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Impact of Physical and Mechanical Job Demands on Employee Outcomes: Examining the Roles of Well-Being and Work Climate

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ABSTRACT

Purpose: The present study aims to examine the impact of physical and mechanical job demands on employee performance, while also exploring the mediating role of employee well-being and the moderating role of work climate in shaping these relationships. The study seeks to provide a comprehensive understanding of how demanding work conditions influence both employee health and effectiveness. Method: A quantitative, cross sectional research design was employed, and data were collected from 295 employees working in physically demanding occupational settings using a structured questionnaire. Standardized scales adapted from previous studies were used to measure all constructs. The data were analyzed using ADANCO through structural equation modeling techniques, including mediation and moderation analysis. Findings: The results indicate that physical and mechanical job demands have a significant impact on both employee performance and employee well-being. Furthermore, employee well-being was found to significantly influence employee performance and to mediate the relationship between job demands and performance. The findings also reveal that work climate moderates the relationship between job demands and performance, such that a supportive work environment reduces the negative effects of high job demands. Originality/Implications: This study contributes to the existing literature by integrating job demands, well-being, work climate, and performance into a single framework. It extends the application of established theories within physically demanding work contexts and offers practical insights for organizations to improve employee well-being and sustain performance through supportive work environments.

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1. Introduction

The growing complexity of the contemporary work environment, especially in industrial and labor intensive markets, has given a lot of concern to the contribution of job demands in the formation of employee outcome (Hidayat & Tannady, 2023). Repetitive work, heavy lifting, extended working hours, and working with machinery are physical and mechanical job demands, which are part and parcel of most jobs, and their implications on the functioning of employees are significant (Abdel Hadi et al., 2025). Over the past few years, productivity and efficiency have become central to organizations, such that employees have been put in a position that requires prolonged physical labor, casting doubts on whether there is a balance between performance standards and the health of employees (Sutaguna et al., 2023). Researchers in organizational and occupational psychology have highlighted that the determination of the effects of such demands on employee performance and well-being is critical to the establishment of sustainable work practices and enhancement of organizational performance (Aulia & Lin, 2025). This increased interest is symptomatic of a larger change toward looking not only at economic results but also at human costs in the form of stressful workplaces.

There has been a significant amount of empirical research studies on the impact of physically challenging work settings on the employee performance, all of which have shown the negative impact of high job demand (Junça Silva & Lopes, 2023). Research has also demonstrated that excessive physical workload is linked to fatigue, musculoskeletal issues, and poorer cognitive performance, which are all connected with low performance and high error rates. Moreover, studies show that the well-being of employees is a very important factor in this correlation, and people with better physical and mental health perform better and demonstrate more interest in their work (Aulia & Lin, 2025). Motivation to support organizational environments, with positive work climate and effective supervision, also indicates a protective effect against the adverse effects of job demands and aid in preserving the level of performance (Aulia & Lin, 2025). All these findings highlight the need to consider both the direct and indirect routes in which job demands affect employee outcomes.

Although there is a large body of literature concerning job demands and employee performance, there exist numerous gaps that restrict the ability to make a full-scale comprehension of the association between job demands and employee performance (Kaur & Haque, 2024). First, the majority of studies have been more concerned with direct effects and have investigated the effect of physical job demands on the performance without sufficiently establishing the mechanisms underpinning such a relationship (Nilsen & Kongsvik, 2023). This has led to a neglect or inadequate investigation of the role of employee well-being as a mediating variable, especially in situations where physical strain is a defining characteristic of the workplace environment (Marzocchi et al., 2024). Also, the current literature has mostly been focused on developed nations, and less focus has been put on the developing world where the working conditions can vary and employees can be exposed to a higher level of physical difficulty (Popov et al., 2025). Such a deficiency in contextual variety limits the generalizability of results and the necessity to conduct studies that would cover such relationships within various cultural and organizational contexts.

The other significant literature gap is associated with the contribution of the contextual influences, including work climate, to the effect of the job demands on employee performance. Although certain researches have recognized the significance of organizational support and safety practice, there is no empirical investigation that explores the interaction between organizational support and safety practice and physical and mechanical job demands to determine the effect on the outcome of performance (Guares, 2025). Specifically, the work climate as a moderating variable has not been adequately examined, and questions have remained unanswered regarding the potential of the supportive environment to counteract the adverse impact of demanding work conditions (Abun et al., 2023). Also, past studies have tended to view well-being and performance as two distinct outcomes instead of two related constructs, which ignores the fact that well-being can be an important mediating variable between job demands and performance (Bhoir & Sinha, 2024). It is crucial to fill in these gaps so that a more comprehensive and refined concept of the ways in which workplace influences can be created to explain employee outcomes.

The current research will fill these gaps by looking at the connections between physical and mechanical job demands, employee well-being, work climate and employee performance. Particularly, the study aims to examine the direct effect of physical and mechanical job requirements on employee performance, to determine the influence that job requirements have on employee well-being, to determine the relationship between employee well-being and employee performance, to determine the mediating role of well-being in employee-job relationship, and to determine the moderating role of the work climate in employee-job relationship. By answering these questions, the research will aim at giving a holistic picture of the direct and indirect mechanisms through which job demands affect employee outcomes.

The importance of the study is that it has the potential of adding to the theory and practice by providing insights into the complex dynamics of job demands, well-being, and performance. In theory, the study is based on prior studies, where a number of constructs are merged in a common framework thereby providing a more detailed perspective on how employees operate in physically challenging workplaces. Practically, the findings of this study can be applied in the organizational policies and interventions that would assist in enhancing the well-being and performance of employees. One way in which the organizations can utilize these insights is by developing improved work environments, using ergonomic practices, and creating favourable work conditions that will help employees address the demanding working conditions. Lastly, this paper has pointed out the applicability of organisational productivity goals to the well-being and health of employees in a bid to achieve sustainable success in organisations.

The connections suggested in the present study are based on theoretical frameworks that have existed previously, such as the job demands-resources (JD-R) model (Bakker et al., 2007), and the conservation of resources (COR) theory (Hobfoll, 1989), which makes a strong foundation of the way job demands impact the outcomes of employees. JD-R model proposes strain and poor performance arising out of excessive job demands which are not accompanied by adequate resources, whereas COR theory focuses on how resource depletion is the cause of well-being and performance decline. All these theories lend credence to the idea that physical and mechanical job demands have a detrimental impact on employee well-being and performance, that well-being mediates this correlation and that work climate acts as a moderator that can either dampen or enhance the performances of job demands. In this regard, the

research objectives are in line with these theoretical approaches with the intention of testing the hypothesized relationships in an empirical manner and making contributions to the advancement of a broad conceptualization.

2. Literature Review

Physical and mechanical job demands are the degree to which a job involves permanent body strain, frequent bodily movement, the use of machines as well as being subjected to physically challenging conditions like noise, vibration, and dangerous settings (Abdel Hadi et al., 2025). This is the main requirement of most positions involving industry and production where workers are required to constantly use physical effort to fulfill the tasks (Scholze & Hecker, 2023). In the context of JD-R model, the demands are classified into job stressors that drain energy and could impair optimal functioning when not balanced with sufficient resources (Nilsen & Kongsvik, 2023). Employee performance on the other hand involves how well people perform their assigned duties such as productivity, efficiency, quality of work done and compliance to organizational standards (Marzocchi et al., 2024). Empirical researches conducted before have shown that high physical workload is always linked to inaccuracy in task performance, higher error rate, and lower productivity (Popov et al., 2025). Studies in manufacturing, construction, and mechanical industry have demonstrated that workers who are subjected to prolonged physical efforts tend to be fatigued and lack concentration, which adversely impacts on their work performance (Abdel Hadi et al., 2025; Tomczak & Kulikowski, 2024). All these findings point to the fact that too much physical and mechanical stress may deteriorate the capacity of employees to maintain high performance levels in the long run (Yang et al., 2025). Developing these empirical observations, the connection between physical job demands and employee performance can be further explained in terms of the COR theory which suggests that people tend to conserve their physical and psychological resources (Nzewi et al., 2018). In cases where employees are exposed to high levels of mechanical demands, their energy resources will run out and hence they will be exhausted and will not be motivated to work efficiently (Ünal & Ekemen, 2026). The research that is already available proves this point by demonstrating that a long-term exposure to physically demanding work leads to slower working rates, higher absenteeism, and reduced efficiency in work (Afsharian et al., 2023). Moreover, research has also pointed out that the adverse effect of such demands is more intense in the settings that do not provide favorable conditions or rest.

H1: Physical/mechanical job demand has significant impact on employee performance

Physical and mechanical job demands include the degree to which workers are obliged to perform tiring tasks to their bodies like repetitive movement, heavy lifting, long-standing and use of complex equipment under stressful working conditions (Hill et al., 2024). These requirements have a direct impact on the physical and psychological conditions of the employees and employee well-being is a key outcome variable (Dumitriu et al., 2025). Employee well-being is a holistic condition that entails physical well-being, emotional stability and general psychological operations in the workplace (Elufioye et al., 2024). The JD-R model suggests that high job demands exert constant pressure on employees and the result is the energy depletion and health problems whenever the jobs are not accompanied by proper job resources (Marzocchi et al., 2024). It has been demonstrated empirically that employees who are exposed to demanding physical tasks often complain of musculoskeletal disorders, chronic fatigue, and high levels of stress (Marzocchi et al., 2024). Mechanical workload and decreased psychological well-being including anxiety and emotional fatigue have also been strongly linked to studies that have been done in industrial and labor intensive environments (Guares, 2025). These results indicate that physically strenuous working conditions have a strong negative effect on the overall health and work life of employees. The additional theoretical justification is the COR theory which states that people aim at preserving and conserving their resources, i.e. Physical energy and mental strength (Fleming, 2024). When such resources are used up repeatedly as a result of high job demands, then employees are more susceptible to stress and poor health (Sadeghi, 2024). Empirical evidence shows that long term exposure to demanding physical activities results in burnout, reduced life satisfaction and increased absenteeism owing to health related conditions (Bhoir & Sinha, 2024). It has also been found that employees who operate with high mechanical stress usually attain low job satisfaction and high occupational stress levels and this makes their well-being worse.

H2: Physical/mechanical job demand has significant impact on employee well-being

Employee well-being is a phenomenon that displays the physical health, emotional balance, and psychological functioning of an individual in a working environment (Aulia & Lin, 2025). It is very important in influencing the attitude, behavior, and performance of employees in executing their job related tasks. The high well-being levels are linked to greater energy, motivation and engagement, which are all related to better performance outcomes (Hidayat & Tannady, 2023). In the context of JD-R model, well-being is regarded as one of the major results of harmonious job conditions and a motivating factor of positive work behaviors (Sutaguna et al., 2023). Empirical studies have always indicated that employees with higher physical and psychological health are more likely to be more productive, have better concentration and more efficient in doing their work. On the other hand, increased stress, fatigue, and emotional exhaustion which are constituents of poor well-being have been found to reduce performance, increase

error, and poor quality of work in different occupational environments (Kaur & Haque, 2024). The COR theory can also be used to explain the relationship between well-being and performance in that, the more personal resources a person has, the more well placed he or she is in terms of investing effort and maintaining high levels of performance (Gandung, 2024). Highly well-being employees have enough physical and psychological energy to deal with the demands of the job and be able to maintain a steady productivity (Muttaqiean et al., 2023). The empirical studies have affirmed this view by indicating that well-being improves cognitive functioning, decision making and task engagement, which are key to effective performance (Anggraini, 2024). Also, research in the field of organizational psychology has established that when better well-being is achieved, job satisfaction and organizational commitment are positively impacted and hence indirectly better performance outcomes are achieved.

H3: Employee well-being has significant impact on employee performance

Employee well-being is an extremely important psychological and physiological process by which work environment has an impact on individual performance, especially in physically demanding work situations (Dullah et al., 2023). The physical and the mechanical demands of the job like repetitive movements, the extended physical effort and machine based work load subject the employees to continuous pressure on their physical and mental resources (Setyawati et al., 2023). According to the JD-R model, too many job demands cause energy loss and poor health, which in turn impacts on the overall functioning of the employees (Rasheed et al., 2023). Such conditions make employee well-being, or a condition of physical health, emotional balance, and psychological stability, particularly susceptible (Nzewi et al., 2018). Empirical studies have revealed that high physical workload is a major cause of fatigue, burnout, and diminished psychological health which are directly related to decreases in task efficiency and productivity (Fein et al., 2023). Research in the industrial and occupational areas has always observed that workers who are exposed to high mechanical loads do not directly record decreased performance, but rather suffer poorer well-being initially which in turn becomes poor work performance (Fein et al., 2023). This would imply that well-being is a significant intervening variable between job demands and performance. The resources are overloaded when job demands are too high and as a result, the well-being is compromised causing the employees to be unable to perform effectively (Abun et al., 2023). This indirect route is supported by empirical studies that indicate that fatigue, emotional exhaustion and health related issues are significant in explaining how job demands are associated with performance outcomes (Anggraini, 2024). Instead of direct relationship, the effect of physical and mechanical demands occurs in a process where the well-being of employees decline first thus interfering with their motivation, concentration and energy to complete tasks (Santoso et al., 2023). Finding of research has also indicated that well-being maintained by supportive organizational practices minimizes the adverse impacts of job demands on performance, which further supports its mediating position.

H4: Employee well-being mediates the relationship between physical/mechanical job demand and employee performance

Work climate is the common perceptions of employees about the organizational environment, which encompasses the safety practices, the support of supervisors, the pattern of communication, and working conditions in general (Hidayat & Tannady, 2023). It is a decisive contextual element that determines the way employees perceive and react job demands. The work climate can have a very powerful effect on the capacity of employees to manage the demands on them in physically demanding working environments where employees are subjected to constant mechanical stress (Prasad et al., 2023). The JD-R model suggests that the negative impacts of job demands can be mitigated by job resources including conducive leadership, secure working conditions, and healthy interpersonal relationships (Yildirim et al., 2024). Empirical studies have expressed that in the organizations where the work climate is positive, employees have been found to report improved coping strategies, reduced stress and sustained performance even with the high physical workload (Marzocchi et al., 2024). On the other hand, when the work environment is poor with poor support and safety, the negative impact that physical and mechanical job demands can have on performance will be amplified, resulting in low productivity and high errors (Said et al., 2023). These conducive resourceful working environment offers the psychological and instrumental support to employees which allows them to keep up the energy and be effective despite the demanding job environment (Gunasekra & Perera, 2023). Empirical evidence shows that workers in organizations with high safety climate and managerial support will not be affected as easily by high physical demands resulting to performance decline. Rather than getting rid of job demands, positive work climate modifies the magnitude and course of their effect on performance (Kaur & Haque, 2024). Conversely, a bad climate increases the rate of resources depletion, and increases the negative impacts of mechanical workload.

H5: Work climate moderates the relationship between physical/mechanical job demand and employee performance

3. Theoretical Framework Supporting the Research

The hypothesised connections between physical and mechanical job demands, employee well-being, work climate, and employee performance are described by the combination of the JD-R model (Bakker et al., 2007) and the COR

theory (Hobfoll, 1989), which offer a good theoretical basis to the comprehension of the role of workplace conditions in affecting employee outcomes. According to the JD-R model, job demands, especially the ones that demand prolonged bodily activity like mechanical workload and repetitive job tasks can cause strain and health impairment when not accompanied by sufficient job resources lowering the capacity of the employees in the performance. In this regard, employee well-being comes out as a core process that the job demands affect performance because excessive demands drain energy, negatively affect physical and psychological functioning, which eventually results in low productivity and efficiency. On the same note, the COR theory has it that people would want to conserve and even guard their scarce resources and when such resources are depleted as a result of excessive job demands, then their well-being is destroyed which consequently impacts negatively on performance outcomes. Moreover, work climate serves as a significant contextual resource that changes the strength of these relationships by either buffering or enhancing the effects of job demands on performance depending on the extent of organizational support and safety practices within the environment. These theoretical propositions have been empirically validated over the years and have shown that high physical demands lower well-being and performance, and that supportive work climate alleviates these effects and maintains employee functioning, thus the combination of these theories can be used to provide a coherent explanation of both the direct and indirect relationships that shall be proposed in this study as well as the moderating role of work climate as seen in figure 1: conceptual framework.

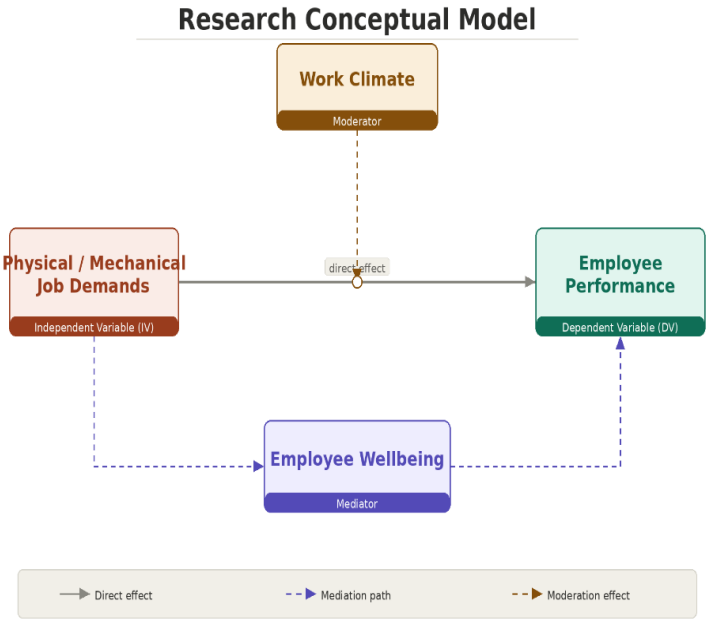

Figure 1: Conceptual Framework

4. Methodology

The current paper used quantitative research design to test the connections between physical and mechanical job demands, employee well-being, work climate, and employee performance. The data was collected through a cross-sectional survey design among employees in physically demanding work environments where mechanical workload and physical exertion are part of occupational work assignments. The population that was targeted was the employees of an industrial and production-based organization, and a sample of 295 respondents was selected using the purposive sampling method to make sure that the respondents were relevant in terms of experiencing physical and mechanical work demands. The data was gathered by way of a structured questionnaire that was filled using both in-person and online methodology depending on their availability. The tool was developed in the English language and with clear and straightforward wording so as to make sense among respondents. To prevent inaccuracy and reliability, the gathered data underwent screening against missing values and outliers before analysis.

The constructs in the present study were measured using standardized scales adopted from prior empirical research to ensure content validity and reliability. All items were assessed on a five-point Likert scale ranging from strongly disagree to strongly agree, with higher scores indicating higher levels of the respective construct. Minor wording adjustments were made where necessary to align the items with the context of physically demanding work environments while preserving their original meaning. Employees' well-being was measured using a three-item scale

adapted from (Dumitriu et al., 2025), capturing the overall physical and psychological state of employees in relation to their work. The scale assessed aspects such as energy levels, emotional balance, and general sense of well-being in the workplace. Work climate was measured using a twelve-item scale adopted from (Meeusen et al., 2011), which evaluated employees' perceptions of the organizational environment, including supervisory support, safety practices, communication, and overall workplace atmosphere. Physical and mechanical job demands were assessed using a three-item scale adapted from (Popov et al., 2025), focusing on the extent of physical effort, repetitive movements, and mechanical workload required in employees' job roles. Employee performance was measured using a five-item scale adopted from (Nzewi et al., 2018). All scales demonstrated acceptable reliability and were considered appropriate for examining the proposed relationships in this study.

To analyze the data, the study used ADANCO, which is a variance based structural equation modeling tool that is appropriate to test complex models that require mediation and moderation. Two steps of analysis were performed, which were the measurement model analysis and structural model analysis. Measurement model was tested on the basis of factor loading, composite reliability and average variance extracted to ascertain construct validity and internal consistency. The heterotrait monotrait ratio was used to measure the discriminant validity. Path coefficients, t values and significant levels were analyzed in the structure model to test the hypotheses proposed. The mediation analysis was used to determine the indirect impact of employee well-being on job demands and performance and moderation analysis was used to determine the interaction impact of work climate on relationship between job demands and employee performance. Bootstrapping steps were used to test the significance of direct, indirect, and interaction effects, hence giving a strong analysis on the proposed research model.

5. Results

According to the results reported in Table 1, all the constructs have high levels of reliability and convergent validity. The Cronbach alpha, the rho of Dijkstra Henseler, and the rho of Joreskog values of all the variables all are above the recommended value of 0.70, which proves high internal consistency between the measurement items. In particular, the work climate indicates the largest values of reliability, and then the performance of employees and their well-being, physical and mechanical job demands also indicate acceptable reliability. In addition, the means of the variance extracted of all the constructs are greater than the acceptable level of 0.50 which means that there is sufficient convergent validity and that the items are adequate to explain the variance of their respective constructs. On the whole, these findings indicate that scales of measurement employed in the research are reliable and valid to be analyzed further.

Table 1: Variables Reliability and Validity

Variables	Dijkstra-Henseler's Rho (ρA)	Jöreskog's Rho (ρc)	Cronbach's Alpha (α)	AVE
Physical/Mechanical Job Demands	0.861	0.854	0.852	0.662
Employee Well-Being	0.870	0.870	0.870	0.690
Work Climate	0.942	0.941	0.940	0.570
Employee Performance	0.911	0.909	0.909	0.666

The confirmatory factor analysis results as shown in Table 2 show that all items have significant loading to their constructs. The physical and mechanical job requirements are between 0.716 to 0.882 in the factor loadings and items in employee well-being are between 0.825 to 0.838, and this shows good item reliability. On the same note, the work climate items have acceptable to high loadings of 0.683 to 0.860, which means that the construct is well represented despite having more items. There are also strong loadings of employee performance items ranging between 0.747-0.883. Because each of the factor loadings is greater than the acceptable minimum of 0.60, the findings confirm that each item serves positively as a part of its construct. Figure 2 also corroborates these results by demonstrating a well specified measurement model that has high item construct relationships.

Table 2 (a): Confirmatory Factor Analysis

Variables	Items	Factor Loadings
Physical/Mechanical Job Demands	PJD1	0.716
	PJD2	0.834
	PJD3	0.882
Employee Well-Being	EWB1	0.838
	EWB2	0.825
	EWB3	0.829

Table 2 (b): Confirmatory Factor Analysis

Variables	Items	Factor Loadings
Work Climate	WC1	0.775
	WC2	0.860
	WC3	0.767
	WC4	0.820
	WC5	0.775
	WC6	0.710
	WC7	0.719
	WC8	0.710
	WC9	0.683
	WC10	0.750
	WC11	0.736
	WC12	0.732
Employee Performance	EP1	0.841
	EP2	0.883
	EP3	0.775
	EP4	0.829
	EP5	0.747

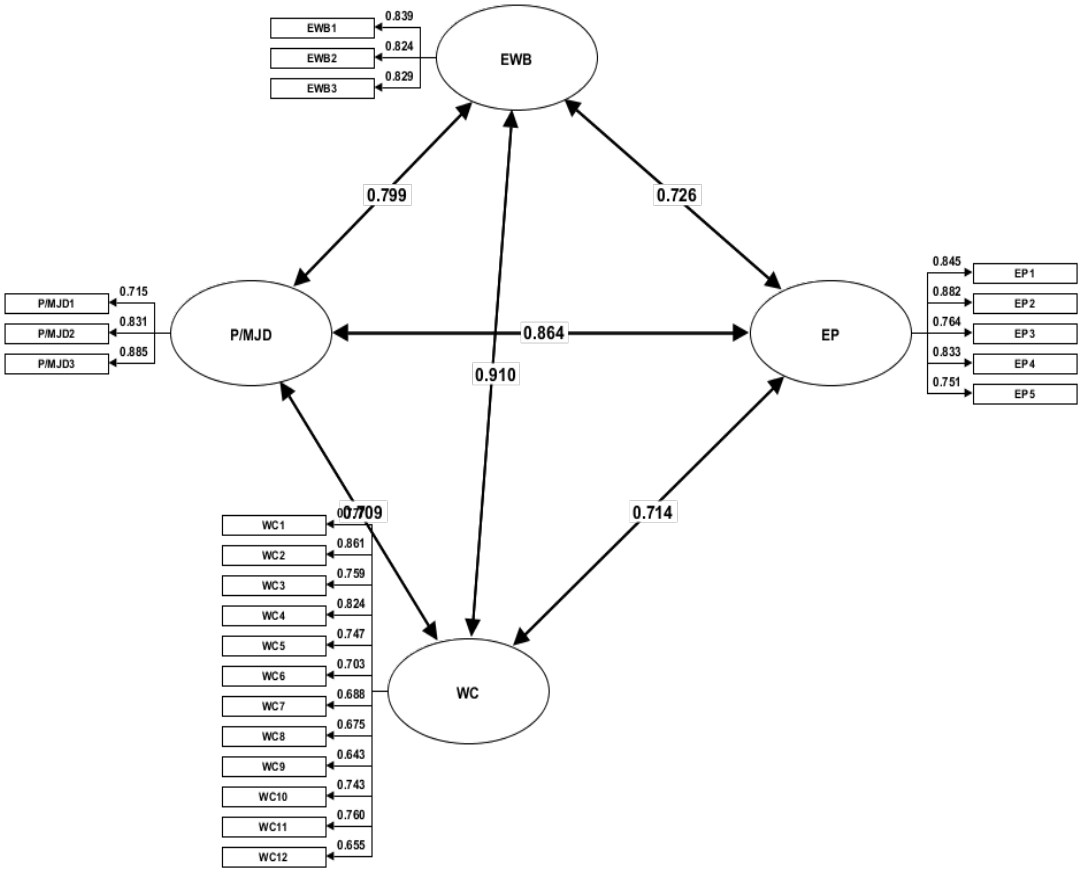

Figure 2: Measurement Model

Table 3 of the results of discriminant validity shows that all of the HTMT values are less than the recommended threshold of 0.85. This confirms that the constructs are different and that there is no discussion of multicollinearity of the variables. As an example, the HTMT between the physical and mechanical job demands and employee well-being is 0.621 and the value between employee well-being and employee performance is 0.712 which are within reasonable levels. These results indicate that the constructs reflect peculiarities of the model and prove the peculiarity of the

theoretical framework.

Table 3: Discriminant Validity (HTMT)

Variables	1	2	3	4
1. Physical/Mechanical Job Demands	—			
2. Employee Well-Being	0.621	—		
3. Work Climate	0.548	0.673	—	
4. Employee Performance	0.589	0.712	0.655	—

Table 4 shows the coefficient of determination and model fit indices, which show that the model is a strong predictor of the overall fit. Employee well-being has a R squared of 0.637 which indicates that the physical and mechanical job demands are related to 63.7 percent of the variance in employee well-being. Likewise, the R-Squared of employee performance is 0.776 meaning that when job demands, employee well-being, and work climate are combined, 77.6 percent of the variance in employee performance is explained which is a significant amount of predictive power. On the model fit, the value of SRMR is 0.052 which is lower than the recommended value of 0.08 which is good. The fact that the value of the normed fit index is 0.913 also proves the sufficiency of the model, as it is higher than the acceptable 0.90. The extra fit indices also lie within reasonable ranges, which proves the fact that the proposed model fits the data.

Table 4: R-Square Statistics and Model Goodness of Fit Statistics

Constructs / Model Fit Indices	Values
R-Square (R^2)	
Employee Well-Being	0.637
Employee Performance	0.776
Model Goodness of Fit	
SRMR	0.052
d_ULS	0.842
d_G	0.691
Chi-Square	412.378
NFI	0.913

The results of the path analysis as shown in Table 5 have significant support to all hypothesized relationships. The direct impact of physical and mechanical job demands on employee performance is adverse and substantial, which implies that increased job demands result in reduced levels of performance. On the same note, the physical and mechanical demands of the job are of significant negative impact on employee well-being which implies that the greater the physical strain, the less the overall well-being of employees. On the other hand, employee well-being positively and significantly impacts on employee performance showing its importance in improving productivity and effectiveness. As shown by the mediation analysis, the employee well-being is a strong mediator between job demands and performance which means that job demands moderate performance indirectly through their effects on well-being. The moderation analysis, further, indicates that work climate is a strong moderator of the relationship between job demands and employee performance, which indicates that a supportive work environment can reduce the negative impact of high job demands. These structural relationships are illustrated on the Figure 3, which once again attests to the soundness and integrity of the proposed model.

Table 5: Path Analysis

Hypotheses	Relationships	Beta (β)	t-Value	p-Value	Decision
H1	Physical/Mechanical Job Demands → Employee Performance	-0.795	5.874	0.000	Supported
H2	Physical/Mechanical Job Demands → Employee Well-Being	-0.798	7.236	0.000	Supported
H3	Employee Well-Being → Employee Performance	0.268	8.115	0.000	Supported
H4	Job Demands → Well-Being → Performance	-0.196	4.982	0.000	Supported
H5	Work Climate × Job Demands → Employee Performance	0.173	3.421	0.001	Supported

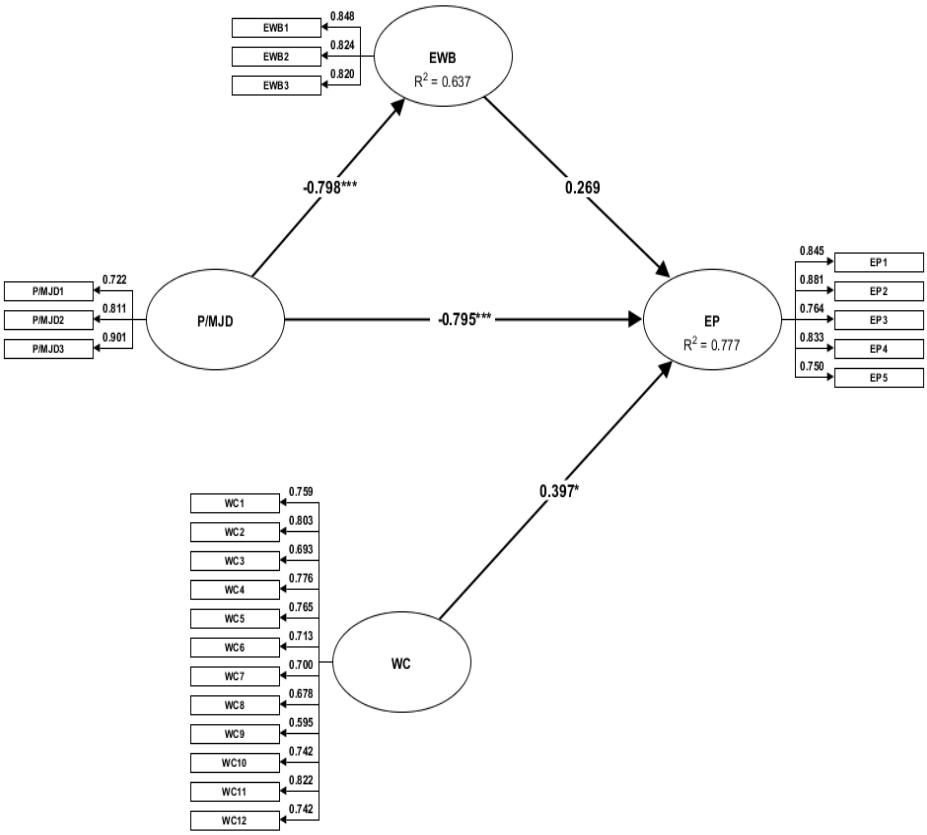

Figure 3: Structural Model

6. Discussion

In the modern work environments and especially those that are highly physical and mechanical demanding, workers are constantly balancing in an intricate game of work, strain, and adjustment. This research paper enters into this current discussion by providing a combined analysis of the physical and mechanical job demands effect on employee performance and well-being as well as taking into consideration the underlying mechanisms and situational circumstances that mediate these relationships.

The physical and mechanical job demands are significantly influencing employee performance, as the results of the current study are solid empirical evidence in support of the first hypothesis. This finding is in line with the theoretical propositions of the JD-R model, which postulates that high job demands absorb the physical and psychological energy of employees making them incapable of working effectively (Abdel Hadi et al., 2025). This hypothesis is acceptable and indicates that workers who are exposed to high physical exertions including repetitive movements, heavy lifting, and constant contact with machinery are prone to fatigue and lack of concentration which eventually reduces their productivity and efficiency. The results are consistent with the previous empirical studies that have reported negative correlation between physical workload and performance outcomes, especially in labor intensive industries where physical work has to be sustained. In addition, the findings are also consistent with the COR theory, which states that people possess a limited amount of resources and that when their needs exceed the available resources, there is depletion of the available resources, and thus their ability to perform optimally reduces (Yang et al., 2025). The present results can be seen as an extension of the existing literature, as it presents evidence in a setting with a high prevalence of physical and mechanical job demands, which will support the claim that job demands that are not managed can greatly impede employee effectiveness.

On the same note, the findings of this research affirm the second hypothesis in that the physical and mechanical job demands significantly affect the well-being of employees. This observation underscores the imperative nature of physically challenging work environments as determinants of physical and mental well-being of employees (Dumitriu et al., 2025). In line with JD-R model, the findings show that high job demands are related to strain and health related problems, which have negative impacts on overall well-being. The employees who have to be subjected to continuous

physical activity tend to be more likely to undergo fatigue, stress, and physical discomfort, which leads to the deterioration of their overall quality of life. COR theory also confirms these findings in that the loss of energy and resilience as a result of too many demands results in a loss of well-being (Bhoir & Sinha, 2024). This hypothesis is accepted by the past empirical research findings that have indicated a significant correlation between physical workload and negative health effects such as burnout and low job satisfaction.

The results of the current study support the third hypothesis to a large extent, which holds that employee well-being is a significant influence on employee performance. This finding puts emphasis on the key factor of physical and psychological wellbeing of employees, in dictating their efficacy in the workplace (Guares, 2025). According to the JD-R model, the results indicate that the employees would be more energized, motivated and able to participate in their activities when they have better levels of well-being resulting to better productivity and efficiency. Workers who are healthier in mind will tend to show more concentration, low rate of errors and increased commitment which are all factors of improved performance (Elufioye et al., 2024). These findings can also be explained in terms of the COR theory according to which people who possess enough physical and mental resources can invest more in their activities and maintain high functioning levels. Past empirical research that has determined a positive relationship between well-being and performance in different work environments gives credence to the acceptance of this hypothesis (Aulia & Lin, 2025). The present research builds on this body of knowledge by amplifying the significance of employee well-being as a determinant of performance, especially where the work environment is characterized by challenging work environments.

Moreover, the study results support the fourth and fifth hypotheses empirically, as it was found that employee well-being mediates the relationship between physical and mechanical job demands and employee performance, whereas the work climate moderates such a relationship. The mediating role of well-being reveals that the effect of job demands on performance is not only direct but a process in which too much physical demands initially impair the well-being of employees, which consequently translates to lower performance (Hill et al., 2024). This observation has been validated by the JD-R model and COR theory, since it is an indicator of the resource depletion and health impairment mechanism that correlates job demands with performance outcomes. The findings indicate that employee well-being intervention may be important in mitigating the adverse effects of physical job demands on performance which makes its critical role as an explanatory pathway (Fleming, 2024). Moreover, the moderating impact of work climate demonstrates that the strength of the relationship between job demands and performance is different according to the quality of the working environment. It seems that a good and encouraging work climate has a cushioning effect against the negative impact of physical demands, and that employees are more likely to perform better in difficult conditions due to the supportive work climate than when the work climate is poor and the negative impact is increased. These conclusions are consistent with the previous studies highlighting the protective nature of organizational support and safety practices.

In conclusion, the overall findings of this study all lead to the fact that the physically and mechanically demanding job requirements are the most vital factors that influence the outcomes of the employees both directly and indirectly. The fact that all the hypotheses that were proposed have been passed shows that job demands, work climate, employee well-being, and job performance are not independent and rather interact significantly with each other to define the effectiveness of an organization. The results indicate that despite the potentially harming effects of high job demands on the functioning of employees, positive conditions and maintenance of well-being can exert significant influence on them. These dynamics are more integrative and enlightening by mediating and moderating mechanisms and lead to the applicability of the JD-R model and the COR theory in explaining workplace behavior.

7. Conclusion

Finally, the current research study offers an in-depth analysis of the associations between physical and mechanical work requirements, employee well-being, work climate, and employee performance, which can be useful in understanding the role of demanding work conditions in determining the outcomes of employees. Not only the outcomes confirm that physical and mechanical job demands have strong influence on employee well-being and employee performance, but also indicate that employee well-being is a significant process through which the effects are produced and that work climate is a significant factor in establishing the strength of the relationships. An integrated approach of both JD-R model and the COR theory is a strong theoretical ground of the research that contributes to the understanding of such complex processes. Overall, the results indicate the importance of establishing the balance between job requirements and adequate resources and positive organizational conditions to ensure the performance and well-being of staff could be maintained. This research is not just an addition to the body of literature in the field, but it also gives viable recommendations to organizations that are willing to have healthier and productive work environments that will eventually result to the success of the organization in the long run.

8. Implications of the Study

The theoretical implications of the current research are considerable in the fact that it enhances the application of the JD-R model and the COR theory to a physically and mechanically strenuous work environment. The most important job demands are the physical and mechanical job demands since their contribution is identified in this research study hence the extension of the scope of these theoretical frameworks. The findings contribute to theory by empirically validating the hypothesis that employee well-being is a heavy mediating variable in that job demands influence performance to offer a more process-based analysis of how resource depletion is translated into visible work performance. Also, work climate as a moderating factor enhances the explanatory strength of the models available since they demonstrate how the situation factors interact with job demands to create an effect on employee behavior. This methodology is more than one-to-one relationships and can be used to contribute to a broader based system that can capture individual and environmental factors. In addition, the study provides theoretical growth since it puts such relationship in a context of a developing country thus bridging gaps in literature and improving externalizability of the formulated theories in a broad scope of occupational context.

In practice, the findings of the study are immensely significant to the organizations that strive to enhance the performance of the employees without the risk of undermining the well-being of the workforce. The results indicate the necessity to make sure that the physical and mechanical job demands are carefully managed by the organizations through the implementation of ergonomics interventions, task redesign, and reasonable distribution of workload to prevent excessive pressure. Also, the mediating role of employee well-being means that health promotion initiatives such as stress management initiatives, regular health examinations, and rest and recovery opportunities should be taken by the organizations as the way of ensuring that employees continue to perform. The importance of developing a supportive and safe work environment, where employees feel valued and safe, is also supported by work climate moderating effect. These insights can be used by managers and policymakers to institute strategies that are capable of improving supervisory support, communication, and safety practices to reduce the adverse impact of the demanding work conditions. Overall, the paper has indicated that there is a need to have the holistic approach of managing the workforce in a way that would balance productivity goals with the health and well-being of the employees that result in sustainable organizational performance.

9. Limitations and Future Research Directions

Although this study has made contributions, it is not devoid of limitations, which also presents opportunities in future studies. To begin with, the research design used, cross sectional, inhibits the possibility of making causal conclusions between physical and mechanical job demands, employee well-being, work climate and employee performance, implying that upcoming studies should consider the longitudinal or experimental research design to create stronger temporal and causal associations. Second, the use of self-reported information can lead to common method bias and social desirability effects that have the potential to affect the validity of the results and, thus, it is recommended that future researchers should include multi source data, such as supervisor ratings or objective performance measures. Third, the research could have been carried out in a particular industry or regional environment thereby restricting the generalisation of the results to other industries or cultural backgrounds, thus the importance of cross cultural and multi-industry research. Moreover, although employee well-being was a mediator and work climate a moderator in this paper, other possible variables like resilience, coping strategies, leadership style, and organizational justice were not analyzed; they may give more understanding to the complexity of such relations. Further studies can also examine various dimensions of work climate further as a way of developing a better understanding of their moderating effect like psychosocial climate or safety climate. In addition, the application of sophisticated analytical methods and mixed methods might contribute to the development of a better understanding of underlying mechanisms and offer more in-depth explanations of how employees perceive and react to physically demanding work conditions.

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