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Significance of the Study

This study is important because it highlights the growing importance of mental health in high-risk industries such as coal mining. SECL relies on a physically and psychologically stable workforce to meet production and safety standards. The findings will help management to understand how poor mental health and unsafe behavior trends contribute to work accidents, absenteeism, low morale and reduced productivity. The study will guide SECL in designing employee assistance programs, stress management workshops, behavioral safety training and wellness initiatives. In addition, it will support decision-makers and safety officers in developing evidence-based safety protocols and promoting a health-oriented organizational culture.

LITERATURE REVIEW

Mohanty and Nimaje (2025) explore the patterns and efficiency of occupational accident management in Indian coal mines using Data Envelopment Analysis (DEA). The study evaluates performance across various coal mining units by analyzing accident frequency, severity, and safety-related inputs such as workforce size, working hours, and safety expenditures. DEA helps identify the most efficient mines in terms of minimizing accidents while optimizing resources. The results highlight significant disparities in safety performance, pointing to operational inefficiencies in several units. The study further underscores the importance of proactive safety management systems and data-driven interventions. By benchmarking high-performing mines, the authors propose strategic recommendations to enhance safety practices and reduce occupational hazards across the coal sector. This work contributes to the broader discourse on sustainable mining by emphasizing the integration of efficiency tools into occupational health and safety evaluation.

This review by **Rai and Kulkarni (2025)** emphasizes the crucial influence of safety measures on employee performance within the coal mining sector, with particular attention to South Eastern Coalfields Limited (SECL). It reveals that safety should not be viewed solely as a compliance mandate but as a vital strategic driver of employee efficiency, organizational loyalty, and long-term operational sustainability. The significance of mental health and behavioral aspects in achieving safety outcomes is gaining recognition. Workers in high-risk settings such as SECL mines often face stress, exhaustion, and psychological strain, which can hinder their ability to follow safety protocols effectively.

This study by **Zhou, Wang, Zhu, Tao, and Liu (2024)** explores the impact of perceived working conditions on employee performance—specifically, task performance and safety compliance—through the mediating role of employee well-being, measured by job satisfaction, within China's coal mining sector. Utilizing the Job Demands–Resources (JD-R) model, the research examines the influence of job demands—including work pressure (as a challenge demand) and perceived risks, hazards, and safety system inefficacy (as hindrance demands)—as well as job resources such as interpersonal harmony.

Bhattacharyya et al. (2023) present a comprehensive overview of recent advancements in coal mining technologies and sustainable mining practices. This chapter in *The Coal Handbook* explores how innovations in mining equipment, automation, and digital systems have significantly improved the efficiency, safety, and environmental performance of coal extraction processes. The authors delve into state-of-the-art technologies such as real-time monitoring, autonomous machinery, and intelligent mine planning systems, which have collectively contributed to reduced ecological impact and enhanced operational productivity.

Sadeghi et al. (2022) investigate the role of wireless sensor networks (WSNs) in enhancing occupational safety and health in underground mining environments. The study highlights how WSNs provide real-time monitoring of critical factors such as toxic gas levels, temperature, humidity, ground movement, and worker location, thereby significantly reducing response time during emergencies. By integrating these sensor systems into underground mines, safety managers can detect hazardous conditions early, facilitate rapid evacuation procedures, and ensure continuous communication with miners.

Yang et al. (2021) explore the crucial role of information technology (IT) in enhancing employee safety within the coal mining industry. The study reviews how the implementation of advanced digital systems—such as real-time monitoring, communication networks, and automated control technologies—contributes to minimizing occupational hazards and improving safety outcomes. The authors emphasize that IT integration enables early detection of

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dangerous conditions, improves emergency response efficiency, and supports data-driven decision-making in high-risk mining environments.

This study by **Senapati, Bhattacherjee & Chau (2019)** investigates the associations between job-related hazards, personal characteristics, and the risk of occupational injuries among workers at continuous miner worksites in underground coal mines in India. Utilizing a matched case-control design, the research compares injured workers (cases) with non-injured counterparts (controls) based on variables such as work environment, safety practices, shift schedules, and individual factors like age, experience, education, alcohol use, and risk-taking behavior. The findings reveal that inadequate lighting, poor roof conditions, irregular safety inspections, and longer work experience were significantly associated with higher injury risk.

Research Gap

Although several studies have examined the relationship between mental health, behavioral factors, workplace safety and employee performance in high-risk industries, there is limited empirical evidence focused on the coal mining sector in India, particularly within SECL. Existing research mainly emphasizes physical hazards, technical safety measures and operational risks, while psychological and behavioral dimensions of safety have not been investigated. Very few studies have analyzed how stress, fatigue, anxiety and risk-taking behavior together affect safety compliance, accident rates and job performance in mining environments. Furthermore, there is a lack of integrated models linking mental well-being, behavioral patterns and safety outcomes in public coal enterprises. This gap highlights the need for focused research in SECL to understand these interdependencies and design comprehensive mental health and behavioral safety interventions to improve workforce safety and performance.

OBJECTIVE

To know the effect of mental health factors on safety and employee performance.

Research Methodology

This study has been designed to examine the relationship between employee-related factors—such as mental health, workplace safety, performance, and productivity—within the organizational context of South Eastern Coalfields Limited (SECL). To achieve this, clear and measurable research objectives were formulated to guide the study's direction and ensure relevance to the core issues of employee welfare and organizational efficiency. A structured questionnaire comprising 15 statements was developed to gather primary data from 515 employees of SECL along with demographics and general statements. The reliability of the instrument was validated using Cronbach's Alpha, which produced a high reliability coefficient of 0.901, indicating strong internal consistency of the responses.

For analysis, both descriptive and inferential statistical methods were employed. Descriptive statistics summarized the demographic characteristics and response patterns, while inferential tools such as correlation, regression were applied to test hypotheses and determine the significance of observed relationships. Secondary data refers to information that has already been collected, processed, and published by other researchers, institutions, or organizations.

RESULTS

H_{01}: Mental health factors of employees do not have a significant effect on workplace safety in SECL.
H_{11}: Mental health factors of employees have a significant effect on workplace safety in SECL

Table 1: Model Summary[b] on Mental health factors of employees and workplace safety

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.519[a]	.269	.267	2.25949	.269	188.659	1	513	.000
a. Predictors: (Constant), Mental Health									
b. Dependent Variable: Workplace Safety									

The model summary shows that the correlation coefficient (R = 0.519) suggests a meaningful positive association between employees' mental health and workplace safety. The R^2 value of 0.269 implies that approximately 26.9% of the variation in workplace safety can be explained by mental health factors of employees. The F-value (F = 188.659, $p < 0.001$) confirms that the regression model is statistically significant.

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This means that employees' mental well-being, emotional stability, and reduced stress levels significantly contribute to improving workplace safety in SECL. Hence, the null hypothesis is rejected, and the alternative hypothesis is accepted — indicating that mental health factors have a significant positive effect on workplace safety.

Table 2: Coefficients[a] on Mental health factors of employees and workplace safety

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	9.433	.935		10.086	.000	7.595	11.270
	Mental Health	.591	.043	.519	13.735	.000	.507	.676
a. Dependent Variable: Workplace Safety								

The regression coefficients table for the relationship between mental health factors of employees and workplace safety in SECL provides meaningful insights into how employees' psychological well-being influences safety practices and perceptions within the organization. The unstandardized coefficient (B) for mental health is 0.591, indicating that for every one-unit increase in employees' mental health score, the workplace safety score increases by 0.591 units, assuming all other factors remain constant. This positive relationship suggests that employees with better mental and emotional well-being tend to perceive higher levels of safety or contribute to a safer work environment. The t-value (13.735) and significance level ($p = 0.000$) confirm that the relationship is statistically significant at the 1% level. This means the influence of mental health on workplace safety is not due to random variation but reflects a genuine effect within the SECL workforce.

H_{02}: Mental health factors of employees do not have a significant effect on Employee Performance in SECL.
H_{12}: Mental health factors of employees have a significant effect on Employee Performance in SECL.

Table 3: Model Summary[b] on Mental health factors of employees and Employee Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.429[a]	.184	.182	1.71606	.184	115.430	1	513	.000
a. Predictors: (Constant), Mental Health									
b. Dependent Variable: Employee Performance									

The model summary indicates that the correlation coefficient ($R = 0.429$) reflects a moderate positive association between employees' mental health and their performance levels. The R^2 value of 0.184 suggests that 18.4% of the variation in employee performance can be explained by mental health factors. The F-value ($F = 115.430$, $p < 0.001$) confirms that the model is statistically significant.

This finding implies that employees who experience better mental health—such as emotional stability, reduced stress, and organizational support—tend to perform better in their work. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted, indicating that mental health factors have a significant positive effect on employee performance in SECL.

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Table 4: Coefficients[a] on Mental health factors of employees and Employee Performance								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	14.926	.710		21.013	.000	13.531	16.322
	Mental Health	.351	.033	.429	10.744	.000	.287	.416
a. Dependent Variable: Employee Performance								

The regression coefficients table examining the relationship between mental health factors of employees and employee performance in SECL reveals a strong and statistically significant positive association. The unstandardized coefficient (B = 0.351) indicates that for every one-unit increase in employees' mental health score, their performance level is expected to increase by 0.351 units, holding other variables constant. This suggests that employees with better mental and emotional well-being tend to demonstrate higher efficiency, focus, and output in their work. This finding highlights that mental health is a key determinant of job performance among SECL employees. Workers with better emotional stability, lower stress levels, and psychological balance are likely to perform their duties more effectively, maintain focus, and contribute positively to organizational goals. Therefore, SECL's efforts toward promoting mental health support systems, such as stress management programs, mental wellness workshops, and counseling services, can significantly enhance overall productivity and job satisfaction.

CONCLUSION

The study concludes that mental health factors play a crucial role in shaping workplace safety and employee performance in SECL's high-risk mining environment. Stress, fatigue, anxiety and emotional stress negatively affect workers' concentration, alertness and ability to make decisions, and increase the likelihood of unsafe practices and occupational accidents. In contrast, employees with stable mental health show higher safety compliance, fewer errors and better work efficiency. The findings highlight that mental health is not just an individual problem, but an important organizational priority that is directly linked to productivity, operational safety and accident prevention. Strengthening psychological support systems, promoting stress management practices and fostering a supportive work culture can significantly improve both safety outcomes and employee performance in SECLs. Therefore, it is important to integrate mental health measures into SECL's occupational safety framework to ensure a healthier, safer and more productive workforce.

Recommendations

1. Conduct regular mental health screenings to identify stress, fatigue and anxiety among workers.
2. Initiate counseling and the Employee Assistance Program (EAP) to provide professional psychological support.
3. Carry out stress management and resilience building training for employees who work in high-risk mining areas.
4. Foster a supportive work culture that encourages open communication, teamwork and reporting of safety issues.
5. Ensure sufficient rest periods and workload regulation to reduce the risk of fatigue.
6. Strengthen behavioral safety training focused on risk perception, compliance and safe decision-making.
7. Increase supervisory support and management involvement to monitor worker well-being and ensure safety compliance.
8. Integrate mental health guidelines into security protocols and make psychological well-being part of SECL's core security strategy.

Scope of the Study

1. The study focuses on SECL employees employed in underground mines, open pits and administrative units.
2. It covers mental health factors such as stress, anxiety, burnout and emotional well-being.
3. It assesses behavioral factors, including risk behaviour, compliance with safety rules, communication and teamwork.
4. Workplace safety indicators include accident rates, near misses and compliance with safety guidelines.
5. Employee performance parameters include productivity, job quality, alertness, absenteeism and teamwork.

Limitations of the Study

1. Employees may hesitate to disclose mental health problems due to stigma.

2. Self-reported data may contain biases or under-reporting.
3. The study is limited to SECL and cannot be generalized to other mining organizations.
4. Environmental and external factors (family problems, external stress) can influence reactions.
5. Time constraints may limit detailed observation of long-term behavioral patterns.

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