Journal of Business, Social and Technology
Volume 7, Issue 4, 2410-2419
e_ISSN: 2807-6362
https://bustechno.politeksci.ac.id/index.php/jbt/index
DOI: doi.org/10.59261/bustechno.v7i4.769

Supervisor Support and Turnover Intention: Mediating Roles of Emotional Exhaustion and Work Engagement in Chemical Manufacturing Employees in Java

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Article Info:
Article history:
Received: July 08, 2026
Revised: August 20, 2026
Accepted: September 07, 2026
Available Online: October 14, 2026

Keywords:
Chemical Manufacturing;
Emotional Exhaustion;
Supervisor Support;
Turnover Intention;
Work Engagement

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Abstract

Background: Employee retention has become a serious concern in Indonesia's chemical manufacturing industry, where turnover among production personnel was approximately 18% in 2023. Because these employees work under considerable physical and psychological demands, identifying the processes that shape their intention to leave is particularly important.
Objective: This research investigates whether emotional exhaustion and work engagement mediate the relationship between supervisor support and turnover intention among production workers employed by chemical manufacturing companies in Java.
Methods: The study was grounded in Job Demands-Resources Theory and Social Exchange Theory and used a quantitative, cross-sectional survey. An online questionnaire generated data from 260 permanent, non-managerial production workers. Covariance-based structural equation modeling (CB-SEM) in SmartPLS 4 was used for the analysis.
Results: Supervisor support was not directly associated with turnover intention (β = -0.019; p = 0.384), although it significantly lowered emotional exhaustion and strengthened work engagement. Turnover intention increased significantly with emotional exhaustion and decreased significantly with work engagement. Both constructs transmitted the effect of supervisor support, and the indirect pathway through emotional exhaustion (β = -0.330; $p < 0.001$) was stronger than the pathway through work engagement (β = -0.114; p = 0.042).
Conclusion: Supervisor support relates to weaker turnover intention mainly by alleviating emotional exhaustion and enhancing work engagement, rather than through a significant direct association. Accordingly, retention efforts in chemical manufacturing should develop supervisory practices that safeguard employees' psychological health and reinforce their engagement at work.

To cite this article: Octaviani, C., & Desiana, P. M. (2026). Supervisor support and turnover intention: Mediating roles of emotional exhaustion and work engagement in chemical manufacturing employees in Java. *Journal of Business, Social and Technology, 7*(4), 2410–2419. https://doi.org/10.59261/bustechno.v7i4.769

INTRODUCTION

Post-pandemic workplace changes and Industry 4.0 have intensified the pressures encountered by organizations and employees. Global employee turnover was estimated at about 20% in 2024, compared with 18% in 2023 (Recruitment, 2024). Gallup (2025) also reported that worldwide engagement fell from 23% in 2023 to 21% in 2024, a decline associated with a greater risk of employee departure. Turnover is therefore more than a temporary operational difficulty:

it can weaken productivity, competitiveness, and organizational continuity and may indicate shortcomings in the work environment and employment relationships (Romaiha et al., 2023; Skelton & Dwyer, 2020). Turnover intention provides an observable early indication of possible departure because it captures an employee's conscious inclination to leave before actual turnover occurs (Sun & Wang, 2016, 2017; Xiong et al., 2023).

Scholarly literature distinguishes employee-initiated voluntary turnover from involuntary separation determined by the employer (Donoghue & Castle, 2007; Gede, 2025). Voluntary departure merits particular attention because it is difficult to anticipate and often reflects dissatisfaction with employment conditions (Andiola et al., 2026; Griffeth & Hom, 2001; Steers & Mowday, 1981). Ardi and Anggraini (2023) reported that 41% of Indonesian manufacturing employees intended to leave, citing limited competency development, work-life imbalance, and a weak sense of meaning at work. Although manufacturing contributed 18.98% of Indonesian GDP in 2024 (Business Indonesia), its employees commonly face intensive demands, production targets, and restricted flexibility that may increase withdrawal intentions (Perumal et al, 2018; Wang & Sun, 2025).

The chemical subsector is economically important because it supplies inputs required by downstream industries (He et al., 2020). Nevertheless, it recorded an average turnover rate of roughly 18% in 2023 Recruitment (2024) and International (2024) while competition for capable personnel continued to intensify. Production workers are especially exposed to hazardous substances, rotating shifts, safety concerns, and stringent output targets (Hoare & Vandenberghe, 2022; Zhang et al., 2024). Work stress has also been identified as a major antecedent of turnover intention among manufacturing personne (Hariani & Issalillah, 2021, 2022). These conditions suggest that the accumulated psychological consequences of persistent job demands may be more relevant to departure intentions than demographic or economic factors alone. It is therefore necessary to assess supervisor support, emotional exhaustion, and work engagement together when explaining why production employees consider leaving.

Supervisor support is frequently identified as an antecedent of turnover intention because supervisors interact directly with employees and are commonly perceived as organizational representatives (Jun et al, 2023; Newman & Hui, 2012; Shaqiqi, 2026). Social Exchange Theory views such support as a valued resource that creates an obligation to reciprocate through stronger commitment and loyalty (Newman & Hui, 2012; Shaqiqi, 2026). In the present framework, supervisor support functions both as a job resource under JD-R Theory and as a social resource within an exchange relationship. The two theories consequently provide complementary explanations: support may discourage withdrawal by improving employees' psychological condition, particularly by limiting emotional exhaustion and fostering work engagement (Grobelna, 2021; Schaufeli et al., 2002; Widlund et al., 2023).

Emotional exhaustion, the central component of burnout, represents a loss of psychological energy caused by continuing job pressure and is closely related to decisions to leave (Saleh et al., 2023). By contrast, work engagement reflects vigor, dedication, and absorption and can maintain employees' connection with the organization, thereby reducing turnover intention (Memon & Baharom, 2019; Schaufeli et al., 2002; Widlund et al., 2023). JD-R Theory positions these constructs along separate processes: exhaustion reflects health impairment, whereas engagement represents the motivational process.

Existing research has usually investigated the health-impairment and motivational processes independently. Pattnaik and Panda (2020) and Siddiqi et al. (2025), using hospitality employees, observed partial mediation by work engagement between supervisor support and turnover intention and recommended testing other industries and mediators. Grobelna (2021) and Sun et al. (2025) demonstrated that emotional exhaustion transmitted the effects of job demands and supervisor support among hotel employees but did not include work engagement in the same model. Because both studies concerned service work and assessed only one pathway, evidence remains limited regarding the simultaneous processes among production employees facing physical hazards and safety demands. Studies from Indonesia and Southeast Asia have likewise tended to examine engagement and exhaustion as separate mediators (Julianto & Febriana, 2024; Ratnasari & Tanjung, 2023; Yucel & Baş, 2023). The present study responds by evaluating emotional exhaustion and work engagement as parallel mediators among chemical production employees in Java, whose work includes hazardous-material exposure, shifts, and

production pressure. It aims to determine how supervisor support relates to turnover intention through both mediators. The study is expected to extend JD-R Theory in a demanding industrial setting and to inform supervisory development and sustainable employee-retention practices.

METHOD

A quantitative explanatory design was employed to evaluate the proposed relationships and hypotheses (Haro-Sarango, 2026; Malhotra & Birks, 2017; Sekaran & Bougie, 2016). Data for the cross-sectional survey were collected at one point in time. Supervisor support served as the independent variable, turnover intention as the dependent variable, and emotional exhaustion and work engagement as parallel mediators. The framework combined the engagement pathway examined by Pattnaik and Panda (2020) and Siddiqi et al. (2025) with the exhaustion pathway assessed by Grobelna (2021), consistent with the dual processes proposed in JD-R Theory.

The target population consisted of permanent, non-managerial production employees with at least one year of service in chemical manufacturing companies located in Java. Participants were selected purposively. An a priori calculation in G*Power 3.1 used power = 0.80, three predictors, a medium effect size (f^2 = 0.15), α = 0.05, and a two-tailed fixed-model multiple-regression approximation of the structural model (Faul et al., 2009; Lenz et al., 2026). This analysis established a minimum of 77 participants. The Google Form survey received 361 responses, of which 260 met the screening requirements and were retained, substantially exceeding the minimum. All constructs were specified reflectively and assessed with Likert-type items. Emotional exhaustion was measured with items adapted from Karatepe and Uludag (2007), based on the Maslach Burnout Inventory (Fosu, 2025; McElroy & Rude, 2001).The remaining measures were adapted from previously validated instruments.

The covariance-based structural equation modeling module in SmartPLS 4 was used to estimate the covariance matrix through maximum likelihood, following the CB-SEM procedure described by Hair et al. (2025). SPSS 29 supported the descriptive and preliminary instrument analyses. Measurement quality was evaluated through standardized loadings, Average Variance Extracted, Composite Reliability, Cronbach's Alpha, and the HTMT criterion below 0.90 (Cheung et al., 2024; Hair et al., 2019; Henseler & Sarstedt, 2015). Path coefficients, R^2, and fit indices were then used to assess the structural model. Bootstrapping supported the directional hypothesis tests; a hypothesis was accepted when the T-statistic exceeded 1.645 and p was below 0.05 in a one-tailed test. This approach corresponded to the directions specified for H1-H7 under JD-R Theory and Social Exchange Theory. Indirect effects were examined to establish mediation (Mukhaiyar et al., 2023; Nitzl & Cepeda-Carrión, 2016; Preacher & Hayes, 2008).

RESULTS AND DISCUSSION

Respondent Characteristics

The final sample comprised 260 production employees, of whom 52.31% were men. Most participants were aged 30-45 years (51.54%), followed closely by those aged 18-29 years (46.54%), indicating that the sample was concentrated in productive-age categories. Bachelor's or D4 qualifications were held by 65.77%, and the largest tenure category was 3-5 years (45.38%). Table 1 presents the complete respondent profile.

Table 1

Respondent Characteristics (n = 260)

Profile	Classification	Frequency	Percentage
Gender	Male	136	52,31%
	Female	124	47,69%
Age	18–29 years old	121	46,54%
	30–45 years	134	51,54%
	46–60 years old	5	1,92%
Education	High School/Vocational School	63	24,23%
	Diploma (D1–D3)	26	10,00%
	Bachelor (S1/D4)	171	65,77%
Tenure	1–2 years	91	35,00%
	3–5 years	118	45,38%

Profile	Classification	Frequency	Percentage
	> 5 years	51	19,62%

Source: Results of research (2026)

Evaluation of Measurement Models

All constructs satisfied the specified validity and reliability thresholds. Composite Reliability exceeded 0.70 and Average Variance Extracted was above 0.50 for every variable, supporting internal consistency and convergent validity (Hair Black W. C. Babin B. J. & Anderson, 2019; Hair & Sabol, 2025). Discriminant validity was also established because each HTMT value remained below 0.90; the largest value was 0.780 for the association between work engagement and supervisor support. Supplementary Table S1 reports the standardized item loadings and Cronbach's Alpha values that support these results, while Table 2 summarizes Composite Reliability and AVE.

Table 2

Convergent Reliability and Validity Test Results

Variable	CR	AVE	Remarks
Emotional Exhaustion	0,967	0,785	Reliable
Supervisor Support	0,945	0,778	Reliable
Turnover Intention	0,976	0,889	Reliable
Work Engagement	0,949	0,860	Reliable

Source: Results of research (2026)

Fit statistics from the SmartPLS 4 CB-SEM measurement model indicated an acceptable specification (Hair et al., 2025). RMSEA was 0.076 and therefore below the 0.08 threshold, SRMR was 0.034, and NFI, TLI, and CFI were 0.937, 0.956, and 0.961, respectively. GFI (0.851) and AGFI (0.812) represented marginal fit, which may reflect their sensitivity to sample size and model complexity (Gaskin et al., 2025). Overall, the results supported proceeding to structural-model assessment.

Structural Model Evaluation and Hypothesis Testing

Supervisor support accounted for 22.0% of the variance in emotional exhaustion and 61.3% of the variance in work engagement. Together, supervisor support, emotional exhaustion, and work engagement explained 60.6% of turnover intention. Under Hair et al. (2019) and Hair and Sabol (2025) behavioral-research guidance, the latter two values are substantial, while the 22.0% value for emotional exhaustion is moderate because exhaustion is likely shaped by several determinants beyond supervisor support. Factors excluded from the model, such as pay, satisfaction, and organizational climate, account for the remaining 39.4% of turnover-intention variance. Direct-effect results appear in Table 3 and indirect effects in Table 4.

Table 3

Direct Effect Hypothesis Testing Results

Hyp.	Pathway	β	T-value	P-value	Results
H1	Supervisor Support → Turnover Intention	-0,019	0,295	0,384	Not Significant
H2	Supervisor Support → Emotional Exhaustion	-0,469	8,294	0,000	Significant
H3	Supervisor Support → Work Engagement	0,783	18,999	0,000	Significant
H4	Emotional Exhaustion → Turnover Intention	0,702	11,798	0,000	Significant
H5	Work Engagement → Turnover Intention	-0,145	1,772	0,039	Significant

Source: Results of research (2026)

Table 3 shows that the direct path from supervisor support to turnover intention was nonsignificant (β = -0.019; p = 0.384); accordingly, H1 was not supported. Supervisor support significantly reduced emotional exhaustion (β = -0.469) and significantly increased work engagement (β = 0.783), supporting H2 and H3. Emotional exhaustion positively predicted turnover intention (β = 0.702), whereas work engagement predicted it negatively (β = -0.145);

consequently, H4 and H5 were supported.

Table 4
Indirect Effect Hypothesis Testing Results

Hyp.	Mediation Pathway	β	T-value	P-value	Results
H6	Supervisor Support → Emotional Exhaustion → Turnover Intention	-0,330	7,287	0,000	Indirect-only Mediation
H7	Supervisor Support → Work Engagement → Turnover Intention	-0,114	1,734	0,042	Indirect-only Mediation

Source: Results of research (2026)

The two indirect pathways were statistically significant. Because the direct path specified in H1 was nonsignificant while both indirect paths were significant, emotional exhaustion and work engagement were classified as indirect-only mediators (Qin, 2024; Zhao & Chen, 2010), supporting H6 and H7. The mediated effect through emotional exhaustion (β = -0.330; p < 0.001) exceeded that through work engagement (β = -0.114; p = 0.042), demonstrating the greater strength of the health-impairment process. Adding the direct coefficient (-0.019) to both specific indirect coefficients (-0.330 and -0.114) produces a combined indirect effect of -0.444 and an overall effect of β = -0.463. The earlier pathway-specific values of -0.799 and 0.669 had combined contributions from both mediators and are therefore corrected. In total, H2-H7 were supported, whereas H1 was not.

Discussion

The absence of a significant direct relationship between supervisor support and turnover intention contradicts H1 but accords with research suggesting that the relationship is transmitted through intervening variables (Astuti & Helmi, 2021; Kissi & Tannor, 2024). Ratnasari and Tanjung (2023) similarly found no direct association among manufacturing employees and identified work engagement as an important mediating route. For chemical production workers, therefore, the intention to leave appears to be explained more closely by emotional exhaustion and work engagement than by perceptions of supervisor support alone (Chami-Malaeb, 2022).

The negative relationship between supervisor support and emotional exhaustion supports H2 and the JD-R proposition that job resources protect employees from the health-impairment process. Attention and guidance from supervisors can help employees cope with job pressure and thereby lessen emotional depletion (Grobelna, 2021; Potipiroon & Faerman, 2020; Sun et al., 2025). The positive association between support and work engagement confirms H3 and the JD-R motivational process, through which available resources foster engagement (Naidoo-Chetty et al., 2026; Pattnaik & Panda, 2020; Schaufeli & Bakker, 2004). Social Exchange Theory offers a complementary explanation: employees may reciprocate supportive treatment by investing more energy and involvement in their work (Ahmad et al., 2023; Cropanzano et al., 2017).

Consistent with H4 and the health-impairment process, greater emotional exhaustion was associated with stronger turnover intention. Exhaustion depletes psychological capacity and can prompt withdrawal (Grobelna, 2021; Qin et al., 2023). This mechanism is especially pertinent to chemical production personnel because hazardous substances, rotating shifts, safety exposure, and continuous output pressure create a combination of sustained demands that is less typical of service-sector employment (Santhanam & Srinivas, 2020; Zhang et al., 2024). Conversely, the negative effect of work engagement supported H5: employees who are highly involved in their work tend to maintain a stronger organizational attachment. Zhang et al. (2020) and similarly observed that engagement can weaken the adverse influence of job pressure on turnover intention.

The parallel mediation results for H6 and H7 constitute the study's principal theoretical contribution. Both emotional exhaustion and work engagement transmitted the association between supervisor support and turnover intention without a significant direct path, supporting the health-impairment and motivational processes of JD-R Theory simultaneously (Bakker et al., 2023; Demerouti et al., 2001). These results correspond with the burnout mediation reported by Chami-Malaeb (2022) and the engagement mediation identified by Kissi and Tannor (2024). The

larger indirect coefficient for emotional exhaustion indicates that the health-impairment route was dominant. This pattern is consistent with Nitzl and Cepeda-Carrión (2016), who note that the larger effect in a parallel mediation model identifies the stronger psychological mechanism, and with Bakker and Bakker and Demerouti (2007) and Bakker et al. (2023) argument that health impairment can predominate in demanding occupations. The findings extend the use of JD-R Theory by demonstrating that its two processes need not carry equal weight in a high-hazard industrial context; their relative importance may depend on the intensity of sector-specific demands. Organizational action should therefore emphasize supervisor practices that prevent or reduce emotional exhaustion.

Taken together, the findings support an integrated application of JD-R Theory and Social Exchange Theory to turnover intention in Indonesian chemical manufacturing. Supervisor support was related to departure intentions through two concurrent psychological mechanisms: lower emotional exhaustion and higher work engagement, rather than through a significant direct path. In view of intensifying competition for talent International (2024) and the established role of work stress in turnover intention (Hariani & Issalillah, 2021, 2022), chemical manufacturers have a clear reason to develop supervisors' capacity to protect the psychological health of production employees.

CONCLUSION

The study established that supervisor support did not directly predict turnover intention, although it was negatively associated with emotional exhaustion and positively associated with work engagement. Emotional exhaustion increased turnover intention, whereas work engagement reduced it. Both psychological conditions operated as indirect-only mediators. The indirect coefficient through emotional exhaustion (-0.330) was larger than the coefficient through work engagement (-0.114), and their combination with the nonsignificant direct coefficient yielded a total effect of $\beta = -0.463$. Thus, among chemical manufacturing production employees, supervisor support appears to relate to turnover intention through employees' psychological state. Because the evidence is cross-sectional, however, it cannot demonstrate temporal or causal precedence.

Chemical manufacturing firms should make supervisor-development initiatives that reduce emotional exhaustion and cultivate work engagement central to sustainable retention. The results imply that supervisor training should address the two psychological processes together instead of separating burnout prevention from engagement enhancement. The cross-sectional design limits causal interpretation, and the restriction of the sample to chemical production personnel in Java constrains generalization to other locations and industries. Future investigations should employ longitudinal data, compare sectors and regions, and test further job demands and resources, including workload and organizational support, as moderators of the health-impairment and motivational mechanisms.

ACKNOWLEDGEMENT

The authors sincerely thank the employees who devoted their time and supplied information for this study. They also acknowledge Universitas Indonesia for the academic facilities and support provided during the research, as well as all individuals whose assistance and feedback contributed to the study and preparation of the manuscript.

AUTHOR CONTRIBUTION STATEMENT

Christy Octaviani contributed to conceptualization, methodology, investigation, data collection, formal analysis, visualization, and preparation of the original draft. Putri Mega Desiana contributed to conceptualization, methodology, supervision, and validation. Both authors participated in completing the study and approved the final manuscript.

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