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Innovative work behavior among health professionals in Ghana

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Abstract

Purpose – We examined the job demands-resources (JD-R) model among Ghanaian healthcare professionals. We aimed to augment the understanding of employee innovative behavior antecedents by assessing potential job demands–resources correlates using Ghanaian health sector data.

Design/methodology/approach – We utilized an online survey to collect data from 422 health workers in Ghana. We assessed the relevant factors of resources, engagement and innovative work behavior (IWB) via a self-reported survey. Structural equation modeling examined the direct and indirect relationships between variables to test the hypotheses.

Findings – After establishing acceptable measurement properties, structural modeling revealed that the JD-R framework explained 53.2% of the variance in IWB. Job resources positively predicted work engagement, which in turn enhanced innovation. Uniquely, job demands moderated the resource-engagement linkage, such that subjective workload attenuated their relationship.

Practical implications – For practice, the findings suggest that healthcare institutions must provide job resources to drive engagement while considering the workloads' detrimental interactive effects.

Originality/value – The findings contribute to the understanding of the moderating effect of job demands, revealing that Ghanaian healthcare professionals' subjective workload experience weakens the positive effects of resourcing on their motivational engagement. These results advance theoretical understanding of the JD-R model's boundary conditions.

Keywords Health, Innovative work behavior, Job resources, Work engagement, Job demand

Paper type Research article

Introduction

In knowledge economies predicated on innovation dynamics, nurturing employee creativity and imagination holds paramount importance from a management perspective (Stoffers, Hendrikx, Habets, & van der Heijden, 2020). Experts widely accept the importance of this ethos for achieving organizational agility, adaptability and competitive advantage (Axtell *et al.*,

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2000). Moreover, Dai and Akey-Torku (2020) underscore the outsized societal role of the healthcare sector and the necessity of motivated medical professionals. In the Ghanaian context, deficiencies in the practitioner-to-population ratio combined with inadequate job fulfillment are thought to contribute to skilled emigration. Ghana's health system faces considerable challenges in retaining skilled professionals amid rising service demands. According to the data available to the Ghana Health Service in May 2018, there was an estimated shortfall of 105,440 healthcare workers needed to satisfy minimum staffing standards relative to the 61,756 personnel occupying posts at the time (Asamani *et al.*, 2021). This represented a vacancy rate of approximately 41% across geographical regions. Inadequate resources and heavy workloads engender burnout, and enthusiasm that fuels innovative solutions.

One of the significant challenges faced by health professionals in Ghana is migration. Many health professionals choose to migrate to other countries in search of better job opportunities, leading to a brain drain in the healthcare sector (Anarfi, Quartey, & Agyei, 2010; Antwi & Phillips, 2013; Boateng *et al.*, 2022; Dovlo, 2007; Poku, Mensah, Kyei, & Ofei, 2023). Bonenberger, Aikins, Akweongo, and Wyss (2014) found high turnover intentions among various healthcare professionals in Ghana. The findings revealed that 69% of these employees expressed intentions to leave their respective health facilities due to insufficient levels of job satisfaction (Bonenberger *et al.*, 2014). The remaining employees face dilapidated infrastructure, inadequate supplies and undefined career paths (Alhassan *et al.*, 2013).

Previous literature notes that individual-level innovation antecedents remain underexplored, warranting empirical examination (Bhattacharjee & Sarkar, 2023). In the Ghanaian sphere, the objective emerges to assess potential job demands-resources (JD-R) correlates of Employee innovative work behavior (IWB) via a quantitative cross-sectional design. A separate meta-analytic inquiry spanning 2000–2021 revealed that the majority of prior public sector IWB studies centered on educational settings, emerging primarily from Asia (Srirahayu, Ekowati, & Sridadi, 2023). Hence, we focused on Ghana's health professions. Theoretical work underscores the role of innovation in bolstering organizational competitiveness and adaptability amid contemporary volatility, highlighting employees as the core source of novel solutions, enabling firms to dynamically respond to challenges. Complementing these individual and firm-level perspectives, multilateral cooperation has supported Ghana's strengthening of national health workforce frameworks, practices and tools critical for attaining universal coverage through optimized human resources, thereby complementing innovation-driven competitive strategies.

Bhattacharjee and Sarkar (2023) notably contributed to prior understanding in three domains: elucidating job resources' effects and origins further, grappling with delineating theoretical bounds and proposing work engagement as an innovative intermediary mechanism whereby resources spur individual-level innovation. Meanwhile, Akuffo *et al.* (2021) explored opticians' job satisfaction levels in Ghana and influencing factors, recognizing motivation's importance therein. An evaluation revealed that salary positively and significantly correlated with overall satisfaction – with higher pay correlated with greater satisfaction.

Scholars widely accepted the JD-R model before this study as a comprehensive framework for understanding employee well-being and performance in a variety of occupational and cultural contexts. The model suggests that job demands, which are labor-intensive and linked to specific physiological and psychological costs, cause stress and burnout, while job resources assist in achieving work goals, lessen job demands and foster personal development, all of which increase work engagement and motivation (Bakker & Demerouti, 2007). Several studies have confirmed the validity of the JD-R model by showing that work engagement and job resources are positively correlated, and that engagement mediates the relationship between resources and favorable organizational outcomes. The model identifies two primary processes, i.e. the motivational process, which is facilitated by ample job resources and leads to increased engagement and productivity, and the health impairment process, which is caused by high job expectations and burnout (Bakker & Demerouti, 2014).

By extending the JD-R model's current theoretical framework to Ghana's healthcare industry and concentrating on IWB among healthcare providers, this study expands on it. By examining

how job demands and resources affect employee innovation in a developing nation context – specifically, the understudied healthcare industry of Ghana – the study fills a gap in the literature.

The results of the study show that employment resources significantly influence work engagement, which in turn fosters innovative work practices among medical professionals. This validates the motivational mechanism in the JD-R model. However, the discovery of job demands, or subjective workload, as a moderator that attenuates the favorable correlation between job resources and work engagement is a singular addition to this study. By highlighting the boundary conditions under which work resources may or may not drive engagement and innovation, this finding enriches the theoretical understanding of the JD-R model (Schaufeli & Taris, 2014).

This article is structured as follows: subsequent sections entail literature/hypothesis development, methodology explication, results discussion and implications, limitations and conclusions appraisal. The study aims to enhance the understanding of employee innovative behavior antecedents by assessing potential job demands–resources relationships using Ghanaian health sector data. This underexplored empirical context merits analysis to inform human capital optimization strategies.

Literature and hypothesis development

Job demands-resources (JD-R) theory

Scholars have extensively used the JD-R model to investigate occupational issues such as work-related outcomes, resources and demands (Hoppner, Mills, & Griffith, 2021). Demerouti, Bakker, Nachreiner, and Schaufeli (2001) developed it to investigate the origins of burnout through the identification of specific job demands and resources that impact employee well-being and performance. According to the JD-R model, job demands, characterized as elements necessitating ongoing exertion, are linked to stress and health challenges, whereas job resources, which support the accomplishment of work-related objectives and promote personal development, contribute to increased motivation and effectiveness (Demerouti *et al.*, 2001). Originally, the JD-R model focused on the health impairment pathway, wherein elevated job demands are linked to burnout, as well as the motivational pathway, where abundant job resources result in employee engagement. Schaufeli and Bakker (2004) made revisions to the model by integrating work engagement and highlighting its favorable psychological dimensions. This updated version of the model argues that job demands contribute to burnout, subsequently leading to health issues, while job resources facilitate engagement, resulting in positive organizational outcomes (Schaufeli & Bakker, 2004).

Empirical evidence backing the JD-R model is derived from a range of studies spanning various professions and cultural contexts, illustrating that job resources play a role in alleviating the adverse impacts of job demands on fatigue, while also showing that engagement acts as a mediator in the connection between job resources and favorable results (Bakker, Demerouti, & Euwema, 2005). Studies have confirmed this model in a multitude of environments, such as healthcare, education and the industrial sector (Adil & Kamal, 2020; Kaiser, Patras, Adolfsen, Richardsen, & Martinussen, 2020; Barello *et al.*, 2021).

Next, the model underwent further refinement through the incorporation of personal resources, such as optimism and self-efficacy. Xanthopoulou, Bakker, Demerouti, and Schaufeli (2007) found that these resources have a direct effect on well-being, moderate the relationship between job characteristics and outcomes and mediate the effects of job resources on engagement. Future research aims to address the model's epistemological status, refine definitions of demands and resources and investigate reciprocal causation and multilevel issues. The JD-R model's broad applicability and flexibility make it a valuable tool for enhancing organizational performance and employee health (Schaufeli & Taris, 2014).

We gave priority to the JD-R model over other theories because a balanced view of employee well-being is possible thanks to the JD-R model's capacity to consider both health

impairment and motivational processes. This dual emphasis is especially important in high-stress settings like the healthcare sector, where engagement and burnout are major problems (Bakker & Demerouti, 2007). For example, Siegrist's (1996) effort-reward imbalance model lacked a significant involvement component and instead concentrated on stress and burnout. Moreover, despite emphasizing task management, the demand-management model (Karasek, 1979) falls short in addressing the motivating resources that encourage involvement. Furthermore, the JD-R model works well in a variety of organizational environments and cultural contexts, including the healthcare industry in Ghana. Tailoring it to the unique demands of the workplace and available resources in the local context can yield valuable insights that help to enhance employee performance and well-being (Dai & Akey-Torku, 2020). Besides, a large body of empirical research corroborates the JD-R model's generalizability and suitability for use in a wide range of industries and societies. According to Schaufeli and Taris (2014) and Bakker and Demerouti (2014), the model's robust empirical foundation increases its credibility and dependability as a tool for organizational analysis and intervention.

The JD-R model provides a useful framework for understanding work engagement and well-being. Empirical research has validated the motivational process whereby job resources lead to engagement and positive organizational outcomes (Schaufeli & Taris, 2014). Numerous studies underscore the JD-R model's authenticity and applicability across contexts (Scholze & Hecker, 2023). The model spotlights three strategies for boosting employee well-being: alleviating demands, augmenting resources and enabling job crafting (Roskams, McNeely, Weziak-Bialowolska, & Bialowolski, 2021).

Job resources refer to the valued physical, psychological, social or organizational aspects of work that help employees achieve goals, reduce demands, or promote growth (Schaufeli & Taris, 2014). Resources link to IWBs, illuminating the work environment's role in shaping employee conduct (Escrig-Tena, Segarra-Ciprés, García-Juan, & Badoiu, 2022). For instance, Bhattacharjee and Sarkar (2023) found that high-performance systems increased innovation by raising engagement, especially amid high work overloads. While their study examined R&D professionals in India, the dynamics may apply to other contexts such as Ghanaian healthcare.

Burnout plagues healthcare providers, manifesting as emotional, physical and mental fatigue leading to disengagement, absenteeism and turnover (Odonkor & Frimpong, 2020). Healthcare's taxing nature makes staff susceptible to burnout, with ramifications for worker welfare, patient care, the workforce and institutions. The JD-R model suggests that one can address burnout's organizational causes through job modifications that enhance healthcare professionals' well-being and performance in Ghana.

Dai and Akey-Torku (2020) examined how psychological capital influenced autonomy and satisfaction among 385 public-sector healthcare professionals. Structural equation modeling revealed that hope, directly and indirectly, heightened satisfaction via autonomy. Optimism also significantly predicted autonomy, though autonomy minimally predicted satisfaction. Furthermore, psychological resources such as hope and optimism emerged as vital to equip Ghanaian healthcare staff with the motivation to overcome challenges and derive fulfillment from their meaningful work.

Job resources and work engagement

A wealth of global research has examined the link between job resources and work engagement. Job resources encompass selective hiring, performance-based promotion, extensive training, participative mechanisms, information sharing, merit pay, clear job design and performance management (Bhattacharjee & Sarkar, 2023). Studies reveal that engagement is positively associated with resources like workplace community, growth opportunities and influence (Bakker, 2011). Schaufeli, Salanova, González-Romá, and Bakker (2002) defined engagement as a fulfilling, positive work-related state characterized by vigor,

dedication and absorption, reflecting occupational well-being (Lesener, Gusy, Jochmann, & Wolter, 2020). Mackay, Allen, and Landis (2017) described engagement as fully dedicating physical, cognitive and emotional energies to meaningful and impactful work. Engagement represents activating one's full self to bring something unique to work, with resources fostering engagement and buffering demands (Kwon & Kim, 2020). Evidence confirms the link between resources and engagement (Ahakwa, Yang, Tackie, & Atingabili, 2021; Kusuma, Kurniawan, & Herawati, 2022). In Ghana's public sector, a culture centered on achievement and support increased engagement (Brenyah & Obuobisa-Darko, 2017). Generally, resources can stimulate engagement, yielding enhanced motivation and favorable work outcomes (Roskams *et al.*, 2021).

The JD-R model provides a useful framework for understanding employee engagement, as examined by Lee and Jo (2023). This model proposes that the interaction between job demands and job resources substantially influences both engagement and performance. A key insight is the importance of personal resources such as mental well-being and autonomy in boosting engagement and performance. In line with this framework, Bhattacharjee and Sarkar (2023) found that job resources are positively associated with work engagement. Resources can facilitate employees' IWBs by promoting greater engagement. While job resources are known to typically enhance work engagement, their impact may vary based on various factors, including job demands, stress levels and the risk of excessive engagement. Hence, it is crucial to consider these intricacies when assessing the overall influence of job resources on work engagement. According to the findings of Bakker and Demerouti (2007), the interaction between job demands and job resources can influence work engagement. When faced with high levels of job demands, the significance of job resources heightens, yet they may not fully offset the adverse consequences of such demands. This moderating mechanism suggests that the beneficial influence of job resources on work engagement could diminish or be eradicated in the presence of severe job demands. Thus, we postulated that:

H1. Job resources have a positive and significant influence on work engagement

Work engagement and innovative work behavior (IWB)

Innovation enables organizations to adapt to environmental transformations, underscoring its importance for efficacy and sustainability (Srirahayu *et al.*, 2023). Job crafting, defined as self-initiated changes to optimize work elements, also boosts well-being, satisfaction and performance (Nie, Tian, Cai, & Yan, 2023). IWB involves intentionally introducing novel ideas that enhance organizational effectiveness (Anderson, Potočnik, & Zhou, 2014). It is critical for organizational growth and progress (Srirahayu *et al.*, 2023). Engagement significantly impacts IWB (Kusuma *et al.*, 2022). A study in Indonesia showed that engagement increases IWB (Charli, Masnum, Hidayat, Menhard, & Hartoyo, 2023). In Ghana, career management heightens engagement and satisfaction for SME employees (Korankye, 2020). Engagement also mediates organizational embeddedness and life satisfaction (Ampofo, Owusu, Coffie, & Asiedu-Appiah, 2022). A meta-analysis found a medium correlation between engagement and IWB (Sari, Christian, & Yudiarso, 2021). The JD-R model indicates that resources can stimulate engagement and performance (Bhattacharjee & Sarkar, 2023). Autonomy and meaning enable job crafting (Nie *et al.*, 2023). For Ghana's public sector, recommended incentives include rewards, clear goals and resources (Baafi, Ansong, Dogbey, & Owusu, 2021). Engaged employees are more likely to exhibit innovative coping behaviors amid challenges (Kwon & Kim, 2020).

Lesener *et al.*'s (2020) comprehensive analysis examined 55 longitudinal studies on diverse job resources' influence on work engagement. Applying meta-analytic structural equation modeling, they analyzed the distinct effects of resources on engagement at the group, leader and organizational levels to uncover engagement determinants. Results revealed that job resources at all three levels predicted long-term engagement. Similarly, Neuber *et al.*'s (2022)

meta-analysis found a positive association between engagement and overall employee performance. As a motivational concept, engagement has considerable beneficial impacts on task performance consistently across regions and facets. Organizations should embrace engagement as a safeguarding factor for workforce well-being and productivity while reducing absenteeism. However, as described by Mauno, Kinnunen, and Ruokolainen (2007), various categories of job demands, such as role ambiguity and role conflict, exhibit a negative correlation with the dedication aspect of work engagement as time progresses. From the foregoing, we hypothesized that:

H2. Work engagement has a positive and significant influence on innovative work behavior.

The mediating role of work engagement

Although Chughtai and Buckley (2011) and Kwon and Kim (2020) identify employee engagement as a significant predictor of IWB, Agarwal, Datta, Blake-Beard, and Bhargava (2012) note that employee engagement might serve as a mediator between IWB and various antecedents. De Spiegelaere *et al.* (2014) discovered that employee engagement plays a partial mediating role between job resources and IWB. Similarly, Wang, Lu, and Oi-ling Siu (2015) observed that employee engagement acts as a mediator between job resources and IWB. Airila *et al.*'s (2014) 10-year study showed that engagement fully mediated the effects of job and personal resources on workability, suggesting long-term impacts on engagement and subsequent ability. Kusuma *et al.* (2022) found that engagement-mediated job resources and task performance. Other research confirms engagement's mediating role between resources and innovation. Bhattarai and Budhathoki (2023) found that engagement-mediated resources and IWB. Wang, Khan, Sajjad, Sarki, and Yaseen (2023) showed engagement-mediated job crafting and innovation performance. Engagement also positively mediated resources and innovation in Escrig-Tena *et al.*'s (2022) study. Hence, we hypothesized:

H3. Work engagement mediates the positive relationship between job resources and innovative work behavior.

Moderating the role of work overload between job resources and work engagement

Research emphasizes the intricate relationships among job resources, job demands and work engagement (Figure 1). Studies show that job resources may gain greater importance in situations of high job demands, although this does not automatically mean that work overload will have a detrimental impact on the relationship. On the contrary, job resources are capable of mitigating the adverse effects of high demands, consequently maintaining work engagement (Broeck, Cuyper, Witte, & Vansteenkiste, 2010). Employees can experience "psychosocial hazards" when their abilities do not match demands, which causes stress (Tsen, Gu, Tan, & Goh, 2023). Work overload, defined as assigned tasks exceeding motivated coping capacity, is a key demand (MacDonald, 2003). Given work overload's role in stress,

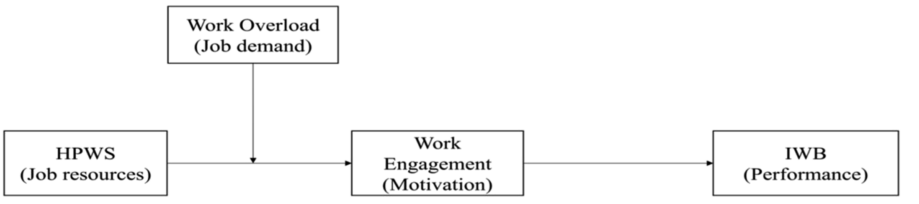

Figure 1. Conceptual framework. Notes*:* HPWS – High-performance work systems; IWB – Innovative work behavior. Source: Own elaboration

Bhattacharjee and Sarkar (2023) and Dlouhy and Casper (2021) examined it as a moderator. Work overload moderates resources and engagement (Wang *et al.*, 2023). Bhattacharjee and Sarkar (2023) tested overload as a boundary condition between resources and engagement based on the JD-R model. While other studies found that overload increased engagement yet lowered commitment (Lopper, Dettmers, & Hoppe, 2022). Bhattacharjee and Sarkar (2023) revealed a direct link between resources and engagement, unaffected by overload. However, high overload could strengthen the positive resources-engagement relationship. With minimal overload, employees may struggle to fully utilize their skills and abilities, diminishing satisfaction and weakening the resource-engagement link. Hakanen, Perhoniemi, and Toppinen-tanner (2008) discovered that job resources, such as social support and opportunities for professional development, consistently retained their beneficial effects on work engagement, regardless of the work overload. Therefore, we hypothesized that:

H4. Work overload moderates the positive relationship between job resources and work engagement.

Methodology

Questionnaire design and data collection

We utilized an online survey to collect data from 422 health workers in Ghana. A 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) measured variables including job resources, work overload/job demands, work engagement/motivation and IWB via a self-reported survey. This article presents a web-based questionnaire. We contacted the participants at their facilities through direct email correspondence containing the web survey link. We informed participants about the voluntary, anonymous nature of the study purpose and provided consent and that they could respond to the questionnaire at their convenience. The sample came from health facilities (such as clinics, hospitals and pharmacies) in the Bono region of Ghana, completing a closed-ended questionnaire based on prior instruments from February to October 2022. Structural equation modeling examined the direct and indirect relationships between variables to test hypotheses. We evaluated reliability using Cronbach's alpha (CA). We analyzed data using structural equation modeling and SmartPLS software. We removed loadings below 0.70. Constructs displayed acceptable composite validity (CR > 0.7) and reliability (Cronbach $\alpha > 0.7$). We confirmed discriminant validity and the average variance extracted (AVE).

Measurement control

We adopted the assessment of job resources, work overload/job demand, work engagement/motivation and IWB/performance from previous studies (Bhattacharjee & Sarkar, 2023; Escrig-Tena *et al.*, 2022), using a 5-point Likert scale. We measured job resources using five items and sample items were "I have an influence over the tasks I do in my work" and "I have an influence over the pace at which I work" ($\alpha = 0.84$). We measured work overload/job demand using six items, and sample items were "I am pressured to work long hours" and "I have unachievable deadlines" ($\alpha = 0.83$). We measured work engagement/motivation using nine items, and sample items were "In my work, I feel bursting with energy" and "In my job, I feel strong and vigorous" ($\alpha = 0.92$). We measured IWB using 10 items, including "Paying attention to issues that are not part of his/her daily work" and "Wondering how things can be improved." The original scale had a CA of 0.94, indicating high reliability. Bhattacharjee and Sarkar (2023) reported these CA values. However, the reliability analysis conducted in this study yielded the following CA values for each construct: job resources: 0.889; job demands: 0.750; work engagement: 0.886; and IWB: 0.904.

As shown in Table 2, all constructs demonstrated acceptable levels of internal reliability, with CA values above the standard threshold of 0.70. This confirms that the adapted survey

instrument used in this study reliably measured the key variables of job resources, demands, engagement and IWB.

Results

For data processing, we employed Smart PLS (Ringle, Da Silva, & Bido, 2014). To test all the proposed correlations, we utilized partial least squares-structural equation modeling (PLS-SEM). PLS-SEM removed the limited sample size restriction. It also provides a larger statistical power. Unlike CBSEM, PLS-SEM does not require stringent data assumptions (Hair, Ringle, & Sarstedt, 2011).

The demographic profile delineated in Table 1 conveys several notable patterns. Specifically, females comprised over half (approximately 54%) of the sample. Moreover, the 20–30 year age group overwhelmingly predominated at about 52% of respondents, whereas senior employees aged 51 and over represented 1.9%. Educationally, approximately 45% of respondents had obtained a master's degree. Regarding work experience, the group with 1–4 years of experience dominated the sample composition. We utilized age and experience coarse scaling in the present study to augment comparability, enhance clarity and streamline analysis, with precedent of similar scaling practices documented in previous research studies (Amofah *et al.*, 2024a, b).

Moreover, Christians represented 86.7%, and married individuals comprised approximately 58.8% of the workforce cohort surveyed.

Measurement model assessment

We evaluated the measurement model first by examining indicator loadings. Following Hair *et al.*'s (2019) recommendation, we dropped indicators with loadings below 0.7 to improve overall model reliability. As shown in Table 2 and Figure 2, all indicators exceeded the 0.70

Table 1. Respondents' demographic characteristics

Variables	Categories	Frequency (%)
Gender	Male	196 (46.4)
	Female	226 (53.6)
Age (years)	20–30	220 (52.1)
	31–40	158 (37.4)
	41–50	36 (8.6)
	51+	8 (1.9)
Educational level	HND	16 (3.8)
	First degree	86 (20.4)
	Masters	190 (45.0)
	PhD	44 (10.4)
	Other	86 (20.4)
Years of working experience	Less than 1year	66 (15.6)
	1–4years	218 (51.7)
	5–9years	74 (17.5)
	10 years +	64 (15.2)
Marital status	Married	248 (58.8)
	Single	174 (41.2)
Religion	Christian	366 (86.7)
	Moslem	44 (10.6)
	Traditional religion	4 (0.9)
	No religion	4 (0.9)
	Other	4 (0.9)

Source(s): Own elaboration

Table 2. Measurement items, their reliability and VIF

Constructs and their respective items	Factor loadings	VIF
Innovative work behavior (IWB) [R^2 = 0.532; R^2-Adjusted = 0.531]		
IWB10-Making an effort to develop new things	0.809	2.222
IWB3-Searching for new working methods, techniques, or instruments	0.709	1.716
IWB4-Generating original solutions to problems	0.724	1.874
IWB5-Finding new approaches to execute tasks	0.819	2.299
IWB6-Making important organizational members enthusiastic about innovative ideas	0.768	2.017
IWB7-Attempting to convince people to support an innovative idea	0.783	2.155
IWB8-Systematically introducing innovative ideas into work Practices	0.775	2.083
IWB9-Contributing to the implementation of new ideas	0.793	2.051
Job demands (JD)		
JD1-I am pressured to work long hour	0.707	1.507
JD2-I have unachievable deadlines	0.717	1.508
JD3-I have to work very fast	0.783	1.566
JD4-I have to work very intensively	0.806	1.593
Job resources (JR)		
JR1-I have an influence over the tasks I do in my job	0.816	2.043
JR2-I have an influence over the pace at which I work	0.852	2.222
JR3-I have an influence over how I do my work	0.841	2.376
JR4-I have an influence over the order in which I carry out tasks	0.831	2.139
JR5-I have an influence over the time I start or finish my working day	0.815	2.134
Work engagement (WE) [R^2 = 0.555; R^2-Adjusted = 0.552]		
WE2-In my job, I feel strong and vigorous	0.752	1.875
WE3-I am enthusiastic about my job	0.856	2.706
WE4-My job inspires me	0.841	2.477
WE5-When I get up in the morning, I feel like going to work	0.769	1.835
WE6-I feel happy when I am working intensely	0.744	1.747
WE7-I am proud of the work that I do	0.824	2.205

Note(s): *VIF – variance inflation factor

Source(s): Own elaboration

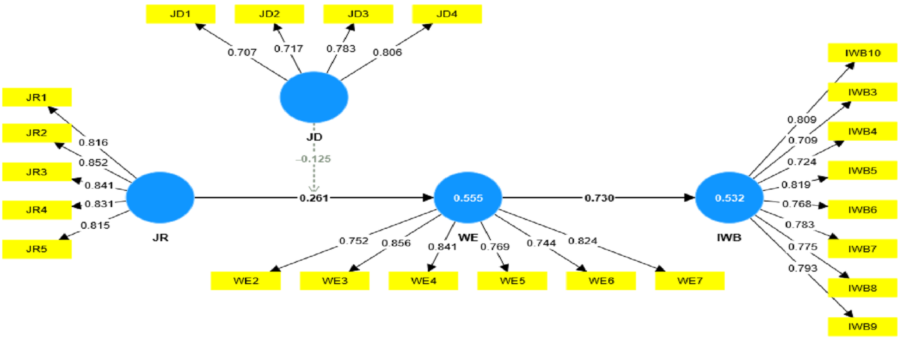

Figure 2. PLS-SEM results. Notes. IWB – innovative work behavior; JD – job demands; JR – job resources; WE – work engagement. Source: own elaboration

threshold. We assessed the internal consistency reliability of CA and composite reliability (CR). All constructs had CA and CR values above conventional limits, demonstrating internal reliability. Exceeding the 0.7 threshold for both CA and CR confirms each construct's validity

(Bagozzi & Yi, 1988). We evaluated convergent validity AVE. As Table 2 shows, AVE values were acceptable. The full set of α, CR and AVE values that underpin these assessments appears in Table 3. Per Hair, Risher, Sarstedt, and Ringle (2019), an AVE of 0.50 or above indicates the construct accounts for at least 50% of the variance among its components. Thus, we established convergent validity for all model constructs. Inter-construct correlations and the square roots of AVE supporting discriminant validity can be found in Table 4.

Structural model assessment

In examining the structural model aspect in SEM (i.e. assessing the relationships between latent variables), it is appropriate to assess the model fit. Table 7 presents model fit statistics for the structural model. We employed the following model fit indices: standardized root mean square residual (SRMR), squared Euclidean distance (SED), geodesic distance (GD), Chi-square and normed fit index (NFI). All these model fit indicators showed that the structural model was acceptable. Thus, the SRMR value was 0.062, which is less than the threshold of 0.08 (Henseler, Ringle, & Sarstedt, 2015).

Moreover, a model is considered to fit well if its SED and GD are all greater than 0.05. Regarding this analysis, the SED and GD values were all greater than 0.05 (see Table 7). Moreover, the value recorded for NFI (values closer to 1 better fit) showed that the model was acceptable.

As Hair *et al.* (2019) note, we may evaluate PLS-SEM results using the effect size (f^2) and coefficient of determination (R^2). We first assessed the model for collinearity issues that could skew results, indicated by variance inflation factors (VIFs) above 5 (Hair *et al.*, 2011).

As shown in Table 2, we found no lateral multicollinearity. Low VIFs signified no common method bias per Kock and Lynn (2012). The (R^2) values in Table 2 and Figure 2 indicated that the model explains 53.2% of the variance in healthcare employees' IWB. Values above 0.67, 0.33 and 0.19 indicated substantial, moderate and weak explanatory power (Kassem, Khoiry, & Hamzah, 2020). This suggests the predictors have a moderate ability to explain variance in IWB and engagement. Table 5 shows the results of the effect size (f^2). We may see that job resources had a small effect on work engagement, whereas work engagement had a large effect on IWB.

Beyond directly examining associations between variables, this study examined the moderating role of job demands on the job resources-work engagement linkage. Notably, we found the estimate for the interactive term (JD*JR) in the structural model to be negatively valued and statistically significant at $p < 0.05$. This inverse moderating impact of job demands implies that one's subjective experience of workload serves to attenuate the positive relationship otherwise anticipated between resourcing and motivational engagement. Complementing these quantitative insights, visualization of the moderated path model observed in Figure 3 manifests a steeper slope for the low versus high job demands scenario,

Table 3. Constructs reliability and validity

Constructs	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
IWB	0.904	0.922	0.598
JD	0.75	0.841	0.569
JR	0.889	0.918	0.691
WE	0.886	0.913	0.638

Note(s): IWB – innovative work behavior; JD – job demands; JR – job resources; WE – work engagement
Source(s): Own elaboration

Table 4. Discriminant validity (Fornell-Larcker criterion)

5	IWB	JD	JR	WE
IWB	*0.773*			
JD	0.583	*0.755*		
JR	0.471	0.501	*0.831*	
WE	0.73	0.696	0.541	*0.799*

Note(s): IWB – innovative work behavior; JD – job demands; JR – job resources; WE – work engagement
Source(s): Own elaboration

Table 5. Effect size

Constructs	Effect size f-square[a]	Result
JR → WE	0.115	Small
WE → IWB	1.139	Large

Note(s):, [a]Interpreting effect size (f2) (Cohen, 1988)
F2 above 0.35 is considered a large effect size
F2 ranging from 0.15 to 0.35 ismedium effect size
F2 between 0.02 and 0.15 is considered a small effect size
F2 values less than 0.02 are considered no effect size
IWB – innovative work behavior; JR – job resources; WE – work engagement
Source(s): Own elaboration

offering insight into a moderate relationship at higher demand levels. Collectively, these empirical patterns provide evidence that job demands emerge as a strong conditional factor weakening the job resources-work engagement nexus among Ghanaian health professionals.

Furthermore, the study assessed the mediation effect of work engagement (WE) on the relationship between job resources (JR) and IWB. The mediation results depicted in Table 6 revealed the statistically significant indirect effect of JR on IWB through WE. We can also see that the total effect was statistically significant at 0.1%; thus, including the mediating variable

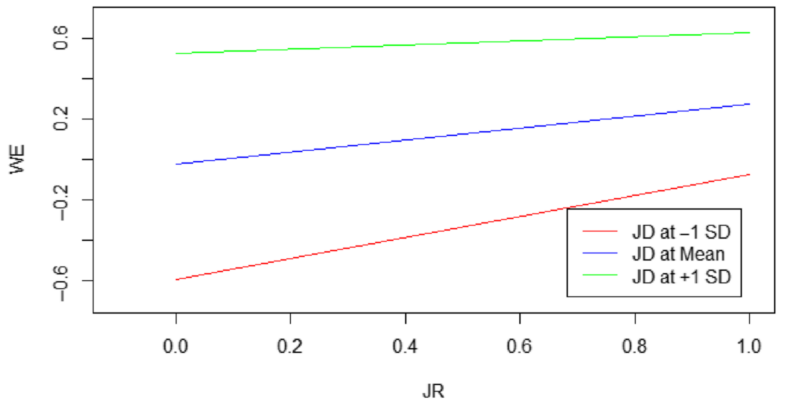

Figure 3. Moderation. Notes. JD – iob demands; JR – job resources; WE – work engagement; SD – standard deviation. Source: own elaboration

Table 6. Regression [estimates of the structural model]

Hypotheses	Estimates	Standard error	Remarks	*P* values
JD → WE	0.521	0.037	Supported	0.000
JR → WE	0.261	0.043	Supported	0.000
WE → IWB	0.730	0.031	Supported	0.000
Moderation				
JD x JR → WE	−0.125	0.025	Not supported	0.000
Mediation				
JR → IWB (Total Effect)	0.191	0.033	supported	0.000
JR → IWB (Direct Effect)	0.189	0.042		0.000
JD → WE → IWB (Indirect Effect)	0.380	0.031		0.000

Source(s): Own elaboration

Table 7. Model fit

Indicators	Values
Standardized root mean square residual (SRMR)	0.062
Squared Euclidean distance (SED)	0.868
Geodesic distance (GD)	0.172
Chi-square	2003.43
Normed fit index (NFI)	0.843

Source(s): Own elaboration

(WE) in the model, the impact of JR on IWB was still statistically significant. Since both direct and indirect effects were positively significant (see Table 6), we therefore can state that WE partially (complementary) mediates the relationship between JR and IWB. This demonstrates the intricate interaction among job resources, work engagement and IWB. Job resources play a vital role by not only cultivating a supportive and challenging work atmosphere that enhances engagement but also by providing employees with the tools to innovate directly. Understanding this correlation enables organizations to develop more effective approaches to promote innovation by guaranteeing that employees are both engaged and adequately supported with essential resources. This result synchronizes with a study by Wang *et al.* (2015). They also established that work engagement positively mediates the relationship between job resources and IWB.

Discussion

The study investigated IWB among health professionals in Ghana through the lens of the JD-R model. The findings offer insights into how job resources, work engagement and job demands enhance IWB in Ghana's healthcare sector. The structural equation modeling results revealed that the proposed model explained 53.2% of the variance in healthcare employees' IWB, indicating a moderate to strong explanatory power (Kassem *et al.*, 2020). This strong explanatory capacity shows the importance of the JD-R framework in understanding the antecedents of innovation in healthcare settings.

Consistent with our hypotheses and prior research, job resources demonstrated a positive relationship with work engagement (Ahakwa *et al.*, 2021; Kusuma *et al.*, 2022). This finding aligns with the motivational process posited by the JD-R model, wherein job resources stimulate employees' intrinsic motivation, leading to higher engagement levels (Bakker &

Demerouti, 2017). The results corroborate previous studies in Ghana's public sector, which have highlighted the role of supportive organizational cultures in enhancing work engagement (Brenyah & Obuobisa-Darko, 2017; Tsen *et al.*, 2023).

Furthermore, our study confirmed the positive relationship between work engagement and IWB, supporting our second hypothesis. This finding resonates with a growing body of literature emphasizing the crucial role of engagement in fostering innovation (Korankye, 2020; Kwon & Kim, 2020; Ampofo *et al.*, 2022; Charli *et al.*, 2023). The mediating role of work engagement between job resources and IWB, as supported by our third hypothesis, aligns with previous longitudinal studies (Airila *et al.*, 2014) and recent research in various contexts (Bhattarai & Budhathoki, 2023; Wang *et al.*, 2023). This mediating effect underscores the importance of engagement as a psychological mechanism through which organizational resources translate into innovative outcomes.

A noteworthy contribution of this study lies in its examination of the moderating role of job demands on the relationship between job resources and work engagement. The significant negative interaction effect (JD*JR) provides empirical support for the buffering hypothesis of the JD-R model (Bakker & Demerouti, 2017). Specifically, our findings suggest that high job demands attenuate the positive relationship between job resources and work engagement. This moderation effect aligns with recent studies (Lopper *et al.*, 2022; Bhattacharjee & Sarkar, 2023; Wang *et al.*, 2023) and extends our understanding of the complex dynamics between job characteristics and employee outcomes in healthcare settings.

The demographic profile of our sample, characterized by a predominance of young, educated females, reflects broader trends in Ghana's health workforce (Bonenberger *et al.*, 2014). The high proportion of Master's degree holders (approximately 45%) is particularly noteworthy, as it suggests ongoing efforts to enhance specialist capacity in the face of critical shortages. This educational profile may have implications for the generalizability of our findings and warrants further investigation into how educational attainment influences IWB in healthcare (see Table 7).

Conclusions

The findings largely corroborate the tenets of the JD-R theory while extending its application to the Ghanaian healthcare sector. The positive association between job resources and work engagement and subsequently between work engagement and IWB, aligns with the motivational process postulated by the JD-R theory. This congruence strengthens the generalizability of the JD-R model across diverse cultural and organizational settings.

However, the study's most significant theoretical contribution lies in its exploration of the moderating role of job demands. The finding that high job demands reduce the positive relationship between job resources and work engagement extends our understanding of the JD-R model's boundary conditions. This interaction effect suggests that the motivational potential of job resources may be constrained in high-demand environments. This finding refines and elaborates upon the JD-R framework.

The focus on healthcare professionals in Ghana offers unique insights into the dynamics of innovation in resource-constrained healthcare systems. The predominance of young, well-educated females in the sample reflects broader demographic trends in Ghana's health workforce and highlights the importance of tailoring resource provision and demand management strategies to this specific population.

From a practical perspective, the findings show the critical importance of strategic resource allocation in healthcare settings. Managers and policymakers should prioritize the provision of job resources that promote work engagement, such as autonomy, social support and opportunities for professional development. However, they must also be cognizant of the potential dampening effect of excessive job demands. Implementing workload management strategies and ensuring a supportive organizational climate may help mitigate the negative impact of high demands on engagement and innovative behavior.

Despite its contributions, this study is not without limitations. The cross-sectional nature of the data precludes causal inferences and the reliance on self-reported measures may introduce common method bias. Future research could benefit from longitudinal designs and multi-source data collection to address these limitations. Furthermore, qualitative studies could provide deeper insights into the specific types of job resources and demands that are most salient in the Ghanaian healthcare context.

Furthermore, the JD-R model explains which types of jobs and personal traits result in particular psychological moods and results, but it does not explain why these associations exist. As such, it is mostly descriptive rather than explanatory. To comprehend the underlying psychological mechanisms, this lack of explanatory capacity needs to be supplemented with alternative theoretical frameworks. Examples of theories that have been applied to explain particular interactions within the JD-R framework are Hobfoll's conservation of resources theory and Bandura's social cognitive theory (Hobfoll, 1989; Bandura, 2001).

Future research could examine other moderators between resources and engagement, apply the model cross-culturally and incorporate non-work demands and resources. Interventions leveraging the JD-R framework may focus on increasing team-level resources or managing home demands affecting work. In conclusion, this research significantly advances the application of the JD-R model.

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