

Mindfulness as a Personal Resource to Reduce Work Stress in the Job Demands-Resources Model

Steven L. Grover, Stephen T. Teo, David Pick, Marie Roche

Abstract

Based on the job demands-resources (JD-R) model, this study examines the different ways that the personal resource of mindfulness reduces stress. Structural equation modeling based on data from 415 Australian nurses shows that mindfulness relates directly and negatively to work stress and perceptions of emotional demands as well as buffering the relation of emotional demands on psychological stress. This study contributes to the literature by employing empirical analysis to the task of unravelling how personal resources function within the JD-R model. It also introduces mindfulness as a personal resource in the JD-R model.

Keywords: Job demands-resources, mindfulness, perceived autonomy, stress

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Mindfulness and the job demands and resources model (JD-R) represent different perspectives on stress in the workplace. Mindfulness research suggests that the mindful state helps people to separate environment characteristics from their reactions to them, thereby reducing stress (Kabat-Zinn, 1994). The JD-R model suggests that the job characteristics of demands and resources influence stress, and an elaboration of that model theorizes that *personal resources – characteristics of the person as opposed to characteristics of the job –* influence this process (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2007). How personal resources function in the JD-R model, however, is not well established, with a number of different pathways theorized (Schaufeli & Taris, 2014). In pursuit of developing greater theoretical clarity, this research examines whether and how mindfulness can be included as a personal resource in the JD-R model.

Mindfulness is a heightened state of awareness and attention derived from focusing on present moment experiences in a non-judgmental and accepting way (Kabat-Zinn, 1994). Research shows that mindfulness reduces stress for chronically ill people (Grossman, Niemann, Schmidt, & Walach, 2004; Speca, Carlson, Goodey, & Angen, 2000) and in the workplace (Aikens et al., 2014; Goodman & Schorling, 2012; Grossman et al., 2004; Gu, Strauss, Bond, & Cavanagh, 2015; Hülshager, Alberts, Feinholdt, & Lang, 2013; Hülshager, Feinholdt, & Nübold, 2015; Hülshager et al., 2014; Newsome, Waldo, & Gruszka, 2012; Speca et al., 2000; Van Gordon, Shonin, Zangeneh, & Griffiths, 2014). Mindfulness reduces stress by de-coupling environmental cues from responses to those cues. As a non-judgmental appreciation of the immediate environment, it allows an individual to recognize events in the environment without reacting to those same stimuli. Mindfulness can be promoted through meditation and other activities such as yoga that help people to focus attention on the

moment, suppressing thoughts and emotions that occur outside the present moment. Intervention studies that invoke meditation show increases in sleep quality (Hülshager et al., 2015), work engagement (Leroy, Anseel, Dimitrova, & Sels, 2013), job performance (Van Gordon et al., 2014), and job satisfaction and turnover (Andrews, Kacmar, & Kacmar, 2014), and mindfulness effects are linked to changes in neurological activity (Cahn & Polich, 2006; Chiesa & Serretti, 2009; Treadway & Lazar, 2009).

This paper assesses the role of mindfulness in helping nurses cope with stress at work by conceptualizing it as a personal resource in the JD-R model. In doing so, this study extends the JD-R model by considering various influences of personal resources, exploring differential pathways identified by Schaufeli and Taris (2014), and it contributes to understanding how mindfulness works in organizational settings by considering these various pathways. As such, the model we test derives from contemporary enhancements of Demerouti, Bakker, Nachreiner, and Schaufeli's (2001) original model that focuses on job elements. The following sections develop the theoretical framework and hypotheses illustrated in Figure 1. The JD-R model is described along with the role of personal resources, and then the role of mindfulness as a personal resource is conceptualized.

Insert Figure 1 about here

Job-demands resources (JD-R) model

The JD-R model predicts work outcomes such as stress, commitment, engagement, and job satisfaction (Bakker, Demerouti, & Verbeke, 2004; Demerouti et al., 2001; Schaufeli & Taris, 2014). Job demands are negative work-related requirements that lead to higher stress, burnout, and negative health effects. They include heavy workloads, uncertain job procedures, and emotional job demands. Job demands operate through a *health impairment* process that exhausts employees because they require sustained effort and energy (Caplan,

Cobb, French, Harrison, & Pinneau, 1975). Emotional demands are important job demands that increase psychological stress (Bakker & Demerouti, 2007; Deery, Walsh, & Zatzick, 2014) in that they “threaten and deplete one’s resources, and over time prolonged exposure...lead to emotional exhaustion, cynicism, and reduced personal accomplishment” (Alarcon, 2011, p. 550).

Previous research indicates that emotional demands require greater job resources and increase stress (Alarcon, 2011; Demerouti et al., 2001; Hu, Schaufeli, & Taris, 2011). Emotional demands are stressors common in challenging human service occupations such as nursing and as such provide an important focus for this study in comparison to other job demands, such as time. Moreover, emotional demands are hindrance demands that make coping difficult and work challenging (Dawson, O'Brien, & Beehr, 2016). These demands operate through an impairment process that use valuable psychological resources that, when depleted, lead to the experience of stress. This forms the basis of the first hypothesis that forms the foundational empirical relationship of this study

Hypothesis 1: Emotional demands are positively related to psychological stress.

Job resources are job characteristics that ameliorate, or help a person cope with, job demands and enable them to work effectively and cope with challenges, consequently mitigating the stress arising from job demands (Bakker & Demerouti, 2007). Job resources imbue a *motivational* process because they help employees to achieve their goals (Schaufeli & Bakker, 2004). The JD-R model captures this process, having been widely tested and receiving robust support from empirical research that employs a variety of job demand and resource variables as well as outcome variables (Alarcon, 2011; Bakker & Demerouti, 2007; Bakker et al., 2004; Fernet, Austin, & Vallerand, 2012; Llorens, Bakker, Schaufeli, & Salanova, 2006; Nahrgang, Morgeson, & Hofmann, 2011). Job resources motivate employees intrinsically by supporting goal attainment and ameliorate emotional and other job

demands by providing people with means to deal with them.

Job Control and Perceived Autonomy Support

Control and autonomy at work are important resources that help a person handle job demands. They are particularly relevant in nursing because it is an occupation characterized as being “high strain” due to lack of job control and high demands (Karasek & Thorell, 1990). In such situations, having autonomy and control helps nurses ameliorate the emotional demands of their job. Autonomy has been widely found to provide a positive work experience captured in self-determination theory (Deci, Connell, & Ryan, 1989), job demands – control – support model (Dawson et al., 2016; Karasek, 1990), and in health research (Bosma et al., 1997; Marmot, 2004). One type of autonomy is perceived autonomy support (PAS), which refers to the perception that there is organizational support for employees to have appropriate autonomy in their work (Gagne & Bhave, 2011; Pelletier, Fortier, Vallerand, & Brière, 2001; Ryan & Deci, 2006) in that “the supervisor understand[s] and acknowledg[es] [a] subordinate’s perspective, providing meaningful information in a non-manipulative manner, offering opportunities for choice, and encouraging self-initiation” (Baard, Deci, & Ryan, 2004, p. 2048). Research suggests that PAS facilitates competence (Richer & Vallerand, 1995; Schaubroeck & Merritt, 1997) and is associated with positive work outcomes, attitudes, and trust within organizations (Deci et al., 1989). PAS is negatively related to outcomes such as stress due to its motivational influence on positive feelings of control (Baard et al., 2004).

Within the JD-R model, perceived autonomy support is conceptualized as a job resource that is deployed by employees in response to job demands. Employees who perceive they have autonomy in their work situation more accurately assess the demands of their jobs and cope with them positively, as they expect their managers’ support for their autonomous action to be ongoing. Job control is a related job resource that encapsulates the

degree to which a job utilizes an employee's skills and their objective autonomy (Karasek & Thorell, 1990). People who perceive that their talents are employed appropriately experience a positive, satisfying emotional state that mitigates stress (Deci & Ryan, 2012). In contrast, it is psychologically taxing to work in an environment in which one cannot contribute to the job concomitant with one's capabilities due to lack of control.

The constructs PAS and job control are related in that both are thought to impact on psychological stress via autonomy but in different ways. PAS assesses the degree to which people feel the structure of the organization and their own supervision provide them with autonomous decision-making opportunities. It focuses on the support network that allows the experience of autonomy. In contrast, job control assesses the experience of autonomy in the job, regarding the decision-making latitude inherent in the job, as opposed to that imposed by one's immediate supervisors.

Hypothesis 2a: The job resource of perceived autonomy support is negatively related to psychological stress.

Hypothesis 2b: The job resource of job control is negatively related to psychological stress.

Karasek's strain hypothesis suggests that job control moderates job demands such that low control, high demand jobs are stressful (Karasek & Thorell, 1990). According to this approach, demands themselves do not directly cause strain. Instead, high levels of job demands, with little control over or autonomy in resolving those demands, leads to stress. This hypothesis lies at the center of stress research that focuses on demand and control-oriented job resources. However, it has received mixed support in the literature (Taris, 2006; Zapf, Dormann, & Frese, 1996). It is important therefore to assess this hypothesis in our study in order to provide a more complete picture of how mindfulness might influence stress within the JD-R model.

Hypothesis 3: Job control and emotional demands interact such that job control reduces the relation of emotional demands on psychological stress.

Mindfulness

Mindfulness has its origins in ancient Eastern thought and has recently come to the fore in the social sciences as a way of helping people to cope with adversity (Brown, Ryan, & Creswell, 2007). Mindfulness is defined as “a state of consciousness characterized by receptive attention to and awareness of present events and experiences, without evaluation, judgment, and cognitive filters” (Glomb, Duffy, Bono, & Yang, 2011, p. 119). It “facilitates stress resilience and more positive coping” (Weinstein & Ryan, 2011, p. 5) because it draws people into the present moment to help them experience greater control over events being experienced. This control comes from reducing rumination, decoupling environmental stimuli from the experience of it, reducing automatic responses to the environment, and focusing attention on one’s own physiological responses (Glomb et al., 2011). These mechanisms allow mindful individuals to cope more effectively with difficult events such as work-life conflict and leadership challenges (Weinstein, Brown, & Ryan, 2009).

Mindfulness offers potential to reduce stress among employees who face challenging work situations. Workers confronting demanding environments cope with those demands by using a variety of resources available to them (Brown & Ryan, 2003; Schultz, Ryan, Niemiec, Legate, & Williams, 2015). Mindfulness can be seen as a personal resource that enables people to cope with the demands by helping them focus their attention on the present moment rather than concentrating on problems and consequences beyond their control (Weick & Putnam, 2006). Mindful people experience mastery in the face of difficult and challenging circumstances, experiencing both a sense of competence and autonomy (Hülshager et al., 2015).

Mindfulness as personal resource

The primary purpose of this study is to explore the extent to which and how the personal resource of mindfulness operates in the JD-R model. People vary in the personal resources they bring to bear on work situations, and these affect how job resources and job demands influence psychological stress. Originally, the JD-R model included only environmental conditions of a job. However, individual differences have been drawn into the model in the form of personal resources, which are defined as “the psychological characteristics or aspects of the self that are generally associated with resiliency and that refer to the ability to control and impact one’s environment successfully” (Schaufeli & Taris, 2014, p. 49). Personal resources in the JD-R model are unique individual employee attributes that affect how people use job resources to cope with job demands (Bakker & Demerouti, 2007; Demerouti et al., 2001; Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2011). These personal resources, such as resiliency, optimism, mindfulness, perceived control and autonomy affect JD-R processes through perceptions of, and the ability to deploy, job resources.

Studies of personal resources have primarily investigated psychological capital variables (hope, optimism, self-efficacy), which relate to resiliency and are linked to positive core self-concept (Barbier, Hansez, Chmiel, & Demerouti, 2013; Xanthopoulou et al., 2011). These personal resources provide opportunities to capitalize on the resources available to face set-backs at work in a positive manner. In contrast, mindfulness relates less to self-concept and more to how people use their attentional resources. More mindful individuals attend to the present moment, which de-couples them from the future and centers their attention around the problems and issues at hand. Less mindful individuals, on the other hand, focus less on the present and allow attention to drift to problems and possibilities in the distant future or deep past.

Mindfulness is therefore a novel and important personal resource to investigate in the JD-R context because it provides a distinctly different perspective on personal resources for inclusion in stress research that investigates job resources and demands. Due to the allocation of limited attentional resources, mindfulness can be seen as a personal resource that influences how people perceive job demands and deploy job resources which in turn affect the degree to which they experience stress. More mindful individuals are able to focus on immediate job demands, filter out extraneous job demands, enhance their ability to focus on utilizing essential job resources. As we explain in this paper, these attention mechanisms follow the various moderating and direct paths of personal resources as explained by Schaufeli and Taris (2014).

The precise manner in which personal resources operate, however, is not yet clear. In their critical review of the JD-R model, Schaufeli and Tauris (2014) argue that personal resources potentially influence outcomes by directly influencing perceptions and outcomes of job demands and the deployment of resources. They also contend that personal resources act as moderators of job demands. This study assesses the extent to which mindfulness can be considered a personal resource and examines how it can enhance the JD-R model in explaining differing employee responses to stress.

Mindfulness could have a number of different influences in the JD-R model. Focusing on immediate and important matters could change perceptions of job demands because it limits the scope of demands within the purview of the mindful individual. Mindful people take less notice of extraneous demands that are not of immediate concern that otherwise could contribute to stress. They focus on the immediate demands of their job rather than a more expansive set of demands. Mindfulness reduces the perceived magnitude of job demands due to decoupling of the self from the experience of work and the emotions experienced (Glomb et al., 2011). Due to this separation of events of work from emotions

being experienced, and making events an experience of the mind rather than the environment, they become less threatening to the ego and are emotionally decoupled from the self (Feldman, Greeson, & Senville, 2010). As a result, mindful people have an awareness of their emotions and reduce the automatic processing that influences emotional responses. When considering the impact of mindfulness on job demands, therefore, emotional demands could be critical job demands that are processed differently when mindfulness is applied as a personal resource. Compared to other job demands, such as workload or physical demands, mindfulness might have the greatest impact on emotional demands because awareness of emotions is the cornerstone of mindfulness. Hence, we examine the relationship between mindfulness and this particular job demand.

Hypothesis 4: Mindfulness directly and negatively relates to perceived emotional job demands.

Mindfulness might also directly reduce the experience of stress. By attuning to the intra-psychic cues and the sequential causes of thought and feelings within the person, mindfulness has potential to reduce stress through a greater awareness of stress activation (Weick & Putnam, 2006). Moreover, even with the same environmental stressors, more mindful people experience reduced psychological stress because they are attuned to the environmental but do not let it affect them automatically. They de-couple their reactions from the environment, and in this de-coupling acknowledge that stressors occur in the environment. This means that mindful individuals separate acknowledgement of stressors in their environment from their reactions to them. Such ideas underpin research about interventions that increase mindfulness and suggest that these types of interventions are associated with stress reduction (Aikens et al., 2014; Cohen-Katz, Wiley, Capuano, Baker, & Shapiro, 2005; Hülshager et al., 2013; Mackenzie, Poulin, & Seidman-Carlson, 2006).

Hypothesis 5: Mindfulness is negatively related to psychological stress.

Finally, mindfulness may moderate the relation of job demands or resources on psychological stress. By attending to the present moment and achieving clear focus on the emotional demands and the greater understanding of them provided by non-judgmental awareness, mindfulness could mitigate the negative impact of emotional demands on the experience of stress. Mindful people separate themselves from the emotions experienced and at the same time are cognizant of the emotional experience. Research suggests that applying mindfulness invokes the ability to regulate emotional responses that buffer stressful demands arising from these situations (Roeser, Skinner, Beers, & Jennings, 2012). It has the potential to focus attention on immediate matters, allowing a person to cope with situational demands by placing important demands within the boundaries of the person's immediate attention. We therefore examine the extent to which mindfulness buffers the influence of job demands on psychological stress.

Hypothesis 6: Mindfulness moderates the effect of emotional demands on psychological stress, such that as mindfulness increases, the positive effect of emotional demands on psychological stress decreases.

Previous research devoted to the connections between job resources and demands show that they are theoretically and empirically related (Bakker, Demerouti, & Sanz-Vergel, 2014; Tuckey & Hayward, 2011). This study does not formally hypothesize the relations between job demands and resources, and instead includes these relations in order to correctly specify the model.

Summary

This study tests the hypotheses using a survey methodology among nurses engaged in contingent employment because these workers are more at risk of stress and poor work and personal wellbeing outcomes (Kalleberg, 2009; Peiró, Sora, & Caballer, 2012). This sample therefore provides a robust test of the JD-R model and the extent to which the effects of job

demands are influenced by PAS and mindfulness.

Method

The hypotheses were tested by collecting data from a sample of nurses in Australia using an online survey. According to the Australian Institute of Health and Welfare (AIHW) (2016) there are 300,979 registered nurses and midwives (including registered nurses, enrolled nurses, and midwives) employed in Australia's health care system. Of these, 90% are employed in clinical roles.

An email containing a link to the online survey was sent to people who matched the occupational and background requirements (e.g., nurses employed in public and nonprofit sector, aged at least 18 years old, working casual and part-time, and residing in Australia) and had previously agreed to participate in research with a for-profit online survey company. The company sent out an invitation email to its panel members who meet our inclusion criteria. The online survey consisted of questions regarding demographic characteristics, mindfulness, job demands and job resources, and psychological distress. The project received ethical approval from the Human Research Ethics Committee at the administering university.

Participants

Overall, 415 useable responses were received from nurses employed in public (62.2%) and nonprofit sector health care organizations. Of these, 336 (81%) were women. Nearly half of the respondents were from the states of New South Wales (30.4%) and Victoria (29.2%), and mainly between 26 and 50 years old (41.9%). A large number of respondents worked as nurses for greater than six years (51%). Nearly half of the respondents were registered nurses (48%). The largest group of nurses worked between 32 to 47.5 hours per week (46.5%), followed by those working between 24-31.5 hours per week (23.4%). This compares well with the national demographic profile of nurses employed in Australia in which 64% are employed in the public sector (AIHW, 2014), 89.5% are women, 27%

employed in New South Wales and 27.5% employed in Victoria, and 55% are in the 26-50 age group (Nursing and Midwifery Board of Australia, 2014). The online survey company sent out 1250 email requests to the target sample, yielding a response rate of 33.2%, which is within the typical response rate range for high quality research (Baruch & Holtom, 2008).

Measures

Emotional Demands. We used four items of the Copenhagen Psychosocial Questionnaire II short form (Kristensen, Hannerz, Høgh, & Borg, 2005) to measure the level of emotional job demands experienced by nurses. The items were rated on a 7-point Likert scale, such that higher ratings indicated high level of emotional demands (A sample item is, “Does your work put you in emotionally disturbing situations?”). This scale had good internal reliability ($\alpha = 0.77$).

Job control. We adopted six items from Karasek et al. (1985) to operationalize job control. These items measured the level of skill utilization and job autonomy. The items were rated on a 5-point Likert scale. Sample items included, “My job requires me to make a lot of decisions on my own” and “I get to do a variety of things in my job” ($\alpha = 0.79$).

Mindfulness. Mindfulness was measured using the 15-item unidimensional Mindfulness Attention and Awareness Scale from Brown and Ryan (2003), ranging from “1” never to “5” all of the time. A sample item is “I could be experiencing some emotion and not be conscious of it until sometime later.” All 15 items are reverse scored: The higher score indicates greater mindfulness and awareness of the present ($\alpha = .94$). It was rated as the most reliable and valid mindfulness scale in a recent review of mindfulness measurement (Qu, Dasborough, & Todorova, 2015).

Perceived autonomy support. We used the six-item scale by Baard et al. (2004) to measure the level of perceived autonomy support received. These were rated as “1” = strongly disagree to “5” = strongly agree. A sample item is “My manager listens to how I

would like to do things” ($\alpha = .94$). A higher score indicates employees perceive greater support for autonomy.

Psychological stress. The 10-item scale from Kessler’s Psychological Distress (K10) scale (Kessler & Mroczek, 1994) was used to measure the level of psychological stress experienced by nurses. This scale included ten stress symptoms faced by the general population (Andrews & Slade, 2001) and has also been used to examine stress in nursing (Rodwell & Demir, 2012). Respondents were asked to indicate the frequency of when they have experienced the stress symptoms over the past 30 days. A sample item is “Did you feel so nervous that nothing could calm you down?” Respondents rated their level of frequency from “1” none of the time to “5” all of the time. This scale is shown to have internal reliability ($\alpha = 0.95$).

Control Variables. Age is a well know correlate of mindfulness: As people age they become more mindful (Hohaus & Spark, 2013). In order to avoid spurious findings, therefore, we controlled for age in the SEM model. Hours worked on a weekly basis were also entered as control variables.

Results

Preliminary data analyses were conducted using *IBM SPSS Statistics version 22*. These analyses included reliability, exploratory and confirmatory factor analysis, and correlation analyses. *IBM SPSS AMOS 22.0* was used to conduct the structural equation modeling analysis. The scales used in this study have established validity and reliability in the literature as well as the national context (that is, Australia). We also included the control variables into the path model as we wanted to control for the confounding effects of these variables on the endogenous variables in the model (Becker, 2005).

Because the data could be affected by common method variance, two checks were conducted to check if it was present in the data (Podsakoff, MacKenzie, Lee, & Podsakoff,

2003). We first conducted Harmon's one factor test using SPSS. The analysis showed that the unrotated factor analysis resulted in seven factors with eigenvalues greater than 1.0, of which the largest factor accounted for 29.5% of the variance. Finally, we incorporated a marker variable into the path model (Lindell & Whitney, 2001) as recommended by Podsakoff et al. (2003). In this instance, we used the 10-item social desirability scale by Crowne and Marlowe (1960) as the marker variable. The fit indices for the model including the marker variable were the following: $\chi^2/df = 1.320$, CFI=.989, TLI= .974, RMSEA=0.028, and SRMR=.034. This result confirms that there were no statistically significant paths from the marker variable to the remaining variables in the model.

Descriptive statistics and inter-correlations are detailed in Table 1. Female respondents tended to be older and more mindful, work fewer hours, and experience less psychological stress compared to male respondents. Older nurses tended to work longer hours, experience more job demands, possess more job resources, be more mindful and experience less psychological stress.

 Insert Table 1 about here

We followed the steps outlined in Anderson and Gerbing's (1988) two-step approach to determine measurement model reliability and validity. Step 1 comprised a series of confirmatory factor analyses (CFA). A measurement model was then tested. Results of the analysis showed that the model met the minimum cut-offs for fit indices (Byrne, 2009) for goodness of fit ($\chi^2/df=1.948$, RMSEA=.05, CFI=.94, TLI=.93, SRMR=.06). In step 2, parameter estimates from Step 1 were used to create composite measures in the structural model. The moderation hypotheses were tested by computing the product of the composite latent measures in step 1.

Results of the analyses the structural model including the moderators and the control

variables are reported in Table 2 and pictorially in Figure 2. The model has a good level of fit as indicated by the fit indices ($\chi^2/df=1.360$, CFI=.989, TLI=.976, RMSEA=.029, SRMR=.038), which satisfied the recommended cut-offs (Byrne, 2009). Following Cohen's (1988) guideline, the effect size for R-square for psychological stress was considered to be high, at 51.0%.

Insert Table 2 and Figure 2 about here

As shown in Table 2 and Figure 2, emotional demands directly influenced stress (H1). Perceived autonomy support related to stress directly (H2a) and job control was significantly related to stress (H2b). Job control did not moderate the effect of emotional demands on psychological stress (H3). Mindfulness was associated with perceptions of emotional demands (H4) and mindfulness directly related to psychological stress (H5). Also as hypothesized, mindfulness moderated the impact of emotional demands (H6). The moderation effects were further interpreted by plotting means one standard deviation above and below the mean (see Figure 2). Emotional demands related to more psychological stress for people low in mindfulness, but not for those who were high in mindfulness. The analysis supports the claim that mindfulness reduced, or buffered, the impact of emotional demands on stress.

Insert Figure 23 about here

Discussion

This study assesses the extent to which mindfulness can be conceptualized as a personal resource in the JD-R model and tests several paths by which it might influence stress

as described by Schaufeli and Taris (2014). The results suggest that mindfulness affects stress in a number of ways: Mindfulness relates directly to stress and to perceptions of emotional demands, and it moderates the relation of emotional demands to stress. Mindfulness as a personal resource therefore has a multi-faceted impact on the experience of work and associated stress. That mindfulness is a significant personal resource that operates in multiple ways is important to JD-R research on personal resources as well as mindfulness research more generally. The following sections provide explanations for the findings and describe the theoretical and practical implications of the findings of this study.

Explanations and implications

This analysis supports the idea that mindfulness reduces stress via multiple mechanisms – reducing perceptions of job demands, moderating the influence of those demands on psychological stress, and directly influencing psychological stress. As such, our study supports the contention that mindfulness influences the psychological stress process in the JD-R model as described by Schaufeli and Taris (2014). Mindfulness training and interventions help reduce stress (Grossman et al., 2004; Speca et al., 2000) and mindfulness helps people to focus their attention on the present moment, which has the effect of squeezing attention-competing cognitions and feelings out of consciousness. This practiced or rehearsed focus helps to reduce stress and can explain the direct effect of mindfulness on psychological stress.

In addition to this disciplined focus, being mindful helps explain relations among a number of concepts and their cause and effect sequences (Weick & Putnam, 2006) which accounts for the moderating effect of mindfulness on emotional demands. In this study, nurses who are mindful and understand cause and effect sequences within themselves have a greater understanding of the emotional demands and are better able to deal with them in ways that do not induce stress. This understanding of the effect of demands on stress reduces the

impact of these demands. Lastly, the reduction of perceived emotional demands comes from increased understanding. Our study finds that more mindful nurses tend to experience lower emotional demands because they have enhanced understanding of those demands and their effects on themselves. Moreover, even though the actual job demands might be perceived similarly, the emotional demands are perceived as reduced by the more mindful nurses because they have greater introspective awareness.

Beyond understanding mindfulness, this study has implications for how we incorporate personal resources into the JD-R model. Our findings support the view that personal resources, especially mindfulness, operate in a number of ways (Schaufeli & Taris, 2014). The boundary conditions around personal resources in the JD-R model depend on the nature of the resource. Mindfulness is a powerful resource that has multiple benefits that work in a variety of ways. Mindfulness reduces stress directly and many intervention programmes are designed specifically to reinforce this stress reduction. At the same time, mindfulness decouples the job characteristics from the reaction to those stimuli. In the JD-R model, job demands influence stress. People higher in mindfulness experience job demands in the same way as others, but they do not engage in an automatic stress reaction to those job demands. Indeed, it appears that more mindful individuals are more aware of their physiological reactions to the environment, placing them in a better position to control and monitor those reactions, explaining the moderation effect of mindfulness. Furthermore, mindfulness supplants the need for job control in coping with stress. Considering the boundary conditions of the JD-R model, other personal resources, such as psychological capital may not help people to cope with job demands, but might more directly influence perceptions of job demands.

Schaufeli and Taris (2014) predicted pathways for personal resources in the ways that they influence job resources. This path was not included in our model because it seems

unreasonable that mindfulness influences job resources, such as perceived autonomy support and job control. The mindfulness characteristics that affect stress, such as decoupling and centering, seem unlikely to influence autonomy perceptions. Perceptions of resources could be closer to an objective reality, and people who are mindful might, therefore, be no more likely to perceive that they have such resources. The theory that personal resources relate to job resource perceptions may more appropriately apply to psychological capital constructs such as optimism and resilience. Furthermore, Shaufeli and Taris (2014) also suggest that personal resources play a potential mediating role in the JD-R. We did not test this path either, because it seems unreasonable that the particular personal resource of mindfulness is influenced by either job demands or job resources. Instead, it is more likely to be influenced by meditation, or yoga.

It is worth noting that in this study the mindfulness effect on stress is much stronger than its effect on emotional demands. The primary means of reducing stress with mindfulness appears to be through the traditional mechanisms found in the mindfulness literature: focusing attention on the present, as opposed to ruminating, being unbiased in judgement about that present, decoupling that present from automatic responses, and concentrating on one's physiological responses. These mechanisms reduce stress by making people aware of the potential for stress. They are represented in the JD-R model by the reduction in the perceived emotional demands and the reduced impact of emotional demands on stress.

The job strain interaction between job resources and job demands was not supported as predicted by the demand-control model (Karasek & Thorell, 1990). In fact, Taris (2006) found that only nine of 90 tests in published studies supported the interaction effect. This has remained an uncertain area, and perhaps should be put to rest.

Practical implications

The major practical implication of this study is that people can experience less stress

in the workplace by being more mindful. One way of looking at mindfulness is that it can be learned through training, but it can also be seen as something that comes natural (Kelley, Pransky, & Lambert, 2016). Either way, people can enhance their mindfulness in a number of ways. For example, meditation and yoga can contribute positively to mindfulness. The health benefits of coping positively with stress, therefore, suggests that focusing on mindfulness should be overtly beneficial.

Mindfulness interventions and training help people learn the tools of mindfulness have been shown to be highly useful in reducing the stress in the workplace along with the attendant health benefits (Aikens et al., 2014; Hülshager et al., 2015; Mackenzie et al., 2006; Shapiro, Astin, Bishop, & Cordova, 2005). The research about mindfulness work supports the idea that improving mindfulness in stressful occupations through training will reap benefits through reduced stress. At the same time, however, we must take into consideration the well-trodden idea in organizational behavior that job characteristics produce stress. This study has found supporting evidence for the idea that being mindful has the potential to reduce stress in multiple ways, directly as well as through perceptions of job demands. The practical applicability of this finding is that mindfulness training in the workplace could bring about positive outcomes for employees. Some occupations, such as nursing, are emotionally and physically demanding. Equipping nurses with the personal resources to cope with these demands and at the same time alter their perceptions of these demands through mindfulness training could enhance their jobs and the organizations they work in more broadly.

Limitations and future research implications

The present study investigates mindfulness as a trait compared to a state, and our approach mirrors the majority of workplace studies (Choi & Leroy, 2015). However, state mindfulness may influence the JD-R model; for example, future research could examine event demands such as difficult patient care or event-based job resource changes to clarify the

potential temporal nature of mindfulness on responses. Recent state mindfulness research suggests a positive relationship between state mindfulness and wellbeing (Nezlek, Holas, Rusanowska, & Krejtz, 2016). As such, state level mindfulness may aid the ability to cope with and perceive job demands in a more positive fashion in a similar way to our trait findings reported here. Future research may examine the nature of state mindfulness using the JD-R model, or move towards mindfulness intervention studies (Good et al., 2015; Nezlek et al., 2016).

A major concern with survey studies is common method variance. In this study, dispositional variables of respondents have the potential to make the results related to stress difficult to interpret (Podsakoff et al., 2003). While this study could have been affected by same-source bias, we conducted several checks to minimize this possibility and it is important to keep this in mind when interpreting our results. On the basis of our analysis, we contend that this study has enhanced theoretical and practical understandings of the JD-R model and, as such, signposts directions for future research. One direction should be conducting longitudinal or intervention studies to better understand the causal connection between job demands and stress and how employees deploy job resources to cope with stress. Research could also focus on data provided by nursing managers or supervisors to compare with nurses' responses. Not only would this provide alternative perspectives, it also helps to reduce the possibility of common method bias affecting the analysis. These two potential research directions could take into account temporal effects (Kelloway & Francis, 2013) providing insights that we were unable to identify in this study.

The cross-sectional design of this study precludes claims of causation among the variables and begs the question of reverse causation. It could be argued that stressed employees may be less mindful and experience both greater emotional demands and reduced job resources, even if that stress derives from outside the workplace (Bakker & Demerouti,

2014; Zapf et al., 1996). Only longitudinal research designs will provide insights into this phenomenon. The moderation effect of mindfulness, however, would, most likely, work in the same way. People who are more mindful would experience less of this reverse causal relation between stress and job demands. Indeed, the theoretical explanatory mechanism would be much the same as we have argued in this paper for the moderation effect.

Age is another correlate worth considering because it was positively and significantly related to mindfulness in this study as well as in previous research (e.g., Hohaus & Spark, 2013). As people age they may become more mindful, more concerned with the present moment and less concerned with extraneous and future oriented possible worries. Only further research can confirm this, but we expect that the results from this study are fairly stable. Older nurses might be more mindful, but it is because they are more mindful that they experience less psychological stress (directly) and experience less stress as a result of emotional demands (the moderation). Methodologically, age or a correlate of age may lend to this result, yet the theory surrounding JD-R and personal resources supports our hypotheses.

Conclusion

The importance of this study lies in its illumination of the extent to which employees deploy mindfulness as a personal resource to reduce stress. It seems that this is best conceptualized using the multiple pathways found in the JD-R model. As personal resources are relatively new in JD-R research, this study helps clarify how at least one personal resource (mindfulness) fits within the JD-R model. In addition, this study illustrates the powerful influence of mindfulness for reducing stress in ways that vary from more traditional mindfulness research for health and pain, and we hope that it spurs further research to disentangle the processes by which mindfulness affects the experience of work.

Ethics Declarations

This study received ethical approval from the Curtin University Human Research Ethics Committee on 11 October, 2013; the approval number is SOM-19-2012. No authors have any conflicts of interest.

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Table 1. Descriptive Statistics and Intercorrelations

	M	SD	1	2	3	4	5	6	7
1. Gender (1=M, 2=F)	--	--							
2. Age	--	--	.11*						
3. Hours worked	5.20	8.13	-.05	-.04					
4. Emotional Demands	3.32	0.67	.04	.16**	.01				
5. Job Control	3.49	0.72	.04	.13**	.05	.28***			
6. Mindfulness	3.68	0.70	.13**	.34***	-.15**	-.11*	-.03		
7. Perceived Autonomous Support	3.07	1.00	-.03	.00	-.05	-.04	.34***	-.03	
8. Psychological Stress	2.04	0.91	-.12*	-.29***	.03	.19***	-.04	-.56***	-.14**

Note: N=415

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 2. Path Results of Structural Equation Model

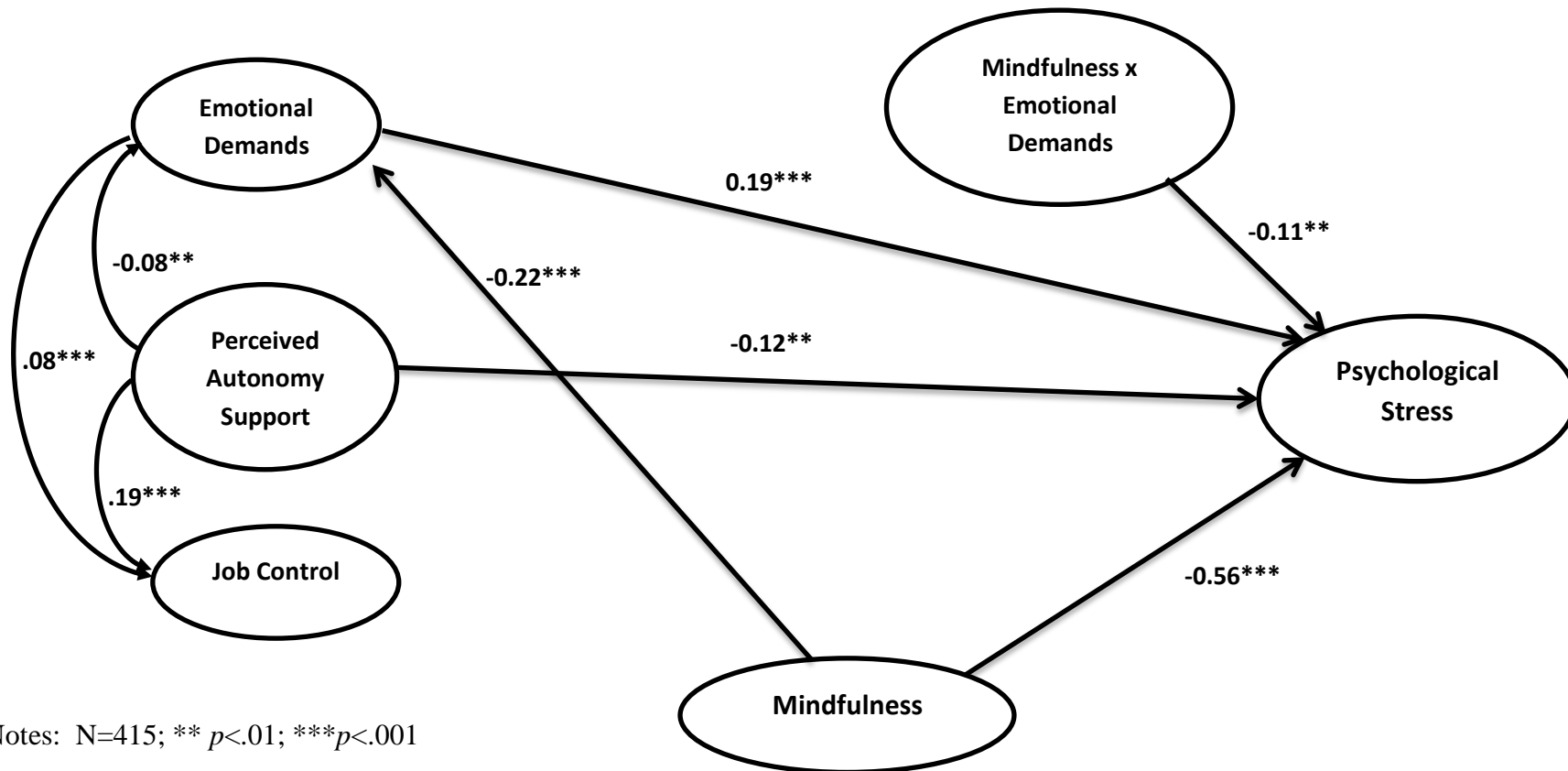
	Paths	Coeff	Sig. level
H1	Emotional Demands → Psychological Stress	0.190	***
H2a	Perceived Autonomy Support → Psychological Stress	-0.124	**
H2b	Job Control → Psychological Stress	-0.086	*
H3	Emotional Demands x Job control → Psychological Stress		ns
H4	Mindfulness → Emotional Demands	-0.216	***
H5	Mindfulness → Psychological Stress	-0.563	***
H6	Mindfulness x Emotional Demands → Psychological Stress	-0.107	**
	Perceived Autonomy Support ↔ Job Control	0.191	***
	Perceived Autonomy Support ↔ Emotional Demands	-0.081	**
	Emotional Demands ↔ Job Control	0.082	***
	Age → Psychological Stress	-0.117	**
	Age → Job Control	0.172	**
	Age → Emotional Demands	0.180	***
	Hours worked → Emotional Demands	0.121	**

Notes: χ^2 /df= 1.360, CFI .988, TLI .976, RMSEA .029, SRMR .0378, N=415,

ns= not significant

p<.01; **p<.01; *p<.001

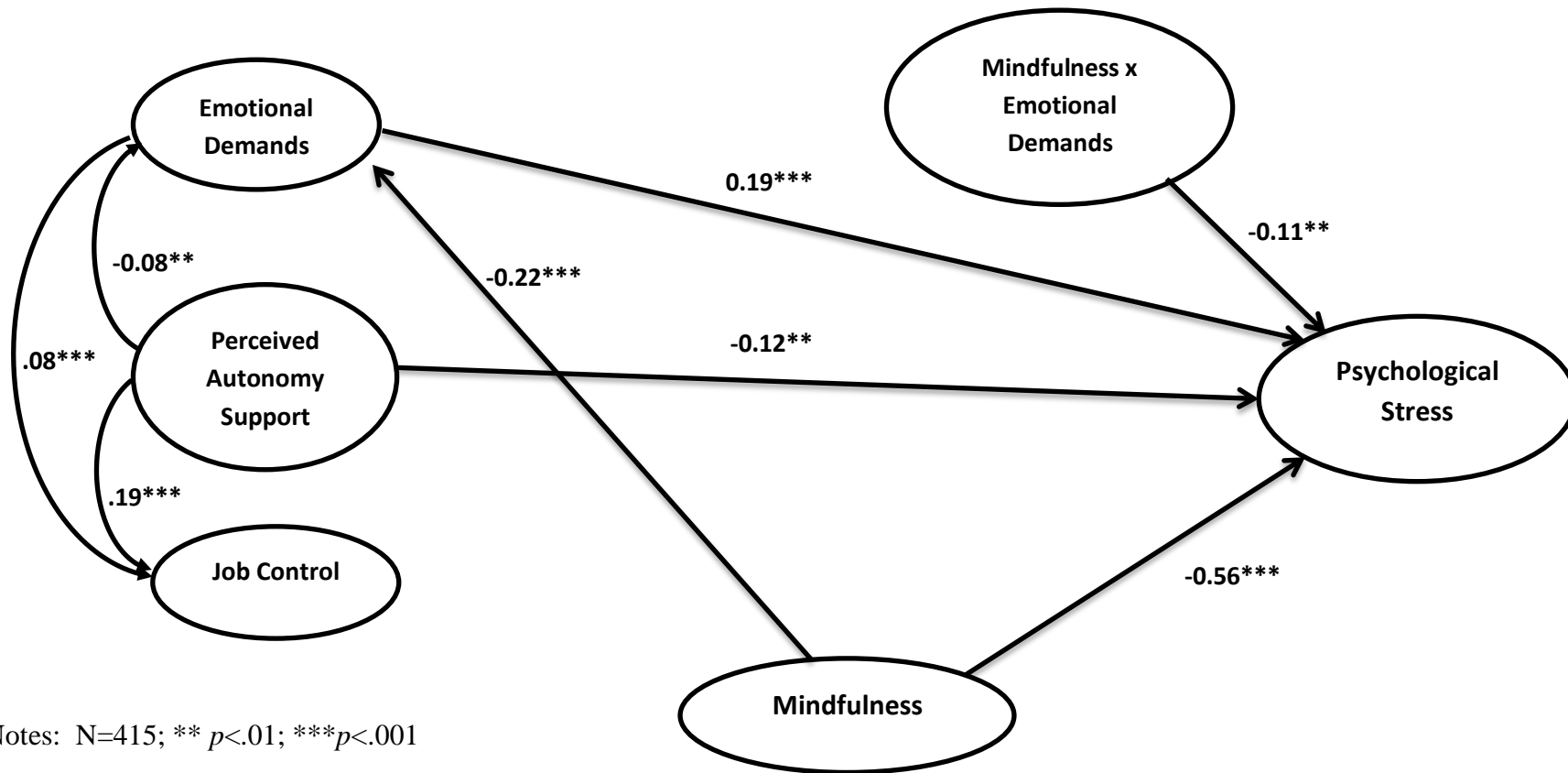
Figure 2. Structural Equation Model Results



Notes: N=415; ** $p < .01$; *** $p < .001$

Only significant paths are shown. Control variables excluded from diagram for clarity.

Figure 2. Structural Equation Model Results



Notes: N=415; ** $p < .01$; *** $p < .001$

Only significant paths are shown. Control variables excluded from diagram for clarity.