

Awareness, Access, Satisfaction and Perceived Barriers Related to ESI and PF Benefits among Engineering Manufacturing Employees

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Abstract—Employees' State Insurance (ESI) and Provident Fund (PF) are important statutory social-security benefits for eligible employees in India. Their effectiveness depends not only on formal enrolment but also on employees' awareness, practical access to services, satisfaction with administrative support, and perceived barriers in using benefits. This revised study examines awareness, access, satisfaction, and perceived barriers related to ESI and PF benefits among employees of a selected engineering manufacturing organisation in Coimbatore, India. A descriptive cross-sectional survey design was adopted. The study records reported simple random sampling and included 130 employees from an organisational workforce of approximately 400; however, the sampling frame, random-selection procedure, non-response pattern, and a priori power analysis were not documented. Primary data were collected using a structured questionnaire containing 7 Awareness items, 6 Access items, 6 Satisfaction items, and 6 Barrier items measured on five-point scales. Reliability was high for all constructs: Awareness (Cronbach's $\alpha = 0.957$), Access ($\alpha = 0.902$), Satisfaction ($\alpha = 0.922$), and Barriers ($\alpha = 0.883$). Pearson correlation showed significant positive associations between Awareness and Access ($r = 0.809$, $p < 0.001$), Awareness and Satisfaction ($r = 0.696$, $p < 0.001$), and Access and Satisfaction ($r = 0.834$, $p < 0.001$). Awareness significantly predicted Access ($R^2 = 0.655$, $\beta = 0.809$, $p < 0.001$). In multiple regression predicting Satisfaction, the model was significant ($R^2 = 0.698$, $F(2,127) = 146.539$, $p < 0.001$), but Access was the only significant independent predictor ($\beta = 0.785$, $p < 0.001$); Awareness was not significant after Access was included ($\beta = 0.061$, $p = 0.463$). Satisfaction did not differ significantly by gender, and Awareness did not differ significantly across age groups. Barriers showed good reliability and moderate descriptive levels, with

processing delay emerging as the highest reported barrier, but the available validated output did not include barrier correlations, barrier regression, or bootstrap mediation. Therefore, the article treats Barriers as a reliable descriptive and conceptual construct and avoids unverified causal or mediation claims. The findings indicate that practical access is more closely associated with satisfaction than awareness alone. The study is limited to one organisation and should be interpreted as associative, context-specific evidence.

Index Terms—Employees' State Insurance; Provident Fund; employee welfare; awareness; access; satisfaction; barriers; engineering manufacturing; Coimbatore

I. INTRODUCTION

Employee welfare is an important component of human resource management because statutory social-security schemes provide healthcare support, income protection, retirement savings, and long-term financial security. In India, ESI provides eligible employees with medical and specified cash benefits, while PF supports retirement savings and related social-security objectives. However, formal enrolment does not automatically ensure that employees understand their entitlements, know the procedures for availing services, or receive timely organisational support in claim and grievance processes.

Previous studies indicate that awareness and utilisation do not always move together. Shingade and Madhavi (2016), in a cross-sectional study of ESI beneficiaries, reported relatively high awareness of medical benefits but weaker awareness of other

benefits, identifying limited awareness as an important reason for underutilisation. Arunraj and Pooja (2021) also examined awareness and satisfaction with ESI benefits, while Raghavi and Pushpalatha (2024) highlighted the role of employers as important sources of ESI information. These studies suggest that employee knowledge is necessary but not sufficient for effective use of social-security benefits.

Recent evidence further emphasises the role of access and administrative experience. Roy, Davis, and Joseph (2025) documented limited awareness of social-security claim procedures among occupational-injury patients and noted that paperwork, complexity, and time-consuming procedures can restrict effective utilisation. Bhat and Mayya (2025) identified low awareness, procedural barriers, inconsistent service delivery, and underutilisation as recurring themes in employee perceptions of ESI. Similarly, Dash Mohapatra, Sahoo, and Chopra (2025) identified employment contracts, accessibility, service delivery quality, and eligibility as important determinants of social-insurance participation.

The present study focuses on employees of a selected engineering manufacturing organisation in Coimbatore. To preserve organisational anonymity, the firm is not identified by name. Since the study is based on 130 employees from a single organisation, its findings should be interpreted as organisation-specific evidence and not as representative of the entire Indian engineering manufacturing sector.

II. REVIEW OF LITERATURE AND RESEARCH FRAMEWORK

2.1 Awareness and Utilisation of ESI and PF Benefits
Awareness refers to employees' knowledge of the purpose of ESI and PF, eligibility conditions, available benefits, procedures, and sources of information. Studies of ESI beneficiaries suggest that employees may be generally aware of a scheme while still lacking detailed procedural knowledge. Shingade and Madhavi (2016) reported that awareness varied across different ESI benefits, and inadequate awareness contributed to underutilisation. Raghavi and Pushpalatha (2024) found that employers were a major source of ESI awareness among salaried employees in Tirupur, reinforcing the role of organisational communication. Arunraj and Pooja (2021) reported

that employee awareness is connected with perceptions of ESI benefits.

Stephen Jeyaraj and Mekala (2023), in a study of ESI subscribers in Madurai City, examined perceptions of ESI benefits, services, and implementation problems. Their study emphasised that utilisation of ESI benefits is closely linked to scheme awareness and that insufficient knowledge can limit effective use of available benefits. This supports the need to distinguish general awareness from functional knowledge of eligibility, procedures, and benefit utilisation.

The International Labour Organization (2022), through a demand-side study of access to ESI medical benefits across selected Indian states, documented the practical obstacles and incentives faced by beneficiaries while seeking ESI services. By focusing on actual access rather than formal entitlement alone, the study supports treating accessibility as a distinct dimension of employee welfare experience.

2.2 Access and Satisfaction

Access reflects the practical ability to obtain information, understand procedures, receive HR support, and use ESI and PF services when required. Satisfaction reflects employees' evaluation of information quality, HR support, ease of availing benefits, timeliness, grievance handling, and overall administration. The distinction is important because awareness alone does not guarantee effective utilisation. Recent evidence on social-security claims indicates that procedural complexity and processing difficulties can reduce the practical value of formal entitlement (Roy et al., 2025). Bhat and Mayya (2025) also identify service delivery and procedural barriers as key dimensions of employee perceptions of ESI.

Hasan et al. (2023), studying workers in India's bidi industry, reported low awareness of statutory social-security schemes including ESI and linked weak awareness and dissatisfaction with limited real-world benefit from formal social-protection provisions. Although the employment setting differs from engineering manufacturing, the study highlights the wider gap between statutory coverage and employees' ability to derive value from social-security schemes.

In the retirement-benefit context, Naresh Kumar and Shailaja (2024) examined employees' perceptions of EPF and NPS and identified ease of access, transparency, perceived security, returns, and benefit

expectations as important elements of employee evaluation. Their findings are relevant to the PF component of the present study because they show that satisfaction with retirement-oriented social-security schemes depends not only on enrolment but also on accessibility and administrative clarity.

2.3 Perceived Barriers

Perceived barriers in this study include lack of awareness, complicated procedures, processing delays, inadequate organisational guidance, technical or documentation problems, and overall difficulty in accessing benefits. Such barriers can exist even when formal coverage is available. Dash Mohapatra et al. (2025) show that accessibility and service delivery quality are important components of social-insurance participation. Roy et al. (2025) and Bhat and Mayya (2025) further support the importance of documentation, procedural simplicity, and service quality in determining whether employees can effectively use social-security benefits.

In the present study, the Barrier construct is retained as a separate construct because it captures the gap between formal scheme availability and practical employee experience. The construct demonstrated good internal consistency ($\alpha = 0.883$), and its descriptive statistics provide evidence of moderate perceived barriers. However, the available validated analysis output does not include barrier correlations or barrier regression coefficients. Therefore, the revised article integrates Barriers into the conceptual model and managerial implications while explicitly avoiding unsupported statistical claims about the effect of Barriers on Satisfaction.

2.4 Research Gap and Objectives

The reviewed literature provides evidence on ESI awareness, utilisation, service experience, procedural barriers, and employee perceptions, together with a smaller body of work on EPF-related perceptions. However, most studies examine these dimensions separately, focus primarily on ESI rather than ESI and PF together, or are conducted in sectors and locations different from engineering manufacturing in Coimbatore. Comparatively fewer studies integrate Awareness, Access, Satisfaction, and perceived Barriers within a single empirical framework.

The present study therefore aims to: (1) assess employee Awareness of ESI and PF benefits; (2)

examine Access and utilisation; (3) measure Satisfaction; (4) identify perceived Barriers; and (5) analyse relationships among Awareness, Access, and Satisfaction using the validated outputs available from the study records.

2.5 Hypotheses

H1: Awareness is positively associated with Access to ESI and PF benefits.

H2: Awareness is positively associated with Satisfaction with ESI and PF benefits.

H3: Access is positively associated with Satisfaction with ESI and PF benefits.

H4: Awareness significantly predicts Access.

H5: Awareness and Access jointly predict Satisfaction.

H6: Satisfaction does not differ significantly by gender.

H7: Awareness does not differ significantly across age groups.

Reviewer clarification: The Barrier construct is included in the conceptual framework, reliability analysis, descriptive interpretation, discussion, and managerial implications. It is not included as a tested predictor because the available study output did not provide respondent-level data or validated barrier correlation/regression estimates. No unverified hypothesis has been added for Barriers.

III. CONCEPTUAL MODEL

Figure 1 presents the revised conceptual model. Awareness is expected to improve practical Access, and both Awareness and Access are associated with Satisfaction. Access is positioned as the closest practical determinant of Satisfaction because employees may know about ESI and PF benefits but still face difficulty using them without procedural clarity, HR assistance, timely guidance, and digital support. Perceived Barriers are included as a negative pressure on Access and Satisfaction because lack of awareness, complicated procedures, processing delays, inadequate guidance, and documentation difficulties may weaken the employee welfare experience. Contextual employee factors such as age, gender, education, employment type, and experience are treated as background variables. They were not included as statistical control variables in the reported

regression models; this is now clarified rather than presenting them as formal controls.

IV. RESEARCH METHODOLOGY

4.1 Research Design and Setting

The study used a descriptive, cross-sectional survey design. It was conducted in a selected engineering manufacturing organisation in Coimbatore. The study documentation reports an organisational workforce of approximately 400 employees and states that 130 employees participated in the survey. Since the data were collected at one point in time, the results are

interpreted as associations and predictive relationships, not causal effects.

4.2 Sampling Procedure and Sample Size

The study records describe the sampling method as simple random sampling and report a sample of 130 employees drawn from different departments. However, the available documentation does not describe the complete employee sampling frame, random-number procedure, replacement method, number of employees approached, number of refusals, or non-response pattern. Therefore, the sampling

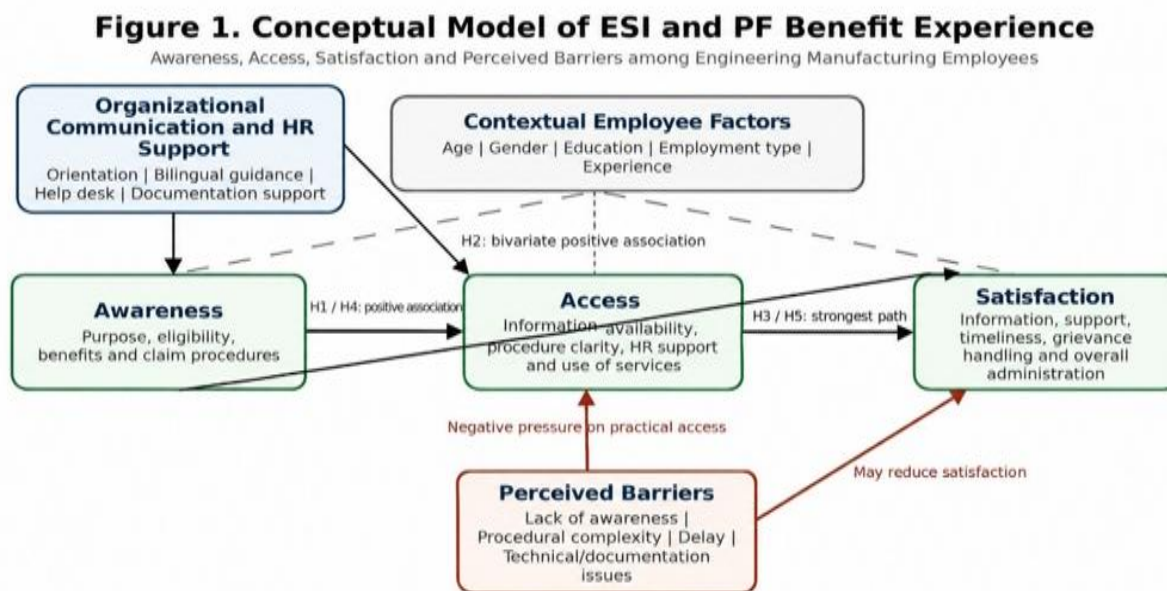


Figure 1. Conceptual model of Awareness, Access, Satisfaction and Perceived Barriers related to ESI and PF benefits.

method is reported as stated in the study records, but the random-selection procedure cannot be independently verified. No a priori power analysis was documented. This limitation is explicitly acknowledged because it restricts the generalisability and statistical power of subgroup comparisons.

4.3 Instrument and Measures

The questionnaire contained demographic items followed by four multi-item constructs. Awareness was measured using 7 statements concerning the purpose of ESI and PF, eligibility criteria, benefits, PF/ESI use, claim procedures, company

communication, and overall awareness. Access comprised 6 statements addressing information availability, procedure clarity, HR support, ease of access, timely guidance, and effective utilisation. Satisfaction comprised 6 items covering information, HR support, ease of availing benefits, timeliness, grievance handling, and overall satisfaction. Barriers comprised 6 items concerning lack of awareness, procedural complexity, delay, lack of guidance, technical/documentation issues, and overall barriers. Awareness, Access, and Barriers used five-point agreement scales, while Satisfaction used a five-point satisfaction scale.

4.4 Reliability

Internal consistency was assessed using Cronbach's alpha. The study reports excellent reliability for Awareness ($\alpha = 0.957$), Access ($\alpha = 0.902$), and Satisfaction ($\alpha = 0.922$), and good reliability for Barriers ($\alpha = 0.883$). These coefficients support the use of summed construct scores. The Barrier construct is therefore retained in the conceptual and descriptive analysis, even though barrier-based relational modelling was not available in the validated outputs.

4.5 Statistical Analysis

IBM SPSS Statistics was used for frequency and percentage analysis, descriptive statistics, Cronbach's alpha, Pearson correlation, simple linear regression, multiple linear regression, an independent-samples t-test, and one-way ANOVA. The original methodology described demographic variables as control variables; however, the reported regression models did not include these demographics as statistical controls. That statement has been removed and replaced with a transparent explanation that demographic variables were examined through separate group-comparison tests. The Barrier construct was analysed descriptively and integrated into the conceptual model and discussion, but it was not included in correlation or regression models because respondent-level data or validated output for barrier modelling was not available in the submitted records. Statistical significance was evaluated at $\alpha = 0.05$, and $p = 0.000$ in SPSS output is reported as $p < 0.001$.

4.6 Treatment of Mediation

The observed regression pattern is compatible with an indirect Awareness $\rightarrow$ Access $\rightarrow$ Satisfaction pathway because Awareness predicts Access, Access predicts Satisfaction, and Awareness becomes non-significant when Access is entered with Awareness. However, a formal mediation test using bootstrapped confidence intervals was not conducted because the available records do not contain respondent-level data required for resampling. Therefore, this article does not claim mediation. The finding is stated only as an associative pattern suggesting that Access may explain substantial overlap between Awareness and Satisfaction. Future research should test this pathway formally using bootstrap mediation analysis.

V. RESULTS

5.1 Respondent Profile

Table 1. Selected demographic characteristics of respondents (N = 130).

Variable	Category	n	%
Age	Below 25	36	27.7
	25-35	59	45.4
	36-45	21	16.2
	Above 45	14	10.8
Gender	Male	95	73.1
	Female	35	26.9
Education	SSLC/HSC	42	32.3
	Diploma	20	15.4
	Undergraduate	29	22.3
	Postgraduate	14	10.8
	Other	25	19.2
Work experience	Below 1 year	21	16.2
	1-3 years	49	37.7
	4-6 years	26	20.0
	Above 6 years	34	26.2
Employment type	Permanent	103	79.2
	Contract	8	6.2
	Temporary	19	14.6

5.2 Descriptive Statistics and Reliability

Table 2. Construct-level descriptive statistics and reliability (N = 130). Means are summed scores; constructs have different numbers of items and should not be ranked without scale adjustment.

Construct	Items	Mean score	SD	Cronbach alpha
Awareness	7	24.723	6.769	0.957
Access	6	21.108	5.245	0.902
Satisfaction	6	22.154	5.049	0.922
Barriers	6	18.362	5.297	0.883

Because Awareness contains 7 items whereas Access, Satisfaction, and Barriers contain 6 items each, raw summed means are not directly comparable. On an approximate per-item basis, Awareness averaged 3.53, Access 3.52, Satisfaction 3.69, and Barriers 3.06. The Barrier item means reported in the study ranged from 2.88 to 3.16, with processing delay showing the highest individual barrier mean. This indicates that perceived barriers were moderate rather than negligible.

5.3 Correlation Analysis

Table 3. Pearson correlations among Awareness, Access, and Satisfaction ($N = 130$).

Relationship	Pearson r	p	Interpretation
Awareness <-> Access	0.809	<0.001	Strong positive; H1 supported
Awareness <-> Satisfaction	0.696	<0.001	Moderate-to-strong positive; H2 supported
Access <-> Satisfaction	0.834	<0.001	Strong positive; H3 supported

All three bivariate relationships were positive and statistically significant. These correlations indicate association, not causation. Access had the strongest bivariate relationship with Satisfaction ($r = 0.834$), followed by Awareness with Access ($r = 0.809$). Barrier correlations are not reported because the available validated study output did not contain those estimates.

5.4 Regression Analyses

In the first model, Awareness significantly predicted Access, $R = 0.809$, $R^2 = 0.655$, adjusted $R^2 = 0.652$, $F(1,128) = 242.485$, $p < 0.001$. The unstandardised coefficient for Awareness was $B = 0.627$ ($SE = 0.040$), with $\beta = 0.809$, $t = 15.572$, $p < 0.001$. Thus, higher Awareness scores were associated with higher Access scores.

Table 4. Simple regression predicting Access ($N = 130$). $R^2 = 0.655$.

Predict or	B	SE	bet a	t	p	95 % CI for B
Awareness -> Access	0.627	0.040	0.809	15.572	<0.001	0.547 to 0.707

In the second model, Awareness and Access jointly predicted Satisfaction, $R = 0.835$, $R^2 = 0.698$, adjusted $R^2 = 0.693$, $F(2,127) = 146.539$, $p < 0.001$. Access was

a strong and statistically significant independent predictor ($B = 0.756$, $\beta = 0.785$, $t = 9.458$, $p < 0.001$), whereas Awareness was not statistically significant after Access was included ($B = 0.046$, $\beta = 0.061$, $t = 0.736$, $p = 0.463$). This pattern suggests that the Awareness-Satisfaction relationship substantially overlaps with Access. It is not reported as formal mediation because bootstrap mediation was not conducted.

Table 5. Multiple regression predicting Satisfaction ($N = 130$). $R^2 = 0.698$; adjusted $R^2 = 0.693$.

Predict or	B	SE	beta	t	p	95 % CI for B
Awareness	0.046	0.062	0.061	0.736	0.463	-0.077 to 0.168
Access	0.756	0.080	0.785	9.458	<0.001	0.598 to 0.914

5.5 Gender Difference in Satisfaction

Male employees ($n = 95$, $M = 22.22$, $SD = 5.11$) and female employees ($n = 35$, $M = 21.97$, $SD = 4.96$) reported very similar Satisfaction scores. Levene's test was non-significant ($F = 0.017$, $p = 0.897$), and the equal-variances t-test showed no statistically significant gender difference, $t(128) = 0.249$, $p = 0.804$. The null hypothesis was therefore not rejected.

5.6 Age-Group Difference in Awareness

One-way ANOVA showed no statistically significant difference in Awareness across the four age groups, $F(3,126) = 2.165$, $p = 0.095$. Tukey post-hoc comparisons were also non-significant for all reported pairs. Accordingly, the null hypothesis was not rejected, indicating that Awareness levels were broadly similar across the age groups represented in the sample.

VI. DISCUSSION

The study provides a coherent pattern of results. Awareness is strongly associated with Access, and Access is strongly associated with Satisfaction. Although Awareness is also positively correlated with Satisfaction, its coefficient becomes non-significant in the multiple regression once Access is included. This suggests that practical access to information, HR support, understandable procedures, timely guidance, and actual utilisation is more closely related to Satisfaction than awareness alone.

This finding is consistent with prior ESI research showing that awareness is necessary but not sufficient for effective utilisation. Shingade and Madhavi (2016) found that low awareness contributed to underutilisation, while recent research highlights procedural and claims-related difficulties that can remain even among covered employees (Roy et al., 2025). Bhat and Mayya (2025) also identify procedural barriers and service-delivery quality as recurring determinants of employee experience.

The revised manuscript gives greater attention to Barriers as requested by the reviewer. Barriers demonstrated good reliability and moderate descriptive levels, with processing delay emerging as the highest item mean. However, because the validated output did not include barrier correlations, barrier regression, or respondent-level data for further modelling, the analysis cannot conclude statistically that Barriers reduce Satisfaction. The valid conclusion is descriptive and conceptual: employees reported moderate difficulties related to delay, guidance, procedure, awareness, and technical/documentation issues, and these barriers should be treated as practical HR intervention points.

The demographic analyses do not support targeted conclusions by gender or age. Satisfaction did not differ by gender, and Awareness did not differ significantly across age groups. However, these non-significant findings should be interpreted cautiously because the subgroup sizes are unequal, especially for female respondents and smaller age categories, and no a priori power analysis was documented. Therefore, the absence of statistically significant differences should not be read as proof that demographic differences can never exist. For the present organisation, the safer implication is to prioritise organisation-wide improvements in communication,

access support, and procedural assistance rather than age- or gender-specific interventions based on these data alone.

VII. MANAGERIAL IMPLICATIONS

Engineering manufacturing organisations may strengthen ESI and PF administration by combining awareness communication with practical access support. Useful measures include clear bilingual guides, periodic orientation, an HR welfare help desk, support for online claim and PF-service navigation, documentation checklists, tracking of pending requests, and systematic grievance follow-up. Since Access was the strongest independent predictor of Satisfaction, managerial attention should move beyond communicating benefits to ensuring that employees can actually use them with minimal procedural difficulty.

The descriptive evidence on Barriers suggests specific action areas. Processing delays should be monitored through service timelines and pending-case registers. Technical and documentation problems may be reduced through standard claim checklists and help-desk support. Lack of awareness and lack of guidance may be addressed through induction sessions, periodic refresher programmes, posters, WhatsApp/email circulars, and bilingual FAQs. Organisations should also document employee queries and grievance outcomes so that future HR analytics can examine whether barrier reduction is associated with improved access and satisfaction.

VIII. LIMITATIONS AND FUTURE RESEARCH

The study has several limitations. First, it is confined to a single organisation and a sample of 130 employees; therefore, the findings cannot be generalised to the Indian engineering manufacturing sector. Second, although simple random sampling was stated in the study records, the available documentation does not describe the complete sampling frame, random selection procedure, replacement method, or non-response handling. Third, no a priori power analysis was documented; this is especially relevant for interpreting non-significant gender and age-group comparisons. Fourth, the design is cross-sectional and self-reported, preventing causal inference and creating possible common-method and

response bias. Fifth, demographic variables were not entered as controls in the reported regression models, and therefore the study does not claim controlled effects. Sixth, the Barrier construct was measured reliably but was not included in the relational models because validated barrier correlation/regression outputs and respondent-level data were not available. Finally, the observed regression pattern is compatible with an indirect Awareness → Access → Satisfaction pathway, but formal bootstrap mediation was not conducted and is not claimed.

Future studies should include multiple engineering firms, larger probability-based samples, documented sampling frames, objective utilisation data, and formal mediation analysis using bootstrap confidence intervals. The Barrier construct should be incorporated into correlation, regression, and mediation models using respondent-level data. Future research may also test whether demographic variables and employment type moderate the relationships among Awareness, Access, Barriers, and Satisfaction.

IX. CONCLUSION

This study examined employee Awareness, Access, Satisfaction, and perceived Barriers related to ESI and PF benefits at a selected engineering manufacturing organisation in Coimbatore. The findings show strong positive associations among Awareness, Access, and Satisfaction. Awareness significantly predicted Access, while Access was the only significant independent predictor of Satisfaction when Awareness and Access were entered together. Thus, employees' practical ability to obtain information, understand procedures, receive HR support, and use benefits appears more closely associated with Satisfaction than Awareness alone.

Employees also reported moderate barriers, particularly processing delays. However, because barrier-based relational analysis was not available, the study does not claim that Barriers statistically predict Satisfaction. No significant gender difference in Satisfaction or age-group difference in Awareness was found, but these findings should be interpreted cautiously due to unequal subgroup sizes and the absence of power analysis. The results support organisation-wide improvements in access, procedural clarity, HR assistance, digital support, and grievance handling. Since the evidence comes from one

organisation and a cross-sectional survey, the findings should be interpreted as associative rather than causal and should not be generalised to the wider engineering sector without further multi-organisation research.

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