

The Mediating Role of Work-Life Balance in the Relationship between Workload, Job Satisfaction, and Job Performance among Generation Z Employees in the Manufacturing Industry

Sumarno^{1*}, heny fitriani², R. Dewi Mutia Farida³, Rosdiana⁴

^{1,2,3,4}Politeknik PGRI Banten, Indonesia

*e-mail: smuakhid@gmail.com¹, heny.fitriani88@gmail.com², d3wu_lp3i@yahoo.com³,
rose@politeknikpgribanten.ac.id⁴

(Received: June 21, 2026; Revised: September 28, 2026 ; Accepted: October 08, 2026)

ABSTRACT

This study examines the mediating role of work-life balance in the relationships between workload, job satisfaction, and job performance among Generation Z employees in the manufacturing industry. A quantitative explanatory approach using a three-wave time-lagged survey was employed, involving 300 employees selected through purposive sampling from manufacturing companies in Tangerang Regency, Banten, Indonesia. Data were analyzed using partial least squares structural equation modeling (PLS-SEM), with job performance assessed through employee self-reports. The findings revealed that higher workload was significantly associated with lower work-life balance, job satisfaction, and job performance. Conversely, work-life balance showed significant positive associations with both employee outcomes. Furthermore, work-life balance significantly mediated the relationships between workload and job satisfaction and between workload and job performance, with indirect effects exceeding the corresponding direct effects in magnitude. These findings provide context-specific evidence consistent with the Job Demands-Resources (JD-R) framework, highlighting perceived work-life balance as an important intervening factor connecting job demands with employee attitudes and self-reported performance. However, the observed mediation represents statistical associations rather than definitive evidence of causal or psychological recovery mechanisms. From a managerial perspective, the findings suggest that manufacturing organizations should consider evaluating workload distribution and employees' perceived ability to accommodate non-work responsibilities alongside employee satisfaction and performance. Overall, the study emphasizes the importance of considering work-life balance within manufacturing workforce management while acknowledging the interpretative limitations of its observational design.

Keywords: Generation Z; job performance; job satisfaction; work-life balance; workload

1. INTRODUCTION

Managing workload while maintaining employee satisfaction and performance presents a persistent challenge in the manufacturing industry. Production targets, standardized procedures, interdependent workflows, fixed working hours, physical attendance requirements, and rotating shifts can impose substantial demands while limiting employees' flexibility in organizing their work and personal lives. Although these arrangements are necessary for operational coordination, sustained workload may restrict opportunities for non-work activities and coincide with less favorable employee attitudes and performance. Evidence from manufacturing employees indicates that work-life balance is closely connected to job conditions, organizational support, and employee well-being, highlighting the importance of examining this relationship within industrial work arrangements (Balvočiūtė & Švėgždienė, 2026). Understanding how workload relates to work-life balance, job satisfaction, and job performance is therefore relevant to organizations seeking to maintain operational effectiveness without overlooking employees' broader functioning.

This issue warrants particular examination among Generation Z employees entering and establishing themselves in manufacturing employment. Existing scholarship suggests that

flexibility, development opportunities, meaningful work, and personal well-being are relevant considerations in understanding this cohort's employment experiences (Schroth, 2019; Gabrielova & Buchko, 2021). Mahmoud et al. (2021) also identify differences in reported workplace motivation across generational groups, although such findings do not imply that all members of a generation share identical preferences or behavioral responses. Within Indonesian manufacturing, Andriyana and Cahyadi (2025) demonstrate the relevance of work-life balance to job satisfaction among Generation Z employees. Nevertheless, the present study treats Generation Z as the population under investigation rather than assuming that the relationships among workload, work-life balance, satisfaction, and performance are unique to this cohort. The manufacturing context is particularly relevant because expectations concerning work and non-work compatibility must be accommodated within production systems that offer limited scheduling discretion.

The Job Demands-Resources (JD-R) theory provides the principal framework for explaining these relationships. According to Bakker and Demerouti (2017), job demands are aspects of work that require sustained physical, cognitive, or psychological effort and may generate costs when they exceed employees' capacity to manage them. Job resources, in contrast, are work-related conditions that facilitate goal attainment, reduce the costs of demands, or support employee development and functioning. In the present model, workload represents a quantitative job demand, whereas work-life balance is conceptualized as employees' perceived ability to accommodate work requirements while maintaining sufficient time for valued non-work activities. Casper et al. (2018) establish that work-nonwork balance is conceptually distinct from the mere absence of work-family conflict and involves an overall evaluation of compatibility across life domains. Consistent with the study's measurement approach, work-life balance is operationalized through perceived time availability for family and friends, personal matters, and personal interests (Talukder et al., 2018; Susanto et al., 2022). Accordingly, work-life balance is not classified as a job resource in itself or treated as a direct measure of psychological recovery. Rather, it is examined as an intervening appraisal through which the implications of workload for subsequent employee outcomes may be understood.

Existing studies provide support for this framework but also reveal important limitations. Johari et al. (2018) examined workload, work-life balance, and job performance among teachers, demonstrating the relevance of these constructs beyond industrial employment. Chowhan and Pike (2023) developed a JD-R model linking workload, the work-life interface, stress, job satisfaction, and performance among university employees working during the COVID-19 pandemic, establishing that related mediating processes have already been investigated. Susanto et al. (2022) examined relationships among work-life balance, job satisfaction, and job performance among employees of small and medium-sized enterprises, including the mediating role of job satisfaction. However, findings concerning work-life balance are not uniformly positive. Rensiana et al. (2024) reported a negative relationship between work-life balance and performance among Generation Z workers, whereas Waworuntu et al. (2022) identified predominantly positive relationships in their systematic review. Furthermore, Kinasih and Asfari (2026) found that work-life balance was not a statistically significant independent predictor of job satisfaction when examined alongside social support. These differences indicate that the direction and significance of work-life balance relationships require further examination rather than being assumed to operate consistently across occupational settings and analytical models.

Three interconnected research gaps emerge from this literature. First, a mechanism gap concerns the limited explanation of how quantitative workload is associated with both job satisfaction and job performance through the same work-life balance mediator within a single structural model. Previous mediation research has examined related processes, but studies such as Chowhan and Pike (2023) and Susanto et al. (2022) emphasize different intervening constructs, model configurations, or occupational settings. Second, an empirical gap remains because the relationships between work-life balance and employee outcomes have produced inconsistent findings, particularly concerning job performance and the independent association with job

satisfaction. Third, a contextual gap arises from the need to examine these relationships among Generation Z manufacturing employees whose work arrangements are characterized by production schedules, task interdependence, and constraints on flexibility. The contribution of the present study therefore lies not in introducing an entirely new set of relationships, but in jointly evaluating two indirect pathways from workload through work-life balance to distinct employee outcomes within a production-oriented employment context.

The first hypothesized relationship concerns workload and work-life balance. Under JD-R theory, higher quantitative workload requires greater expenditure of time, attention, and effort, potentially reducing employees' perceived capacity to fulfill non-work responsibilities. In manufacturing, this pressure may be particularly relevant when production targets, shift arrangements, and overtime limit employees' discretion over the allocation of personal time. Vito and Widigdo (2026) found that workload was negatively associated with work-life balance among Generation Z employees in Indonesia, providing evidence consistent with this demand-based explanation. Chowhan and Pike (2023) similarly demonstrated that workload and working hours are relevant to the work-life interface, although their study employed a different occupational context and conceptual model. Based on these theoretical and empirical considerations, H1 proposes that workload is negatively associated with work-life balance.

Workload may also relate directly to employees' job satisfaction and job performance, independently of its association with work-life balance. Job satisfaction represents an employee's cognitive and affective evaluation of the employment experience, whereas job performance concerns the fulfillment of work responsibilities and contributions to expected job outcomes. When workload is perceived as excessive or difficult to manage, employees may evaluate their jobs less favorably because sustained demands increase the effort required to meet organizational expectations. Inegbedion et al. (2020) found that perceptions of workload balance were significantly associated with job satisfaction, while Chowhan and Pike (2023) identified connections among workload, the work-life interface, stress, and employee outcomes. For performance, excessive quantitative demands may reduce the attention and energy available for consistent task execution, even though greater work intensity does not necessarily lower immediate output under every circumstance. The investigation by Johari et al. (2018) further supports the relevance of assessing workload alongside employee performance. Accordingly, H2 proposes that workload is negatively associated with job satisfaction, while H3 proposes that workload is negatively associated with job performance.

Work-life balance is expected to exhibit a positive relationship with job satisfaction because employees evaluate their work partly in terms of its compatibility with personal responsibilities and valued non-work activities. When employees perceive that work requirements leave sufficient time for these activities, their employment experience may be evaluated more favorably. Susanto et al. (2022) reported a positive relationship between work-life balance and job satisfaction, while Andriyana and Cahyadi (2025) identified the relevance of work-life balance among Generation Z employees in manufacturing. However, Kinasih and Asfari (2026) found that its partial association with job satisfaction was not statistically significant after accounting for social support. This finding highlights the importance of distinguishing theoretically expected relationships from universally established empirical effects. Nevertheless, the compatibility-based interpretation of work-life balance and supporting evidence from previous studies provide grounds for expecting a positive association in the manufacturing context. Thus, H4 proposes that work-life balance is positively associated with job satisfaction.

The relationship between work-life balance and job performance requires additional consideration because favorable non-work conditions do not automatically translate into improved work outcomes. Within the JD-R perspective, sufficient compatibility between work and personal life may help employees avoid excessive interference between competing responsibilities and maintain the capacity to meet occupational requirements. Susanto et al. (2022) reported a positive relationship between work-life balance and job performance, while Waworuntu et al. (2022) identified a similar general pattern in research involving Millennial and

Generation Z employees. However, Rensiana et al. (2024) observed a significant negative relationship among Generation Z workers and found that work-life balance did not significantly moderate the relationship between job characteristics and performance. Because these studies differ in their occupational contexts, explanatory variables, and analytical specifications, their findings should not be interpreted as directly equivalent estimates of a universal relationship. Nevertheless, the positive evidence and the theoretical relevance of sustaining employees' functional capacity support the proposed direction. Therefore, H5 proposes that work-life balance is positively associated with job performance.

Beyond these direct relationships, work-life balance may explain part of the association between workload and job satisfaction. The JD-R framework suggests that demanding work conditions can be associated with unfavorable employee evaluations through the pressure they place on employees' capacity to manage competing requirements. Higher workload may coincide with reduced availability for family, personal interests, and other non-work responsibilities, which may subsequently be reflected in lower satisfaction with employment. This interpretation is consistent with evidence linking workload to work-life balance (Vito & Widigdo, 2026) and work-life balance to job satisfaction (Susanto et al., 2022). It also complements the broader mediation framework examined by Chowhan and Pike (2023), although the intervening construct and outcome specification differ. The proposed pathway therefore distinguishes the remaining direct association between workload and job satisfaction from the indirect association operating through perceived work-life balance. Accordingly, H6 proposes that workload has a negative indirect association with job satisfaction through work-life balance.

A parallel indirect relationship is proposed for job performance. Quantitative workload may be associated with employees' reduced ability to maintain a satisfactory arrangement between occupational requirements and personal activities, while lower work-life balance may coincide with difficulty sustaining effective work functioning. Although recovery and resource availability provide a plausible theoretical explanation, these processes are not measured independently in the present study and should not be interpreted as additional empirically tested mediators. Johari et al. (2018) demonstrated the relevance of workload, work-life balance, and performance within an integrated analysis, while Susanto et al. (2022) documented the relationship between work-life balance and performance in an Indonesian employment context. The conflicting findings of Rensiana et al. (2024) further justify examining the indirect pathway rather than presuming that its expected direction will hold across settings. In this model, work-life balance is therefore evaluated as the intervening construct connecting workload with employee-reported performance, while the direct workload-performance relationship is retained. Consequently, H7 proposes that workload has a negative indirect association with job performance through work-life balance.

To test these seven hypotheses, the study examines Generation Z employees working in manufacturing companies in Tangerang Regency, Banten, Indonesia. The setting provides an industrial context in which production-oriented work arrangements, physical attendance, and scheduling requirements are relevant considerations for evaluating employees' workload and work-life balance. Using a three-wave time-lagged survey, workload is assessed before work-life balance, followed by job satisfaction and job performance, enabling the proposed relationships to be examined with temporal separation between the principal constructs. The study simultaneously estimates the direct relationships and the two indirect associations through work-life balance without assuming that temporal ordering alone establishes causality. Its contribution is threefold: providing a more specific account of perceived work-life balance as an intervening appraisal within JD-R reasoning, integrating attitudinal and self-reported performance outcomes in one model, and examining these relationships within Generation Z manufacturing employment. By distinguishing the direct and indirect associations of workload with employee outcomes, the study seeks to inform workload allocation, scheduling practices, and human resource management while contributing context-specific evidence to the literature on work demands and work-life balance.

2. METHOD

2.1 Research Design and Setting

This study employed a quantitative explanatory research design using a three-wave time-lagged survey to examine the mediating role of work-life balance in the relationships between workload, job satisfaction, and job performance among Generation Z employees in the manufacturing industry. The unit of analysis was the individual employee. The research was guided by Job Demands-Resources (JD-R) theory, with workload specified as the independent variable, work-life balance as the mediator, and job satisfaction and job performance as two distinct dependent variables.

The three-wave design was adopted to establish temporal separation between the measurement of the predictor, mediator, and outcome variables. Workload and respondent characteristics were assessed at Time 1 (T1), work-life balance at Time 2 (T2), and job satisfaction and job performance at Time 3 (T3). The study protocol specified approximately two-week intervals between successive waves. This separation was intended to reduce certain risks associated with common-method variance while preserving the temporal ordering of the measured constructs. Nevertheless, temporal separation does not eliminate potential measurement bias, unmeasured confounding, or alternative explanations for the observed relationships.

The study was conducted among Generation Z employees working in manufacturing companies in Tangerang Regency, Banten Province, Indonesia. Manufacturing provides a relevant setting because employment conditions commonly involve production targets, standardized work procedures, interdependent workflows, physical attendance requirements, and shift-based scheduling. The respondents represented several manufacturing subsectors, including automotive and components, food and beverages, electronics and electrical products, textiles and garments, chemicals and plastics, and metal and machinery. These occupational characteristics provided an appropriate context for examining the relationships between quantitative workload, perceived work-life balance, and employee outcomes.

2.2 Population, Sampling Technique, and Sample Size

The target population comprised Generation Z employees working in manufacturing companies in Tangerang Regency. Generation Z was operationally defined as employees aged 18–29 years at the time of data collection. Eligible participants were required to be at least 18 years old, employed full-time in a manufacturing company, have a minimum organizational tenure of six months, and hold either permanent or fixed-term employment status. Internship participants and employees who did not meet the eligibility requirements were excluded. Complete and successfully matched responses across the three survey waves were required for inclusion in the final analytical dataset.

Purposive sampling was employed because a complete sampling frame of eligible Generation Z manufacturing employees across the participating firms was unavailable. The recruitment approach described in the study involved company human resource units, line supervisors, professional networks, and employee communities. The sampling strategy sought to include employees from different manufacturing subsectors rather than concentrating exclusively on a single occupational category. As a nonprobability sampling approach, purposive sampling limits the statistical generalizability of the findings to the wider population of Generation Z manufacturing employees.

The initial sample-size requirement was determined using the inverse square root method for partial least squares structural equation modeling (PLS-SEM) proposed by Kock and Hadaya (2018). Based on the reported assumptions of 80% statistical power, a 5% significance level, and a minimum path coefficient of substantive interest of $|\beta_{\min}| = 0.15$, the minimum sample requirement was calculated as follows:

$$n_{\min} > (2.486 / 0.15)^2 = 274.68 \approx 275$$

Accordingly, the study established a target of at least 300 complete matched responses to exceed the estimated minimum requirement and accommodate possible attrition across measurement waves.

The data collection process initially produced 382 responses at T1. Following eligibility screening, seven responses were excluded, leaving 375 eligible baseline respondents. At T2, 348 responses were successfully matched, and 319 matched responses remained at T3. Final data-quality screening excluded 19 additional records, resulting in an analytical sample of 300 complete matched respondents. The final sample represented an 80.0% retention rate relative to the 375 eligible baseline respondents. This percentage reflects analytical retention rather than an invitation-based survey response rate.

2.3 Instrument Development and Measurement

Data were collected using a structured questionnaire based on established measurement instruments adapted to the manufacturing employment context. The questionnaire was prepared in Bahasa Indonesia and comprised four reflective latent constructs: workload (WL), work-life balance (WLB), job satisfaction (JS), and job performance (JP). Each construct was operationalized using indicators derived from previously developed or applied measurement scales.

Workload was measured using five indicators adapted from the Quantitative Workload Inventory (QWI) developed by Spector and Jex (1998). The indicators captured quantitative job demands, including workload volume, work pace, the frequency of heavy workload, time pressure, and simultaneous task requirements. Responses were recorded using a five-point frequency scale ranging from 1 (never or less than once per month) to 5 (several times per day). This measurement focused on quantitative workload rather than the broader range of physical, emotional, or psychological job demands.

Work-life balance was assessed using three indicators derived from Talukder et al. (2018) and subsequently applied in the Indonesian employment context by Susanto et al. (2022). These indicators assessed employees' perceived availability of sufficient time for family and friends, personal matters, and personal interests. Accordingly, work-life balance was operationalized as perceived compatibility between work requirements and valued non-work activities rather than as a direct assessment of psychological recovery or objective working hours.

Job satisfaction was measured using five indicators capturing enjoyment, interest, happiness, job preference, and overall positive evaluation of employment. Job performance was assessed using six indicators covering the fulfillment of formal work requirements, completion of expected tasks, execution of job responsibilities, constructive suggestions, and contributions to effective work practices (Talukder et al., 2018; Susanto et al., 2022). Work-life balance, job satisfaction, and job performance were measured using five-point agreement scales ranging from 1 (strongly disagree) to 5 (strongly agree).

All constructs were assessed through employee self-reports. Consequently, job performance represented employees' perceptions of their task accomplishment and work-related contributions rather than performance ratings provided by supervisors or independently recorded production indicators. The operational definitions, number of indicators, response formats, and measurement sources are summarized in Table 1.

Table 1. Measurement of Constructs

Construct	Operationalization and Indicator Domains	Primary Source
Workload (WL)	Five reflective indicators assessing workload volume, work pace, heavy workload frequency, time pressure, and simultaneous task demands. Responses used a five-point frequency scale from 1 (never or less than monthly) to 5 (several times per day).	Spector & Jex (1998); conceptually aligned with Vito & Widigdo (2026)

Construct	Operationalization and Indicator Domains	Primary Source
Work-Life Balance (WLB)	Three reflective indicators assessing sufficient time for family and friends, personal matters, and personal interests. Responses used a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree).	Talukder et al. (2018); Susanto et al. (2022)
Job Satisfaction (JS)	Five reflective indicators assessing job enjoyment, interest, comparative happiness, job preference, and overall positive job evaluation. Responses used a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree).	Talukder et al. (2018); Susanto et al. (2022)
Job Performance (JP)	Six reflective indicators assessing fulfillment of formal work requirements, completion of expected tasks, job-description responsibilities, constructive suggestions, and support for effective work practices. Responses used a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree).	Talukder et al. (2018); Susanto et al. (2022)

The measurement model was evaluated using the main analytical dataset to assess indicator reliability, internal consistency, convergent validity, and discriminant validity. The evaluation procedures and assessment criteria are described in Section 2.5.

2.4 Data Collection Procedure and Data Quality Control

Data collection followed a three-wave survey structure using digital questionnaires. At T1, participants provided information concerning quantitative workload and demographic and employment characteristics. At T2, work-life balance was assessed among continuing respondents. At T3, participants completed the job satisfaction and job performance measures. An anonymous self-generated alphanumeric code was specified to match individual responses across the three measurement waves without requiring employee names or identification numbers.

The three-wave response-matching process yielded 375 eligible baseline responses at T1, 348 successfully matched responses at T2, and 319 matched responses at T3. Following the final screening procedures, 300 respondents provided complete and usable matched records across all three waves. The reduction in matched responses between successive waves was treated as participant attrition, while the additional 19 exclusions at the final screening stage were associated with reported data-quality concerns.

Data screening involved eligibility verification and examination of duplicate response patterns, excessive straight-lining, implausibly short completion times, and incomplete matching across survey waves. Only complete matched records were retained for the principal structural model. This complete-case approach ensured that workload, work-life balance, job satisfaction, and job performance were available for all respondents included in the final analysis.

Attrition diagnostics were also reported to assess whether the retained respondents differed from those who discontinued participation after baseline measurement. Comparisons focused on baseline workload, age, and gender composition. These diagnostics provided information about observable differences between retained respondents and attriters, although the absence of statistically significant differences cannot establish that attrition-related selection bias was entirely absent.

The measurement of predictor, mediator, and outcome variables at separate time points represented a procedural approach intended to reduce certain sources of common-method variance. The survey procedure also described anonymity, separation of construct measurements, and neutral questionnaire wording. However, all four constructs were measured through employee self-reports, and both job satisfaction and job performance were assessed during the

same T3 wave. Therefore, residual common-method variance remained possible and was considered when interpreting the structural relationships.

2.5 Data Analysis Strategy

Data were analyzed using partial least squares structural equation modeling (PLS-SEM) with SmartPLS 4. This analytical approach was selected because the proposed model included multiple reflective latent constructs, five direct relationships, two mediated relationships, and an emphasis on both explanatory and predictive assessment. The analysis followed established PLS-SEM reporting recommendations (Hair et al., 2019; Hair et al., 2022).

Descriptive statistics were calculated to summarize respondent characteristics and the distribution of the principal study constructs. Respondent characteristics included age, gender, educational background, employment status, organizational tenure, work arrangement, overtime frequency, and manufacturing subsector. Descriptive measures for workload, work-life balance, job satisfaction, and job performance included means and standard deviations.

The reflective measurement model was assessed before evaluating the structural relationships. Indicator reliability was evaluated using standardized outer loadings, with values of approximately 0.708 or higher considered preferable. Internal consistency reliability was assessed through Cronbach's alpha, ρ_A , and composite reliability, with values between 0.70 and 0.95 considered satisfactory. Convergent validity was evaluated using average variance extracted (AVE), with a minimum acceptable value of 0.50. Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT), with 0.85 adopted as a conservative reference threshold and 0.90 considered an upper benchmark depending on construct similarity (Hair et al., 2020; Hair et al., 2022).

Indicators with loadings between 0.40 and 0.70 were not designated for automatic deletion. Their retention or removal required consideration of construct reliability, convergent validity, and theoretical content coverage. The measurement-model results were evaluated according to these criteria before interpreting the structural paths.

The structural model was evaluated through collinearity diagnostics, standardized path coefficients, statistical significance, explanatory power, local effect sizes, and predictive assessment. Inner variance inflation factors (VIF) were examined to identify potential multicollinearity among predictors. Hypothesis testing was performed using nonparametric bootstrapping with 10,000 subsamples, two-tailed statistical tests at $\alpha = 0.05$, and 95% bias-corrected confidence intervals. Standardized coefficients (β), t-statistics, p-values, and confidence intervals were reported for the estimated relationships.

Explanatory power was assessed using the coefficient of determination (R^2) and adjusted R^2 for work-life balance, job satisfaction, and job performance. Local effect sizes were evaluated using f^2 to determine the relative contribution of individual predictors to the explained variance of the endogenous constructs. The standardized root mean square residual (SRMR) was reported as a supplementary diagnostic rather than as a stand-alone criterion for accepting or rejecting the proposed theoretical model.

Predictive assessment was conducted using PLSpredict following the approach described by Shmueli et al. (2019). The assessment examined Q^2_{predict} values and root mean square error (RMSE) for job satisfaction and job performance indicators. Predictive performance was evaluated by comparing the PLS-SEM prediction errors with those obtained from a linear-model benchmark.

A supplementary full-collinearity VIF assessment was also reported with reference to the threshold of 3.3 proposed by Kock (2015). This diagnostic was used to examine potential common-method collinearity. However, full-collinearity VIF values were not treated as definitive evidence of the absence of all forms of common-method bias.

2.6 Structural Equations and Mediation Testing

The structural model comprised one exogenous variable, workload (WL); one mediating variable, work-life balance (WLB); and two endogenous outcomes, job satisfaction (JS) and job

performance (JP). The specified model included five direct hypotheses (H1–H5) and two mediation hypotheses (H6–H7). The structural equations were expressed as follows:

$$WLB = \beta_{10} + \beta_{11}(WL) + \varepsilon_1$$

$$JS = \beta_{20} + \beta_{21}(WL) + \beta_{22}(WLB) + \varepsilon_2$$

$$JP = \beta_{30} + \beta_{31}(WL) + \beta_{32}(WLB) + \varepsilon_3$$

In these equations, β_{11} represents the relationship between workload and work-life balance. The coefficients β_{21} and β_{31} represent the direct relationships between workload and job satisfaction and between workload and job performance, respectively. The coefficients β_{22} and β_{32} represent the relationships between work-life balance and the two employee outcomes. The error terms ε_1 , ε_2 , and ε_3 represent residual variation not explained by the specified predictors.

The indirect relationship between workload and job satisfaction through work-life balance was calculated as $\beta_{11} \times \beta_{22}$. Similarly, the indirect relationship between workload and job performance through work-life balance was calculated as $\beta_{11} \times \beta_{32}$. The total effects were expressed as the sum of the respective direct and indirect components:

$$\text{Total effect } (WL \rightarrow JS) = \beta_{21} + (\beta_{11} \times \beta_{22})$$

$$\text{Total effect } (WL \rightarrow JP) = \beta_{31} + (\beta_{11} \times \beta_{32})$$

Mediation was evaluated using nonparametric bootstrapping with 10,000 subsamples and 95% bias-corrected confidence intervals. An indirect relationship was considered statistically significant when its confidence interval did not include zero. The nature of mediation was interpreted by considering the significance and direction of both direct and indirect effects. Significant direct and indirect effects operating in the same direction were classified as complementary mediation, whereas effects operating in opposite directions were interpreted as competitive mediation. Indirect-only mediation was identified when the indirect relationship was significant while the remaining direct relationship was not statistically significant, consistent with PLS-SEM mediation guidance (Hair et al., 2022).

The mediation analysis was intended to determine whether work-life balance statistically accounted for part of the relationships between workload and the two employee outcomes. Because the research employed an observational survey design, the estimated indirect effects were interpreted as statistical mediation rather than definitive evidence of causal mechanisms. Although the three-wave structure established temporal ordering between construct measurements, it did not fully eliminate unmeasured confounding, measurement error, or alternative explanations for the observed associations.

2.7 Ethical Considerations

The study involved adult employees aged 18 years or older. The reported survey procedure specified voluntary participation, informed consent, confidentiality, and the right to discontinue participation without employment-related consequences. The questionnaire introduction provided information concerning the study purpose and the handling of respondent information.

Individual responses were linked across the three survey waves using anonymous alphanumeric codes rather than employee names or personnel identification numbers. The reported data-management arrangements specified restricted access to research files, use of the information for academic purposes, and presentation of findings in aggregate form to protect the confidentiality of individual respondents and participating organizations.

3. RESULTS AND DISCUSSION

Results

3.1 Response Screening, Sample Formation, and Respondent Profile

The three-wave survey initially yielded 382 responses at Time 1 (T1). Eligibility screening excluded seven records, leaving 375 eligible baseline responses. At Time 2 (T2), 348 responses were successfully matched to baseline records, a reduction of 27 cases. At Time 3 (T3), 319

matched responses remained, representing a further reduction of 29 cases. Final data-quality screening excluded 19 additional records because of reported concerns involving duplicate response patterns, excessive straight-lining, implausibly short completion times, or incomplete matching. The final analytical sample comprised 300 complete matched responses, equivalent to 80.0% of the 375 eligible baseline cases.

The sample-flow results distinguish between 56 cases not retained or successfully matched across subsequent survey waves and 19 records excluded during final quality screening. The available records do not establish whether all unmatched cases represented actual participant withdrawal rather than unsuccessful matching or other forms of nonresponse. Furthermore, the total number of employees invited to participate was not reported; therefore, an invitation-based response rate cannot be established from these figures. The analytical sample formation is summarized in Table 2.

Table 2. Response Flow and Data Screening

Stage	Received/Match ed	Loss/Excluded	Retained
T1: Workload survey	382	7	375
T2: Work-Life Balance	348	27	348
T3: Job Satisfaction and Performance	319	29	319
Final quality screening	319	19	300

Note. Losses of 27 and 29 represent records not retained or successfully matched at successive survey waves. The 19 final exclusions occurred during data-quality screening. These categories should not be combined and described as participant attrition alone.

The original baseline comparison reported differences between the final analytical sample of 300 employees and a comparison group of 75 cases. No statistically significant differences were reported for baseline workload, age, or gender composition. However, the designation of all 75 cases as attriters is not supported by the sample-flow accounting because the difference between the eligible baseline sample and final analytical sample includes both inter-wave losses and final data-quality exclusions. Accordingly, Table 3 reproduces the reported comparison statistics without treating the entire comparison group as confirmed survey attrition.

Table 3. Reported Baseline Characteristics of the Final Sample and Comparison Group

Baseline characteristic	Final sample (n = 300)	Comparison group (reported n = 75)	p-value
Workload, mean (SD)	3.62 (0.68)	3.67 (0.71)	0.574
Age, mean years (SD)	24.31 (2.57)	24.08 (2.63)	0.486
Male respondents (%)	58.0	60.0	0.681

Note. The original table identified the comparison group as “attriters.” Its exact case composition was not established by the accompanying records. The workload mean for the retained sample is 3.62 in this baseline comparison and 3.63 in the descriptive statistics presented in Table 5. Both values are reproduced as originally reported, pending verification of their calculation and measurement basis. Nonsignificant comparisons do not establish that selection bias was absent.

The final sample consisted of 174 male employees (58.0%) and 126 female employees (42.0%). Respondents aged 22–25 years constituted the largest age group (49.3%), followed by those aged 26–29 years (30.3%) and 18–21 years (20.3%). Fixed-term employees accounted for 57.3% of the sample, while 42.7% held permanent positions. Most respondents had worked for their organizations for more than one year, and 56.0% reported rotating-shift arrangements. Respondents represented six manufacturing subsectors, providing variation in employment

characteristics within the sampled industrial context. The full respondent profile is presented in Table 4.

Table 4. Respondent Characteristics

Characteristic	Category	Frequency	Percentage (%)
Gender	Male	174	58.0
	Female	126	42.0
Age	18–21 years	61	20.3
	22–25 years	148	49.3
	26–29 years	91	30.3
Education	Senior high school	153	51.0
	Diploma	55	18.3
	Bachelor's degree	92	30.7
Employment status	Permanent	128	42.7
	Fixed-term	172	57.3
Tenure	6–12 months	74	24.7
	More than 1–3 years	145	48.3
	More than 3 years	81	27.0
Work arrangement	Regular/non-rotating	132	44.0
	Rotating shift	168	56.0
Overtime frequency	≤1 time/month	54	18.0
	2–4 times/month	97	32.3
	5–8 times/month	91	30.3
	More than 8 times/month	58	19.3
Manufacturing subsector	Automotive/components	72	24.0
	Food and beverage	58	19.3
	Electronics/electrical	53	17.7
	Textiles/garments	47	15.7
	Chemicals/plastics	39	13.0
	Metal/machinery	31	10.3

Note. N = 300. Minor differences from 100% in the sum of displayed percentages are attributable to rounding.

3.2 Descriptive Statistics

The descriptive statistics indicated variation across the four study constructs. Workload had a reported mean of 3.63 (SD = 0.68), while work-life balance recorded a mean of 3.19 (SD = 0.74). Job satisfaction and job performance had means of 3.42 (SD = 0.71) and 3.61 (SD = 0.63), respectively. These descriptive findings indicate that respondents reported relatively frequent workload demands alongside moderate perceived availability for non-work activities and generally favorable evaluations of their jobs and task performance. Because these values represent descriptive summaries, they do not independently establish relationships or mechanisms among the constructs.

Table 5. Descriptive Statistics

Construct	Mean	SD	Minimum	Maximum
Workload	3.63	0.68	1.40	5.00
Work-Life Balance	3.19	0.74	1.00	5.00
Job Satisfaction	3.42	0.71	1.20	5.00
Job Performance	3.61	0.63	1.50	5.00

3.3 Measurement Model Assessment

3.3.1 Indicator Reliability, Internal Consistency, and Convergent Validity

The reflective measurement model was evaluated using standardized indicator loadings, Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE). All reported indicator loadings ranged from 0.771 to 0.881, exceeding the preferred threshold of approximately 0.708. Cronbach's alpha ranged from 0.826 to 0.903, rho_A from 0.832 to 0.907, and CR from 0.896 to 0.925. All reported internal consistency coefficients were within the adopted acceptable range.

The AVE values ranged from 0.652 to 0.742, exceeding the minimum criterion of 0.50. These results support the indicator reliability, internal consistency, and convergent validity of the four reflective constructs under the specified assessment criteria. No indicator deletion was reported. The complete measurement results are presented in Table 6.

Table 6. Reliability and Convergent Validity

Construct	Indicator	Loading	α	rho_A	CR	AVE
Workload	WL1	0.782	0.866	0.871	0.904	0.652
	WL2	0.813				
	WL3	0.846				
	WL4	0.771				
	WL5	0.824				
Work-Life Balance	WLB1	0.846	0.826	0.832	0.896	0.742
	WLB2	0.881				
	WLB3	0.857				
Job Satisfaction	JS1	0.823	0.899	0.903	0.925	0.713
	JS2	0.861				
	JS3	0.842				
	JS4	0.879				
	JS5	0.814				
Job Performance	JP1	0.786	0.903	0.907	0.925	0.673
	JP2	0.824				
	JP3	0.851				
	JP4	0.817				
	JP5	0.839				
	JP6	0.804				

Note. α = Cronbach's alpha; rho_A = reliability coefficient; CR = composite reliability; AVE = average variance extracted. Reliability and validity coefficients are reported at the construct level.

3.3.2 Discriminant Validity and Common-Method Diagnostics

Discriminant validity was evaluated using the heterotrait-monotrait ratio (HTMT). The reported HTMT coefficients ranged from 0.402 to 0.738, with the highest value observed between job satisfaction and job performance. All point estimates were below the conservative threshold of 0.85 adopted in the Methods section. These findings support discriminant validity based on the reported HTMT point-estimate criterion. However, bootstrapped confidence intervals for HTMT were not available in the reported results; therefore, an additional inference-based assessment of discriminant validity could not be established from the existing outputs.

Full-collinearity VIF values ranged from 1.41 to 1.93, remaining below the specified reference threshold of 3.3. These values did not indicate excessive full collinearity under the adopted diagnostic criterion. Nevertheless, the diagnostic does not independently demonstrate the absence of all common-method bias, particularly because all constructs were measured through employee self-reports.

Table 7. HTMT and Full-Collinearity Diagnostics

Assessment	WL	WLB	JS	JP
HTMT: Workload	–			
HTMT: Work-Life Balance	0.544	–		
HTMT: Job Satisfaction	0.488	0.716	–	
HTMT: Job Performance	0.402	0.657	0.738	–
Full-collinearity VIF	1.41	1.78	1.93	1.72

Note. WL = Workload; WLB = Work-Life Balance; JS = Job Satisfaction; JP = Job Performance. The HTMT values represent point estimates. HTMT bootstrap confidence intervals were not reported.

3.4 Structural Model Assessment

The structural model was evaluated using predictor collinearity, explained variance, adjusted explained variance, local effect sizes, and a supplementary model diagnostic. All reported inner VIF values ranged from 1.00 to 1.31, indicating no problematic predictor collinearity under the adopted assessment criteria.

Workload explained 23.6% of the variance in work-life balance ($R^2 = 0.236$). Workload and work-life balance jointly explained 41.2% of the variance in job satisfaction ($R^2 = 0.412$) and 30.3% of the variance in job performance ($R^2 = 0.303$). The adjusted R^2 values were close to the corresponding unadjusted estimates.

The effect-size results indicated that workload had an f^2 value of 0.309 for work-life balance, while its direct relationships with job satisfaction and job performance had smaller f^2 values of 0.044 and 0.020, respectively. Work-life balance exhibited larger local effect sizes for job satisfaction ($f^2 = 0.368$) and job performance ($f^2 = 0.243$). The supplementary standardized root mean square residual (SRMR) was 0.058. This statistic was considered an additional model diagnostic rather than a stand-alone basis for accepting the theoretical model.

Table 8. Structural Model Quality and Effect Sizes

Assessment/Path	VIF	R^2	Adjusted R^2	f^2	Interpretation
Work-Life Balance		0.236	0.233		Moderate explanatory power
Workload → WLB	1.00			0.309	Medium effect
Job Satisfaction		0.412	0.408		Moderate explanatory power
Workload → Job Satisfaction	1.31			0.044	Small effect
WLB → Job Satisfaction	1.31			0.368	Large effect

Assessment/Path	VIF	R ²	Adjusted R ²	f ²	Interpretation
Job Performance		0.303	0.299		Moderate explanatory power
Workload → Job Performance	1.31			0.020	Small effect
WLB → Job Performance	1.31			0.243	Medium effect

Note. SRMR = 0.058, reported as a supplementary model diagnostic. The original table positioned SRMR in the R² column; it is presented here as a separate note to avoid confusing two distinct statistics. The qualitative effect-size descriptors are retained from the original Results.

3.5 Direct Effects and Hypothesis Testing

The five direct hypotheses were evaluated through nonparametric bootstrapping with 10,000 subsamples. All five standardized path coefficients were statistically significant, and their reported 95% bias-corrected confidence intervals excluded zero.

Workload exhibited a negative relationship with work-life balance ($\beta = -0.486$, $p < 0.001$), supporting H1. Negative direct relationships were also observed between workload and job satisfaction ($\beta = -0.184$, $p < 0.001$) and between workload and job performance ($\beta = -0.137$, $p = 0.005$), supporting H2 and H3, respectively.

Work-life balance was positively associated with job satisfaction ($\beta = 0.532$, $p < 0.001$) and job performance ($\beta = 0.471$, $p < 0.001$), supporting H4 and H5. These relationships were larger in absolute standardized magnitude than the remaining direct relationships between workload and the respective employee outcomes. Table 9 presents the complete direct-effect estimates, and Figure 1 displays the estimated structural model.

Table 9. Direct Effects and Hypothesis Testing

H	Relationship	β	t	p	95% BC CI	f ²	Decision
H1	Workload → WLB	-0.486	9.88	<0.001	[-0.575, -0.391]	0.309	Supported
H2	Workload → Job Satisfaction	-0.184	3.63	<0.001	[-0.282, -0.084]	0.044	Supported
H3	Workload → Job Performance	-0.137	2.80	0.005	[-0.234, -0.041]	0.020	Supported
H4	WLB → Job Satisfaction	0.532	10.96	<0.001	[0.436, 0.626]	0.368	Supported
H5	WLB → Job Performance	0.471	9.15	<0.001	[0.366, 0.567]	0.243	Supported

Note. β = standardized path coefficient; t = bootstrap t-statistic; BC CI = bias-corrected confidence interval; f² = effect size. All tests were evaluated at $\alpha = 0.05$.

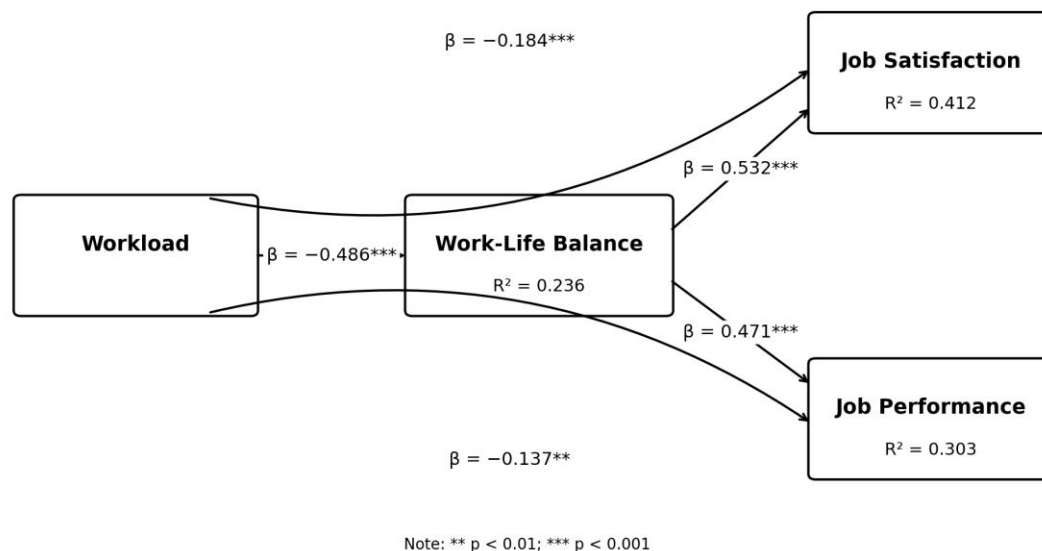


Figure 1. Estimated Structural Model

The original structural diagram is retained without modification to its path coefficients, significance markers, or explained-variance values.

3.6 Mediation Analysis

The indirect relationship between workload and job satisfaction through work-life balance was negative and statistically significant ($\beta = -0.259$, $p < 0.001$; 95% BC CI $[-0.329, -0.195]$), supporting H6. The corresponding indirect relationship between workload and job performance was also negative and significant ($\beta = -0.229$, $p < 0.001$; 95% BC CI $[-0.299, -0.166]$), supporting H7.

For both outcomes, the direct and indirect relationships were statistically significant and operated in the same negative direction. Accordingly, the reported patterns were classified as complementary mediation. The absolute indirect effects exceeded the respective remaining direct effects. The total association between workload and job satisfaction was -0.443 , while the total association between workload and job performance was -0.366 .

These results provide evidence of statistically significant indirect associations through work-life balance within the specified structural model. They should not be interpreted as definitive evidence that work-life balance causally transmits the effects of workload, because the observational time-lagged design does not eliminate alternative explanations or unmeasured confounding.

Table 10. Mediation and Total Effects

H	Indirect Relationship	Direct Effect	Indirect Effect	Total Effect	p	95% BC CI	Mediation Type
H6	WL → WLB → JS	-0.184	-0.259	-0.443	<0.001	$[-0.329, -0.195]$	Complementary
H7	WL → WLB → JP	-0.137	-0.229	-0.366	<0.001	$[-0.299, -0.166]$	Complementary

Note. The reported p-values and confidence intervals refer to the indirect effects. Total effects represent the sum of the corresponding direct and indirect coefficients.

3.7 Predictive Assessment

Predictive performance was evaluated using PLSpredict. All reported Q^2 predict values for the job satisfaction and job performance indicators were positive, indicating predictive relevance under the applied assessment procedure.

The reported PLS-SEM RMSE values were lower than those of the linear-model benchmark for all 11 outcome indicators. However, the differences were relatively small, ranging from 0.007 to 0.018 in absolute RMSE units. These findings indicate consistent numerical improvements relative to the benchmark for the indicators examined, rather than a substantial or universally superior predictive advantage. The practical magnitude of the improvements should therefore be interpreted cautiously.

The reported results do not provide the number of cross-validation folds, repetitions, or other prediction settings. Consequently, the configuration of the predictive assessment cannot be independently reconstructed from the existing table alone.

Table 11. PLSpredict Results

Indicator	Q^2 predict	PLS RMSE	LM RMSE	Difference
JS1	0.342	0.612	0.629	-0.017
JS2	0.365	0.591	0.606	-0.015
JS3	0.328	0.628	0.640	-0.012
JS4	0.387	0.574	0.592	-0.018
JS5	0.311	0.639	0.650	-0.011
JP1	0.241	0.598	0.611	-0.013
JP2	0.268	0.579	0.590	-0.011
JP3	0.291	0.561	0.577	-0.016
JP4	0.254	0.586	0.594	-0.008
JP5	0.276	0.568	0.582	-0.014
JP6	0.229	0.607	0.614	-0.007

Note. PLS RMSE = prediction root mean square error from PLS-SEM; LM RMSE = linear-model benchmark RMSE; Difference = PLS RMSE – LM RMSE. Negative values indicate lower numerical prediction error for PLS-SEM relative to the benchmark.

3.8 Integrated Interpretation of the Results

The measurement-model results satisfied the reported reliability, convergent-validity, and point-estimate discriminant-validity criteria. The structural analysis supported all five direct hypotheses, while the mediation analysis identified significant negative indirect associations between workload and both employee outcomes through work-life balance. The indirect associations were larger in absolute magnitude than the remaining direct associations, indicating that work-life balance was an important statistical mediator within the specified model.

The predictive assessment also demonstrated positive Q^2 predict values and slightly lower prediction errors than the linear-model benchmark across the reported outcome indicators. Nevertheless, these findings should be considered together with the observational design, employee self-reported measures, and unresolved questions concerning organizational clustering and sensitivity analyses. Overall, the results support the proposed structural relationships without establishing definitive causal mechanisms or demonstrating that the findings are invariant across organizations and employment conditions.

Discussion

Main Findings and Theoretical Interpretation

The findings indicate a consistent pattern of relationships among workload, work-life balance, job satisfaction, and job performance among Generation Z manufacturing employees. Workload was negatively associated with work-life balance and both employee outcomes, whereas work-life balance showed positive associations with job satisfaction and job performance. All five direct relationships were statistically significant. Furthermore, the two indirect relationships through work-life balance were negative and significant, with indirect effects exceeding the corresponding remaining direct effects in absolute magnitude. This pattern suggests that perceived work-life balance is an important intervening construct in the specified model, although the results do not establish that it causally transmits the consequences of workload.

From the perspective of Job Demands-Resources (JD-R) theory, the negative relationship between workload and work-life balance is consistent with the proposition that sustained job demands may place pressure on employees' capacity to accommodate competing responsibilities (Bakker & Demerouti, 2017). Similar relationships have been examined by Johari et al. (2018), Chowhan and Pike (2023), and Vito and Widigdo (2026). However, the present study operationalized work-life balance through three self-reported indicators assessing sufficient time for family and friends, personal matters, and personal interests (Talukder et al., 2018; Susanto et al., 2022). Consequently, the findings concern perceived availability for non-work activities rather than directly measured psychological recovery, resource restoration, or boundary-management behavior. Although these processes may offer plausible theoretical explanations, their operation cannot be confirmed from the present measurements.

The negative direct relationships between workload and job satisfaction and job performance remained statistically significant after work-life balance was included in the model. This indicates that workload retained associations with both outcomes beyond those represented by the specified mediator. The satisfaction finding is consistent with evidence that perceptions of workload manageability are relevant to employees' evaluations of their jobs (Inegbedion et al., 2020). The smaller direct relationship with performance requires more cautious interpretation. Employees may continue to report satisfactory task accomplishment despite demanding work conditions, but compensatory effort, accumulated fatigue, or resource depletion were not directly measured. Moreover, because performance was self-reported, the findings cannot establish corresponding changes in objective production output.

Comparison with Previous Research and Mediation Interpretation

The positive associations of work-life balance with job satisfaction and job performance are broadly consistent with previous evidence linking work-life conditions to employee attitudes and functioning (Talukder et al., 2018; Susanto et al., 2022; Waworuntu et al., 2022). Research conducted among manufacturing employees has also identified the relevance of work-life balance to employment evaluations (Andriyana & Cahyadi, 2025; Zahra & Indryawati, 2025). Nevertheless, the literature is not entirely consistent. Rensiana et al. (2024) reported a negative relationship between work-life balance and performance among Generation Z workers and found no significant moderating role of work-life balance in the relationship between job characteristics and performance. Similarly, Kinasih and Asfari (2026) reported that work-life balance was not a significant partial predictor of job satisfaction when social support was included in their regression model. These differences suggest that observed relationships may depend on model specification, measurement, and occupational circumstances. However, the present study did not directly test these potential explanations, and differences between studies should not be interpreted as established contextual effects.

The mediation results provide the principal evidence for the study's proposed statistical mechanism. The indirect workload associations through work-life balance were significant for both job satisfaction ($\beta = -0.259$) and job performance ($\beta = -0.229$). Because the remaining direct

relationships were also significant and operated in the same negative direction, both patterns were classified as complementary mediation. These findings extend the integrated examination of work demands and the work-life interface found in Chowhan and Pike (2023) by evaluating perceived work-life balance as a common mediator for two distinct outcomes in a manufacturing sample. Nevertheless, statistical mediation should not be equated with causal mediation. Although workload, work-life balance, and the outcomes were assessed in successive waves, the observational design did not establish the absence of unmeasured confounding or alternative explanations for the indirect relationships.

Alternative organizational and employment conditions may also contribute to the observed associations. Supervisor support, job autonomy, compensation, employment insecurity, and organizational culture could be relevant to how employees perceive workload, balance their responsibilities, and evaluate their employment. Existing research highlights the importance of organizational support and employment conditions in understanding work-life balance and employee outcomes (Talukder et al., 2018; Susanto et al., 2022; Balvočiūtė & Švėgždienė, 2026). However, these potential explanatory factors were not incorporated as additional constructs in the tested structural model. Their possible influence therefore remains an alternative explanation requiring further investigation rather than an established finding of the present study.

Theoretical, Contextual, and Managerial Implications

The study makes a specific contribution to the contextual application of JD-R theory by demonstrating that quantitative workload is associated with both an attitudinal outcome and self-reported performance through a shared statistical mediator. Rather than introducing a new theoretical mechanism, the findings clarify how perceived availability for non-work activities fits within an existing demand-outcome framework. The simultaneous examination of job satisfaction and job performance also distinguishes employee evaluations from reported task functioning, while showing that both outcomes exhibit comparable indirect patterns. This contribution is supported by the estimated relationships but should not be interpreted as direct evidence of psychological resource depletion or recovery.

The manufacturing context adds relevance because production schedules, physical attendance, task interdependence, and overtime requirements may constrain employees' ability to accommodate non-work commitments. The findings provide evidence for these relationships among Generation Z employees in Tangerang Regency, but they do not establish that this cohort responds differently from older employees. Although previous research discusses generational expectations concerning work and personal life (Schroth, 2019; Gabrielova & Buchko, 2021; Mahmoud et al., 2021), no cross-generational comparison was conducted. The study's contextual contribution should therefore be understood as evidence from a defined workforce population rather than confirmation of generation-specific psychological mechanisms.

Managerially, the findings suggest that manufacturing organizations may benefit from jointly monitoring workload, perceived work-life balance, satisfaction, and employee performance rather than relying exclusively on production-related indicators. Managers could review workload distribution, staffing adequacy, shift predictability, and overtime practices to identify conditions that potentially interfere with employees' non-work responsibilities. Supervisor communication and opportunities for appropriate scheduling adjustments may also warrant consideration within operational constraints. These recommendations follow from the observed associations and relevant organizational literature, but their effectiveness was not evaluated experimentally. Consequently, they represent practical considerations for work-design evaluation rather than interventions proven by this study to improve satisfaction or performance.

Limitations and Future Research

Several limitations qualify the interpretation of these findings. First, purposive sampling and the concentration of respondents in manufacturing companies in Tangerang Regency limit statistical generalizability beyond the sampled employees. Although respondents represented different manufacturing subsectors and work arrangements, organizational characteristics and

policies may vary across companies. Employees within the same organization may also share working conditions that create dependence among observations. Because company-level clustering adjustments were not reported, the extent to which such dependence affected statistical inference remains uncertain. These considerations restrict generalization without establishing that the estimated relationships were necessarily biased.

Second, all constructs were measured using employee self-reports. Job satisfaction and job performance were collected during the same third wave, creating a potential source of shared-method variance despite temporal separation from workload and work-life balance. The reported full-collinearity diagnostics did not indicate problematic collinearity, but they cannot rule out all forms of common-method bias. Furthermore, the work-life balance instrument primarily assessed perceived time availability for non-work activities and did not capture the full conceptual range of work-life balance or directly measure recovery processes. The study also lacked baseline measurements of the mediator and outcomes, limiting conclusions about within-person change and causal direction. Although the reported PLSpredict results indicated favorable indicator-level predictive performance relative to the linear-model benchmark, prediction quality does not establish causal validity or generalizability to different populations.

Future research should replicate the proposed relationships across companies, manufacturing subsectors, regions, and age cohorts while incorporating more comprehensive measures of work-life balance and independent assessments of job performance. Where organizational identifiers and adequate cluster structures are available, multilevel or cluster-sensitive analyses could help evaluate between-company variation. Subsequent studies may also examine supervisor support, autonomy, compensation, employment insecurity, and organizational culture as theoretically justified explanatory factors. Designs incorporating repeated measurements of the mediator and outcomes, together with stronger controls for potential confounding, would provide a more rigorous basis for evaluating temporal processes. Comparative generational research would additionally be required before claiming that the relationships identified here differ systematically between Generation Z and older employees.

4. CONCLUSIONS AND SUGGESTION

This study examined the mediating role of work-life balance in the relationships between workload, job satisfaction, and job performance among Generation Z employees in the manufacturing industry. The findings revealed significant negative associations between workload and work-life balance, job satisfaction, and job performance, while work-life balance was positively associated with both employee outcomes. Furthermore, work-life balance significantly mediated the relationships between workload and job satisfaction and between workload and job performance, with indirect effects exceeding the corresponding direct effects in absolute magnitude. These findings contribute to the Job Demands-Resources (JD-R) literature by simultaneously examining an attitudinal outcome and a self-reported performance outcome through a common work-life balance mediation pathway within a manufacturing context. However, the observed complementary mediation represents statistical associations rather than definitive evidence of causal resource depletion or psychological recovery mechanisms, which were not directly measured. The results therefore highlight the relevance of employees' perceived availability of time for non-work activities in understanding the relationships between quantitative job demands and employee outcomes.

From a managerial perspective, the findings suggest that manufacturing organizations should consider evaluating workload distribution and reviewing shift arrangements, overtime practices, and work-life balance support within operational constraints. Although staffing adequacy, supervisor support, and scheduling predictability may represent relevant managerial considerations, their effectiveness was not directly tested in this study. Several limitations warrant caution, including purposive sampling within Tangerang Regency, potential organizational heterogeneity and unaccounted within-company clustering, reliance on self-

reported measures, and possible common-method influences. The three-wave observational design provided temporal separation between the predictor, mediator, and outcomes but did not establish causal relationships or eliminate unmeasured confounding. Moreover, the findings cannot establish generational differences because no comparison with older employees was conducted. Future research should examine these relationships across industries, organizations, regions, and generational cohorts using independent performance measures, more comprehensive work-life balance instruments, and longitudinal or multilevel approaches. Overall, the study suggests that manufacturing workforce management should consider employees' perceived compatibility between work demands and non-work responsibilities alongside conventional performance objectives.

REFERENCES

- Andriyana, M. F., & Cahyadi, N. (2025). Compensation as a mediating variable between work-life balance and employee loyalty on job satisfaction of Generation Z in the manufacturing industry. *Assets: Jurnal Ekonomi, Manajemen dan Akuntansi*, 15(2), 214–230. <https://doi.org/10.24252/assets.v15i2.62908>
- Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. <https://doi.org/10.1037/ocp0000056>
- Balvočiūtė, R., & Švėgždienė, R. (2026). Balancing work and life among manufacturing employees: The role of job conditions, support and well-being. *Sustainability*, 18(9), 4239. <https://doi.org/10.3390/su18094239>
- Bellmann, L., & Hübler, O. (2021). Working from home, job satisfaction and work–life balance: Robust or heterogeneous links? *International Journal of Manpower*, 42(3), 424–441. <https://doi.org/10.1108/IJM-10-2019-0458>
- Borgia, M. S., Di Virgilio, F., La Torre, M., & Khan, M. A. (2022). Relationship between work-life balance and job performance moderated by knowledge risks: Are bank employees ready? *Sustainability*, 14(9), 5416. <https://doi.org/10.3390/su14095416>
- Casper, W. J., Vaziri, H., Wayne, J. H., DeHauw, S., & Greenhaus, J. (2018). The jingle-jangle of work–nonwork balance: A comprehensive and meta-analytic review of its meaning and measurement. *Journal of Applied Psychology*, 103(2), 182–214. <https://doi.org/10.1037/apl0000259>
- Chowhan, J., & Pike, K. (2023). Workload, work–life interface, stress, job satisfaction and job performance: A job demand–resource model study during COVID-19. *International Journal of Manpower*, 44(4), 653–670. <https://doi.org/10.1108/IJM-05-2022-0254>
- Djelassi, S., Diallo, M. F., Osburg, V.-S., & Collin-Lachaud, I. (2026). The double-edged-sword effect of constant connectivity on work performance: Roles of perceived value, work–life balance, and work–family conflict. *Journal of Management Studies*, 63(6), 3003–3033. <https://doi.org/10.1111/joms.13248>
- Gabrielova, K., & Buchko, A. A. (2021). Here comes Generation Z: Millennials as managers. *Business Horizons*, 64(4), 489–499. <https://doi.org/10.1016/j.bushor.2021.02.013>
- Galanti, T., Guidetti, G., Mazzei, E., Zappalà, S., & Toscano, F. (2021). Work from home during the COVID-19 outbreak: The impact on employees' remote work productivity, engagement, and stress. *Journal of Occupational and Environmental Medicine*, 63(7), e426–e432. <https://doi.org/10.1097/JOM.0000000000002236>
- Haider, S., Jabeen, S., & Ahmad, J. (2018). Moderated mediation between work life balance and employee job performance: The role of psychological wellbeing and satisfaction with coworkers. *Journal of Work and Organizational Psychology*, 34(1), 29–37. <https://doi.org/10.5093/jwop2018a4>

- Hair, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 109, 101–110. <https://doi.org/10.1016/j.jbusres.2019.11.069>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE Publications.
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Inegbedion, H., Inegbedion, E., Peter, A., & Harry, L. (2020). Perception of workload balance and employee job satisfaction in work organisations. *Heliyon*, 6(1), e03160. <https://doi.org/10.1016/j.heliyon.2020.e03160>
- Irawanto, D. W., Novianti, K. R., & Roz, K. (2021). Work from home: Measuring satisfaction between work-life balance and work stress during the COVID-19 pandemic in Indonesia. *Economies*, 9(3), 96. <https://doi.org/10.3390/economies9030096>
- Johari, J., Tan, F. Y., & Tjik Zulkarnain, Z. I. (2018). Autonomy, workload, work-life balance and job performance among teachers. *International Journal of Educational Management*, 32(1), 107–120. <https://doi.org/10.1108/IJEM-10-2016-0226>
- Kelliher, C., Richardson, J., & Boiarintseva, G. (2019). All of work? All of life? Reconceptualising work-life balance for the 21st century. *Human Resource Management Journal*, 29(2), 97–112. <https://doi.org/10.1111/1748-8583.12215>
- Kinasih, S. A., & Asfari, N. A. B. (2026). Peran work-life balance dan dukungan sosial terhadap kepuasan kerja karyawan generasi Z. *Acta Psychologia*, 8(1), 16–26. <https://doi.org/10.21831/ap.v8i1.85878>
- Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration*, 11(4), 1–10. <https://doi.org/10.4018/IJEC.2015100101>
- Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, 28(1), 227–261. <https://doi.org/10.1111/isj.12131>
- Mahmoud, A. B., Fuxman, L., Mohr, I., Reisel, W. D., & Grigoriou, N. (2021). “We aren't your reincarnation!” Workplace motivation across X, Y and Z generations. *International Journal of Manpower*, 42(1), 193–209. <https://doi.org/10.1108/IJM-09-2019-0448>
- Mahmuda, G. P. S., & Nugrohoseno, D. (2026). Pengaruh keseimbangan kehidupan kerja terhadap kinerja melalui kepuasan kerja. *Jurnal Ilmu Manajemen*, 14(2), 288–298. <https://doi.org/10.26740/jim.v14n2.p288-298>
- Molino, M., Ingusci, E., Signore, F., Manuti, A., Giancaspro, M. L., Russo, V., Zito, M., & Cortese, C. G. (2020). Wellbeing costs of technology use during COVID-19 remote working: An investigation using the Italian translation of the technostress creators scale. *Sustainability*, 12(15), 5911. <https://doi.org/10.3390/su12155911>
- Palumbo, R. (2020). Let me go to the office! An investigation into the side effects of working from home on work-life balance. *International Journal of Public Sector Management*, 33(6/7), 771–790. <https://doi.org/10.1108/IJPSM-06-2020-0150>
- Rattanaburi, K., Ketwan, P., & Hernandez, A. A. (2026). Generation Z's work-life balance, mental welfare, and career ambitions: The impact of digital workspaces, psychological resilience, and social media influence. *Social Sciences & Humanities Open*, 13, 102791. <https://doi.org/10.1016/j.ssaho.2026.102791>

- Rensiana, S., Wulandari, J., & Roni, M. (2024). Analysis of job characteristics, performance, and work life balance in Generation Z workers. *Indonesian Journal of Economics and Management*, 5(1), 39–49. <https://doi.org/10.35313/ijem.v5i1.6406>
- Schroth, H. (2019). Are you ready for Gen Z in the workplace? *California Management Review*, 61(3), 5–18. <https://doi.org/10.1177/0008125619841006>
- Shmueli, G., Sarstedt, M., Hair, J. F., Cheah, J.-H., Ting, H., Vaithilingam, S., & Ringle, C. M. (2019). Predictive model assessment in PLS-SEM: Guidelines for using PLSpredict. *European Journal of Marketing*, 53(11), 2322–2347. <https://doi.org/10.1108/EJM-02-2019-0189>
- Sirgy, M. J., & Lee, D.-J. (2018). Work-life balance: An integrative review. *Applied Research in Quality of Life*, 13, 229–254. <https://doi.org/10.1007/s11482-017-9509-8>
- Soomro, A. A., Breiteneker, R. J., & Shah, S. A. M. (2018). Relation of work-life balance, work-family conflict, and family-work conflict with the employee performance-moderating role of job satisfaction. *South Asian Journal of Business Studies*, 7(1), 129–146. <https://doi.org/10.1108/SAJBS-02-2017-0018>
- Spector, P. E., & Jex, S. M. (1998). Development of four self-report measures of job stressors and strain: Interpersonal Conflict at Work Scale, Organizational Constraints Scale, Quantitative Workload Inventory, and Physical Symptoms Inventory. *Journal of Occupational Health Psychology*, 3(4), 356–367. <https://doi.org/10.1037/1076-8998.3.4.356>
- Susanto, P., Hoque, M. E., Jannat, T., Emely, B., Zona, M. A., & Islam, M. A. (2022). Work-life balance, job satisfaction, and job performance of SMEs employees: The moderating role of family-supportive supervisor behaviors. *Frontiers in Psychology*, 13, 906876. <https://doi.org/10.3389/fpsyg.2022.906876>
- Talukder, A. K. M., Vickers, M., & Khan, A. (2018). Supervisor support and work-life balance: Impacts on job performance in the Australian financial sector. *Personnel Review*, 47(3), 727–744. <https://doi.org/10.1108/PR-12-2016-0314>
- Vito, R. A., & Widigdo, A. M. N. (2026). Work-life balance among Generation Z: The role of workload, social support, and work flexibility. *Jurnal Doktor Manajemen (JDM)*, 9(1), 95–106. <https://doi.org/10.22441/jdm.v9i1.38814>
- Waworuntu, E. C., Kainde, S. J. R., & Mandagi, D. W. (2022). Work-life balance, job satisfaction and performance among Millennial and Gen Z employees: A systematic review. *Society*, 10(2), 384–398. <https://doi.org/10.33019/society.v10i2.464>
- Zahra, C. P., & Indryawati, R. (2025). Work-life balance dan kepuasan kerja pada karyawan industri manufaktur. *Jurnal Psikologi*, 18(2), 300–307. <https://doi.org/10.35760/psi.2025.v18i2.467>