. job demands and job resources. This means it is possible to develop a comprehensive model that can be used in diverse professional frameworks, regardless of the particular requirements and resources of each occupation (Bakker *et al.*, 2003).

3.2 Hypothesis formulation

The constructs for this study were selected principally by relying on the JD–R model, because there is a shortage of studies outside Western countries using the model, especially in the nursing sector. The specific job demands and job resources (workload, time pressure, social support and job autonomy) were selected because of their high importance in the healthcare sector. We wanted to find ways to improve positivity in the workplace, so focused on work engagement as a mediator, rather than burnout. This more positive approach has been less explored than the more negative approach examining burnout. Previous work has largely focused on negative job elements, such as impaired

health, repetitive stress and burnout (Bakker and Demerouti, 2007). Most theoretical approaches to job-related health and welfare emphasize work pressure, and ignore positive workplace influences such as engagement (Schaufeli et al., 2009). We also used perceived overall justice (POJ) as a moderator because of its impact on the attitudes and behaviors of employees. Organizational justice may act as a moderator to influence the behavior and attitudes of employees in response to a demanding working environment (Wang et al., 2015). Viewpoints on organizational justice may affect behaviors and attitudes, in addition to emotions, in the workplace (Colquitt et al., 2001; Yang et al., 2014).

3.2.1 Job demands (workload and time pressure) and work engagement. Many scholars have researched work engagement, but very few have empirically explored the negative relationships between job demands and engagement in the workplace (however, see Nahrgang et al., 2011). Extensive evidence suggests that job resources, such as autonomy and development opportunities, are positively correlated with work engagement (Halbesleben, 2010). However, few studies have examined the relationship between job demands and engagement (Breevaart and Bakker, 2018). The JD–R model, for instance, ignores the direct relationship between job demands and job engagement (Radic et al., 2020). Similarly, findings on the relationship between job demands and work engagement are inconsistent (Sawang, 2012). Studies have found that job demands have a direct negative impact on engagement (Breevaart and Bakker, 2018; Oshio et al., 2018), and also that high job demands can have detrimental effects on workers' engagement (Pieters and Matheus, 2020). We therefore hypothesized that:

H1. Job demands negatively influence work engagement.

3.2.2 Job resources (social support and job autonomy) and work engagement. Korunka et al. (2009) acknowledged that most researchers highlight support from both supervisors and co-workers when describing the link between social support and engagement at work. Social support plays a beneficial and substantial role in work engagement (Crawford et al., 2010), so can be considered an important job resource that positively affects engagement at work (Christian et al., 2011; Halbesleben, 2010). Employees who perceive that they have autonomy in the workplace expect their managers to support them in acting independently, and are likely to appropriately evaluate the demands of their job and be able to treat them positively (Grover et al., 2017). It is clear that job autonomy and social support are therefore important job resources (Buch et al., 2015). Both factors are linked to work engagement (Bakker and Demerouti, 2007; Hakanen and Roodt, 2010). Colleagues' support and autonomy are also resources that help to motivate workers to become engaged in their work, remain committed to their companies and learn at work (Taipale et al., 2011). We therefore hypothesized that:

H2a. Social support positively influences work engagement.

H2b. Job autonomy positively influences work engagement.

H2c. Job resources positively influence work engagement.

3.2.3 Work engagement and job performance (in-role and extra-role performance). Engaged employees with higher energy levels perform better (Lazauskaite-Zabielske et al., 2018). Job performance also improves when employees have a positive and energetic motivational state of mind, marked by emotion (dedication), vitality (vigor) and mental activity (absorption) on the job. These conditions inspire and encourage hard work and good performance (Alessandri et al., 2018). Vigor and dedication, as components of work engagement, mediate the link between job characteristics and nurses' contextual and task performance (Bhatti et al., 2018). Work engagement is also correlated with organizational performance, task performance, extra-role performance and morale (Bailey et al., 2017). However, few studies have examined the relationship between work engagement and performance, as opposed to the association between work engagement and other outcomes (Lazauskaite-Zabielske et al., 2018). We therefore hypothesized that:

H3a. Work engagement positively influences in-role performance.

H3b. Work engagement positively influences extra-role performance.

H3c. Work engagement positively influences job performance.

3.2.4 The moderating role of perceived overall justice. It is important to understand how people make judgments about fairness in their firms, as well as how they respond to perceptions, as a way to understand organizational behavior (Colquitt and Greenberg, 2005; Ghosh *et al.*, 2014). These perceptions may affect their behaviors and attitudes in the workplace (Colquitt *et al.*, 2001; Yang *et al.*, 2014). Organizational aspects and external factors can influence employee engagement (Heyns and Rothmann, 2018), meaning that when employees feel that an organization is lacking in fairness, they may be less engaged, and other positive organizational outcomes may be reduced (Cenkci and Otken, 2019). Views about justice also affect organizational citizenship behavior and engagement at work (Farid *et al.*, 2019). Employees who feel that they are treated fairly at work are more engaged than those who feel unfairly treated (Biswas *et al.*, 2013). Justice is also positively correlated with work engagement and employee satisfaction (Suliman and Al Kathairi, 2013), and is a moderator of the impact of job insecurity on performance (Wang *et al.*, 2015). However, only a few studies have examined the association between perceptions of justice and employee work engagement (Agarwal, 2014). We therefore hypothesized:

H4a. Perceived overall justice moderates the influence of job demands on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice.

H4b. Perceived overall justice moderates the influence of social support on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice.

H4c. Perceived overall justice moderates the influence of job autonomy on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice.

H4d. Perceived overall justice moderates the influence of job resources on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice.

3.2.5 The mediating role of work engagement. Workload and time pressure have an obscure relationship with work engagement. This is because of two opposing situations: in some cases, employee busyness signifies employee importance, which might enhance work engagement, but a heavy workload may also lead employees to have negative feelings toward an organization (Oshio *et al.*, 2018). The presence of both insecurity and time pressure also undermines work engagement (Breevaart and Bakker, 2018; Oshio *et al.*, 2018). Both insecurity and time pressure also contribute to lower work engagement (Saari *et al.*, 2017). Job demands lower engagement at work (Bakker, 2015), a finding also confirmed by studies in the tourism and hospitality industries (Schaufeli, 2017). Psychological contracts and work engagement have been linked to job satisfaction and contextual performance (Rahman *et al.*, 2017). Engaged employees are more attentive and focused on their work tasks, so work engagement positively affects task performance (Christian *et al.*, 2011). We therefore hypothesized that:

H5a. Work engagement mediates the influence of job demands on in-role performance.

H5b. Work engagement mediates the influence of job demands on extra-role performance.

H5c. Work engagement mediates the influence of job demands on job performance.

The support of both supervisors and co-workers are important job resources that are positively associated with work engagement (Christian *et al.*, 2011; Halbesleben, 2010).

Similarly, social support and job autonomy are motivational aspects that encourage and enhance learning, work engagement and organizational commitment (Taipale *et al.*, 2011). Job autonomy is positively correlated with both career commitment and work engagement, but negatively correlated with emotional distress and burnout (Littman-Ovadia *et al.*, 2013). Work engagement is strongly associated with both in-role performance (Halbesleben *et al.*, 2013) and performance (Geue, 2018). It is also significantly correlated with both objective and subjective task performance (Bakker *et al.*, 2012; Saks and Gruman, 2014). We therefore hypothesized that:

- H6a.* Work engagement mediates the influence of social support on in-role performance.
- H6b.* Work engagement mediates the influence of social support on extra-role performance.
- H6c.* Work engagement mediates the influence of social support on job performance.
- H6d.* Work engagement mediates the influence of job autonomy on in-role performance.
- H6e.* Work engagement mediates the influence of job autonomy on extra-role performance.
- H6f.* Work engagement mediates the influence of job autonomy on job performance.
- H6g.* Work engagement mediates the influence of job resources on in-role performance.
- H6h.* Work engagement mediates the influence of job resources on extra-role performance.
- H6i.* Work engagement mediates the influence of job resources on job performance.

3.3 The conceptual research model

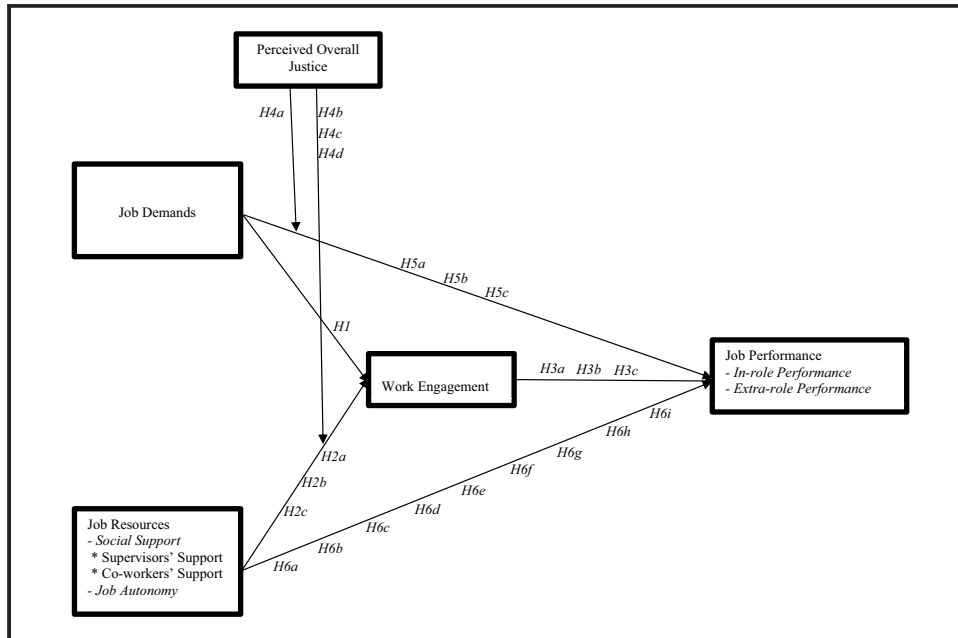
Building on the literature on work engagement, its antecedents, job performance and POJ, this conceptual paper is based on the following assumption: to be highly engaged in their work and make a positive contribution to the performance of their medical institution through enhanced job performance, it is desirable for nurses to work in a positive workplace characterized by justice, which provides appropriate work attributes, i.e. job characteristics (both job demands and job resources). Figure 1 shows the theoretical research model.

4. Methodology

4.1 Participants and procedure

The population for this study was the local and expatriate nursing workforce in the UAE public healthcare sector, some 20,098 people. The study sample was 2,369, of whom the majority were noncitizens (93.12%) and women (85.65%). The biggest age group was those aged 25–35 years (38.7%), closely followed by those aged 35–45 years (37.9%). The majority held bachelor's degrees (69.2%) and had more than 10 years of work experience (65.5%). The biggest group (45.6%) had the shortest tenure with the same employer, i.e. less than five years.

There were some inclusion and exclusion criteria for the targeted sample. First, this was a quantitative study established to describe the perceptions of nurses in the UAE's public healthcare sector. The research was therefore limited to nurses in the public institutions of the UAE healthcare sector across the seven emirates, who were willing to participate in the online survey. Managers' perceptions were not included in this research. Other professionals, such as physicians, management and administrators, were not included in the sample population. The study also focused on the public healthcare sector, excluding nurses working in private healthcare entities, because the nature and rules of each sector are different. We also required the nurses to be current employees at one of the public entities in the healthcare sector to be eligible to participate in the research, and agree to

Figure 1 Theoretical research model

participate in the research voluntarily. Nurses of different ages, levels of experience and qualifications were included in this study.

The sampling procedure for the research followed a multistage stratified sampling procedure:

- Stage 1: Two agencies in the public healthcare sector assisted in the data collection. They have almost equal populations (49.97% and 50.03% of the nurses in the sector). The sample was therefore drawn proportional to their populations, with 1,178 (49.73%) from Agency 1 and 1,191 (50.27%) from Agency 2. Agencies were the first stratum of the study.
- Stage 2: From each organization, we drew a sample that was proportional to general population figures on the basis of gender, with 961 (81.6%) women and 217 men from Agency 1 and 1,068 (89.7%) women and 123 men from Agency 2. Gender was the second stratum.
- Stage 3: From the list of nursing staff from each agency, organized by emirate and gender, we selected the required number of people using random sampling. Random numbers were generated using SPSS version 28.0.

4.2 Overview

This research used a quantitative approach, with a questionnaire as the data collection tool. The data were collected only after getting ethical approval from the university ethical committee, and ensuring that all the nurses had given written informed consent to protect their privacy and confidentiality. A multistage stratified sampling was used, with a sample size of 2,369 from the two bodies governing the sector. The data were analyzed using SPSS 28.0 and Jamovi 2.0.

4.3 Measures

The instrumentation for the study's constructs was selected based on its widespread use in the literature. SurveyMonkey was used to develop the survey and it was distributed among nurses working in the public healthcare sector in the UAE.

4.3.1 Workload. To assess workload, we used the scale developed by [Janssen \(2001\)](#), which contains six items. It was adapted by removing two items that reflect time pressure more than workload. A sample item is “I have to work extra hard to finish a task.” A five-point Likert-type scale was used, ranging from 1 (never) to 5 (always).

4.3.2 Time pressure. Time pressure was assessed using three items adapted from the instrument for stress-oriented job analysis developed by [Semmer et al. \(1999\)](#). A sample item is “I had to work faster than usual to get my work done.” The items were answered using a five-point Likert-type scale, ranging from 1 (never) to 5 (always).

4.3.3 Social support. Social support was measured using eight items adapted from the Multidimensional Scale of Perceived Social Support developed by [Zimet et al. \(1988\)](#). This concentrates on social support provided by friends, family and a special person. The eight items selected were rephrased to measure supervisor and co-worker support instead of a special person and friends. Sample items included, “My supervisor is available when I am in need” and “I have co-workers with whom I can share my joys and sorrows.” The items were answered on a five-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

4.3.4 Job autonomy. Job autonomy was assessed by adapting the three-item autonomy subscale of the Job Diagnostic Survey ([Hackman and Oldham, 1980](#)), with slight rephrasing. A sample item is “My job gives me the chance to use my personal initiative and judgment in carrying out my work.” The items were answered on a five-point Likert-type scale, ranging from 1 (never) to 5 (always).

4.3.5 Work engagement. Work engagement was measured using the shortened Utrecht Work Engagement Scale (UWES) developed by [Schaufeli et al. \(2006\)](#). The UWES measures vigor, dedication and absorption, all of which contribute to an employee’s overall work engagement. A sample item is “At work, I feel that I am bursting with energy.” The items were answered using a five-point Likert-type scale, ranging from 1 (never) to 5 (always).

4.3.6 Perceived overall justice. POJ was measured by adapting the six-item scale developed and validated by [Ambrose and Schminke \(2009\)](#) with two negative items reversed. A sample item of the scale is “For the most part, this organization treats its employees fairly.” The items were assessed using a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4.3.7 In-role performance. To measure in-role performance, we used the seven-item job performance scale developed by [Williams and Anderson \(1991\)](#), adapted to measure perceptions of nurses not supervisors, and deleting two negative items. A sample item is “I adequately complete the duties assigned to me.” The items were answered on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

4.3.8 Extra-role performance. Extra-role performance was measured using seven items directed at individuals (OCB-I) developed by [Williams and Anderson \(1991\)](#). A sample item is “I help others who have been absent.” The items were answered on a five-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

5. Results

5.1 Reliability and validity analyses

The means, standard deviations and scale reliabilities (Cronbach’s α and McDonald’s ω) are shown in [Table 1](#). We used three multidimensional scales, each consisting of two subscales, and two unidimensional scales. Before proceeding to the reliability analysis, it is essential to ensure that all the items are coded in the same way. In the questionnaire for this study, the items under the subscale workload and time pressure were phrased the opposite way from the items in other scales. These items were coded from 1 (never) to 5 (always), so

Table 1 Results of reliability analysis of scales, including reassessment

No.	Scale	Items	Mean	SD	Cronbach's α	McDonald's ω
<i>Initial assessment</i>						
1	Job demands					
1.1	Workload	4	3.17	0.858	0.866	0.869
1.2	Time pressure	3	2.93	0.937	0.847	0.848
2	Job resources					
2.1	Social support	8	3.77	0.606	0.873	0.875
2.2	Job autonomy	3	3.56	0.908	0.849	0.851
3	Work engagement	9	3.99	0.674	0.862	0.877
4	Job performance					
4.1	In-role performance	5	4.43	0.522	0.857	0.885
4.2	Extra-role performance	7	4.02	0.538	0.779	0.791
5	Perceived overall justice	6	3.68	0.886	0.965	0.965
<i>Reassessment</i>						
1	Job demands	7	3.07	0.83	0.91	0.91
2	Job resources	11				
2.1	Social support	8				
2.1.1	Supervisors' support	4	3.62	0.82	0.92	0.92
2.1.2	Co-workers' support	4	3.91	0.60	0.81	0.82
2.2	Job autonomy	3	3.56	0.91	0.85	0.85
3	Work engagement	7	4.14	0.73	0.89	0.89
4	Job performance	9				
4.1	In-role performance	5	4.43	0.52	0.86	0.89
4.2	Extra-role performance	4	4.17	0.52	0.73	0.75
5	Perceived overall justice	6	3.58	0.89	0.96	0.97

Source: Computed from the primary survey data

that higher values indicated a less healthy situation. They were recoded from 1 (always) to 5 (never), so that higher values indicated a better situation.

Both measures of reliability, Cronbach's α and McDonald's ω , attained a value of more than 0.8 for all eight scales except for extra-role performance, which had α 0.779 and ω 0.791, values close to 0.8. This meant that all scales could be treated as reliable measures of the intended constructs. The reliability analysis therefore confirmed the consistency of the scales, and further analysis could be built on them with confidence. None of the items in any of the scales were removed or modified after the reliability analysis. We also assessed the construct validity (convergence and discriminant validity) using confirmatory factor analysis (CFA). This analysis used IBM SPSS Amos Version 28.0 (Statistics, 2021) with the plugins developed by Gaskin and Lim (2016).

The study constructs were tested separately for fitness and to assess the measurement model by running CFA and/or exploratory factor analysis (EFA). We used EFA because the CFA model for all the constructs together was not a good fit, with concerns about its validity. The final model is shown in Supplementary Figure 1, and had a good fit, with discriminant and convergent validity. The values of average variance extracted (AVE) for all the constructs were greater than 0.5, demonstrating convergent validity, and the values of maximum shared variance (MSV) were less than AVE for all the constructs, confirming discriminant validity. The model fit measures are shown in Table 2. There was excellent fit for all the listed fit measures except for CMIN/df, which was acceptable. Chi square-based measures tend to show a lesser model fit as the sample size increases. Overall, the model was considered to be a good fit. The convergent and discriminant validity of all the constructs is shown in Table 3.

All the constructs in the modified scales therefore showed both convergent and discriminant validity. The CFA model, with all the scales, is shown in Supplementary

Table 2 Fit measures for the re-specified CFA model for all constructs in the study			
<i>Measure</i>	<i>Estimate</i>	<i>Threshold</i>	<i>Interpretation</i>
CMIN	2,907.904	–	–
DF	688.000	–	–
CMIN/DF	4.227	Between 1 and 3	Acceptable
CFI	0.966	>0.95	Excellent
TLI	0.962	>0.95	Excellent
NFI	0.956	>0.95	Excellent
SRMR	0.045	<0.08	Excellent
RMSEA	0.037	<0.06	Excellent
Source: Compiled and calculated from the results of CFA			

Table 3 Validity measures for the CFA model for all constructs in the study												
<i>Construct</i>	<i>CR</i>	<i>AVE</i>	<i>MSV</i>	<i>MaxR(H)</i>	<i>JD</i>	<i>S</i>	<i>C</i>	<i>JA</i>	<i>WE</i>	<i>IR</i>	<i>ER</i>	<i>POJ</i>
<i>JD</i>	0.902	0.570	0.169	0.909	0.755							
<i>S</i>	0.923	0.752	0.301	0.940	0.406***	0.867						
<i>C</i>	0.814	0.533	0.199	0.877	0.211***	0.446***	0.730					
<i>JA</i>	0.829	0.626	0.211	0.939	0.285***	0.402***	0.294***	0.791				
<i>WE</i>	0.887	0.534	0.260	0.903	0.411***	0.422***	0.344***	0.459***	0.731			
<i>IR</i>	0.884	0.615	0.238	0.916	0.133***	0.182***	0.224***	0.204***	0.433***	0.784		
<i>ER</i>	0.893	0.686	0.238	1.171	0.086***	0.190***	0.284***	0.134***	0.346***	0.488***	0.828	
<i>POJ</i>	0.962	0.810	0.301	0.966	0.386***	0.549***	0.328***	0.377***	0.510***	0.235***	0.199***	0.900
Notes: Significance: † $p < 0.100$, * $p < 0.050$, ** $p < 0.010$, *** $p < 0.001$												
Source: Compiled and calculated from the results of CFA												

Figure 2. It includes the second- and third-order constructs of the multidimensional scales and all single constructs of unidimensional scales.

5.2 Reliability revisited

The modifications in the scales were required to reconsider and re-measure the reliability of the scales using alpha and omega. The results are shown in the bottom half of Table 2, which shows that all scales retained good reliability.

5.3 Exploratory and comparative analysis of scales

5.3.1 Descriptive statistics of the scales. The descriptive statistics of the scales (Table 4) show each scale's magnitude and nature and provide a basic univariate understanding of the measure of each scale, enabling us to advance to multivariate analyses.

The distributions of all the scales had minimum and maximum values of 1 and 5. The highest average value was scored by job performance, 4.30, and the lowest by job demands, 2.93. The standard deviation of all the major scales was less than 1, meaning low variations from the central value, the mean. Only work engagement had a skewness greater than 1. Two scales, work engagement and job performance, had a kurtosis value greater than 1. The measures of skewness and kurtosis show that the distribution of the scales did not follow a normal distribution. Work engagement and job performance scales showed the strongest non-normal features, but all the scales were affected ($p < 0.001$). However, the values for skewness and kurtosis measures were less than +1 and –1, meaning that the departure from normality was not very large. As the sample size increases, the scale variables are more likely to follow a normal distribution. We attempted to test mean

Figure 2 Bivariate and canonical correlations

		JD	JR	WE	POJ	IR	ER	JP
JD	Pearson's r	1						
	p-value	< 0.001						
JR	Canonical correlation	1						
	Pearson's r	-0.305	1					
	p-value	< 0.001	< 0.001					
WE	Canonical correlation	0.442	1					
	Pearson's r	-0.352	0.507	1				
	p-value	< 0.001	< 0.001	< 0.001				
POJ	Canonical correlation	0.458	0.542	1				
	Pearson's r	-0.359	0.491	0.478	1			
	p-value	< 0.001	< 0.001	< 0.001	< 0.001			
IR	Canonical correlation	0.404	0.57	0.496	1			
	Pearson's r	-0.076	0.278	0.386	0.233	1		
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001		
ER	Canonical correlation	0.217	0.342	0.432	0.262	1		
	Pearson's r	-0.07	0.279	0.334	0.207	0.504	1	
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
JP	Canonical correlation	0.159	0.384	0.393	0.24	0.548	1	
	Pearson's r	-0.084	0.321	0.415	0.254	0.866	0.868	1
	p-value	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
	Canonical correlation	0.227	0.408	0.472	0.288	NA	NA	1

Notes: Green shows positive correlations and red negative. A darker shade of a blue shows a stronger canonical correlation

differences among scales using a robust measure of Welch's statistic that remains immune to the heterogeneity of variances. The results gave valuable insights on the differences between scale variables across different demographic variables (Table 4).

The most important finding was that there were statistically significant differences across all demographic variables with regard to job demands, but no differences across any

Table 4 Descriptive statistics and summary of testing for the mean differences in the scale variables across demographic variables

Code	Scales and subscales	Agency	Nationality	Gender	Age	Education	Experience	Tenure
JD	Job demands	0.022	0.009	< 0.001	0.042	< 0.001	< 0.001	< 0.001
S	Supervisors' support	< 0.001	0.205	< 0.001	0.531	0.014	0.798	0.04
C	Co-workers' support	0.254	0.093	0.329	0.006	0.333	< 0.001	0.054
SS	Social support	0.06	0.092	< 0.001	0.234	0.059	0.078	0.073
JA	Job autonomy	0.342	0.104	0.233	0.01	0.996	0.019	0.362
JR	Job resources	0.114	0.052	0.012	0.016	0.47	0.011	0.126
WE	Work engagement	0.337	< 0.001	0.001	< 0.001	0.003	0.014	0.004
IR	In-role performance	< 0.001	0.238	0.991	0.211	0.443	0.022	0.037
ER	Extra-role performance	0.462	0.529	0.557	0.256	0.022	0.752	0.233
JP	Job performance	0.136	0.285	0.732	0.164	0.233	0.523	0.115
POJ	Perceived overall justice	< 0.001	< 0.001	0.026	0.802	0.008	0.002	< 0.001
<i>Summary statistics</i>								
Scale		Mean		SD		Skewness		Kurtosis
Job demands		2.93		0.834		0.026		-0.039
Job resources		3.67		0.633		-0.403		0.452
Work engagement		4.14		0.734		-1.112		1.488
Job performance		4.30		0.453		-0.591		2.081
Perceived overall justice		3.68		0.886		-0.911		0.944

demographic variables with regard to job performance. This striking and surprising finding can be explained because of the nature of the duties of nurses, who deal with human life-related issues that do not prevent them delivering their duties despite differentiating factors.

5.3.2 Bivariate correlations. All correlation coefficients were statistically significant at less than 0.001 (Figure 2). As expected, job demands (JD) were negatively correlated with all other scale variables. They were mildly correlated with job resources (JR), work engagement (WE) and POJ, and negligibly (close to zero) correlated with the performance scale variables in-role performance (IR), extra-role performance (ER) and job performance (JP). This very low level of correlation shows that even with varying levels of job demands, nurses' performance remained unaffected. This result vindicates the findings from the exploratory and comparative analysis of scale across different demographic variables. We also found very strong correlations between job performance and its components, and the relationship between in-role and extra-role performance was only moderate. Other moderate correlations were found between job resources, work engagement and perceived organizational justice. All other correlations were negligible.

5.3.3 Canonical correlation. There was a noticeable difference in correlations from the bivariate Pearson correlation and multivariate canonical correlation analyses. Both of them showed low levels of correlation between the scale variables (Figure 2). The canonical correlation value could show the relationship more clearly. All the canonical correlation values were higher than the values from the bivariate analysis. Job demands was negatively related to all variables, but all relationships, though statistically significant, showed negligible or moderate levels.

5.4 Hypothesis testing

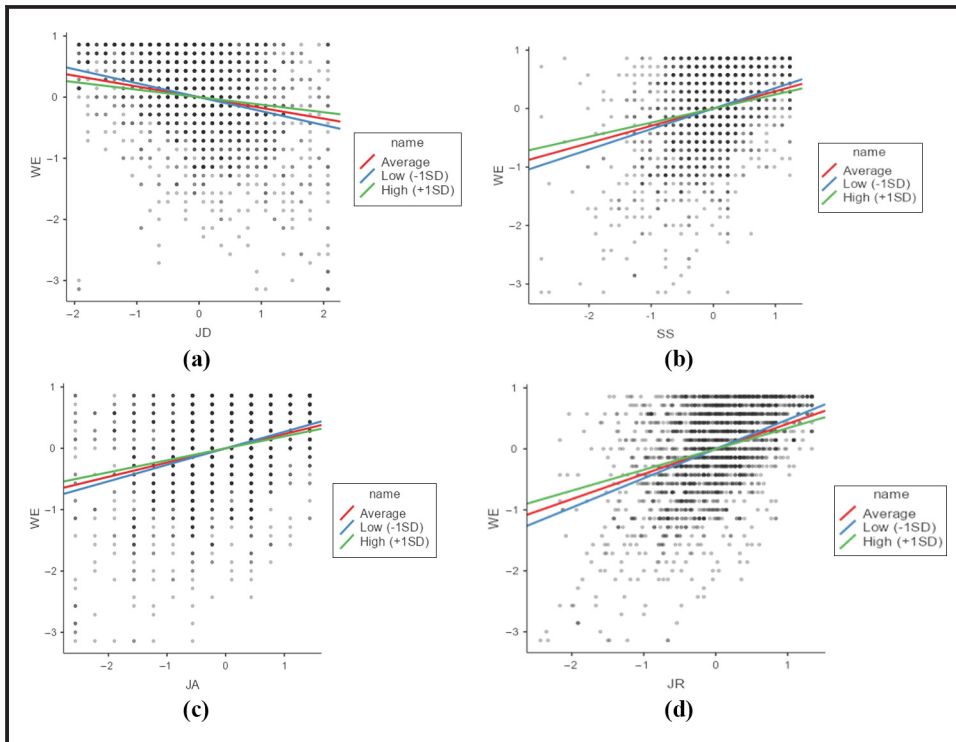
The simple regression, mediation and moderation analyses used the statistical software Jamovi 2.0 and its add-on module Medmod (jamovi.org, 2021).

5.4.1 Moderation effect of perceived overall justice. This section of the research attempted to measure the causality of the relationships between job demands, job resources and work engagement, and to test for the presence and magnitude of moderation by perceived organizational justice. In the moderation analysis, the p -value of the independent variable job demands was significant ($p < 0.001$). The coefficient value (-0.176) shows that job demands exerted a negative influence on the dependent variable work engagement, so any increase in job demands will result a decline in engagement. The interaction term ($JD \times POJ$) was also significant ($p < 0.05$) indicating that it moderated the relationship between engagement and job demands (0.059). The value of the coefficient at the lower level of perceived organizational justice (-0.228) was greater than its value at the higher level (-0.123). This suggests that for nurses with lower perceived organizational justice, there is a stronger negative relationship between job demands and engagement (see Figure 3).

All regression coefficients were positive and significant ($p < 0.001$). The moderation effect of perceived organizational justice on the relationship between social support and engagement was estimated as 0.295. The coefficients of social support, job autonomy and job performance show that these three were linked to work engagement, though the magnitude was "mild" (job autonomy 0.232). The simple slope estimates show that social support had more influence on engagement among those with low than high perceived organizational justice (0.35 vs 0.24). The relationship was stronger between job autonomy and engagement among those with low than high perceived organizational justice (0.269 vs 0.196). The relationship between job resources and work engagement was stronger among those with low than high perceived organizational justice (0.481 vs 0.342). The simple slope coefficients are shown visually in Figure 3.

Perceived organizational justice was a statistically significant moderator in all the examined contexts, but the moderation effect was very small. The simple slope estimates showed the

Figure 3 Slope plots to show the influence of perceived organizational justice on study relationships: (a) Job demands (JD) and work engagement; (b) social support (SS) and work engagement; (c) job autonomy (JA) and work engagement; (d) job resources (JR) and work engagement



strength of the relationship between the independent variable and work engagement at different levels of the moderating variable. Those with low perceived organizational justice had a closer relationship between the independent and dependent variables. Even if the level of perceived organizational justice is low, work engagement therefore remains largely unaffected, and the moderation effect is very small or negligible.

5.4.2 Mediation analysis of work engagement. The influence of job demands and job resources (and their components) on job performance (and its components) was also examined. We hypothesized that the relationships between the independent and dependent variables would be influenced by work engagement. This analysis therefore aimed to explore the existence, nature and magnitude of the influence of work engagement as a mediator.

All the coefficients were statistically significant and positive for the effect of work engagement on in-role, extra-role and overall job performance. However, the influence was mild. In-role performance was slightly more affected than either extra-role or overall job performance (0.275 vs 0.239 and 0.257).

Work engagement had a partial mediation role in the relationship between job demands and performance (67.87% for in-role, 69.73% for extra-role and 68.72% for overall performance). Job demands had a negative indirect effect on performance through engagement (in-role -0.090 , extra-role -0.078 and overall performance -0.084). The direct effect was positive (in-role 0.043 , extra-role 0.034 and overall performance 0.038), so the total effect was negative (in role -0.048 , extra-role -0.044 and overall performance -0.046). The low value of the coefficients clearly shows the practical significance of the effects. Their closeness to zero can be interpreted as the lack of sensitivity of the

independent variable job demands upon the dependent variables. Variations in job demands therefore do not have a sizable impact on performance.

Work engagement also acted as a partial mediator in the relationship between social support and performance (58.81% for in-role, 32.70% for extra-role and 44.16% for overall performance). The effects were small (in-role 0.216, extra-role 0.276 and overall, 0.246), but all were positive and statistically significant. Job autonomy had a small influence on any type of performance, but the level of mediation by work engagement was high (67.88% for in-role, 75.25% for extra-role and 71.16% overall). The values of the coefficients were very low (indirect 0.081, direct 0.033 and total 0.114), indicating the very low influence of job autonomy on performance.

Job resources had a positive and significant impact on all types of performance, with a significant mediation effect (60.26%, 47.21% and 53.71% of the total effect). However, the magnitude of the total effect itself was low (in-role 0.229, extra-role 0.231 and overall performance 0.23). [Table 5](#) shows the results of the hypothesis testing, and [Table 6](#) the mediation effects of work engagement.

The only fully mediated relationship was between job autonomy and extra-role performance. The mediation was partial for all other relationship. All the mediation models gave significant results, so we can conclude that work engagement is a significant mediator variable. However, the coefficients were all low or very low, indicating the low levels of relationship between independent and dependent variables.

6. Discussion

This study aimed to establish the level of work engagement and its antecedents, and its impact on job performance, among public healthcare nurses. It also assessed whether organizational justice influenced these relationships. The correlation between job demands and work engagement has not been extensively studied ([Breevaart and Bakker, 2018](#)). The literature using the JD–R model as a theoretical framework has also obtained inconsistent conclusions ([Radic et al., 2020](#)), meaning that the association between job demands and work engagement is unclear ([Sawang, 2012](#)). This study reinforces the negative relationship between job demands and work engagement, adding to the literature that proposes such a relationship ([Breevaart and Bakker, 2018](#); [Oshio et al., 2018](#)). This led us to accept the hypothesis that job demands negatively influence work engagement. Job demands were negatively associated with all other constructs, but the degree of the association was mild to negligible. This suggests that the level of job demands does not affect the level of job performance of nurses in the UAE. This may suggest that nurses in the UAE public healthcare sector do not permit the demands of their work to prevent them from carrying out their duties.

The relationship between job demands and work engagement was significantly negative, which means that any increase in job demands will result in a decline in work engagement. However, the level of influence was mild, so job demands are not expected to have much impact on the engagement of nurses. Previous studies have used distinct measurement items for time pressure and workload constructs, but we concluded that the items fitted into a single dimension labeled “job demands”. This may be attributed to the very specific nature of nurses’ work and duties, meaning that their workload and time pressure are closely linked, and cannot be detached as separate constructs.

We found that job resources and its components positively influenced work engagement, which was consistent with previous studies such as [Bakker and Demerouti \(2007\)](#) and [Hakanen and Roodt \(2010\)](#). They found that high levels of autonomy and social support were linked to work engagement. Previous studies have found that organizational elements and external factors also influence employee engagement ([Heyns and Rothmann, 2018](#)), and our findings confirmed this. When perceived organizational justice was considered as a

Table 5 Results of hypothesis testing

No.	Hypothesis	Decision
H1	Job demands negatively influence work engagement	Accepted
H2a	Social support positively influences work engagement	Accepted
H2b	Job autonomy positively influences work engagement	Accepted
H2c	Job resources positively influence work engagement	Accepted
H3a	Work engagement positively influences in-role performance	Accepted
H3b	Work engagement positively influences extra-role performance	Accepted
H3c	Work engagement positively influences job performance	Accepted
H4a	Perceived overall justice moderates the influence of job demands on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice	Accepted
H4b	Perceived overall justice moderates the influence of social support on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice	Rejected
H4c	Perceived overall justice moderates the influence of job autonomy on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice	Rejected
H4d	Perceived overall justice moderates the influence of job resources on work engagement such that the influence will be stronger for employees with perceptions of higher overall justice	Rejected
H5a	Work engagement mediates the influence of job demands on in-role performance	Accepted
H5b	Work engagement mediates the influence of job demands on extra-role performance	Accepted
H5c	Work engagement mediates the influence of job demands on job performance	Accepted
H6a	Work engagement mediates the influence of social support on in-role performance	Accepted
H6b	Work engagement mediates the influence of social support on extra-role performance	Accepted
H6c	Work engagement mediates the influence of social support on job performance	Accepted
H6d	Work engagement mediates the influence of job autonomy on in-role performance	Accepted
H6e	Work engagement mediates the influence of job autonomy on extra-role performance	Accepted
H6f	Work engagement mediates the influence of job autonomy on job performance	Accepted
H6g	Work engagement mediates the influence of job resources on in-role performance	Accepted
H6h	Work engagement mediates the influence of job resources on extra-role performance	Accepted
H6i	Work engagement mediates the influence of job resources on job performance	Accepted

Table 6 Summary of the mediation effect of work engagement on relationships between variables

No.	Relationship	Type of mediation	Mediation effect of work engagement (%)
1	Job demands on in-role performance	Partial	67.87
2	Job demands on extra-role performance	Partial	69.72
3	Job demands on job performance	Partial	68.71
4	Social support on in-role performance	Partial	58.81
5	Social support on extra-role performance	Partial	32.70
6	Social support on job performance	Partial	44.16
7	Job autonomy on in-role performance	Partial	67.88
8	Job autonomy on extra-role performance	Full	75.25
9	Job autonomy on job performance	Partial	71.16
10	Job resources on in-role performance	Partial	60.26
11	Job resources on extra-role performance	Partial	47.21
12	Job resources on job performance	Partial	53.71

moderator variable, the value of the coefficient was higher at a lower level of POJ. Nurses with lower POJ therefore showed a stronger negative relationship between job demands and work engagement. Previous studies found that when employees perceive fairness in their firms is low, this may affect their engagement and other positive organizational outcomes (Cenkci and Otken, 2019).

However, some of our results were contrary to previous studies. We found that job resources were significant, with a positive influence of both the overall construct and its components (social support and job autonomy) on work engagement. However, the magnitude was low. The influence of job resources and its components on work engagement was stronger among those with low perceptions of justice. Employees who perceive less justice might disengage from their work, as Suliman and Al Kathairi (2013) found, claiming that justice was positively associated with both employee satisfaction and work engagement. However, in our study, even when the level of POJ is low, work engagement remained unaffected. This was a surprising finding, and it requires further exploration in future studies.

Only one model, job autonomy on extra-role performance, was fully mediated. All the other mediation models showed partial mediation. All mediation models were significant, and work engagement is therefore a significant mediator, which supports the JD–R model. However, all the coefficients had low or very low values, indicating weak relationships between the independent and dependent variables. This research has therefore helped to clarify the ambiguity in the literature on the relationship between job demands and work engagement, showing a negative association in line with previous studies (Breevaart and Bakker, 2018; Oshio *et al.*, 2018) that found a negative association between job demands and work engagement. Our findings are also consistent with previous studies on job resources. Job resources, and especially social support, have a positive and strong impact on work engagement (Crawford *et al.*, 2010). Another study also found a positive link between job autonomy and both work engagement and career commitment, but a negative association between job autonomy and both burnout and emotional distress (Littman-Ovadia *et al.*, 2013). Our findings also fit previous studies that found a significant connection between work engagement and in-role performance (Halbesleben *et al.*, 2013), and a positive association between task performance and work engagement (Geue, 2018).

6.1 Theoretical implications

Our findings contribute to the literature on the JD–R model, and help to reduce the ambiguity of the job demands–work engagement relationship. They support the existence

of a direct negative relationship. Previous studies have mainly considered the relationship between job demands and burnout (see, e.g. Demerouti *et al.*, 2001). We have also expanded the literature by exploring the theory in a non-Western context, and in the field of nursing, which has not previously been much investigated. The mediating role of work engagement is also new, and supports the modified version of the JD–R model that emphasizes the importance of studying positive psychological aspects to create a more holistic model (Schaufeli and Bakker, 2004). Our study also enriches the literature on organizational factors, especially overall justice, because our results on this are contrary to previous studies. This was a surprising and striking result, with a stronger influence between job resources and work engagement among nurses with lower perceptions of organizational justice. Our study also provided new findings on the time pressure and workload measurement scales, with no discriminant validity between the two subscales. We therefore combined job demands as a unidimensional construct with items from both subscales.

6.2 Practical implications

Our findings have several potential practical implications. First, they may encourage human resources (HR) practitioners to improve understanding of work engagement among nurses, and educate them about its role in supporting positive outcomes. They may therefore provide development and awareness plans, training programs, workshops, courses and conferences to help nurses to manage job demands, improve utilization of job resources and better foster engagement by reinforcing its association with performance. It is also important to prepare and train supervisors to support nurses. HR professionals and policymakers may also develop strategies to pinpoint the significance of work engagement and develop approaches to improve it. The findings are important for nurses, because they highlight the importance of understanding the demanding nature of their tasks, and using their personal resources to cope. Decision-makers should develop specific programs to attract and motivate employees, and ensure that firms appreciate good performance. Managers and HR practitioners should ensure a common understanding of organizational justice and aim to deliver fairness in the workplace, because organizational elements have a direct impact on the attitudes and behaviors of employees.

6.3 Limitations and directions for future research

Just as with all research, this study was not without limitations, which might be used as an agenda for future studies. First, this study used a cross-sectional design, in which the data were collected at one point in time, which may restrict the generalizability of the results. A longitudinal study would be helpful to bridge this restriction and provide a better opportunity to generalize findings. Our data were also collected via a self-reported survey, which may result in issues of common-method variance (Podsakoff *et al.*, 2003). We addressed this by selecting measurement scales from previous studies that have proven validity. We also ensured the anonymity of the respondents. However, future studies should gather data from multiple sources to further reduce common method variance. Our study also only included nurses working in the public healthcare sector. Future studies should include the private sector and other healthcare professionals. Our findings were inconsistent with previous work on the effect of overall justice and job resources, which needs further exploration in different sectors or with antecedent variables. Our work on the subscales of job demands should also be further explored in different sectors in the UAE.

7. Conclusions

Our study was in line with previous work on the relationship between job resources and work engagement, and work engagement and job performance, and the role of work

engagement as a mediator. However, it has added to the literature of the relationship of job demands and work engagement, which was previously ambiguous. We have confirmed the negative association and shown that job demands have a relationship with work engagement, which is not restricted to burnout. The role of overall justice was as expected for job demands, but not for the relationship of job resources and work engagement, which necessitates further studies. Most significant and interesting is that performance was unaffected by changing job demands. This indicates a positive attitude among nurses in handling a demanding working environment and sustaining performance.

Supplementary materials

The supplementary material for this article can be found online

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Further reading

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