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Cognitive Job Demands and Employee Work Engagement: The Mediating Role of Emotional Exhaustion among Managerial Employees in Sri Lankan Apparel Firms

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K.K.H. Nanayakkara*
Faculty of Graduate Studies, University of Sri Jayewardenepura, Sri Lanka

Abstract

This study examines how cognitive job demands relate to employee work engagement with emotional exhaustion as a mediating mechanism among managerial-level employees in export-oriented apparel firms in Sri Lanka. Drawing on Job Demands–Resources (JD-R) theory, cognitive job demands were operationalized as a reflective–formative (Type II) higher-order construct comprising four first-order dimensions namely information processing, decision making, time pressure and sustained attention. Data were collected from 758 managerial employees across 45 firms in the Western Province using a structured questionnaire. Partial least squares structural equation modeling indicated that cognitive job demands were positively associated with emotional exhaustion and negatively associated with employee work engagement. Emotional exhaustion was also negatively associated with engagement and partially mediated the relationship between cognitive job demands and engagement. The indirect effect accounted for approximately 48.7% of the total effect, indicating that emotional exhaustion plays a substantial but not exclusive role in linking cognitive demands to engagement outcomes. Cognitive job demands explained about 34.7% of the variance in emotional exhaustion and together with emotional exhaustion, explained about 80.6% of the variance in employee work engagement. Given the cross-sectional, self-reported design and voluntary participation, these findings should be interpreted as associative rather than causal. The study contributes to JD-R research by testing the health-impairment pathway in a developing economy, export-manufacturing context and by modeling cognitive demands as a multidimensional formative construct. The results suggest that managing excessive cognitive demands and supporting employee recovery may be relevant to sustaining engagement among managerial employees in Sri Lankan apparel firms.

Keywords: Apparel industry, Cognitive job demands, Emotional exhaustion, Employee Work Engagement, Job Demands–Resources theory, Sri Lanka

* Corresponding Author – hansikananayakkara22@gmail.com

Introduction

Global economic turbulence characterized by protectionist trade policies, geopolitical conflicts, supply chain disruptions and volatile demand has intensified pressure on firms operating in export dependent industries in developing economies where heavy reliance on international markets heightens exposure to economic shocks and demand contractions (UNCTAD, 2026). Sustaining performance under such conditions depends heavily on the workforce as firms cannot respond effectively to disruption if employees are disengaged or psychologically depleted. This makes employee work engagement a critical outcome for organizations operating in volatile, export driven sectors.

Sri Lanka illustrates this tension directly by having rebounded from a major economic crisis between 2022 and 2025 caused by substantial government debt, foreign currency shortages and inflation exceeding 70%. The country reached total export earnings of approximately US$17.25 billion in 2025, a 5.6% increase over the previous year (Export Development Board of Sri Lanka, 2026). Yet this recovery remains fragile since apparel exports declined 2.66% to US$425.44 million in January 2026 alone, driven by softer US and EU demand which underscores persistent pressure from tariffs, exchange rates and low cost competitors (Joint Apparel Association Forum, 2026). Within this environment, the apparel sector remains economic cornerstone of Sri Lanka by generating $5.02 billion in 2025 exports (Joint Apparel Association Forum, as cited in Just Style, 2026) which comprise 43–44% of merchandise exports (Eximpedia, 2026), contribute around 7% to gross domestic product (Ministry of Industries, 2023) and employ over 350,000 workers while supplying nearly 10% of the United States and European Union undergarment markets (Export Development Board of Sri Lanka, n.d.).

Sustaining this level of performance places substantial cognitive demands on the managerial workforce of the sector. Managerial level employees confront escalating cognitive job demands including processing complex specifications, coordinating with global buyers, optimizing production during shortages and ensuring quality compliance within tight production cycles demands that align with the mental effort dimension central to the Job Demands–Resources (JD-R) framework (Bakker & Demerouti, 2007). According to Kahn (1990), work engagement is defined as the holistic investment of physical, cognitive and emotional energies in one's work role, directly shaping organizational outcomes. Under JD-R theory, sustained cognitive demands are associated with emotional exhaustion which in turn is associated with reduced work engagement in high pressure environments such as apparel manufacturing (Bakker & Demerouti, 2007).

Despite extensive research on job demands and employee work engagement in developed economies (Demerouti & Bakker, 2023; Galanakis & Tsitouri, 2022), significant gaps persist in understanding how cognitive job demands specifically affect work engagement in developing-country contexts such as the Sri Lankan apparel sector, particularly through emotional exhaustion as a mediating mechanism. Existing Sri Lankan studies have examined related constructs largely in isolation. For instance, Weerarathna et al. (2023) examined employee engagement and firm performance in the apparel sector without specifically addressing cognitive job demands, while Jayathilake (2023) focused on determinants of job security rather than cognitive strain or emotional exhaustion. Consequently, the joint mechanism linking cognitive job demands, emotional exhaustion, and employee work engagement remains empirically

untested in this context. Moreover, few studies have examined these dynamics alongside export volatility, where high cognitive demands intersect with economic pressure, thereby limiting the generalizability of Western findings, which are largely grounded in the Job Demands–Resources (JD-R) model (Bakker & Demerouti, 2017), to resource-constrained and export-dependent settings (Jayathilake, 2023; Wickramasinghe, 2024). Against this background, the present study addresses the three research questions: RQ1: To what extent do cognitive job demands impact employee work engagement? RQ2: Does emotional exhaustion mediate the relationship between cognitive job demands and employee work engagement? RQ3: What practical implications emerge from the findings for managing cognitive job demands and emotional exhaustion to support employee work engagement in export-oriented apparel firms? This study is significant because it provides empirical evidence on how cognitive job demands affect employee work engagement in the Sri Lankan apparel industry, while offering evidence-based insights for managers seeking to mitigate emotional exhaustion, sustain employee engagement, and support competitive performance in export-oriented apparel firms.

Literature Review

Job Demands–Resources (JD-R) theory

This study is grounded in Job Demands-Resources theory, which posits that every occupation has its own specific risk factors associated with job stress which can be classified into two categories such as job demands and job resources (Pezirkianidis et al., 2022). Job demands are aspects of work that require sustained physical, cognitive or emotional effort and are associated with physiological and psychological costs (Schaufeli & Taris, 2014; Bakker & Demerouti, 2007). On the other hand, job resources are aspects of work that help achieve goals, reduce demands or stimulate personal growth (Schaufeli & Taris, 2014). When resources are insufficient to buffer high demands, employees are more likely to experience strain and disengagement. The JD-R theory explains how excessive cognitive demands can lead to emotional exhaustion which in turn mediates the relationship between demands and employee engagement (Schaufeli & Taris, 2014; Bakker & Demerouti, 2007). This dual pathway makes JD-R versatile in explaining how different types of demands and resources interact to shape employee outcomes across occupational contexts.

Within this framework, cognitive job demands have emerged as a critical dimension in knowledge intensive and industrial sectors where mental effort is central to task performance. Cognitive demands encompass the mental processes required to sustain attention, process complex information, solve problems and make decisions under pressure (Sarhadi et al., 2024). In this study, cognitive job demands are conceptualized as a higher-order construct comprising four first order dimensions which together capture the multifaceted nature of mental effort at work. This higher-order approach reflects the flexibility of JD-R theory, which can be tailored to the specific occupation under consideration rather than applied uniformly across industries (Bakker, 2014; Galanakis & Tsitouri, 2022). This study extends the JD-R literature in several ways as it operationalizes cognitive demands in a multidimensional manner by offering a more precise account of how mental effort influences employee outcomes. Also, it situates cognitive demands within the motivational process of JD-R by highlighting their potential to act as both challenges and hindrances. Further, it contributes to specific knowledge of the apparel industry by clarifying how cognitive load shapes engagement in industries where mental effort is a

defining feature of work. In doing so, the study bridges theoretical insights with practical implications that advance the understanding of how cognitive demands interact with resources to sustain employee engagement.

While JD-R theory in its complete form specifies a dual process in which resources buffer the effects of demands, the present study focuses specifically on the health impairment process, the pathway through which job demands deplete energy and reduce motivation via exhaustion (Bakker & Demerouti, 2007; Demerouti & Bakker, 2011). This focused design allows for closer examination of how cognitive demands relate to engagement through emotional exhaustion without the influence of resource variables. This approach is consistent with prior JD-R research that has examined the health impairment pathway on its own to establish the demands, exhaustion, engagement mechanism before introducing resource variables as moderators (Kulikowski, 2022; Rothmann & Essenko, 2007).

Cognitive job demands and employee work engagement

Cognitive job demands are recognized as central within the Job Demands–Resources (JD-R) theory. These demands represent the mental effort required to adapt to dynamic work environments (Bakker & Demerouti, 2007). Research consistently shows that cognitive demands can act as either hindrances or challenges depending on the organizational context. Bakker and Demerouti (2007) argue that when paired with autonomy and social support, cognitive demands stimulate learning, innovation and engagement, but in the absence of adequate resources they contribute to strain and disengagement. This duality reflects the assertion of Crawford, LePine, and Rich's (2010) meta-analytic extension of JD-R theory, which found that challenge-oriented demands including cognitive and mental workload are positively associated with engagement, while hindrance demands are negatively associated with it across 65 independent samples.

Direct empirical support for a cognitive demands and engagement link specifically has grown in recent years. Uhlig et al. (2022), in a two-wave study of 279 employees transitioning to flexible work arrangements found that cognitive demands operationalized as planning, structuring and coordinating tasks were significantly related to increases in work engagement over time functioning as challenge stressors rather than purely depleting ones. Similarly, Tsuno et al. (2015), surveying 9,134 Japanese employees found that cognitive and workload-related demands were positively associated with work engagement when appraised as challenges while role-ambiguity-type hindrance demands showed the opposite relationship. In a South Asian banking context closely comparable to the setting of present study, Rai (2018) surveyed 608 officers in Indian public sector banks and found a significant positive relationship between challenge demands and employee engagement, moderated by job resource availability. At the meta-analytic level, Mazzetti et al. (2023) synthesized 533 correlations from 113 independent samples (N = 119,420) and found that job demands are consistently and meaningfully associated with engagement once the role of job resources is taken into account. This confirms that the demand engagement relationship is a well-replicated empirical pattern not just a theoretical proposition.

In Sri Lanka, Mayuran and Kailasapathy (2022) found that managerial employees in licensed commercial banks reported higher engagement when self-efficacy and employer branding offset the strain of cognitive demands, highlighting the importance of resource availability in shaping

outcomes. Similarly, Lesener et al. (2019) demonstrated that cognitive demands enhance engagement when employees perceive them as opportunities for mastery, but excessive demands without support lead to burnout. Weeratunga (2020) further emphasized that Western engagement models may not fully apply in Sri Lanka, where contextual factors such as organizational politics and work-family conflict alter the demand-engagement relationship. Taken together, these findings of spanning meta-analytic, cross-national and South Asian sector specific evidence establish both the theoretical mechanism and the direct empirical precedent needed to justify testing this relationship in the Sri Lankan apparel sector.

Work engagement, defined as vigor, dedication and absorption (Schaufeli et al., 2006) is strongly influenced by how employees interpret cognitive challenges. When cognitive demands are framed as challenges, they can foster intrinsic motivation, resilience and sustained engagement (Schaufeli, 2017). Conversely, when demands are excessive or perceived as hindrances, they contribute to exhaustion and disengagement (Crawford et al., 2010). This distinction between challenge and hindrance demands is crucial to understanding the motivational process within JD-R, as it explains why similar cognitive tasks can yield divergent outcomes depending on organizational climate and resource allocation.

H1: Cognitive job demands has a significant effect on employee work engagement.

Cognitive job demands and emotional exhaustion

Cognitive job demands are widely recognized as significant stressors in the workplace. Within the Job Demands–Resources (JD-R) framework, these demands are classified as "hindrance stressors" when they exceed the coping capacity of employees, leading to strain and eventual burnout. Bakker and Demerouti (2007) emphasize that cognitive demands drain psychological energy more intensely than physical demands by making employees vulnerable to emotional exhaustion. According to Xanthopoulou et al. (2007), employees facing high cognitive demands reported greater fatigue and disengagement unless buffered by personal resources such as optimism and self-efficacy.

Direct empirical evidence for a cognitive demands and emotional exhaustion link has since accumulated. In a structural equation modeling study of the Dutch working population (N = 4,589), Van Ruysseveldt, Verboon, and Smulders (2011) found that job demands specifically workload, emotional demands and cognitive demands directly and significantly increased emotional exhaustion, confirming the core energy-depletion pathway proposed by the JD-R model. Notably, their study found this direct exhausting effect held even though cognitive demands simultaneously functioned as a challenging stressor that indirectly reduced exhaustion through increased learning opportunities by illustrating that cognitive demands can be depleting and motivating at once, but that the direct strain pathway remains robust. This finding has been echoed in adjacent literatures. Bakker and Mostert's (2024) extension of JD-R theory to academic settings found that cognitive and emotional demands were consistent, direct predictors of emotional exhaustion across university student populations that reinforce the demand-exhaustion relationship generalizes across occupational and quasi-occupational contexts.

Emotional exhaustion, the central dimension of burnout, is defined as the depletion of emotional and cognitive resources (Maslach & Leiter, 2016). Research shows that excessive cognitive

demands are a strong predictor of exhaustion in knowledge-intensive sectors. Schaufeli and Taris (2014) argue that when employees are continuously exposed to complex cognitive tasks without adequate recovery, exhaustion manifests as irritability, withdrawal and reduced performance. In Sri Lankan contexts, Mayuran and Kailasapathy (2022) observed that managerial employees in banking reported emotional exhaustion when cognitive demands were high, unless organizational support and self-efficacy acted as protective factors. Similarly, Lesener et al. (2019) demonstrated that cognitive demands predict exhaustion more strongly than physical demands which reinforce the assertion of JD-R theory that mental strain is a critical antecedent of burnout. Taken together, this body of direct empirical evidence spanning large sample structural equation models, cross-lagged longitudinal designs and South Asian sector specific studies provides sufficient grounding to test this relationship in the Sri Lankan apparel sector.

H2: Cognitive job demands has a significant effect on emotional exhaustion.

Emotional exhaustion and work engagement

Within the Job Demands–Resources (JD-R) theory, emotional exhaustion is often positioned as the negative outcome of excessive job demands. When employees experience exhaustion, they struggle to invest energy and enthusiasm in their work, which undermines their capacity for engagement. Schaufeli et al. (2004) found that employees reporting high levels of exhaustion demonstrated significantly lower levels of vigor and dedication suggesting that exhaustion is associated with a reduced motivational basis of engagement.

This inverse relationship has since been confirmed at the meta-analytic level. Halbesleben (2010), synthesizing decades of work-engagement research, reported a consistent negative correlation between overall work engagement and exhaustion across studies, establishing exhaustion as one of the most robust and replicated correlates of engagement in the literature. Similarly, Cole, Walter, Bedeian, and O'Boyle (2012) found burnout to be strongly and inversely associated with engagement, to the extent that the two constructs share substantial variance while remaining conceptually distinct dimensions of employee well-being in a meta-analysis of 50 independent samples. Longitudinal evidence further supports a genuine temporal pathway rather than a merely cross-sectional pattern. Maricuțoiu, Sulea, and Iancu's (2017) meta-analysis of longitudinal studies found significant cross-lagged effects between burnout and work engagement with the strongest relationships emerging at a 12-month time lag providing evidence that exhaustion and engagement influence one another over time rather than reflecting only a same time, cross-sectional association.

Work engagement, defined as a positive, fulfilling state of vigor, dedication and absorption is often positioned as the opposite pole of burnout. Research consistently shows that emotional exhaustion and engagement are negatively correlated with exhaustion acting as a barrier to sustained involvement in work tasks. In Sri Lankan contexts, Weeratunga (2020) highlighted that cultural and organizational factors such as work-family conflict and limited managerial support exacerbate exhaustion and weaken engagement. These findings reinforce the assertion of JD-R theory that reducing emotional exhaustion through adequate resources and supportive practices is essential for fostering employee engagement.

H3: Emotional exhaustion has a significant effect on work engagement.

Mediating role of emotional exhaustion

The Job Demands–Resources (JD-R) theory provides a useful framework for understanding how emotional exhaustion mediates the relationship between cognitive job demands and work engagement. Cognitive demands can stimulate engagement when employees perceive them as challenges. However, when these demands become excessive and resources are insufficient, they lead to emotional exhaustion which in turn undermines engagement. Bakker and Demerouti (2007) argue that emotional exhaustion acts as a psychological mechanism that transforms cognitive demands from potential motivators into barriers to sustained engagement. According to Xanthopoulou et al. (2007), employees with high cognitive demands reported lower engagement levels when emotional exhaustion was present, highlighting its mediating role.

This mediating mechanism has been directly tested in several structural equation modeling studies. Korunka, Kubicek, Schaufeli, and Hoonakker (2009) testing the full JD-R model in a heterogeneous occupational sample (N = 956) found that exhaustion partially mediated the relationship between job demands and downstream outcomes by providing empirical confirmation of the "energetic process" through which demands operate on engagement related outcomes via exhaustion. In a large sample study of 670 industrial workers, Li, Jiang, Yao, and Li (2013) used structural equation modeling to confirm that job demands significantly predicted emotional exhaustion which subsequently and significantly predict reduced engagement related outcomes by directly supporting a demands – exhaustion – engagement mediation chain rather than a purely additive or direct-effects model. At the meta-analytic level, Nahrgang, Morgeson, and Hofmann (2011) synthesized evidence across multiple occupational samples and confirmed that burnout with exhaustion as its central component functions as a significant mediating mechanism linking job demands to reduced motivational and engagement outcomes that lends broad empirical generalizability to the mediation pathway proposed in H4.

Emotional exhaustion is associated with reductions in vigor, dedication, and absorption, the three dimensions of work engagement (Schaufeli et al., 2002). As per the findings of Lesener et al. (2019), cognitive demands predict exhaustion which subsequently lowers engagement confirming the mediating effect. In the Sri Lankan context, Mayuran and Kailasapathy (2022) observed that managerial employees in banking experienced emotional exhaustion under high cognitive demands which weakened their engagement unless buffered by organizational support and self-efficacy.

H4: Emotional exhaustion mediates the relationship between cognitive job demands and employee work engagement.

Methodology

Sample and data

Data were collected from executive-level, middle-managers and top-management personnel across export-oriented apparel manufacturing firms in Sri Lanka. The population comprised all managerial level employees within the Western Province where most export firms exist. A cluster sampling method was employed by treating each organization as a distinct cluster to reduce selection bias at the organizational level and support sample representativeness.

However, it should be noted that organizational participation was contingent on institutional consent (45 of 52 selected organizations agreed to participate) and individual participation within organizations was voluntary. Both factors introduce a degree of self-selection that random cluster sampling alone cannot fully eliminate. From the full list of 75 organizations registered in the Sri Lanka Apparel Exporters Association, 52 firms were randomly selected using Microsoft Excel. After initial contact and explanation of the study purpose, 45 organizations consented to participate. Surveys were distributed voluntarily via HR channels to all eligible executives and managers in all the departments namely product development, R&D, industrial engineering and HRM departments.

A total of 780 structured questionnaires were distributed to the respondents. The questionnaires were administered through electronic modes depending on the convenience of the respondent. Following the data collection phase, all returned questionnaires were subjected to a rigorous data screening and validation process including checks for completeness, consistency and response quality. After eliminating incomplete and invalid responses, 758 questionnaires were deemed usable for further statistical analysis. This resulted in a highly effective response rate of approximately 97.2% which is considered highly satisfactory for organizational and managerial research and indicates strong participant engagement and data reliability.

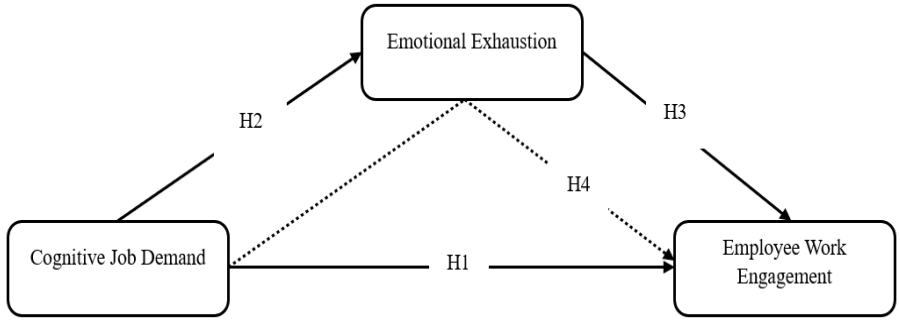


Figure 01: Conceptual framework

Measures

Respondents rated their agreement with each statement on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). Items were adapted from previously validated scales. Cognitive job demands were operationalized as a formative higher-order construct encompassing four dimensions as information processing demands ("I need to deal with complex information to perform my job effectively"), decision-making demands ("I often have to make decisions under uncertain or changing conditions"), time pressure ("I have to manage multiple tasks simultaneously within limited time") and sustained attention ("My job requires maintaining a high level of concentration for long periods") with four items per each dimension. Emotional exhaustion was measured using a six-item scale adapted from (Maslach et al., 1997) exemplified by "I feel emotionally drained by my work". Employee work engagement was assessed using the Utrecht Work Engagement Scale (Schaufeli et al., 2011) evaluating three core dimensions as vigor (3 items; e.g., "I feel strong and vigorous when I am working"), dedication (4 items;

e.g., “I feel proud of the work that I do”) and absorption (5 items; e.g., “I feel happy when I am working intensely”).

Common method bias assessment

Common method bias (CMB) poses a potential threat to validity when data are collected via self-reported questionnaires. To mitigate this concern, this study followed procedural safeguards recommended by Podsakoff and Organ (1986) and Podsakoff et al. (2003). An introductory session preceded the questionnaire by providing clear instructions about the study purpose and reassuring respondents that their data would be secured, protected and used only for research purposes. Participants were assured of complete anonymity and confidentiality to reduce evaluation apprehension and socially desirable responses. Questionnaire items were carefully worded to ensure clarity and simplicity by minimizing ambiguity and misinterpretation. Predictor and criterion variables were positioned in separate survey sections to prevent respondents from inferring relationships among constructs. Additionally, collinearity assessment using variance inflation factor (VIF) values for all latent constructs was conducted as an additional diagnostic check.

In addition to procedural remedies, common method bias was statistically assessed using Harman's single-factor test which showed that a single factor accounted for 38.9% of the total variance, below the 50% threshold indicating that common method bias is unlikely to be a serious concern (Podsakoff et al., 2003). Full collinearity VIF values (Kock, 2015) for all latent constructs reported in Table 2 remained below the conservative threshold of 3.3 providing further evidence that common method bias does not substantially affect the results.

Results

The data analysis was carried out using IBM SPSS and SmartPLS 4. SPSS facilitated the calculation of descriptive statistics to explore the fundamental characteristics of the dataset. To validate the measurement model, SmartPLS 4 was used to conduct confirmatory factor analysis (CFA) by assessing both lower-order and higher-order constructs for reliability and validity.

The structural model was then evaluated to test the hypothesized relationships among the key constructs of the study. This approach enabled a robust examination of the direct and indirect paths specially the mediating role of emotional exhaustion in the relationship between cognitive job demands and work engagement. By integrating these analytical techniques, nuanced insights were derived on how cognitive demands translate into engagement outcomes through the lens of emotional exhaustion.

Demographic profile of the respondents

Table 01: Demographic Attributes

Particulars	Description	Frequency	Percentage
Gender	Male	352	46.4%
	Female	383	50.5%

Particulars	Description	Frequency	Percentage
	Prefer not to say	23	3.0%
Age Group	Below 30	196	25.9%
	31–40	258	34.0%
	41–50	190	25.1%
	Above 50	114	15.0%
Current Job Level	Executive level	384	50.7%
	Middle management	203	26.8%
	Senior management	171	22.6%
Years of Experience	Less than 5 years	189	24.9%
	5–10 years	239	31.5%
	11–15 years	176	23.2%
	More than 15 years	154	20.3%

The demographic analysis includes 758 respondents. In terms of gender, the group is nearly evenly divided with 50.5% identifying as female and 46.4% as male. The largest age group is 31–40 years old representing 34% of the sample. About half of the participants hold executive-level positions and the majority have between 5 and 10 years of work experience. Overall, these demographics reflect a broad range of ages, genders, and professional backgrounds across the sample.

Validating lower-order constructs (LOCs)

Table 2 presents the results of the reliability and validity assessments for all lower-order constructs (LOCs). As recommended by Hair et al. (2014) factor loadings should exceed 0.50, Cronbach's alpha and composite reliability should be greater than 0.70 and the average variance extracted (AVE) should be above 0.50. All constructs in this study met these criteria by indicating strong internal consistency and convergent validity. Furthermore, all variance inflation factor (VIF) values were well below the threshold of 5 that confirm the absence of multicollinearity among indicators. It is noted that the reliability and validity indices for emotional exhaustion and employee work engagement are markedly high relative to conventional benchmarks (Hair et al., 2014).

Table 02: Confirmatory factor analysis, reliability and convergent validity for LOCs

Lower-order constructs	Indicators	Factor Loadings	VIF	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Information processing demand	IPD1	0.854	2.196	0.875	0.914	0.727
	IPD2	0.850	2.205			
	IPD3	0.850	2.154			
	IPD4	0.857	2.160			
Decision	DMD1	0.867	2.302	0.890	0.924	0.752

making	DMD2	0.865	2.325			
demand	DMD3	0.863	2.367			
	DMD4	0.874	2.438			
Time pressure	TP1	0.879	2.498	0.887	0.922	0.747
	TP2	0.862	2.251			
	TP3	0.862	2.343			
	TP4	0.855	2.202			
Sustained	SA1	0.850	2.171	0.882	0.919	0.738
attention	SA2	0.867	2.286			
	SA3	0.853	2.206			
	SA4	0.867	2.284			
Emotional	EE1	0.976	1.572	0.990	0.992	0.952
exhaustion	EE2	0.975	1.621			
	EE3	0.977	1.578			
	EE4	0.976	1.518			
	EE5	0.975	1.566			
	EE6	0.975	1.603			
Employee	EWE1	0.971	1.904	0.995	0.995	0.946
work	EWE2	0.974	1.841			
engagement	EWE3	0.972	1.875			
	EWE4	0.972	2.050			
	EWE5	0.974	1.954			
	EWE6	0.974	1.871			
	EWE7	0.974	1.921			
	EWE8	0.972	1.926			
	EWE9	0.974	1.810			
	EWE10	0.972	1.902			
	EWE11	0.974	1.838			
	EWE12	0.971	1.797			

Table 3 demonstrates acceptable discriminant validity using both the heterotrait-monotrait ratio (HTMT) and the Fornell–Larcker criteria. All HTMT values were below the conservative threshold of 0.85 which confirms that the constructs are distinct from one another. Additionally, for each construct, Square root of AVE values across the diagonal are greater than its correlation with all other constructs. These results satisfy the Fornell–Larcker criteria and confirm that all latent variables in the model exhibit good discriminant validity.

Table 03: Discriminant Validity

S.no.	Metric	1	2	3	4	5	6
Heterotrait-Monotrait ratio (HTMT)							
1	Decision Making Demand						
2	Emotional Exhaustion	0.276					
3	Employee Work Engagement	0.380	0.849				
4	Information Processing Demand	0.032	0.323	0.374			
5	Sustained Attention	0.028	0.306	0.396	0.048		
6	Time Pressure	0.039	0.364	0.454	0.058	0.025	
Fornell-Larcker criterion							
1	Decision Making Demand	0.867					
2	Emotional Exhaustion	0.259	0.976				
3	Employee Work Engagement	-0.358	-0.842	0.973			
4	Information Processing Demand	-0.007	0.301	-0.349	0.853		
5	Sustained Attention	0.000	0.286	-0.371	-0.033	0.859	
6	Time Pressure	0.028	0.341	-0.427	0.052	-0.000	0.864

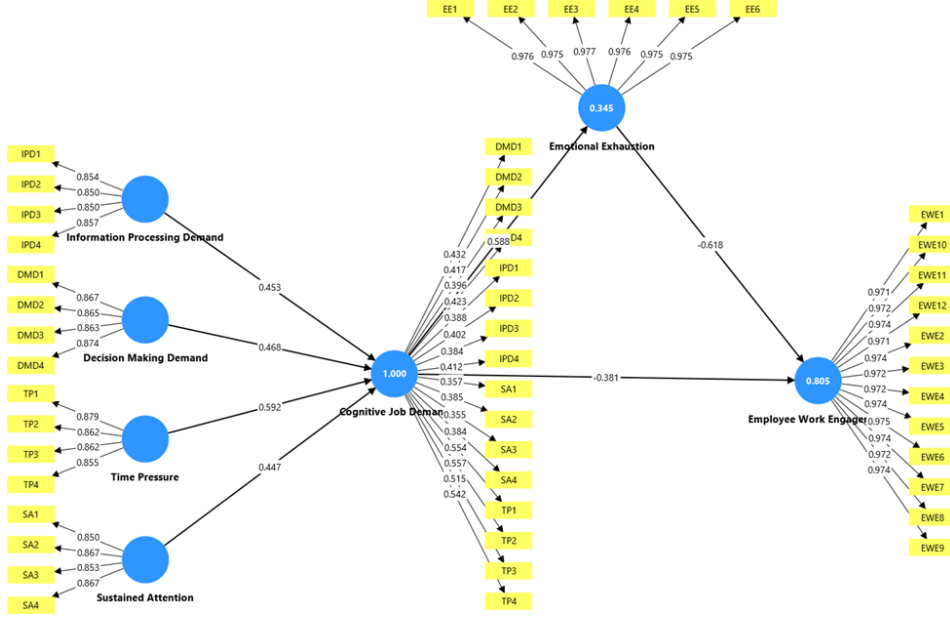


Figure 02: Path model (lower-order construct)

It is worth noting that the HTMT value between emotional exhaustion and employee work engagement (0.849) approaches the conservative threshold of 0.85 indicating a comparatively high degree of shared variance between these two constructs. This is consistent with the broader literature noting substantial conceptual and empirical overlap between burnout-related exhaustion and work engagement which are often theorized as opposite poles of a shared underlying continuum (Cole et al., 2012; Halbesleben, 2010). While the value remains below the threshold and the Fornell-Larcker criterion (Table 3) further supports discriminant validity, results should be interpreted with appropriate caution and noted as a boundary condition.

As per figure 2, the path model of the cognitive job demands construct shows the relationships among dimensions of information processing demand, decision-making demand, time pressure and sustained attention. Each of these lower-order constructs contributes to the formation of the higher-order latent variable with path coefficients indicating the relative contribution of each dimension. With the path coefficients of 0.453 from information processing demand, 0.468 from decision-making demand, 0.592 from time pressure and 0.447 from sustained attention, it is clear that each dimension contributes to cognitive job demands to varying degrees.

Validating the higher-order construct (HOC)

From Table 4, the outer loadings and outer weights of each lower-order construct related to the higher-order construct of cognitive job demands were examined. All the p-values associated with these lower-order constructs are well below the 0.05 threshold, in fact recorded at 0.000, confirming that each lower-order dimension makes a statistically significant contribution to the formation of cognitive job demands. Since this higher-order construct is formative in nature, the assessment of outer weights and their statistical significance was necessary to confirm that each lower-order dimension makes a meaningful and relevant contribution to cognitive job demands alongside collinearity diagnostics to rule out redundancy among the dimensions. The four dimensions including information processing, decision making, time pressure and sustained attention represent conceptually distinct sources of cognitive load rather than interchangeable manifestations of a single underlying attitude. This is consistent with established formative-measurement criteria (Jarvis et al., 2003; Diamantopoulos & Winklhofer, 2001).

In fact, the outer weights such as time pressure at 0.537 and sustained attention at 0.509 indicate the relative contribution of each dimension to cognitive job demands and these weights were all statistically significant with t-statistics above 1.96. This further confirms their relevance and significance in the model. Figure 3 illustrates that cognitive job demands exerts a strong positive influence on emotional exhaustion ($\beta = 0.589$). In contrast, cognitive job demands demonstrate a weak negative relationship with employee work engagement ($\beta = –0.383$). Additionally, emotional exhaustion itself has a strong negative effect on employee work engagement ($\beta = –0.616$) suggesting a mediating role in the overall model. Within the construct of cognitive job demands, the dimensions of decision making demand ($\beta = 0.453$), information processing demand ($\beta = 0.476$), sustained attention ($\beta = 0.509$) and time pressure ($\beta = 0.537$) significantly contribute to its formation.

Table 04: Outer weights and significance for the formative higher-order construct

Higher-order construct	Lower-order constructs	Outer loadings	Outer weights	t-stats	p-values
Cognitive Job Demands	Information processing demand	0.484	0.476	11.696	0.000
	Decision making demand	0.465	0.453	11.221	0.000
	Time pressure	0.574	0.537	14.922	0.000
	Sustained attention	0.493	0.509	11.430	0.000

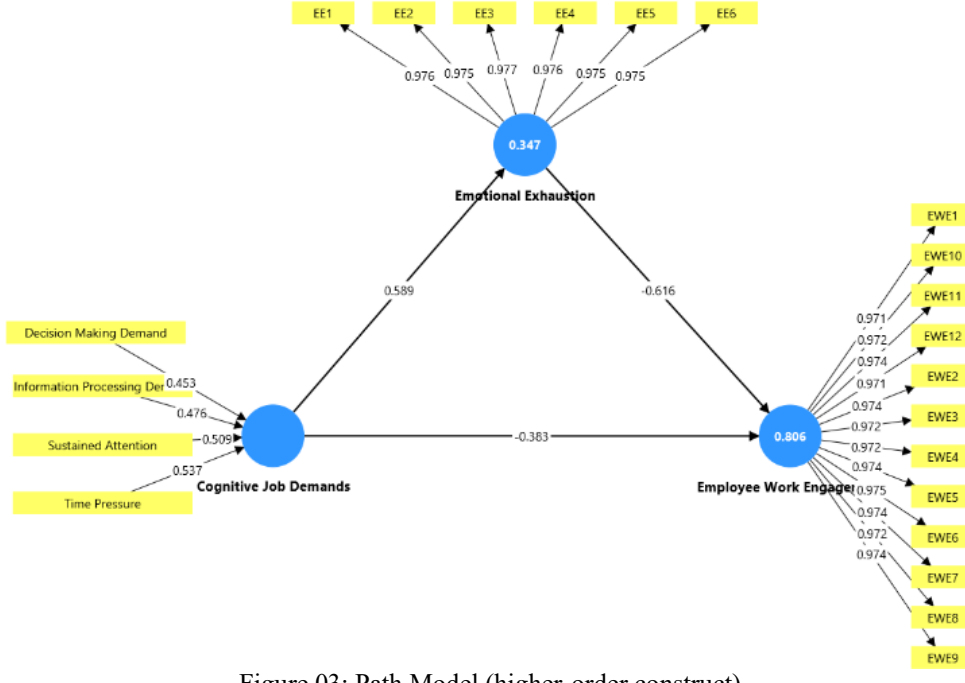


Figure 03: Path Model (higher-order construct)

According to the data shown in Table 5, the T value of 26.304, which is greater than 1.96 with the significant p value less than 0.05 indicate that cognitive job demands significantly influence emotional exhaustion. The T value of 19.892, which is greater than 1.96 with a significant p value less than 0.05, confirm that cognitive job demands significantly influences employee work engagement with a negative path coefficient (β = -0.383) indicating that higher cognitive job demands are associated with lower employee work engagement. Similarly, the T value of 33.910 which is greater than 1.96 with a significant p value less than 0.05, indicate that emotional exhaustion significantly influence employee work engagement with a negative path coefficient (β = -0.616) indicating that higher emotional exhaustion leads to lower employee work engagement.

Table 05: Path coefficient results

Path coefficient	Original sample	Sample mean	Standard deviation	T statistics	P values	Decision
Cognitive job demands -> emotional exhaustion	0.589	0.591	0.022	26.304	0.000	Supported
Cognitive job demands -> Employee work engagement	-0.383	-0.383	0.019	19.892	0.000	Supported
Emotional exhaustion -> employee work engagement	-0.616	-0.616	0.018	33.910	0.000	Supported

Table 06: Indirect effect

	Original sample	Sample mean	Standard deviation	T statistics	P values	Decision
Cognitive job demands -> emotional exhaustion -> employee work engagement	-0.363	-0.364	0.017	21.595	0.000	Partial mediation

Mediation was assessed following the bootstrapping based approach recommended for PLS-SEM (Hair et al., 2019). The indirect effect of cognitive job demands on employee work engagement through emotional exhaustion was $\beta = -0.363$ ($T = 21.595$, $p < 0.001$). The direct effect remained significant in the presence of the mediator ($\beta = -0.383$, $T = 19.892$, $p < 0.001$) indicating partial mediation rather than full mediation. The total effect was $\beta = -0.746$, and the Variance Accounted For (VAF) was calculated as 48.7% falling within the conventional 20%–80% range and confirm partial mediation (Hair et al., 2017).

In Table 7, the R-squared values illustrate the explanatory power of the model with emotional exhaustion having an R-squared of 0.347 and employee work engagement showing a notably higher R-squared of 0.806. These figures indicate that the model explains approximately 34.7% of the variance in emotional exhaustion, a moderate level of explanatory power and about 80.6% of the variance in employee work engagement which is strong. Although the adjusted R-squared values are in a similar range, they can sometimes decrease slightly due to model complexity. These results indicate that the model accounts for a substantial proportion of variance in employee work engagement, whereas its explanatory power for emotional exhaustion remains theoretically meaningful.

Table 07: Coefficient of determination

Construct	R-square	R-square adjusted
Emotional Exhaustion	0.347	0.347
Employee Work Engagement	0.806	0.805

The comparatively high R^2 value for employee work engagement (0.806) warrants careful

interpretation. While this indicates strong explanatory power for the hypothesized predictors, values of this magnitude in a two-predictor model are less common and should be considered alongside the elevated reliability values and the HTMT proximity to threshold. It is possible that shared method variance arising from the single-source, self-reported nature of the data contributes in part to this result.

Table 08: Effect Size

Path coefficient	f-square
Cognitive Job Demands – Employee Work Engagement	0.493
Cognitive Job Demands – Emotional Exhaustion	0.532
Emotional Exhaustion – Employee Work Engagement	1.276

Table 8 presents the effect sizes of the model's structural paths with f^2 values interpreted by Cohen (2013). The path from cognitive job demands to employee work engagement shows an f^2 value of 0.493 representing a large effect. The relationship between cognitive job demands and emotional exhaustion yields an f^2 of 0.532 also a large effect. Most notably, the path from emotional exhaustion to employee work engagement exhibits an f^2 value of 1.276 which is statistically large relative to Cohen's (2013) conventional thresholds.

Discussion and Conclusion

This study makes significant contributions to organizational psychology and human resource management literature by empirically examining the impact of cognitive job demands on employee work engagement through emotional exhaustion in the Sri Lankan apparel sector.

The finding of the impact of cognitive job demands on employee work engagement ($\beta = -0.383$, $p < 0.001$, $f^2 = 0.493$) is consistent with Bakker and Demerouti's (2007) proposition that excessive cognitive demands are associated with lower engagement consistent with the erosion of psychological resources supporting H1. However, this differs from challenge-hindrance perspectives where moderate demands can boost energy and motivation (Lesener et al., 2019). In Sri Lanka, Mayuran and Kailasapathy (2022) similarly reported negative demand engagement links among managers without sufficient resources which validates the context-specific outcome of this study where high cognitive loads manifest as hindrances during economic pressures. Under economic pressures, high cognitive loads were associated with hindrance type outcomes rather than motivational ones. This pattern is consistent with Conservation of Resources theory (Hobfoll, 1989) which suggests that when demands substantially outpace available resources, the hindrance pathway dominates over the challenge pathway.

Beyond aligning with prior findings, this result suggests a specific mechanism relevant to the apparel export context. Unlike Western managerial samples, where cognitive demands often co-occur with high autonomy and decision latitude, Sri Lankan apparel managers operate within tightly buyer-driven production cycles that constrain discretion even at senior levels. This structural feature may explain why the hindrance pathway dominated here rather than the challenge pathway more commonly reported in Western, higher-autonomy contexts. An alternative explanation worth noting is that the cross-sectional design may capture employees

during a period of unusually high sector-wide pressure which could inflate the hindrance framing relative to a more stable period.

The study also reveals a strong, statistically significant relationship between cognitive job demands and emotional exhaustion ($\beta = 0.589$, $p < 0.001$, $f^2 = 0.532$) supporting H2. This result corroborates Xanthopoulou et al.'s (2007) finding that cognitive demands predicted exhaustion more intensely than physical demands due to sustained mental depletion. Schaufeli and Taris (2014) emphasized this in knowledge work, mirroring the experiences of employees with complex specifications and time pressure. Local evidence from Mayuran and Kailasapathy (2022) in banking reinforces cognitive strain as a consistent precursor to burnout across sectors.

Moreover, the strongest path between emotional exhaustion and work engagement ($\beta = -0.616$, $p < 0.001$, $f^2 = 1.276$) is consistent with Maslach and Leiter's (2016) positioning of exhaustion as the antithesis of engagement, depleting vigor and dedication supporting H3. As per the findings of a Sri Lankan study, Weeratunga (2020) found that exhaustion was associated with reduced proactive behaviors. The comparatively large f^2 value points to an important role for emotional exhaustion within this sector, though, as noted earlier, this magnitude should be interpreted alongside the elevated reliability values discussed in the results chapter.

Partial mediation ($\beta = -0.363$, $p < 0.001$) supports H4 by illustrating exhaustion as a mechanism linking demands to disengagement. Lesener et al. (2019) and Xanthopoulou et al. (2007) reported similar pathways while Mayuran and Kailasapathy (2022) highlighted resource buffers that were absent in this context helping to explain the partial mediation effect. This synthesis bridges global JD-R applications with South Asian realities. The uniqueness of this study lies in operationalizing cognitive job demands as a formative higher-order construct capturing nuanced dimensions such as time pressure which is the strongest contributor. This methodological advancement enhances precision over unidimensional measures and addresses calls for multidimensional demand modeling. Applying JD-R to Sri Lankan apparel white collar workers fills a critical gap by extending the theory beyond operators to strategic roles central to sustaining export performance.

Theoretical Implication

Theoretically, this study enriches JD-R theory by testing its health-impairment pathway in a South Asian, export-pressured context where cognitive demands emerged as a hindrance rather than a challenge stressor. Unlike Western samples, where job resources are often emphasized as buffering mechanisms (Bakker & Demerouti, 2007), the present findings are consistent with the possibility that resource scarcity amplifies strain within this context. Although resource availability was not directly measured in this study, this interpretation aligns with broader evidence on the heightened economic vulnerabilities faced by developing economies (UNCTAD, 2026). The formative higher-order specification of cognitive job demands also refines demand categorization within JD-R theory, supporting calls for more finely grained, multidimensional demand modeling (Kubicek et al., 2014). Furthermore, the partial mediation finding suggests that a direct demand-engagement path persists alongside the exhaustion pathway which may be influenced by broader cultural or organizational factors noted in prior Sri Lankan research (Weeratunga, 2020), though this study did not directly test cultural variables and this explanation should be treated as tentative.

These contributions extend JD-R theory by situating it within a developing-economy context by refining demand constructs and pointing to potential cultural boundary conditions worth testing directly in future research. The study therefore advances theoretical development while offering practical implications for managing cognitive demands and emotional exhaustion in export oriented manufacturing settings.

Practical Implications

The Sri Lankan apparel industry contributes over 40% of national merchandise exports (Joint Apparel Association Forum, 2026) and continues to face significant cognitive demands during the post 2022 recovery period. The findings highlight the need for HR strategies that sustain employee engagement while mitigating emotional exhaustion given ongoing pressure in volatile global markets. This directly addresses RQ3, as the practical implications outlined below focus on managing cognitive job demands and emotional exhaustion to support engagement.

Training in time management and decision-making strategies emerges as a potentially valuable intervention. Such programs may help reduce exhaustion and support employees in maintaining focus and engagement which is important for competitiveness against low-cost rivals during declining US and EU demand. By equipping staff with structured decision-making approaches, firms may be better positioned to manage uncertainty and sustain performance. At the same time, the large effect size observed for emotional exhaustion ($f^2 = 1.276$) within tight production cycles signals meaningful burnout risk. Managers should consider prioritizing structured recovery breaks and embedding well-being practices into operational routines which may help protect employee health while supporting consistent performance during periods of volatility. Resource augmentation is another relevant consideration. Investing in digital tools for information processing along with greater autonomy and access to supportive technologies may help offset the negative demand pathway identified in this study and support sustained engagement.

Targeted interventions for executives are also worth considering. With 50.7% of the sample comprising executives, well-being programs tailored to leadership roles may help buffer the effects of emotional exhaustion and support sustained decision-making capacity. During ongoing global trade pressure, supporting engagement through resource investment and well-being practices may help apparel firms sustain productivity and continue contributing to the export performance of Sri Lanka.

Limitations and Future Research

The findings of the study are supported by a strong response rate (97.2%) and satisfactory model fit (SRMR < 0.08). However, several limitations should be noted where the cross-sectional design limits causal inference and future research should adopt longitudinal designs to trace demand-exhaustion-engagement trajectories over time. Further, while self-report measures provided valuable insight, they carry inherent risks of common method bias. Diagnostic checks such as Harman's single-factor test, VIF, HTMT values suggested this was not a serious concern in the present data, but future studies should integrate multi-source data such as supervisor ratings or objective performance indicators to further strengthen validity. The present study did not incorporate individual-level control variables such as age, managerial level or tenure, nor

organizational-level variables such as firm size into the structural model. Future research should consider these as controls to further test the robustness of the reported relationships. The reliability and validity indices for emotional exhaustion and employee work engagement were markedly high relative to conventional benchmarks while this confirms strong internal consistency such elevated values may also reflect item redundancy within the adapted scales and future studies should examine alternative or abbreviated item sets for these constructs.

Finally, consistent with the study's focus on the health impairment process of JD-R theory, job resources were not measured. Future research should incorporate resource variables such as organizational support, peer collaboration or digital augmentation as moderators to test the complete dual process model. Comparative studies across South Asian economies would also offer valuable insight into how these relationships hold across similar developing economy export-driven contexts. Such extensions would help validate the current findings and further develop the applicability of JD-R theory in resource-constrained export-dependent settings.

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