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**Individual and organizational psychosocial predictors of hospital doctors' work-related wellbeing: A multilevel and moderation perspective**

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### **Abstract**

**Background:** The high prevalence of burnout and depression among doctors highlights the need to understand the psychosocial antecedents to their work-related wellbeing. However, much of the existing research has been a-theoretical, operationalized a narrow measurement of wellbeing, and predominantly examined such relationships at the individual level.

**Purpose:** This study uses a multilevel perspective to examine individual (i.e., job demands and resources) and organizational level psychosocial predictors of three measures of work-related wellbeing: perceived stress, presenteeism and work engagement. The Job Demands-Resources (JD-R) theory underpins the postulated relationships.

**Methodology:** The 2014 National Health Service Staff Survey was analyzed using multilevel modelling in MPlus. The dataset involved 14,066 hospital-based doctors grouped into 157 English hospital organizations (i.e., Trusts).

**Results:** Congruent with the JD-R, job demands (workplace aggression and insufficient work resources) were stronger predictors of perceived stress and presenteeism than job resources. Equally, job resources (job control and manager support) were generally stronger predictors of work engagement than job demands. At the organizational level - bed occupancy rates and number of emergency admissions predicted work engagement. No hypothesized individual or multilevel interactions were observed between any of the job demands and resources.

**Practical Implications:** The findings emphasize that a broader perspective of work-related wellbeing among hospital doctors should be employed, and the empirical value of examining such relationships from a multilevel perspective. Successful health intervention should target the appropriate antecedent pathway, and recognize the role of organizational level factors when trying to manage hospital doctors' work-related wellbeing.

## **Individual and organizational psychosocial predictors of hospital doctors' work-related wellbeing: A multilevel and moderation perspective**

For hospitals to continue to provide safe, sustainable and patient-centered care, the wellbeing of their workforce is critical. The statistics on the wellbeing of doctors are, however, concerning. Globally, 28.8% of doctors report depressive symptoms (Mata et al., 2015), with the prevalence of burnout typically ranging between 25% and 36% (Prins, Gazendam-Donofrio, et al., 2007). Not only are these levels higher in comparison to the general population, but symptoms of burnout and depression among doctors have progressively increased over time (Shanafelt et al., 2015). By focusing almost exclusively on burnout, and to a lesser extent perceived stress, contemporary research provides a skewed perspective of doctors' wellbeing that neglects doctors' ability to engage and flourish in their work. Work-related wellbeing is a broad and inclusive construct that exists on a continuum, encompassing a range of negative and positive constructs. This includes burnout and ill-health on one end, and happiness, flourishing and thriving on the other (van Horn, Taris, Schaufeli, & Schreurs, 2004). Therefore, there is a continuing need to better understand and quantify how the social, organizational, physical and psychological aspects of work (broadly defined as psychosocial working conditions) functions as a predictor to different dimensions of doctors' work-related wellbeing. Most studies to date examine these direct relationships at the individual level, not considering that the complexity of the healthcare system means that work-related wellbeing is not only predicted by organizational level factors, but that these predictors should also interact with each other.

The current study aims to examine the predictive association between perceived exposure to psychosocial working conditions (namely, job demands and resources) and organizational level demands in relation to three work-related wellbeing outcomes (perceived

stress, presenteeism, and work engagement). The Job Demands-Resources (JD-R) Theory (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001) theoretically underpins the postulated pathways between psychosocial working conditions and doctors' work-related wellbeing. The main objectives of this study are, therefore, to: (i) test and quantify such relationships using a national sample of hospital doctors in the English National Health Service (NHS); and (ii) to examine the nature of these pathways from a multilevel perspective.

### **The Psychosocial Working Conditions and Work-related Wellbeing Relationship**

Psychosocial working conditions can be separated into job demands and job resources (Demerouti et al., 2001). The former refers to the any social, organizational, physical or psychological aspect of work associated with psychological or physiological costs. In contrast, job resources are aspects of work that help reduce job demands, achieve work goals or stimulate personal learning and development. According to JD-R theory (Demerouti et al., 2001), all aspects of work are classed as either a job demand or resource. This allows the theory to capture a wider range of the work environment than earlier studies that have tested the Job Demand-Control (Johnson et al., 1995) or Effort-Reward Imbalance (Loerbroks, Weigl, Li, & Angerer, 2016) models among doctors.

Unlike other wellbeing models, JD-R theory makes explicit inclusion of a broader perspective of work-related wellbeing. A core tenant of this theory is that job demands and resources separately and respectively predict negative (e.g., burnout and perceived stress) and positive (e.g., work engagement; Figure 1) wellbeing. The greater psychological and physical cost associated with chronic job demands drain an individual's energy and eventually results in negative wellbeing (Schaufeli & Bakker, 2004). Extrinsically, job resources support the reaching of one's goals; while intrinsically, they foster growth, development and learning. Having increased access to job resources can improve the extent the worker feels efficacious,

as those with a wider array of resources have more opportunities to learn new behaviors (Bakker, Hakanen, Demerouti, & Xanthopoulou, 2007). Such postulations underpin the view of a positive association between job resources and work-related wellbeing.

Although the model advocates these separate and independent pathways (Bakker & Demerouti, 2017), meta-analytical studies yield mixed-evidentiary support (LePine, Podsakoff, & LePine, 2005). Further studies explicitly testing the JD-R's dual pathways also report cross-paths, where job resources predicted ill-health (Bakker, Demerouti, & Schaufeli, 2003) and burnout (Schaufeli & Bakker, 2004); or that job demands predicted engagement (Bakker et al., 2007; Hakanen, Bakker, & Demerouti, 2005). This suggests that although there is strong evidence for separate pathways, this process may not be completely independent and cross-paths may still occur.

### **Psychosocial Working Conditions and Doctors' Work-related Wellbeing**

To date there have been limited attempts to frame and understand such observed associations (psychosocial work predictors and work-related wellbeing) among doctors on well-established theoretical frameworks (Prins, Gazendam-Donofrio, et al., 2007). The JD-R's proposition that job demands is the primary predictor of burnout (compared to job resources; see Figure 1) is evidenced in Lee et al.'s (2013) meta-analysis of 65 samples. Lee et al. observed the core components of burnout (i.e., emotional exhaustion, depersonalization) to correlate positively with multiple forms of job demands, including: workload, incivility and conflict, insufficient work resources and role ambiguity. In contrast to job demands, they reported that fewer job resources have been examined in the extant literature, with typically weaker negative effect sizes in relation to burnout.

Burnout remains a popular measure of wellbeing in the healthcare sector, evidenced by a number of reviews involving burnout (Lee et al., 2013; Prins, Gazendam-Donofrio, et

al., 2007). Work-related wellbeing, however, is broader than burnout. It is made up of both negative and positive constructs, and includes affect, motivation, behavior, cognition and psychosomaticism (van Horn et al., 2004). To the best of our knowledge no reviews exist that examine the association between doctors' psychosocial working conditions with either perceived stress or psychological morbidity. Nevertheless, the available evidence suggests that such measures of poor work-related wellbeing typically correlate positively with job demands and negatively with job resources (Bernburg, Vitzthum, Groneberg, & Mache, 2016; Johnson et al., 1995; Kivimäki et al., 2001). Even less is known about positive (e.g., work engagement) or behavioral (e.g. presenteeism and sickness absence) measures of work-related wellbeing among doctors. The current study seeks to address this gap in knowledge.

This study expands the current understanding of the predictive power of job demands and resources among hospital doctors in England by examining their associated impact on a broader representation of work-related wellbeing, namely: perceived stress, presenteeism and work engagement. *Perceived stress* refers to the perceived imbalance between the demands encountered by the individual, and, in turn, their perceived ability resources, skills and ability to manage such demands (Lazarus & Folkman, 1984). *Presenteeism* is defined as coming to work despite the worker not feeling well enough to perform their duties (Jansen et al., 2004). *Work engagement* represents a positive, fulfilling, work-related state of mind characterized by vigor, dedication and absorption (Schaufeli & Bakker, 2004). These three measures are pertinent to the healthcare sector with implications to patient care and safety (Jansen et al., 2004; Scheepers, Boerebach, Arah, Heineman, & Lombarts, 2015). They provide a different, but complementary, perspective of work-related wellbeing by representing dimensions of work attitude (work engagement), affect (perceived stress) and behavior (presenteeism). Work engagement also represents a positive dimension of work-related wellbeing with the latter two measures reflective of the negative end of the spectrum. The conceptual flexibility

of the JD-R theory provides a framework to capture hospital doctors' job demands and resources as well as a broader perspective of work-related wellbeing. Therefore, we hypothesize that:

H<sub>1</sub>: Hospital doctors' work-related stress and presenteeism will be more strongly predicted by their job demands than their job resources; and

H<sub>2</sub>: Hospital doctors' work engagement will be more strongly predicted by their job resources than by their job demands.

[insert Figure 1]

### **Interactions between Job Demands and Resources in Predicting Work-Related Wellbeing**

In a dynamic work environment, individual psychosocial predictors do not operate in isolation; and, in fact, they are likely to interact with each other. The JD-R theory postulates that job resources have two key functions: to buffer the negative effect of job demands; and, to interact with job demands to amplify the motivational role of job resources onto work engagement (Hakanen et al., 2005). The buffering effect is evidenced in studies involving burnout among homecare workers (Xanthopoulou et al., 2007), and work-home interference among medical residents (Bakker, ten Brummelhuis, Prins, & van der Heijden, 2011). The amplification of job resources' motivational role, when paired with job demands, lies in an individual's tendency to obtain, retain and protect whatever they value (Hobfoll, 1989). When threatened with the possibility of losing these (e.g., through increased demands), job resources provide additional motivational propensity to act. However, despite studies supporting these interactions, collectively the evidence is not conclusive; with one study of Dutch medical residents reporting that less than half of potential interactions were observed

(Prins, Hoekstra-Weebers, et al., 2007). To test the interactions between hospital doctors' job demands and resources, in accordance with the JD-R theory (Figure 1), we further postulate that job resources will moderate the relationship between job demands and doctors' work-related wellbeing. More specifically, we hypothesize that:

H<sub>3</sub>: The relationship between job demands and hospital doctors' perceived stress and presenteeism will be weaker when job resources are high than when job resources are low; and,

H<sub>4</sub>: High job demands will have a stronger relationship with hospital doctors' work engagement when paired with high job resources than when job resources are low.

### **A Multilevel Perspective of the JD-R**

In reality, the relationships between job demands and resources and hospital doctors' reported work-related wellbeing are situated in a complex healthcare sector, where individual, interpersonal, organizational, political and societal factors directly or indirectly impact doctors' wellbeing (Powell, Dawson, Topakas, Durose, & Fewtrell, 2014). As doctors are typically nested in wards, departments and hospitals, over time they become more alike to their in-group and have less in common with those from other groups (Heck & Thomas, 2015). Much of the research to date has focused, almost exclusively, on the individual level association between psychosocial working conditions and work-related wellbeing. This ignores both nesting and organizational level predictors. Where a multilevel perspective has been taken, senior leadership support and communication are among the organizational level predictors related with healthcare workers' job satisfaction and perceived stress (Powell et al., 2014). Elsewhere, there is evidence that organizational level predictors influence the strength of the relationship between job demands and resources with work-related wellbeing. For example, individuals in groups with strong consensus of their leadership reported weaker

relationships between job demands and depression, than groups with a weak consensus towards their leaders (Bliese & Britt, 2001).

While the JD-R theory has been extrapolated to the organizational (or unit) level, it cannot be assumed that individual level constructs maintain the same meaning at the organizational level (Bakker & Demerouti, 2017). This has implications for the proposed JD-R relationships, for example: would job resources still mitigate the relationship between job demands and strain at the organizational level? The validity of the JD-R theory from a multilevel perspective is mixed. Support is seen in studies where work engagement and burnout amongst police officers did relate to team level engagement and burnout (Bakker, van Emmerik, & Euwema, 2006), or where team social support had the same effect on outcomes as individual level social support (Torrente, Salanova, Llorens, & Schaufeli, 2012). However, other studies have reported different results. For example, unit level cohesion and support was found to exacerbate the crossover of perceived job demands from the team to the individual (Westman, Bakker, Roziner, & Sonnentag, 2011). This implies that unit level job resources might foster burnout within teams, and that what may be protective at the individual level may be harmful at the unit level.

The present study responds to calls for more work to understand the JD-R theory from a multilevel perspective (Bakker & Demerouti, 2017). To include both organizational level demands and resources would increase the complexity of this study. Instead, we focus on organizational level demands to reflect the attention on the demands placed on the NHS. In England, NHS hospitals are administered by Acute Trusts, these are NHS organizations that provide secondary care to a geographical area primarily through one or more hospitals. We hypothesize that organizational level demands (i.e., bed occupancy rate and number of emergency admissions) operate in a similar manner to individual level job demands (Figure

1). We also extend the JD-R theory by testing cross-level interactions between constructs at the individual and organizational level:

H<sub>5</sub>: High organizational demands will positively predict perceived stress and presenteeism among doctors.

H<sub>6</sub>: High organizational demands will moderate the individual level relationship between job resources and work engagement. More specifically, this relationship will be stronger when organizational demands are high than when organizational demands are low.

## **Method**

### **Sample and Survey Background**

The study sample was drawn from England's 2014 NHS Staff Survey (NHS Staff Survey Co-ordination Centre, 2015), which assesses the views of NHS staff about their work and wellbeing. Responses to this annual survey are returned by post to an external supplier to preserve confidentiality. The minimum sample size for each Trust is dependent on the number of staff employed. In 2014, over 624,000 employees from 287 NHS Trusts in England were surveyed, with 255,150 (42%) responses returned. The present study's sample was restricted to the medical occupational group working in Acute or Specialist Trusts ( $n=14,066$ ). In total 157 Trusts were represented including 18 Specialist Trusts, with 94.1% of doctors from Acute Trusts. Mean doctors per Trust was 89.59 ( $SD=94.76$ ; median=41). Due to data protection laws, neither gender nor age was available for analysis.

### **Measures**

All individual level items were from the NHS Staff Survey. The survey is based on established questionnaires and theoretical frameworks, and its psychometric properties are

assessed annually (NHS Staff Survey Co-ordination Centre, 2015). The survey process emphasizes respondent anonymity and reducing evaluation apprehension to mitigate against socially desirable responses. Unless otherwise specified, all measures were administered on a five-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Job demands.** Two different job demands were measured. Two items measured *insufficient work resources*, which refers to a lack of staff and material resources (e.g., “I do not have adequate materials, supplies and equipment to do my work”). Internal reliability for the measure was .72. *Workplace aggression* consisted of three items asking respondents to indicate how frequently they had experienced physical violence or harassment from patients and their families, and colleagues ( $\alpha=.57$ ). A five-point frequency scale was used (“1=*never*”, “5=*more than 10 times*”). Work aggression represents a social aspect of job demands associated with physical or psychological cost (Demerouti et al., 2001), and is consistent with other studies which have classed interpersonal conflict (Schaufeli, 2015) and patient harassment (Xanthopoulou et al., 2007) as job demands.

**Job resources.** Three job resources were examined. *Manager support* was measured with five items (e.g., “my immediate manager gives me clear feedback on my work”), and had a Cronbach alpha of .93. Three items measured *effective teamwork* ( $\alpha=.81$ ), which reflected how well-structured teamwork practices were (e.g., “team members have a set of shared objectives”). Job control used four items ( $\alpha=.90$ ), including “I am able to make improvements happen in my area of work”.

**Work-related wellbeing.** *Perceived stress* and *presenteeism* were respectively measured by one item: “during the last 12 months have you felt unwell as a result of work-related stress?” and “in the last three months have you ever come to work despite not feeling well enough to perform your duties?” Both items used binary “yes” and “no” responses.

Work engagement used three items (e.g., “I am enthusiastic about my job”;  $\alpha=.84$ ) based on the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003).

**Organizational demands.** Two organizational demands drew on existing Trust data. The first was the average *overnight bed occupancy rate* within the Trust between October and December 2014. The second was the mean *number of weekly emergency admissions* to the Trust in October 2014. A higher proportion represented more demands placed onto the Trust.

**Control variables.** Three control variables were used based on past research (Admasachew & Dawson, 2011; Powell et al., 2014). The first was whether the Trust was a Specialist Trust. Specialist Trusts have a more narrow focus and are typically better resourced than non-specialist Trusts. The second control factor was the Trust size, which represented by the number of beds available. The third was organizational tenure at the individual level.

### **Analytical Framework**

Multilevel regressions in MPlus 7 tested the individual and organizational predictors, as well as the hypothesized cross-level interactions. Prior to model building, data screening and assumption testing for multiple regressions were undertaken. Full-maximum likelihood (ML) estimation was used, which is robust against missing and non-normal data (Muthén & Muthén, 2017). Predictors at the individual level were group-mean centered while organizational level predictors were grand-mean centered. Hospital doctors were grouped according to their respective Trusts.

Similar to hierarchical regression, the complexity of the multilevel regressions increases as additional predictors are included with each subsequent model based on the hypotheses made. For the purpose of this study, six models were required. The first was the unconditional model containing perceived stress, presenteeism and work engagement (M0), followed by models with the control variables (M1), individual level predictors (M2),

organizational level predictors (M3), individual level interactions (M4a), and the prediction of individual level slopes by organizational predictors (M4b). A significant change in deviance between the loglikelihood of the simpler versus the more complex model means the inclusion of new variables improved the model (Heck & Thomas, 2015), and the individual regression coefficients for this model are then examined. Finally, to assess the level of common method variance a single unmeasured latent factor was modelled and controlled for within a confirmatory factor analysis (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

## Results

### Descriptive Results

Table 1 presents the descriptive statistics and correlations for all study variables. At both the individual and organizational level, all 28 correlations were significant. Measures of demands at both the individual and organizational level all positively correlated with perceived stress and presenteeism. These demands also negatively correlated with work engagement. The job resources measures also correlated positively with work engagement, and negatively with perceived stress and presenteeism.

[insert Table 1]

### Multilevel Regression Analysis

The null model (M0) indicates low ICC for perceived stress (0.008), presenteeism (0.006) and work engagement (0.014). However, when these were converted to *deff* scores their respective values were 1.79, 1.71 and 2.23, suggesting that it was appropriate to group hospital doctors into their respective Trusts.

Control variables at the individual (tenure) and organizational (Trust type, number of beds) levels were added to M1 (Table 2). These additions reduced model deviance ( $X^2(15) = 14,938, p < .001$ ). However, control variables had differing effects on the three dependent

variables. Tenure associated positively with perceived stress ( $\beta=.06$ ) and presenteeism ( $\beta=.05$ ) and negatively with work engagement ( $\beta=-.07$ ). Doctors working at non-specialist Trusts were more likely to report experiencing perceived stress ( $\beta=-.36$ ) and less work engagement ( $\beta=.41$ ) than doctors in specialist Trusts.

[insert Table 2]

To test  $H_1$  and  $H_2$ , the individual level predictors of insufficient work resources, workplace aggression, job control, manager support and effective teamwork were added to the first model. Model deviance decreased ( $\chi^2(15) = 14,938, p < .001$ ) significantly. M2 demonstrated that both job demands (insufficient work resources, workplace aggression) positively predicted perceived stress and presenteeism, and negatively predicted work engagement. The opposite effects were observed when work engagement was the outcome, with the exception of effective teamwork on perceived stress which reported no significant relationship. Examining standardized coefficients, insufficient work resources and workplace aggression were stronger predictors of perceived stress and presenteeism than any of the three job resources in M2, supporting  $H_1$ . This is as there was no overlap between the confidence interval ranges of the job demands and resources predictors. Table 2 also demonstrates that range of the confidence interval for job control ( $\beta=.32$ ), manager support ( $\beta=.11$ ), and effective teamwork ( $\beta=.09$ ) did not overlap with and were stronger predictors than workplace aggression ( $\beta=-.07$ ). However,  $H_2$  is not supported as insufficient work resources ( $\beta=-.11$ ) was a stronger predictor of work engagement than effective teamwork and manager support.

The addition of emergency admissions and bed occupancy rate as organizational demands in M3 resulted in a significant change in model statistics ( $\chi^2(6) = 4,208, p < .001$ ). Emergency admissions predicted doctors' presenteeism ( $\beta=.56$ ) and work engagement ( $\beta=-$

.50), but not perceived stress (Table 2). Surprisingly, high bed occupancy rates was associated with increased doctor work engagement ( $\beta=.31$ ).

To test H<sub>3</sub> and H<sub>4</sub>, six new interaction terms representing each job demand and resource interaction were added to M4a as predictors. These addition did not result in M4a having a better fit compared to M3 ( $\chi^2(18) = 20, p>.05$ ). Consequently, job resources did not moderate the effect of job demands on perceived stress, presenteeism and work engagement as predicted by H<sub>3</sub> and H<sub>4</sub>. The  $\beta$  for these interaction terms were all less than .001.

The final model (M4b) specified a random slope for the significant relationships from M2 and M3. These random slopes were then predicted by organizational demands to see whether the job resources and outcome relationship was influenced by the organizational demand. More specifically, job control, manager support and effective teamwork were set as random effects where presenteeism and work engagement were outcomes. Emergency admissions was modelled to predict the random slopes where presenteeism was the outcome variable. Emergency admission and bed occupancy rate predicted the random slopes where work engagement was the outcome variable. These additions did not result in an improved model fit ( $\chi^2(14) = 8, p>.05$ ), meaning that H<sub>6</sub> is rejected as no cross-level interactions between organizational demands and doctor level job resources were observed.

### **Common Method Bias**

To test for the level of common method variance a confirmatory factor analysis was carried out where a single unmeasured latent factor was modelled and controlled for (Podsakoff et al., 2003). This yielded a well-fitting model (RMSEA=.04, CFI=.98, TLI=.98) similar to the final proposed measurement model. Squaring the unstandardised regression coefficients between the items and the latent factor demonstrated that common method variance accounted for 13.2% of the total variance. As an additional step, we compared the

differences between the standardized regressions from the models with and without the common latent factor. Only two items had a large difference ( $>.200$ ) suggesting they may be affected by common method variance. Although it is not possible to completely rule out common method variance influencing our individual level analyses, these observations suggest it is not likely to be a significant issue.

### **Discussion**

The present study aimed to test the predictive power of job demands, job resources and organizational demands in relation to three work-related wellbeing outcomes (perceived stress, presenteeism and work engagement) in a sample of hospital doctors in England. The results support the proposition that different measures of work-related wellbeing may be more strongly influenced by different psychosocial working conditions, supporting  $H_1$  and  $H_2$ . Although we tested for interaction effects,  $H_3$ - $H_6$  were not supported as no interactions were found involving predictors at either the individual or organizational level. By including perceived stress, presenteeism and work engagement, this study expands the evidence based on different dimensions of doctors' work-related wellbeing. All three measures are important in their own right: perceived stress as a traditional strain measure of affect; presenteeism, a behavioral measure more recently recognized for its costs, under-reporting and care implications (Admasachew & Dawson, 2011); and work engagement, representing a more positive attitude (Schaufeli & Bakker, 2004).

### **Psychosocial Predictors of Hospital Doctors' Work-related Wellbeing**

As expected, hospital doctors' job demands and resources predicted their work-related wellbeing ( $H_1$  &  $H_2$ ). Congruent with our understanding of the JD-R theory (Bakker & Demerouti, 2017), job demands were more strongly associated with perceived stress and presenteeism than job resources; while work engagement was primarily associated with job

resources. These findings do not completely support independent and separate pathways as insufficient work resources was among the strongest predictors of work engagement. This highlights the saliency of this job demand within this work environment. The provision of staff and material in the workplace can be a reflection of wider organizational demands (Laschinger, Grau, Ashley, Finegan, & Wilk, 2012). They are also likely to have an impact on other job demands and resources, such as workload, social support and autonomy, and is likely a precursor to job demands and resources.

Similarly, the different directions in the relationship between both organizational demands with work engagement suggests a distinction between challenge and hindrance demands (LePine et al., 2005). The former stimulates work engagement by promoting growth and mastery, while the latter thwarts it. Bed occupancy rate could be an example of a challenge demand; more specifically, as long as spare beds remain then the resources exist to cope with the demand faced. Instead, it is only when operating at or exceeding capacity that this could become a hindrance demand. In contrast, emergency admissions are unplanned, non-routine and often complex. They also have the potential to interfere with other tasks. Hence, a high number of emergency admissions functions as a hindrance demand, with detrimental relationships to work engagement and presenteeism.

Collectively, these findings suggest two things. First, that job demands are not a homogenous construct. Future research should explore job demands' sub-constructs and how they are interlinked, and perhaps crucially, how different types of job demands influence doctors' work-related wellbeing at care. Second, different individual and organizational level psychosocial predictors have a different relationship with the outcome depending on the work-related wellbeing dimension examined. Therefore, interventions to address and manage work-related wellbeing among doctors should target both job demands and resources.

### **When Job Demands and Resources Do Not Interact**

Not one of hypothesized interactions ( $H_3 - H_6$ ) were found. This may be due to the relevance of the job demand and resource being dependent on specific job characteristics that prevail within that context (Bakker & Demerouti, 2017). For example, in the two studies that tested this interaction in a medical setting, none of the job resources that interacted with job demands were used in this study (Bakker et al., 2011; van Vegchel, de Jonge, Bakker, & Schaufeli, 1999). These job resources were development opportunities, feedback, supervisory coaching and participation. Both these studies found that job autonomy, which is conceptually similar to job control, did not fully interact with job demands.

Van Vegchel et al. (1999) also found that job autonomy only buffered the influence of psychological, but not physical or emotional demands. This reinforces the notion that the type of job demands matters as well. Insufficient work resources and workplace aggression both correlated negatively with work engagement in this study, suggesting that they function as hindrance demands (LePine et al., 2005). The findings for workplace aggression, nevertheless, contradict the existing research where job resources interacted with similar job demands, including patient harassment (Xanthopoulou et al., 2007) and pupil misbehavior (Bakker et al., 2007) to predict work engagement. It may be that the detrimental impact of workplace aggression and insufficient work resources is such that none of the three job resources from this study adequately mitigate job demands' impact on doctors' perceived stress or presenteeism. We did not consider job resource accumulation, and future researchers should explore whether a latent representation of job resources could function as a stronger buffer between job demands and work-related wellbeing.

### **Multilevel Psychosocial Predictors of Work-related Wellbeing**

The present study contributes to the JD-R theory and the wider understanding of the association between psychosocial working conditions and work-related wellbeing by integrating a multilevel perspective. H<sub>5</sub> and H<sub>6</sub> were not supported as bed occupancy rate did not predict perceived stress or presenteeism, while emergency admissions only predicted presenteeism. Contrary to expectations, we also observed a relationship between organizational demands and work engagement. These findings counter the dual process pathways suggested by the JD-R theory at the individual level (Demerouti et al., 2001), suggesting that the theory may operate differently across different levels (Bakker & Demerouti, 2017). This could also explain why no evidence of cross-level interactions involving job resources and organizational demands was found (H<sub>6</sub>), as neither of the organizational demands interacted with the relationships that job resources had with the three work-related wellbeing outcomes.

Finally, the low ICC values suggest that the doctors' within Trusts were rather heterogeneous. This is not surprising given the various specialties, seniority, wards and work environments of doctors within hospitals. Future multilevel researchers should consider how job demands and resources at different levels vary in their influence of individual outcomes. The clustering of doctors at a more local level could yield wellbeing experiences more strongly influenced by group level demands. Nevertheless, multilevel modelling for this study was appropriate as the data in this study presented in hierarchical form. This means variation can still occur in the predicted relationships despite the low ICCs (Heck & Thomas, 2015). Crucially, multilevel modelling allowed for the inclusion of organizational demands and individual level outcomes within as single model.

## **Limitations**

The use of secondary data restricted the variables available. Other related psychosocial (e.g., role conflict, hours worked), individual (e.g., personality, resilience) or organizational (e.g., climate) measures that function as important antecedent or confounding variables were not measured and hence could not be modelled. Moreover, data protection laws meant that some key demographic variables were not available to researchers. For some constructs (e.g., perceived stress, presenteeism) measures that are more robust could have provided a deeper representation of the construct. Equally, it was not possible to test a group level (e.g., doctors' specialty, department) between the individual and organizational level due to the absence of this data. Future researchers may seek to use a wider set of predictors at both the individual and organizational level, taking into consideration the most relevant predicting and confounding variables to that particular setting. In particular, organizational level resources, which were not included in this study, warrant consideration.

A further limitation lies in the cross-sectional design, which means causality cannot be determined. It could therefore be that poor wellbeing results in doctors perceiving their work environment as more demanding. Finally, although the overall response rate is congruent to organizational research (Baruch & Holtom, 2008), we are not able to determine the actual response rate for doctors. Doctors who are struggling with work demands or poor health are less likely to complete research surveys, which may skew the findings by reducing the variance in responses. Consequently, these findings cannot be generalized to all hospital doctors in England, or to doctors from other settings, healthcare systems or countries.

### **Practical Implications**

Our findings advocate employing a broader understanding of work-related wellbeing, and to examine how psychosocial factors can be better managed to yield more positive responses (e.g., motivation and work engagement). In addition to the moral argument, the

evidence suggests that engaged and happy doctors are more likely to deliver better patient outcomes, safety and experience (Scheepers et al., 2015). That job demands primarily predicted strain while job resources predicted work engagement indicates a differential effect between predictors and work-related wellbeing. The target of change should differ depending on the work-related wellbeing measure being. These findings reinforce the argument that interventions should not only attempt to reduce job demands but to strengthen job resources in the workplace (Knight, Patterson, & Dawson, 2017). Interventions also need to move beyond those that target change within the doctor (i.e., individual interventions) and consider instead approaches that target multiple job demands and resources in the work environment (i.e., organizational interventions). Similarly, the findings provide evidence that events at the hospital level, such as the number emergency admissions and bed occupancy rates, are associated with the work-related wellbeing of doctors. This should elucidate to decision makers at the national and organizational level that the demands placed upon hospitals, and the resources they have to deal with it, have a real impact on the wellbeing of hospital staff.

## **Conclusion**

This study highlights the complexity of work-related psychosocial predictors to doctors' work-related wellbeing. It uses a broader perspective of doctors' work-related wellbeing to include perceived stress, presenteeism and work engagement. The relationship that each wellbeing dimension has with their psychosocial predictor is dependent on the type of job demands and resources examined. Crucially, this study applies a multilevel perspective to the JD-R theory, demonstrating that organizational demands influence work engagement and presenteeism in hospital doctors. Hence, it is likely that any successful intervention will have to target the appropriate antecedent pathway and recognize the role of organizational factors when trying to manage hospital doctors' work-related wellbeing.

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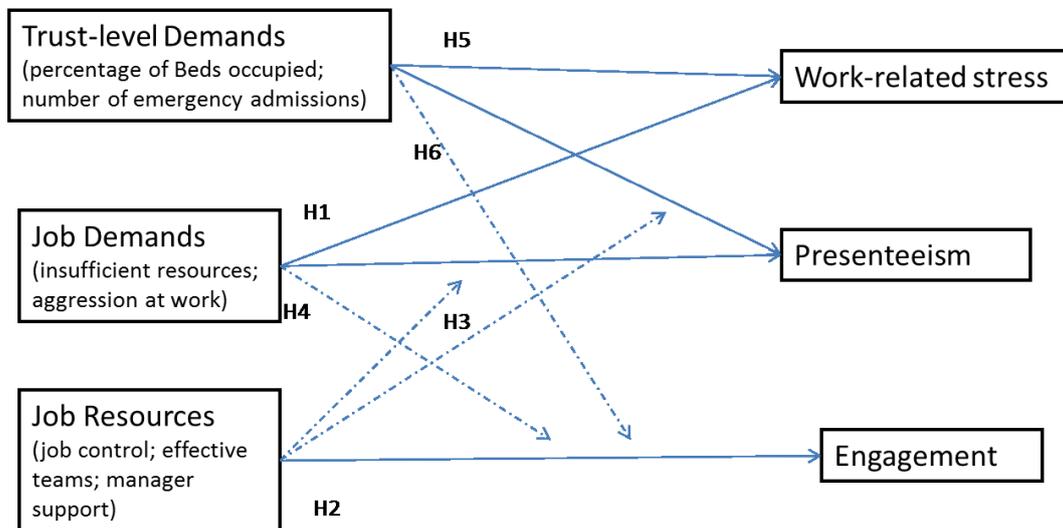
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Figure 1

*Job Demands, Job Resources, and Trust level Demands' Hypothesized Relationships with Doctors Work-related Wellbeing*



Note: solid lines reflect direct effects, dotted lines reflect moderation.

Table 1

*Descriptive statistics and correlations*

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. Workplace aggression	13700	3.61	1.09	-	.19**	-.10**	-.08**	-.11**	.21**	.18**	-.16**
2. Insufficient work resources	13890	6.09	2.00	.42**	-	-.40**	-.28**	-.41**	.29**	.21**	-.40**
3. Manager support	13563	17.64	4.63	-.21**	-.58**	-	.41**	.57**	-.26**	-.18**	.42**
4. Effective teams	13581	11.51	2.53	-.25**	-.43**	.50**	-	.47**	-.17**	-.13**	.34**
5. Job control	13832	14.44	3.67	-.29**	-.61**	.65**	.61**	-	-.26**	-.18**	.51**
6. Perceived stress	13807	0.33	0.47	.34**	.56**	-.47**	-.41**	-.38**	-	.29**	-.36**
7. Presenteeism	12138	0.51	0.50	.32**	.26**	-.24**	-.33**	-.26**	.24**	-	-.21**
8. Work engagement	13907	11.82	2.38	-.35**	-.55**	.60**	.40**	.52**	-.60**	-.36**	-
9. Bed occupancy	157	88.03	9.07	.16*	.23**	-.11	-.16*	-.12	.13	.02	-.06
10. Emergency admissions	150	689.32	369.80	.15	.30**	-.27**	-.24**	-.32**	.05	-.07	-.21**

Note: \*\* $p < .01$ ; \* $p < .05$ . Correlations above the diagonal are individual level correlations. Correlations below the diagonal are Trust level correlations, with individual level measures aggregated to the Trust level ( $N=157$ ).

Table 2  
*Model fit statistics and standardized coefficients for predictors in Models 0-3*

	M0			M1			M2			M3		
	STR	PRS	ENG	STR	PRS	ENG	STR	PRS	ENG	STR	PRS	ENG
Tenure (w)				.06*** (.04, .07)	.05*** (.03, .06)	-.07*** (-.087, -.049)	.03** (.01, .04)	.03*** (.01, .05)	-.02** (-.03, -.01)	.03** (.01, .04)	.03*** (.01, .05)	-.02* (-.03, -.01)
Specialist (b)				-.36* (-.70, -.03)	-.171 (-.63, -.60)	.41*** (.16, .66)	-.36* (-.68, -.04)	-.16 (-.48, .17)	.41*** (.20, .63)	-.32* (-.69, -.05)	.20 (-.14, .55)	.40** (.15, .65)
Beds (b)				.12 (-.18, .42)	-.212 (.08, -.52)	-.21 (-.44, .03)	.08 (-.21, .36)	.21 (-.49, .07)	-.10 (-.32, .12)	.02 (-.55, .59)	-.71** (-1.22, -.21)	-.32 (-.09, .73)
Insufficient work resources (w)							.16*** (.15, .18)	.12*** (.10, .14)	-.19*** (-.21, -.17)	.16*** (.14, .18)	.12*** (.09, .14)	-.19*** (-.21, -.17)
Workplace aggression (w)							.16*** (.14, .18)	.15*** (.13, .16)	-.07*** (-.08, -.05)	.16*** (.14, .18)	.15*** (.13, .16)	-.07*** (-.08, -.05)
Manager support (w)							-.10*** (-.12, -.08)	-.06*** (-.08, -.04)	.11*** (-.09, .13)	-.10*** (-.12, -.08)	-.06*** (-.08, -.04)	.11*** (.09, .13)
Effective teams (w)							-.01 (-.03, .01)	-.03** (-.05, -.01)	.09*** (.08, .11)	-.02 (-.03, .01)	-.03** (-.05, -.01)	.09*** (.08, .11)
Job control (w)							-.10*** (-.13, -.08)	-.06*** (-.09, -.04)	.32*** (.28, .33)	-.10*** (-.13, -.08)	-.06*** (-.09, -.04)	.32*** (.30, .33)
Bed occupancy (b)										-.24 (-.59, .12)	-.03 (-.36, .30)	.31* (.07, .56)
Emergency Admissions (b)										.10 (-.44, .64)	.56* (.07, 1.05)	-.50* (-.89, -.10)
-2LL	96380			94708			79769			78070		
Deviance, <i>df</i> change	n/a			1672, 15			14938, 15			4208, 6		
Sig.	n/a			<i>p</i> <.001			<i>p</i> <.001			<i>p</i> <.001		
Within-trust variance	0.22	0.25	5.60	0.22	0.25	5.60	0.19	0.23	3.76	0.19	0.23	3.75
Between-trust variance	0.002	0.002	0.08	0.001	0.002	0.06	0.001	0.003	0.09	0.001	0.002	0.08

Note: STR = perceived stress; PRS = presenteeism; ENG = work engagement; (b) = Trust level predictor; (w) = individual level predictor.

Note 2: Parentheses denotes 95% confidence interval for regression coefficients;

\*\*\**p*<.001, \*\**p*<.01, \**p*<.05

