

Effects of multi-level job demands on academic leaders' health impairment process and in-role performance among Malaysian research universities



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ABSTRACT

This study's primary purpose was to investigate the effects of job demands on in-role performance through the health impairment process among academic leaders at Malaysian Research Universities (MRU)s. The focus was given to both groups' levels (faculties) and individuals' levels (educational leaders). Data were collected via a five-point Likert scale questionnaire emailed to 252 academics at 31 different faculties. Data analysis by utilizing Hierarchical Linear Modeling (HLM) revealed that while the health impairment process is negatively related to in-role performance, job demands from both individuals and group levels are positively associated with the impairment path. By applying the "Monte Carlo Mediation Test; MCMT" in the mediating pathways, the results revealed that the mediation affects academics' impairment health among the relation of individual/group demands and academic leaders' in-role performance. This research indicates that individual conditions influence academic performance, and the group's shared perception has a substantial role. In turn, decision-makers would gain a comprehensive understanding of potential factors that may impact educational leaders' well-being and performance and strive to improve them in a way that develops MRUs.

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1. Introduction

Public universities worldwide have witnessed a dramatic change in the past few years (Bentley et al., 2013), which urges the need for effective management and academic leadership (Teichler et al., 2013). According to the Malaysian Ministry of Higher Education, Malaysian higher education is undergoing serious developments, aiming at MRUs' ranking to be a Centre of excellence. Notably, the Malaysian Ministry of Higher Education seeks to nominate three research universities to be among the top 100 international universities by 2020 and upgrade at least one of them among the top 50 universities globally. To achieve such a vision, the concept of academic leadership has received widespread interest among MRUs (Pihie et al., 2011).

Academic leadership includes a typical pattern of academic leaders' behaviors to influence their subordinates to attain educational goals (Wahab and

Tyasari, 2020). This conceptualization is no longer limited to the top management level; alternately, academics at any position should act as leaders who can handle various educational challenges (Korschinowski, 2018).

From this standpoint, it is assumed that academic leaders within RUs can face multiple challenges of keeping their research title and enhancing RUs ranking, along with other academic requirements (Abdulrab et al., 2017). This situation, alongside high expectations, puts academicians at RUs under high academic demands. As a result, the concept of academic stress has emerged (Abdulrab et al., 2017; Lina, 2014; Sheriff and Abdullah, 2017), and chronic demands have become a significant cause of academic-related stress (Kasinathan and Arokiasamy, 2019).

Despite the essential role of academics within Malaysian tertiary education, little attention has been paid to prevalent work-related stressors/demands at RUs (Ahsan et al., 2009; Ismail and Noor, 2016; Khairuddin and Makhbul, 2011). Therefore, there is a call to pay more attention to academic leaders at MRUs and to redesign the academic demands to suit their capabilities (Abdulrab et al., 2017; Pihie et al., 2011; Rosnah and AM, 2017; Safaria, 2013).

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Also, a comprehensive understanding of the various level of job demands must be taken into consideration. While the existing literature explains the individual realization of academic needs, the group perspective on job demands has generally been ignored (Han et al., 2020). This situation indicates that the role of both individuals and organizational levels on employees' well-being and their outcome should be sought (Bakker and Demerouti, 2018). Thus, it is essential to bridge this gap by investigating job demands (i.e., individual and group demands) at RUs through a multi-level approach.

Job demands, whether from an individual or group level, influence employees' well-being and performance. While the optimum level of requests would associate with performance improvement and high productivity (Dollard et al., 2000; Tadić et al., 2015; Ventura et al., 2015), obstruct demands lead to academics' health impairment process (e.g., psychological strain/burnout), and negatively affect the universities' productivity (Biron et al., 2008; Idris and Dollard, 2011; Han et al., 2020; Jonasson et al., 2017). However, investigations on the psychological state of academics at RUs are still not satisfactory (Ismail and Noor, 2016; Lina, 2014; Makhbul and Khairuddin, 2013).

According to the empirical findings, an unfavorable psychological state (strain) obstructs academic performance at Malaysian public universities (Beta et al., 2019). This situation reduces academics' in-role performance (Ling and Bhatti, 2014). Ruokolainen et al. (2018) confirmed that the imbalance of work design influences academics' well-being and directly impairs their in-role performance. As stated by Organ (1988), in-role performance "in the aggregate promotes the efficient and effective functioning of the educational organization".

Thus, academic leaders' well-being, caused by academic demands, cannot be neglected, as they have a significant role in universities' quality (DuBrin, 2006). Moreover, influential academic leaders can also design choice strategies to comply with the challenges of educational demands (Riaz and Haider, 2010). Hence, multiple factors that affect academic leaders' performance through their psychological state at MRUs were examined in this research.

As mentioned above, this study's primary goal is to identify the impact of multi-level job characteristics on academic leaders' in-role performance at Malaysian research universities via the mediation role of the psychological strain. The study objectives were interpreted using the following research questions:

1. Does the health impairment process (strain) predict academic leaders' in-role performance at RUs?
2. Do individual demands predict the psychological strain of academic leaders at RUs?

3. Does psychological strain mediates the relationship between individual demands and academic leaders' in-role performance at RUs?
4. Do group demands from (L2) predict psychological strain at (L1) of academic leaders at RUs?
5. Does psychological strain at (L1) mediates the relationship between group demands (L2) and academic leaders' in-role performance at RUs?

2. Theoretical base of the study

The current research's theoretical framework was based on two theories: The Path-Goal Theory and the Job Demands-Resources (JD-R) theory.

2.1. Path-goal theory

This leadership theory postulated that employees' well-being and performance are influenced by their leaders' behavior (House, 1971). In congruence with the study variables, while directive and supportive behaviors from leaders help their subordinates to remove work obstacles (e.g., individual demands), along with enhancing their well-being (e.g., controlling the strain), the participative and achievement-oriented behaviors from the leaders result in higher quality performance (e.g., in-role performance) for employees (Muchinsky, 2006). Howieson (2008) claimed that the pivotal role of the leader's behaviors is to encourage workers to adapt to the demanding environmental factors like primary workgroups (e.g., group demands), contributing to institutional production development. While the former discussion clarifies the extent to which the leadership theory implicitly related to the present study, the research variables were mainly derived from the JD-R theory.

2.2. The job demand-resource model (JD-R)

The literature on Job Demand-Resource Model has demonstrated several stress theories to explain work-related stressors (or demands). Job demands are simply the work conditions that drain energy, resulting in professional stress (Bakker and Demerouti, 2014). While the previous theories, such as; JDC, JDC-S, and ERI, were limited to few work characteristics that reflect workers' and institutions' output (Karasek and Theorell, 1990; Siegrist, 2016), the JD-R model has continually been improved to be a comprehensive theory for several factors that influence employees psychological state and their performance within various professional ranges (Bakker and Demerouti, 2007).

Traditionally, Demerouti et al. (2001) stated that job demands lead to the health-impairment process (i.e., psychological strain, burnout, exhaustion, fatigue). The health-impairment process is explained as the psychological strain that mainly occurs due to fatigue and relates to stressors to comply with work

demands (Posig and Kickul, 2003). In turn, psychological stress results in energy depletion, associated with in-role performance (Demerouti et al., 2001). The In-role performance referred to the officially required behavior, which directly serves the institution's goals (Bakker et al., 2008).

Although the basic assumption of the JD-R model is that occupational stressors (job demands) reinforce employees' strain and impair their in-role performance, recently, Bakker and Demerouti

(2018) asserted that multi-level job demands (i.e., work demands from individual and organizational level) directly affect subordinates' well-being and performance. While particular demands refer to physical and psychological efforts (Bakker and Demerouti, 2017), group demands are the aggregated data for the individual perspective of job demands. Based on the explanation mentioned above, this investigation's framework was built, as shown in Fig. 1.

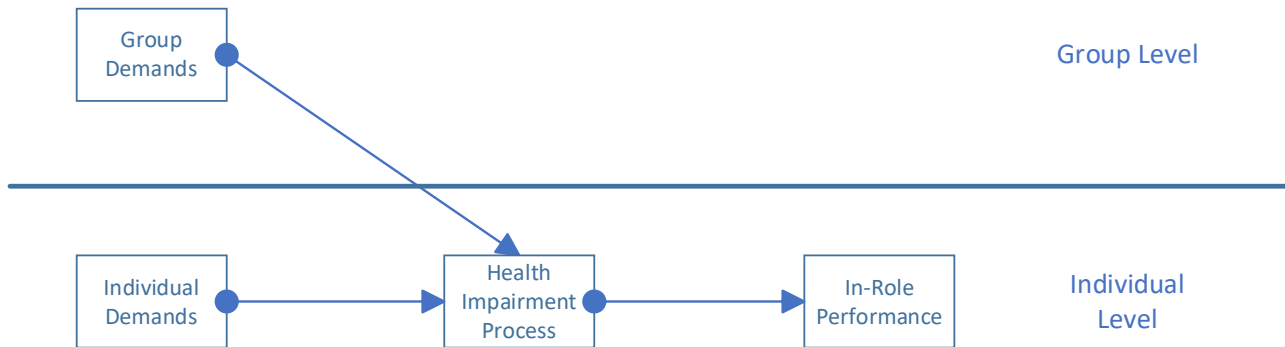


Fig. 1: The effect of multi-level job demands on academic leaders' in-role performance

3. Assumptions in JD-R model

3.1. Proposition 1 (work environment)

The first assumption in this theory states that each working environment is distinguished by its work stress characteristics, which can further be divided into two categories—namely, job demands and job resources (Bakker et al., 2003).

(a) Job Demands: According to Bakker and Demerouti (2007), "job demands refer to any physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological effort and are associated with certain physiological and/or psychological costs". Simply, job demands depict the physical, emotional, and cognitive requirements imposed by specific professions (Bakker and Demerouti, 2007; Fernet et al., 2015).

According to the notion that the work environment contains particular emotional, cognitive, and physical components, de Jonge and Dormann (2003) have criticized the generalization of job demands perspective in the stress literature. Based on this principle, they created a triple-match model, namely, Demand-Induced Strain Compensation (DISC), which has clarified job demands multidimensionality (de Jonge and Dormann, 2006). The model concept illustrates that each job's demands and job-related strains consist of physical, emotional, and cognitive elements. Thus, it is supposed that physical demands would affect the physical type of strain (e.g., work overload); emotional type of strain would be affected by emotional demands (e.g., emotional exhaustion); and cognitive type of strain would be affected by cognitive demands (e.g., professional efficacy).

In the context of Malaysian higher education, the job demand is believed to affect commitment and,

eventually, the performance of academicians. In addition, Shaiful et al. (2017) assumed that one of the organizational predictors that cause stress among university-level academicians in Malaysia is job demand. As stated by them, the main reason is causing burnout and less engagement, which affect academic performance. Such studies indicate that job demand is worthy of investigation among Malaysian academicians.

(b) Job resources: The second category of job conditions is job resources. Kahn and Cooper (1993) stated that job resources are those work characteristics through which employees express themselves physically, emotionally, and cognitively in terms of their performance. They are attributed to the positive attributes of the respective profession as per a broad perspective of the concept of the resource. Work resources refer to the physical, psychological, organizational, or social aspects of work that can (a) reduce the demands of work and the associated physiological and psychological costs, (b) be decisive in achieving the work objectives, or (c) stimulate personal growth, learning, and development (Demerouti et al., 2001). In line with the current research purposes, job resource is the job/social support (perceived organizational support), and the personal resource (emotional intelligence), which will be clarified in detail in the coming assumptions explanation.

In Malaysian higher education, job resources have been subjected to insufficient research. There are very few studies that have investigated the concept of job/personal resources. In addition, these studies have not focused on personal resources as EI, and organizational social resources as POS (at a higher level). In most cases, studies have focused on personality and autonomy. This issue warrants more research. Thus, there is a need to shed light on the

perception of job/personal resources and find out their impact on organizational outcomes.

Clearly, the first JDR proposition, careers have their own particular job conditions; job demands, and job resources. Each of these conditions has inevitable consequences, which will be reviewed in the second proposal of the theory.

3.2. Proposition 2 (dual pathways)

Based on this theory, job characteristics trigger two relatively very different processes to explain the individual's well-being (i.e., motivation and strain) at

his/her occupation, known as the dual pathways—which includes strain (energetic process or the process of deterioration of health) and motivational approaches (Bakker and Demerouti, 2007) (Fig. 2). While job demands are generally the main predictors of variables such as exhaustion or psychosomatic health problems (Bakker et al., 2003), resources are overall, the most important predictors of job satisfaction, motivation, and engagement (Bakker et al., 2007). The reasons for these effects are that work demands effort and consumes energy resources, while resources satisfy basic human needs.

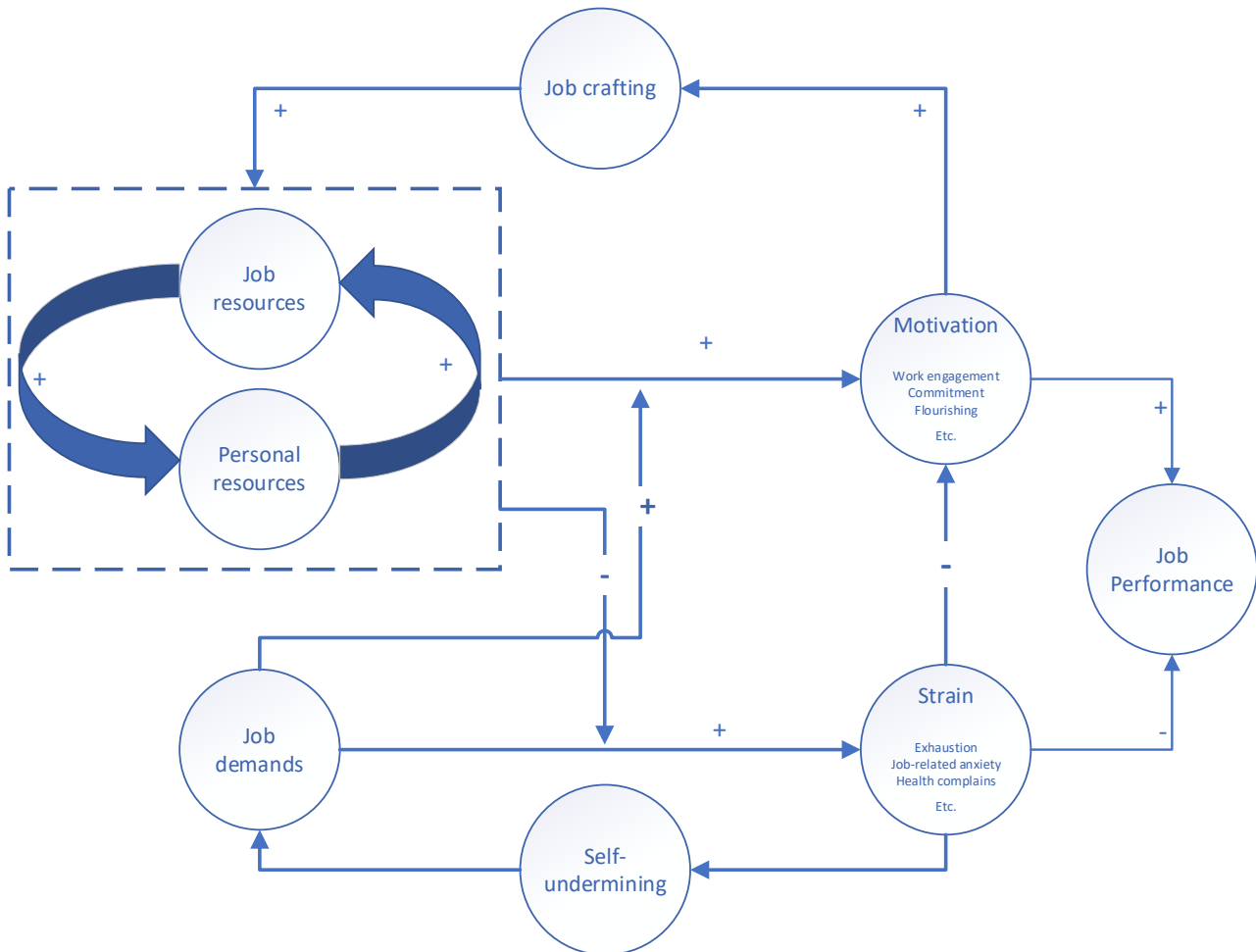


Fig. 2: The job demands-resources model (Bakker and Demerouti, 2017)

Numerous studies support the double track proposed by the JD-R theory, showing that it can predict important organizational variables. For instance, research pointed out that job demands associate with in-role performance via exhaustion, whereas job resources predict extra-role performance via engagement (Bakker et al., 2004). In turn, burnout over time was predicted by job demands, which also influenced future depression. The same study showed a negative impact on job resources on burnout. Recent diary and longitudinal investigations have also supported the dual or double-track processes of JDR theory.

Burnout/engagement has also been studied in the context of Malaysian universities. In a recent study, Teoh and Kee (2020) posited that Malaysian

universities are attempting to take the lead among world universities, and this issue has resulted in burnout. Shaiful et al. (2017) also stated that burnout is one of the results of excessive job demand among Malaysian academicians. Although these studies have looked into burnout among academicians, a comprehensive framework to consider burnout among other variables in the context of Malaysian RUs is still missing.

On the other hand, engagement in the academic context of Malaysia has received insufficient attention. Most researchers have a focus on students' engagement, and the academicians' engagement is taken for granted. Few studies have focused on academicians' work engagement in Malaysia, such as the one by Abdulrab et al. (2017) found a bond

between engagement and empowerment and asserts that there is room for more research.

Needless to mention that, despite the processes (a health-impairment; strain/burnout and a motivation; work-engagement) of work characteristics, work demands, and resources, is remarkable, they may be united in terms of some factors, as illustrated by both the third and fourth propositions of theory.

3.3. Proposition 3 (work wellbeing)

Job characteristics result in various psychological inputs. Although job demands and resources initiate different dual processes, they can also have common effects (Fig. 2). The third proposal presented by the JD-R theory is that job demands and resources interact when predicting work well-being (i.e., burnout and engagement). In other words, job demands and resources can have a combined effect on well-being and indirectly influence performance in two possible ways.

The first interaction is in which resources cushion (or buffer) the impact of demands on stress/discomfort (Bakker et al., 2003). This theory agrees with that of Karasek and Theorell (1990), who pointed out in the JDC model that job resources (i.e., control) can safeguard the influence of job demands. This argument inspired Bakker and Demerouti (2007), who expanded it further through the JD-R model. They claimed that the buffering (safeguarding) role is not limited to control, and there may be diverse resources that can have the same effect and which avoids the impact of a stressor.

3.4. Proposition 4 (motivation/engagement)

The model of JDR indicates that job resources become more critical and have a more significant impact on engagement when demands are high (Bakker and Demerouti, 2014). This suggestion follows the notion when job resources are needed. They are supposed to gain their potential users, as occupations characterized with high demands and resources will motivate their subordinates to learn new behaviors to cope with high job demands.

The various institutional functions of organizations are based on joint and collaborative tasks among staff to achieve the best-expected results. Logically, work-related social support is the essential boost for effective communication factors that enhance the outcomes of individuals and their organizations (Demerouti et al., 2001). In other words, social support resources are substantial in the workplace, in terms of their effectiveness in expanding available resources or in enhancing the resources it lacks in the working environment.

Social support has gotten great attention among the conducted research within Malaysian higher education. Research at Malaysian research universities was demonstrated academic social support (e.g., POS) as a pivotal element that cushion

lectures from stress. However, this investigation was limited to the individual perspective of social support and overlooked the shared perception of groups. This was one object to be achieved in this research.

Based on the previous propositions, job resources (e.g., social support) represent the external or environmental factors that protect individuals from the impairments of work demands. However, other internal resources contribute effectively to institutions, which are represented in the next propositions.

3.5. Proposition 5 (personal resources)

Personal resources act similar to the motivational role of job resources by buffering the undesirable effects of work characteristics and enhance the desired effects of challenging work demands. Personal resources are positive self-evaluations linked to resilience related to the perception of one's ability to control and influence the environment.

According to the JD-R model, personal resources promote individuals' motivation (i.e., engagement), and at the same time, contribute towards the prevention of strain (i.e., burnout), which boots workers' inputs (Bakker and Demerouti, 2014). Scholars revealed that personal resources mitigate the relationship job demands-exhaustion, while it may moderate the relation work resources-engagement. It is observed that these self-assessments predict goal setting, motivation, work performance, and life satisfaction. Simply, the greater the personal resources in individuals, the more positive their self-esteem and self-agreement exist.

Research on Malaysian academicians concerning resources has focused chiefly on social resources and organizational resources. Thus, personal resources are not yet fully explored, especially at MRUs. Therefore, personal resources (e.g., EI) were given attention to the proposed model in the current study.

3.6. Proposition 6 (strain/motivation)

Recent updates to the JD-R model showed that strain decreases employees' output as opposed to motivation, which has a positive effect on employees' outputs (Bakker and Demerouti, 2014). Scholastic evidence confirmed that engaged employees would characterize with high enthusiasm to achieve their institution tasks. On the contrary, burden workers do not have much energy to perform well (Bakker and Demerouti, 2017). Moreover, other studies have acknowledged the reciprocal influence between job characteristics and consequent strain and motivation. Scholastic evidence from twenty public universities in Malaysia postulates that academic leaders' well-being (i.e., strain/motivation) is a key predictor for academic performance (Beta et al., 2019). As noted by The same authors, high strain is negatively associated with academic leaders' performance; reversely, engaged academic leaders

have high motivation, and positively correlated with their outputs. [Ling and Bhatti \(2014\)](#) asserted that stressors/demands at Malaysian universities have a huge influence on academic leaders' burnout/engagement, in turn, reduces the productivity of Malaysian higher education. Therefore, it is inevitable to highlight academic leaders' well-being, in order to improve the job performance at Malaysian research universities ([Idris, 2011](#)). It was previously argued how physical, emotional, and cognitive demands lead to individuals' strain through health-related outputs (i.e., burnout), and motivations emerge from the job and personal resources through staff engagement. This idea shows the integral principle on which the rules of this theory are based; the proposals of this theory do not stand here.

4. Methods

4.1. Design, population, and sampling

SI system in this research has a quantitative cross-sectional multi-level design. It was performed using 252 academic leaders (at different positions) at 31 faculties among prominent Malaysian research universities. These universities were selected as research universities by the Malaysian Ministry of Higher Education. The researcher distributed 2000 Google online forms, among which only 252 formed were returned and had no specific problem. The number of academics who replied to the survey per faculty ranged between 5 and 12. According to [Mathieu et al. \(2012\)](#), the current study's sample size is adequate.

4.2. Research instruments

This research represents a partial selection of a large study. The five-point Likert scale questionnaire used in this study contains 81 items. The items related to job demands were taken from the "Copenhagen Psychosocial Questionnaire; COPSOQ II" ([Pejtersen et al., 2010](#)). As a multi-level study requirement and based on [Anderson and West \(1998\)](#), the participants' shared perception and their agreement about the working environment were also investigated. While individual academics reported individual demands, group demands were assessed through the matched repeated measure using a plural formula. For example, "In the department where I work". In terms of the health impairment process, items were chosen from [Kristensen et al. \(2005\)](#) scaled to measure academics strain. The related items were selected from [Williams and Anderson's \(1991\)](#) measurement to estimate academics leaders' in-role performance.

4.3. Analysis strategy

Based on the multi-level nature of this research, individuals level (academics) known as L1 nested

within groups level (faculties) known as L2; thus, a hierarchical linear modeling software was used for data analysis based on [Raudenbush et al. \(2005\)](#). Before the primary research by HLM, the researcher used SPSS to ascertain if the higher-level variable (i.e., group demands) possesses group-level properties and whether it could be aggregated as an upper-level variable. [Kozlowski \(2012\)](#) stated that group-level properties exist in case a shared perception shows between-group members by utilizing inter-rater reliability and intra-class correlation coefficient.

The inter-rater reliability (Rwg) findings for each group of the study by using the [James et al.'s \(1984\)](#) formula showed that the mean value of Rwg for group demands was 0.95. This indicates a high value ([LeBreton and Senter, 2008](#)) of within-group agreement between academic leaders about their respective faculties' job demands.

Regarding the intra-class correlation coefficient, the ICC[I] value for group demands was 0.05, indicating that 8% of the variance within job demands constructs was because of group factors. Following the recommendation of empirical studies, the ICC1 value should be between .05 and .20 ([Bliese, 2000](#)); therefore, the UL variable's aggregation (i.e., group demands) was justified.

To examine the research hypotheses, the researcher followed [Aguinis et al. \(2013\)](#). Accordingly, four analyses were performed: The null hypothesis model, random intercepts model, random intercepts, and fixed/random slope model. It should be noted that the group demands were treated as a level 2 variable that has Upper-Lower influence on level 1 construct (academics) ([Snijders and Bosker, 2012](#)).

Firstly, the researcher applied a null hypothesis model to check the variance within and between dependent variables. The result of the null model M2a ([Table 2](#)) shows a significant variance in psychological strain by UL groupings ($\chi^2(30)=175.43728, p < 0.001$), and the ICC1 value is also significant (0.40) based on [Kahn \(2011\)](#). This is additional evidence on our data's nested properties that required a multi-level analysis ([Aguinis et al., 2013](#)).

For Hypotheses 1 and 2, i.e., the direct lower effects using random intercepts model, the L1 dependent variables were regressed on the independent variables, which are the in-role performance to strain (M1b), and strain to individual demands (M2b), respectively. Concerning LL mediation test; Hypothesis 3, the researcher followed [Baron's and Kenny's \(1986\)](#) procedure, i.e., X→Y (individual demands → in-role performance; M1c), X→M (individual demands→strain; M2b), M+X→Y variable (strain+individual demands→in-role performance; M1e).

To check the mediation relationship, as noted by [Selig and Preacher \(2008\)](#), the Monte Carlo test was used by "95% confidence interval (CI) and with 20,000 repetitions". Through MCMT, the variable's

mediation pathway would be confirmed if it is not zero (MacKinnon et al., 2004).

This was followed by running a cross-level direct effect from UL to LL (i.e. regressing LL variables on group demands by using random intercepts and fixed/random slope model) for testing Hypothesis 4; M2c, M2b. For the last Hypothesis (5), the same steps for lower-level mediation were conducted by replacing individual demands with group demands in order to test the cross-level mediation effect (M1d, M2d, and M1f).

5. Limitations of the study

While conducting this study, the researcher was limited to some factors. These factors are explained in this section as the limitations of the study. A number of factors can affect the relationship between the variables in a study, however, not all these factors can be studied in a single study. The socio-economical background of the participants, their gender, ethnicity, and even their age can be among these factors. In this study, the focus solely on the variables proposed based on the research model.

While longitudinal studies are reliable, the relationship between the variables under investigation was studied using a cross-sectional study, meaning that the researcher administered the questionnaires to the participants only once (except for the pilot study). The main reason is that academicians are very engaged in their careers, and it is cumbersome to approach them at least twice to fill in a questionnaire. Therefore, the researcher opted for a cross-sectional design rather than a longitudinal one.

In addition, the researcher in this study had to opt for a quasi-experimental design to conduct the study, as the number of academicians in research universities is very high, and not all of them could be given a chance to take part in the study. However, to justify the quasi-experimental design selected for this study, the researcher used a well-established sampling method, i.e., cluster sampling.

6. Results

Table 1 depicts the descriptive statistics and reliability of the study variables.

Based on Piaw (2013) and Hinton et al. (2014), the Cronbach Alpha index (between 0.6 and 0.85) indicates that the data are reliable. Table 2 shows HLM Random Intercept and Slope models for In-Role Performance and Table 3 shows HLM random intercept and slope models for the health impairment process.

7. Equations

Tables 2 and 3 present HLM results for the study hypotheses. As mentioned earlier, the researcher started HLM analysis by running an unconditional model and found a significant potential cross-level influence between UL and LL (Table 2 and Table 3) (M1a, M2a). For H1; it was observed that the health impairment process (strain) predicted academics' in-role performance, $\gamma = -0.32$, $p < .01$ (Model 1b, Table 2), confirming Hypothesis 1. The second Hypothesis (H2) suggested that individual demands relate to the health impairment process (strain), which was also supported, $\gamma = 0.14$, $p < .01$ (Model 2b, Table 3).

Table 1: Means, standard deviations, and reliability

Variables	Mean	Standard Deviations	Reliability (α)
Group Demands (GD)	2.92	0.52	0.85
Individual Demands (ID)	2.99	0.43	0.77
Strain (BO)	2.66	0.40	0.69
In-Role performance (IR)	4.10	0.52	0.83

Table 2: HLM random intercept and slope models for in-role performance

Effect	M1a	M1b	M1c	M1d	M1e	M1f
Level 1						
Intercept (γ_{00})	4.11***	4.11***	4.11***	4.11***	4.11***	4.10***
Strain (γ_{10})		-0.32**			-0.32**	-0.31*
ID (γ_{20})			-0.09		0.04	
Level 2						
GD (γ_{01})				-0.05		-0.04
Variance components						
Within-team (L_1) variance (r) / (σ_2)	0.263	0.252	0.262	0.262	0.252	0.242
Intercept (L_2) variance (u_0)	0.004	0.005	0.003	0.004	0.005	0.009
Slopes (L_2) variance ($u1$)						0.069
Intercept-slopes (L_2) covariance (τ)						0.03
Additional information						
ICC1	0.02					
-2log x likelihood (deviance)	381.451694	372.180035**	380.494951	381.363724	371.968508**	369.675615
Number of parameter	3	4	4	4	5	7
Pseudo R ²	0	0.042	0.004	0.004	0.042	0.081

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

Table 3: HLM random intercept and slope models for health impairment process

Effect	M2a	M2b	M2c	M2d
Level 1				
Strain Intercept (γ_{00})	2.71***	2.71***	2.71***	2.70***
ID (γ_{10})		0.14**	0.14**	0.19*
Level 2				
GD (γ_{01})			0.71**	0.66**
Variance components				
Within-team (L_1) variance (r) / (σ_2)	0.105	0.102	0.101	0.094
Intercept (L_2) variance (u_0)	0.0697	0.07	0.051	0.052
Slopes (L_2) variance (u_i)				0.046
Intercept-slopes (L_2) covariance (τ)				0.019
Additional information				
ICC1	0.4			
-2log x likelihood (deviance)	202.88684	195.877936**	187.660615**	182.798739
Number of parameter	3	4	5	7
Pseudo R ²	0	0.029	0.038	0.104

Individuals; n=252, Groups; n= 31, ns= not significant. * p< .05, ** p< .01, *** p< .001

We assumed in H3 that the health impairment process (strain) would mediate the relationship between individual demands and in-role performance. To evaluate the mediation effect, it was observed that both path an (Individual demands → strain) ($\gamma=0.14$, $p<.01$; Model 2b, Table 3), and path b (Individual demands+strain→in-role performance) were significant ($\gamma=-0.32$, $p<.01$ (Model 1e, Table 2), but the relation $X\rightarrow Y$ was not significant. Consistent with H3, the mediation testing was confirmed using MCMT (95% CI, LL -0.1088, UL -0,0006). Hence, Hypothesis 3 of the lower mediation effect was supported.

Hypothesis 4 (cross-level) checks whether or not group demands (L_2) relate to the health impairment process (strain). The data analysis showed a significant relationship, supporting hypothesis 4, $\gamma=0.66$, $p<.01$ (Model 2 c/d, Table 3). Finally, hypothesis 5 postulated a mediation effect among L_2 (group demands) and L_1 (in-role performance) through strain. Inputs showed a significant impact for both paths a (Group demands→pressure, $\gamma=0.66$, $p<.01$, M2d, Table 3), and path b (Group requires + strain→in-role performance, $\gamma=-0.31$, $p<.01$, M1f, Table 2); however, $X\rightarrow Y$ was not significant. The cross-level mediation relation was affirmed via MCMT (95% CI, -0.4388 UL -0.0405), to support Hypothesis 5.

Based on Aguinis et al.'s (2013) approach, it is worth mentioning that researchers would gain extra information from the HLM analysis. As depicted in Table 2 and 3, the results show the "full information maximum likelihood estimation; FIML, to estimates u_0 , u_1 , τ), the number of estimated parameters, and the value of pseudo R² (to calculate a measure of effect size; the residual variance between models)" (Aguinis et al., 2013).

8. Results and discussion

The findings of the present research are consistent with what has been explained extensively in the existing literature. Theoretically speaking, the outcomes of the current paper were supported by the path-goal and the JD-R theories.

As previously mentioned, environmental factors (i.e., individual and group demands) designed by leaders (i.e., academic leaders) influence subordinates' psychological states (i.e., strain) and job performance (i.e., in-role performance) (Howieson, 2008; Muchinsky, 2006). On the other hand, Demerouti and her groups stated that job demands strongly correlated with employees' health Health-impairment path significantly associated with their in-role performance (Demerouti et al., 2001). The JD-R model's recent updates postulate that multi-level job demands impact workers' well-being and job performance (Bakker and Demerouti, 2018).

Practically, numerous documents have reported a strong relationship between health impairment processes and performance. The majority of these investigations showed significant negative effects via the former variables (Akca and Küçüköğlü, 2020; Bakker and Heuven, 2006; Castanheira and Chambel, 2010; Demerouti et al., 2001; Du et al., 2018; Falco et al., 2013; Idris, 2011; Noblet et al., 2012; Schreurs et al., 2012; Siu et al., 2013; Yavas et al., 2013). For instance, Beta et al. (2019) examined academics' in-role performance employed in 20 Malaysian public universities. They realized that the health impairment process, represented by strain, negatively affects academics' in-role performance. Thus, they proposed urging attention to the psychological strain and further efforts to gain solutions for the stress problem that impacts Malaysian public universities' productivity.

Ling and Bhatti (2014) found a significant relationship between job stressors (strain) and academic performance. This research was also applied in Malaysian public universities. Similar outcomes were found in the present study where psychological strain showed significant negative effects on in-role performance among Malaysian academicians at RUs. These outcomes are consistent with Demerouti et al. (2001), who confirmed that the employees' negative psychological state hinders their in-role performance.

Previous findings also emphasize that psychological strain in Malaysian research universities is imperative to protect academics

leaders from work-related stress, threatening academics productivity.

On the other hand, it was observed that job demands predict psychological strain. Congruent with current empirical studies, our findings reveal the positive impact of job demands on health psychological process/strain. On rules of thumb, job stressors/demands would contribute to employees' health impairment process (i.e., strain and burnout) (Bakker and Demerouti, 2007; 2014; 2017). In line with this principle, the majority of results in the higher education realm assert the negative influence of high job demands on academic's well-being (Bell et al., 2012; Boyd et al., 2011; Han et al., 2020; Jonasson et al., 2017; Kinman and Jones, 2008). In the Malaysian context, examinations within RUs claimed that several jobs demands increase academics exhaustion. As noted by Makhbul and Khairuddin (2013), various job demands result in undesirable outcomes of academics' well-being at RUs. Another research conducted by Ismail and Noor (2016) confirmed the former finding, the positive association between hinder demands and academics stress at MRUs.

Regarding our finding, it was noticed that individual demands directly impact academic psychological state and group demands. These results are consistent with the recent multiple investigations by Bakker and Demerouti (2018). They confirmed that job demands, from the lower and higher levels, impair employees' well-being and performance (Bakker and Demerouti, 2018). This explanation, as noted by Bliese et al. (2002), justifies the multi-level organizational perspective. Empirical research by Costa et al. (2015) postulated that individuals who nested within level 2 (i.e., group level) increase each others' psychological strain. In contrast, they decrease their performance at the upper and lower institutional levels.

Additionally, top management and leaders' factors relate to the psychological behavior and attitude of subordinates (employees) through decreasing their work demands. Consequently, it may reinforce the positive reactions to job demands (Fernet et al., 2015). A multi-level longitudinal study revealed that teaching demands from teachers and school-level also significantly impact teachers' efficacy and fatigue (Pas et al., 2012). At the same line, Näring et al. (2012) indicated that job and teachers' emotional demands are positively linked with emotional exhaustion.

Regarding the mediation outcomes, the present research revealed the mediating effect of the health impairment process (strain) in the relationship between UL and LL job demands and in-role performance. The majority of existing research confirms the mediator role of strain in the relationship between academics demands and their arrangement (Adil and Kamal, 2020; Cotton et al., 2002; Diestel and Schmidt, 2009; Winefield et al., 2014). For example, Idris (2009) asserted that Malaysian academics who experienced high work demands were more likely to increase work-related

strain. Subsequently, they were more likely to have low organizational commitment and professional efficacy. The same researcher strongly agreed on the mediation role of strain on the relationship between job stressors the academics outcomes. Consistent with previous results, Panatik et al. (2012) claimed that Malaysian academics' psychological strain mediates the relationship between work demands and turnover intention. Congruent with these views concerning psychological strain, in this study, the researcher observed that psychological strain mediates the effect of individual needs on in-role performance.

The same mediation effect was also noticed in the relationship between group demands and academics performance. A serious multi-level job demands analysis of the teaching environment was performed by Yin et al. (2018). They strongly argued that emotional demands from higher school levels are associated with teachers' health impairment (depression and anxiety) at an individual level—subsequently, it obstacles their contentment and enthusiasm. In the same vein, Pecino et al. (2018) explained Spanish academics' shared perspective about their job performance, which was predicted by the health impairment process (strain/burnout).

Also, Wang et al. (2017) highlighted the interplay between the leaders' behavior (from the upper level) and their followers' outcomes (from the lower level). The focus was given to the well-being of the followers. They realized that the upper level (leaders) behavior could affect the employees' health impairment. Similarly, de Gieter et al. (2018) documented the mediation role of employees' psychological needs on multiple hindrance demands-job performance relationships. The current study observed employees' psychological states' mediation role about multi-level job demands and performance in line with these two studies.

The findings of this study are in line with the theoretical content of the JD-R model. Bakker and Demerouti (2007; 2018) assumed that job characteristics have no direct effect on organizational outcomes. In other words, job demands influence employees' performance through the mediation factor. Similar results were gained in this study concerning psychological syndrome/strain. Thus, the direct impact of IV and DV variables (i.e., $X \rightarrow Y$) to test the study variables' mediation effects is justified. The researcher found no direct effects of job demands from different organizational levels (L1 and L2) on academics in-role performance. Moreover, after adding the M variable into $X \rightarrow Y$ (to examine path b for mediation hypotheses), the relationship remained insignificant, considered full mediation (Selig and Preacher, 2008). Accordingly, we concluded that both individual demands and group demands indirectly impact academics in-role performance via the full mediation effect of psychological strain.

The discussion mentioned above, especially concerning the Malaysian context, indicates a lack of research in the higher education sector to determine

the direct and indirect influence of academics' psychological health on their outputs by considering the multi-level organizational factors. Congruent with the researchers' recommendations and the main objective of this paper, there is an urgent need to understand the multi-level academic demands and their consequences on academics' well-being and performance (Han et al., 2020).

9. Managerial implication of the study

As an implication, this research can have a managerial impact on higher education policymakers, tertiary syllabus designers, and academic leaders. Initially, it should be mentioned that few studies have highlighted the terminology of educational leadership in Malaysian higher education. There is a scarce examination for the effect of academic leaders' personal and environmental components on their psychological states and outcomes. Specifically, limited investigations have focused on the thesis variables as predictors of academic leaders' pressure at Malaysian research universities. Thus, this study attempts to justify the role of these variables in educational leaders' performance and encourage the readership to endeavor to solve stress-related problems among the academicians at MRUs.

The essential reason for educational stress is the high academic demands. Therefore, this research is among the few studies that tested the impact of the most common needs in the academic domain. Moreover, this study has a multidimensional look at work-related stresses and investigates this issue from a multi-level physical, emotional, and cognitive perspective. Thus, the findings can be beneficial to readers who seek a comprehensive look at work-related stressors/demands due to the multi-level design of the study. This study targets the individual job demands and seeks for the collaborative perception of job conditions. This gives an in-depth understanding of the problem under investigation at MRU(s).

In these respects, the expectations from the research universities in Malaysia are on the rise, especially, in light of the increasing competition among new universities and the growing pattern of academic demands. This study can unveil how group demands vs. individual demands affect the performance of Malaysian RUs through academic leaders' psychological state (health impairment; burnout) and performance. Therefore, the extent to which such demands are justified and acceptable is revealed in this study. Especially that job demands are the main predictor for academic leaders' well-being, health impairment.

The current investigation indicated that academic leaders' well-being; strain/burnout are essential indicators for academic leaders' performance. This research provides a guideline for decision-makers to achieve high productivity at MRUs, as work-burnout would obstacle academic leaders' performance. However, academic leaders' well-being has been

neglected in the context of Malaysian universities. Although these variables can play a vital role in academic leaders' performance, they have been given little attention in the literature. This makes the finding of this study more significant, as in this research, these variables were taken into account.

Needless to mention that Malaysian universities expect high engagement from their academic staff in terms of both research and teaching. Although the overall belief is that high demands lead to professionalization, the results gained from this study revealed that this expectation is contrary to reality, as job demands impair academic leaders' psychological health process, in turn, negatively affect their performance. This was realized by looking at the relationship between job demands and job performance of Malaysian academicians through the mediating effect of work-related burnout.

This study can help education in the context of Malaysian research universities by providing pieces of evidence of burnout and its relationship with performance. Although the literature supports the idea that burnout is very likely to occur as the high work demand increases, which impair academic performance, only if evidence-based research exists, can the universities take action to solve this problem. This study proves such evidence for possible further action.

By according focus to the findings of this study and the pieces of evidence provided, educational policymakers should be able to manage work-related stress among academic leaders. This problem can be solved by understanding the factors that affect academic leaders' performance. In turn, this can ensure the high-quality productivity and well-being of academic leaders. Eventually, it would help to achieve the vision of the ministry of Malaysian education.

10. Conclusion

In general, the present paper provides an understanding of how the multi-level job demands influence health impairment and affect the outcomes of academic leaders at Malaysian research universities. Job demands from individual and group organizational levels have a significant positive impact on academics' psychological strain at the lower level. Subsequently, they negatively affect the academic leaders' in-role performance. Additionally, the mediation impact of academics' psychological strain for both relationship (lower and higher level) of job demands and in-role performance was observed. As mentioned above, the outcomes of this research are in line with prior empirical investigations. However, the current findings also refer to both the groups' level and the individuals' level.

This research is one of the rare studies that shed light on the organizational characteristics and their effect on the academic leaders' psychological health (strain) and their in-role performance among Malaysian research universities. This research

bridges the gap between the existing literature that has overlooked the impact of job demands from several organizational levels and their association with employees' well-being and performance.

Consequently, this research provides a clear understanding of several organizational factors, from individual and group corporate level, that affect academics inputs, asserting the importance of multi-level analysis within the educational realm. This research confirms the essential role of academics' psychological state' as a result of job demands. Their direct impact on the academic leaders' in-role performance would hinder the universities' productivity.

The upper-level leader's policies and regulations should be considered a crucial element within universities to determine academics' well-being and outcomes. The decision-makers should bear in mind that job stress's negative effect is no longer limited to individuals. Instead, it extends to work for units/groups, leading to serious negative consequences for the institutions.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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