

The Impact of Occupational Health and Safety of Human Capital on Improving Job Performance: A Case Study of the Bouira Cement Company (GICA Group), Algeria.

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Abstract

Given the growing importance of protecting human resources as a cornerstone of organizational performance, this study aims to determine the impact of human capital-oriented occupational health and safety (OHS) practices on enhancing job performance levels at the Algerian Cement Company. To achieve this objective, a descriptive-analytical approach combined with a case study design was adopted. Data were gathered through field observation, direct interviews, and a structured questionnaire distributed to a representative sample determined by the Stephen Thompson formula, resulting in a final sample of 180 valid responses analyzed via SPSS (V22). The empirical findings indicate that OHS standards are effectively implemented within the enterprise, alongside high levels of employee performance. Furthermore, statistical analysis reveals a significant positive impact of OHS dimensions on improving job performance at a significance level of $\alpha \leq 0.05$. The study concludes that continuous investment in securing both the physical and psychological work environment is not merely an operational cost, but rather an imperative strategic mechanism to foster sustainable job performance and boost labor productivity within the Algerian industrial sector.

Keywords: occupational health and safety, human capital, job performance, Algerian Cement Company.

1. Introduction

The contemporary business environment has undergone a radical shift in its view of human resources, which are no longer regarded merely as a factor of production but as intellectual and strategic capital upon which an organization's competitiveness and sustainability depend. In light of this shift, occupational health and safety has emerged as a fundamental pillar for protecting and developing this capital, defined as the set of procedures and regulations designed to preserve workers' physical and psychological well-being and protect them from workplace hazards. This concept is closely linked to job performance, which reflects individuals' outputs and behaviors in achieving organizational goals efficiently and effectively. The importance of this interconnection is amplified in the heavy industry sector, specifically in cement manufacturing facilities, given the complex nature of their operations and the serious environmental and health risks they entail, such as dust emissions, high temperatures, and the handling of heavy machinery and hazardous chemicals, making the implementation of safety measures essential.

Research Problem:

The research problem centers on a gap in knowledge and practice regarding the extent to which cement industry institutions recognize and adopt comprehensive occupational safety and health dimensions, as well as the lack of a precise definition of the causal relationship between these dimensions and the job performance of their employees; There is a noticeable disparity in levels of environmental and preventive compliance, which may directly affect the stability of the work environment and the operational efficiency of human capital. Accordingly, the primary objective of this research is to measure and determine the impact of occupational health and safety dimensions on improving job performance in the cement industry. This objective gives rise to

a central question: What is the impact of implementing occupational health and safety dimensions for human capital (senior management commitment, training and awareness, employee health care, employee responsibilities, machinery and equipment safety, and quality of environmental conditions) on improving job performance at a cement company?

Research Questions:

The following research questions fall under this main question:

- What is the current status of occupational health and safety practices at the cement company?
- What is the level of job performance at the cement company?
- 3.What is the impact of each dimension of occupational health and safety on improving job performance at the cement company?

Significance of the Study :

The significance of this study stems from its contribution of original research through an integrated model that measures the impact of occupational health and safety measures on production outputs in developing industrial environments. Its scientific value lies in analyzing and measuring the impact of both worker-related risk prevention measures and work-environment-related risk prevention measures on improving job performance and reducing waste, thereby providing empirical evidence that preventive investment in human capital is the primary driver of operational excellence. In practical terms, this importance is further underscored by addressing the urgent need of the cement company (the subject of this study) to reduce accidents that are costly both in human and economic terms, by providing practical indicators that ensure the creation of a safe and motivating work environment that improves employee performance.

Research Hypotheses:

As a preliminary response to the research problem and research questions, we propose the following main hypothesis:

"There is no statistically significant impact of occupational health and safety on human capital's impact on improving job performance in a cement company at a significance level of $\alpha \leq 0.05$."

The following sub-hypotheses stem from this main hypothesis:

Sub-hypothesis 1: There is no statistically significant impact of senior management commitment on improving job performance at a significance level of $\alpha \leq 0.05$.

Sub-hypothesis 2: There is no statistically significant impact of training and awareness on improving job performance at a significance level of $\alpha \leq 0.05$.

Sub-hypothesis 3 : There is no statistically significant impact of employee health care on the improvement of job performance at a significance level of $\alpha \leq 0.05$.

Sub-hypothesis 4: There is no statistically significant impact of employee responsibilities on the improvement of job performance at a significance level of $\alpha \leq 0.05$.

Sub-Hypothesis 5: There is no statistically significant impact of the safety of machinery and equipment on improving job performance at a significance level of $\alpha \leq 0.05$.

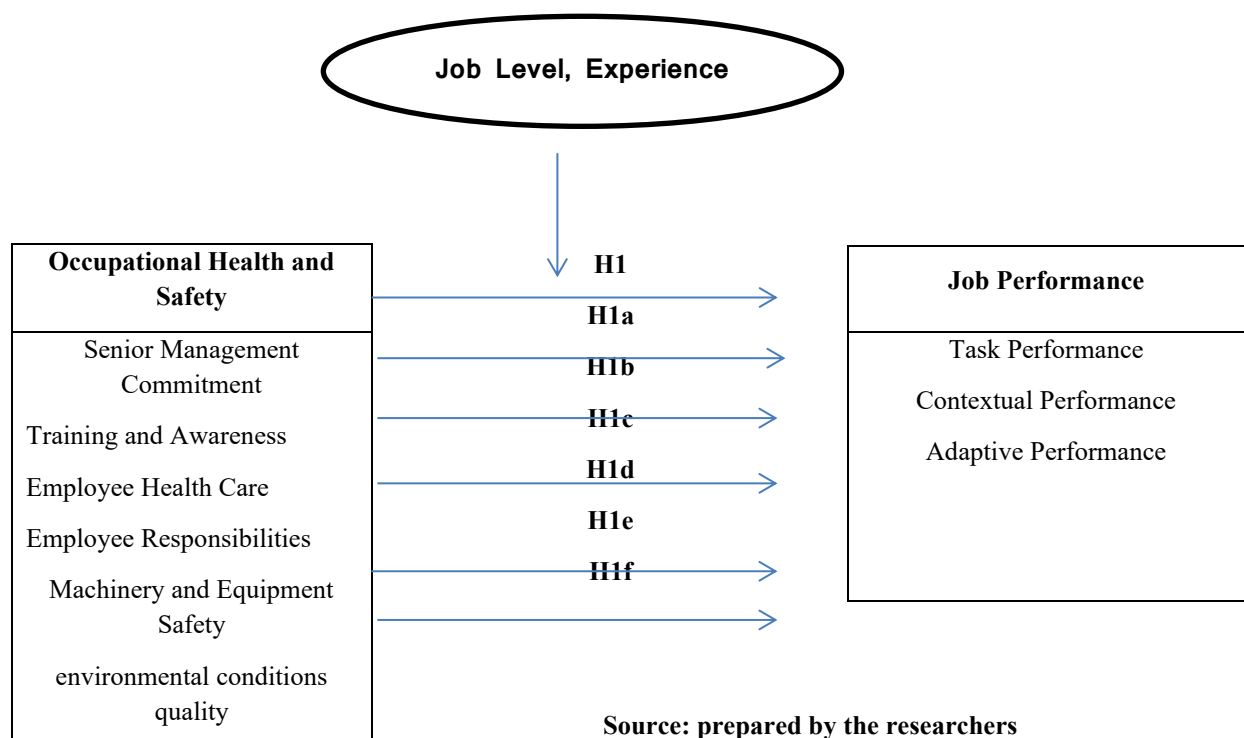
Sub-Hypothesis 6: There is no statistically significant impact of the quality of working conditions on improving job performance at a significance level of $\alpha \leq 0.05$.

2. Objectives: This study sought to achieve the following objectives:

- To identify the most prominent occupational health and safety practices at the Cement Corporation.
- To present the level of job performance at the Cement Company.
- To examine the impact of occupational health and safety on human capital and its role in improving job performance at the Cement Company.

The study employs a descriptive approach to establish its theoretical framework and a case study approach for its applied component at the Algerian Cement Company, targeting a total population of 341 workers (211 managers, 122 supervisory staff, and 8 operational staff). To ensure comprehensiveness and diversity of data sources, field observations and face-to-face interviews were combined to directly assess working conditions, with a questionnaire serving as the primary quantitative tool. The representative sample size was determined based on Steven Thompson's formula . Accordingly, 200 questionnaires were distributed, of which 14 were missing and 6 were invalid, resulting in a net sample of 180 responses for analysis. The data were statistically analyzed to test the hypotheses of the study model using SPSS V22.

Figure 1. Study Model



Source: prepared by the researchers

4. Literature Review

The Concept of Occupational Health and Safety: Occupational health refers to the relationship between work and health and focuses primarily on achieving three objectives: the first is to maintain and enhance workers' health and their ability to work; the second is to improve the work environment so that it is conducive to ensuring the health and safety of workers; and finally, to develop organizations in a way that supports occupational health and safety and fosters positive social interactions by improving productivity. (Suparna & Jaiswal, 2021, p. 263) Some view occupational health and safety as the protection of individuals' physical and mental health from illnesses and injuries resulting from work processes, procedures, or materials .(Hughes & Ferrett, 2016, pp. 2-3) On the other hand, in 2001, the European Network for the Promotion of Health at Work defined occupational health and safety as the joint efforts of employers, workers, and society to improve the health and well-being of individuals at work; this can be achieved by combining improvements to the work environment with the promotion of active participation and the encouragement of personal development. (Muller & Mairiaux, 2008, p. 162)

Measures to Prevent Occupational Hazards and Injuries: Preventing occupational injuries and hazards involves identifying the causes that lead to them in order to manage and control them, thereby reducing the resulting risks. Among these causes are those related to working conditions and human factors related to the worker himself. Accordingly, the measures are divided into the following: (Al-Araqi, , 2012, pp. 188-190)

Measures to Prevent Risks Associated with the Worker: These measures include the following:

- **Careful selection and hiring of employees:** This is achieved through the following: conducting psychological tests to ensure the psychological balance and stability of employees; measuring the muscular coordination required for certain jobs; testing employees' visual acuity; and conducting comprehensive medical examinations.
- **Awareness campaigns:** These include the following: educational seminars; posters addressing occupational safety.
- **Training:** This refers to training related to occupational safety that leads to a reduction in accidents, especially among new workers.
- **Creating a positive culture of risk avoidance:** Good occupational safety programs foster a positive culture among workers toward avoiding the risks that cause many workplace accidents and injuries.
- **Senior management's commitment to occupational safety:** This commitment refers to senior management's regular involvement in occupational safety-related activities and prioritizing occupational safety in their meetings with specialists, as well as focusing on training new employees and granting occupational safety specialists the authority and senior management positions that enable them to perform their duties impactively.
- **Employee Responsibilities:** Employees have specific responsibilities under the International Labor Organization (ILO), including: complying with instructions and adhering to occupational health and safety procedures; reporting any accident or health-related injury that occurs during work; and using and maintaining safety devices and protective equipment properly. (Ferrett, 2022, p. 12)

Measures to Avoid Risks Associated with Working Conditions: There are a number of measures that must be followed to prevent risks and workplace injuries, which can be summarized as follows:

- **Work Site and Construction:** The organization must select a work site appropriate for the nature of the activity to be performed. The workplace must be laid out according to the sequence of production processes, with adequate spacing between machines to allow for easy movement and prevent collisions among workers. Work areas must also be fenced off, and the organization must provide various means of communication and safety equipment.
- **Machinery and Equipment:** Care must be taken to maintain machinery, install guards in front of it, and cover its sharp parts. Additionally, warning signs must be placed on electrical generators, electrical wires must be insulated, and only qualified personnel should be allowed to operate the machinery.
- **Materials Used:** This includes refraining from using materials prohibited by law and isolating hazardous materials in designated areas.
- **environmental conditions quality:** In accordance with labor laws, organizations are required to provide appropriate working conditions that ensure the comfort of workers and protect them from work-related injuries and illnesses. This is achieved by controlling various factors, such as regulating temperature, lighting, and ventilation—ensuring air renewal through the installation of air purifiers—controlling noise by soundproofing noisy machinery with sound-insulating materials, and preventing pollution by providing extraction systems for various types of waste.

The Concept of Human Capital : Credit for establishing the theoretical foundations of this concept goes to pioneers in managerial economics such as Becker and Schultz; according to this classical theory, human capital is defined as: the sum of the qualifications, abilities, and competencies accumulated by workers, in addition to their intrinsic motivation to use and apply these qualifications in the workplace. (Mier, 2014, p. 113) With the evolution of managerial and economic thought, this concept has expanded to take on an international institutional character; the Organization for Economic Cooperation and Development (OECD) defines it as: the set of knowledge, skills, competencies, and other attributes of an individual that enhance personal, social, and economic well-being (Brian, 2007, p. 30). This well-being is reflected operationally within industrial organizations, where human capital is viewed as the largest and most important intangible asset an organization

possesses, encompassing collective knowledge, accumulated experience, and innovative capabilities that enable it to solve complex problems and meet customer expectations. (Ahanger, 2011, p. 89) Furthermore, the human capital approach views health and prevention as an investment to increase productive capacity and profits, and evaluates them based on the lost wages that a worker would have received had he or she remained alive and in good health. (Antonopoulou & Targoutzidis, 2010, p. 28)

The concept of job performance : Performance: a multifaceted concept Etymologically, the word 'performance' derives from the Old French 'parformer', which, in the 13th century, meant 'to accomplish, to carry out' (Petit Robert). In the 15th century, it appeared in English as 'to perform', from which the word 'performance' is derived. It refers both to the completion of a process or a task, along with the resulting outcomes, and to the success that may be attributed to it. (Pesqueus, 2004, p. 6) In technical terms, job performance refers to an individual's success in carrying out their duties over a specific period of time, whilst adhering to pre-defined standards for work outputs and objectives. (Hartin Nst & and others, 2023, p. 129)

Based on the above definitions, it can be said that job performance is the approach taken by employees in utilising available resources and channelling them towards achieving the objectives set by the organisation.

Dimensions of Job Performance: The most important dimensions of job performance are as follows:

- **task performance:** was identified as a critical feature of job performance in all circumstances. The fulfillment of the requirements that are part of the employer/employee contract is referred to as task performance. It has a direct connection to the technical core of the organization either by technical processes or through the servicing and maintenance of its technical requirements. Hence, Greenslade and Jimmieson (2007) mention that provision of support, technical care, provision of information, and coordination of care are all components of task performance. (Qaralleh & and others, 2023, p. 6)

- **Contextual performance :** Borman and Motowidlo (1993) defined CP as an individual's performance, which maintain and enhances an organization's social network and the psychological climate that supports technical tasks. Furthermore, they explained that CP includes activities that may not represent formal work tasks although they still make an important contribution to the impactiveness of an organization. This type of performance is often not written in a job description but it is considered to be an important component of Job Performance. (Kappagoda Sampath, 2012, p. 4)

- **Adaptive Performance:** The concept of adaptive performance is defined in general terms as an individual's ability to adapt to dynamic work situations. Employees demonstrate adaptive performance by adjusting their behaviours to the requirements of work situations and new events. Including: dealing with uncertain or unpredictable work situations, handling emergencies or crisis situations, solving problems creatively, handling work stress, learning new tasks, technologies and procedures, demonstrating interpersonal adaptability, demonstrating cultural adapt-ability, and demonstrating physically oriented adaptability. (Charbonnier-Voirin & Roussel, 2012)

5. Empirical Study

Reliability Test Using Cronbach's Alpha Coefficient

Table 1. Cronbach's Alpha Coefficients for the Study Instrument Reliability

	Number of Items	Reliability Coefficient (α)
Occupational Health and Safety	30	0.887
Job Performance	17	0.800
Overall Questionnaire Reliability	47	0.900

Source: Prepared by the authors based on SPSS (v.22) outputs.

As indicated in Table 1, the overall reliability coefficient of the questionnaire is remarkably high, reaching 0.900 for the total of 47 items. This value significantly exceeds the universally accepted threshold of 0.70. Furthermore, the reliability coefficients for the individual dimensions ranged between a minimum of 0.800 and a maximum of 0.887. These results demonstrate that the questionnaire possesses a very high degree of internal consistency and reliability, confirming its suitability for field application and subsequent empirical analysis.

Normality Testing : The assessment of normality is based on two fundamental hypotheses:

- **Null hypothesis (H0):** The data follow a normal distribution if the significance level (sig) is greater than 0.05.
- **Alternative hypothesis (H1):** The data do not follow a normal distribution if the significance level (sig) is less than 0.05.

Table 2. Normality Test for the study variables

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Occupational Health and Safety	0.045	180	0.197	0.994	180	0.135
Job Performance	0.041	180	0.200	0.997	180	0.978

Source: Prepared by the authors based on SPSS (v.22) outputs.

As demonstrated in the table, the Kolmogorov-Smirnov statistic for the Occupational Health and Safety variable is 0.045, with a statistical significance level (Sig.) of 0.197, which is greater than 0.05. Similarly, the Shapiro-Wilk statistic reached 0.994, with a significance level (Sig.) of 0.135, also exceeding the 0.05 threshold. Consequently, we accept the null hypothesis, indicating that the data for the independent variable follow a normal distribution. According to the table, the Kolmogorov-Smirnov statistic for the Job Performance variable is 0.041, with an associated significance level (Sig.) of 0.200, which is greater than 0.05. Furthermore, the Shapiro-Wilk value is 0.997, with a significance level (Sig.) of 0.978, which is also higher than the 0.05 significance threshold. Therefore, the null hypothesis is accepted, confirming that the dependent variable's data follow a normal distribution. Based on these findings, the empirical data of the study are normally distributed. This justifies the appropriateness of utilizing parametric statistical tests to address the study's questions and test its hypotheses.

Construct Validity

Table 3. Construct Validity for the Occupational Health and Safety Variable

Main Variable	Dimensions	Pearson Correlation (r)	Significance (p)
Occupational Health and Safety	Top Management Commitment	0.704	< 0.001
	Training and Awareness	0.662	< 0.001
	Healthcare	0.784	< 0.001
	Employees' Responsibilities	0.733	< 0.001
	Machinery and Equipment Safety	0.735	< 0.001
	Environmental Conditions	0.641	< 0.001

Source: Prepared by the authors based on SPSS (v.22) outputs.

The empirical results in Table indicate that all correlation coefficients are statistically significant at the 0.05 level, with values ranging from 0.641 to 0.784. These findings demonstrate a strong, positive, and statistically

significant correlation between the sub-dimensions and the overarching Occupational Health and Safety variable, thereby confirming the construct validity of the scale.

Table 4. Construct Validity for the Job Performance Variable

Main Variable	Dimensions	Pearson Correlation	Significance (p)
Job Performance	Task Performance	0.863	< 0.001
	Contextual Performance	0.845	< 0.001
	Adaptive Performance	0.829	< 0.001

Source: Prepared by the authors based on SPSS (v.22) outputs.

Similarly, Table shows that the correlation coefficients for the Job Performance dimensions (Task, Contextual, and Adaptive Performance) are highly significant ($p < 0.001$), ranging between 0.829 and 0.863. This strong positive inter-correlation verifies that the dimensions consistently align with the core construct of Job Performance, ensuring that the instrument impactively measures the phenomena it was originally designed to assess.

Sample Characteristics

Sample Distribution by Job Level

Table 5. Sample Distribution by Job Level

Job Level	Frequency (f)	Percentage (%)
Operational Staff	8	4.4%
Support & Technical Staff	41	22.8%
Middle Management / Professionals	120	66.7%
Senior Management / Executives	11	6.1%
Total	180	100.0%

Source: Prepared by the authors based on SPSS (v.22) outputs.

As indicated in Table 05 the vast majority of the respondents belong to the middle management/professional category, accounting for 66.7% of the total sample. This is followed by support and technical staff at 22.8%, senior management/executives at 6.1%, and finally, operational staff at 4.4%. This comprehensive distribution demonstrates that the sample encompasses all administrative and operational levels within the organization, which enhances the accuracy, reliability, and generalizability of the gathered data. Furthermore, this demographic breakdown reveals that a substantial majority of the participants hold supervisory, administrative, or professional roles. Given their organizational positions, these individuals possess a deep and thorough understanding of institutional policies and procedures, particularly regarding occupational health and safety (OHS). Their insights are crucial for evaluating top management commitment to fostering a safe work environment, supporting safety initiatives, and monitoring compliance, which ultimately reflects on the enhancement of overall job performance within the enterprise.

Sample Distribution by Work Experience

Table 6. Sample Distribution by Work Experience

Work Experience	Frequency (f)	Percentage (%)
Less than 5 years	3	1.7%

5 to 10 years	36	20.0%
More than 10 years	141	78.3%
Total	180	100.0%

Source: Prepared by the authors based on SPSS (v.22) outputs.

As demonstrated in Table 6, the respondents' professional tenure exhibits varying degrees of experience across three distinct categories. Notably, the vast majority of the workforce possesses extensive experience exceeding 10 years, representing 78.3% of the total sample. This is followed by participants with 5 to 10 years of experience at 20.0%, while the remaining 1.7% represents those with less than 5 years of tenure. This distribution indicates that the cement factory under study possesses a rich repository of accumulated institutional expertise. Such a high concentration of seasoned professionals is highly likely to foster a stronger commitment to occupational health and safety (OHS) protocols and risk prevention measures. Furthermore, accumulated tenure within a heavy industry environment typically contributes to mitigating operational errors and minimizing workplace accidents, which ultimately serves as a catalyst for enhancing overall job performance.

Descriptive Analysis of Study Results

Descriptive Statistics for the Occupational Health and Safety (OHS) Construct

Table 7. Descriptive Statistics for the Occupational Health and Safety Construct

Dimension	Mean (M)	Std. Deviation (SD)	Trend	Rank
Top Management Commitment	4.13	0.270	Agree	4
Training, Awareness	4.08	0.237	Agree	6
Employees' Healthcare	4.13	0.316	Agree	5
Employees' Responsibilities	4.23	0.303	Strongly Agree	2
Machinery and Material Safety	4.35	0.350	Strongly Agree	1
Quality of Environmental Conditions	4.14	0.285	Agree	3
Overall Occupational Health and Safety	4.18	0.210	Agree	-

Source: Prepared by the authors based on SPSS (v.22) outputs.

The descriptive statistics presented in Table 7 reveal a high level of consensus among the respondents regarding the implementation of occupational health and safety measures within the organization. Individually, the dimension "Machinery and Material Safety" ranked first, yielding the highest agreement level ($M = 4.35$, $SD = 0.350$) with a "Strongly Agree" trend. This was followed closely by "Employees' Responsibilities" in the second position ($M = 4.23$, $SD = 0.303$), also reflecting a "Strongly Agree" response pattern. Conversely, while all dimensions fell within positive evaluation intervals, "Training, Awareness, and Safety Culture" captured the final rank, albeit still maintaining a favorable score ($M = 4.08$, $SD = 0.237$) with an "Agree" trend.

Cumulatively, the overarching construct of Occupational Health and Safety registered an overall mean of 4.18 and a standard deviation of 0.210, corresponding to a general trend of "Agree". This solid statistical baseline demonstrates that the surveyed workforce shares a strong institutional alignment regarding the presence of well-defined, transparent, and structured OHS policies tailored to mitigate workplace hazards and reinforce operational compliance within the enterprise.

Descriptive Statistics for the Job Performance Construct

Table 8. Descriptive Statistics for the Job Performance Construct

Dimension	Mean (M)	Std. Deviation (SD)	Trend	Rank
Task Performance	4.12	0.309	Agree	2
Contextual Performance	4.12	0.275	Agree	3
Adaptive Performance	4.17	0.248	Agree	1
Overall Job Performance	4.18	0.210	Agree	-

Source: Prepared by the authors based on SPSS (v.22) outputs.

The empirical data in Table 8 demonstrate a substantial consensus among the respondents regarding the presence of high job performance standards within the organization. At the dimensional level, "Adaptive Performance" emerged in the first position, yielding the highest agreement level ($M = 4.17$, $SD = 0.248$) with an "Agree" trend. Conversely, "Task Performance" and "Contextual Performance" shared identical mean scores ($M = 4.12$), ranking second ($SD = 0.309$) and third ($SD = 0.275$) respectively, while both maintained a favorable "Agree" response pattern. Cumulatively, the overarching construct of Job Performance captured an overall mean score of 4.13 with a standard deviation of 0.210, falling under the "Agree" evaluation threshold. This high statistical baseline indicates a strong unanimous agreement within the targeted sample regarding the manifestation of superior job performance levels at cement factory in, Algeria. This outcome strongly implies that the workforce maintains a resilient and adaptive operational capability, which serves as a critical asset for sustaining organizational productivity and efficiency.

Testing the Main Hypothesis: The main hypothesis states that "there is no statistically significant impact of occupational health and safety of human capital on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$). To test this hypothesis, the following statistical hypotheses were formulated:

- **H0:** There is no statistically significant impact of occupational health and safety of human capital on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$).
- **H1:** There is a statistically significant impact of occupational health and safety of human capital on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$).

This hypothesis was tested using Simple Linear Regression analysis. The null hypothesis (H0) is rejected if the significance level (p-value) is less than or equal to 0.05, and accepted if the significance level is greater than 0.05.

Table 9. Simple Linear Regression Results for the Impact of Occupational Health and Safety of Human Capital on Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Occupational Health & Safety	Job Performance	0.569	0.324	1.758	0.569	85.316	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

As illustrated in Table 9, the correlation coefficient (R) reached 0.569, indicating a moderate positive correlation between occupational health and safety and job performance. Furthermore, the coefficient of determination (R²) was 0.324, which demonstrates that 32.4% of the variance in job performance is explained by occupational health and safety practices. The remaining percentage is attributed to other variables not captured in the current research model. Regarding the regression coefficient (sloped factor), it reached 0.569, implying that a single-unit increase in occupational health and safety leads to a 0.569 increase in job performance. Finally, the calculated F-statistic indicates the high significance of the overall model, recording a value of 85.316 with a

significance level (Sig.) of 0.000, which is strictly below the designated threshold ($\alpha=0.05$). Consequently, these empirical findings provide sufficient evidence to reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). Thus, there is a statistically significant impact of occupational health and safety of human capital on improving job performance at the $\alpha \leq 0.05$ level.

Testing the Sub-Hypotheses

Testing the First Sub-Hypothesis: There is no statistically significant impact of top management commitment on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$).

Table 10. Simple Linear Regression Results for the Impact of Top Management Commitment on Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Top Management Commitment	Job Performance	0.361	0.130	2.977	0.280	26.628	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

The empirical results presented in Table 10 indicate that the correlation coefficient (R) equals 0.361, which reveals a weak positive correlation between top management commitment and job performance. Additionally, the coefficient of determination (R²) is 0.130, demonstrating that 13.0% of the variance in job performance is accounted for by top management commitment, whereas the remaining 87.0% of the variance is explained by other external variables not included in this model. The regression coefficient (β) was found to be 0.280. This implies that for every single-unit increase in top management commitment, job performance is expected to increase by 0.280 units. Furthermore, the overall model fit is statistically significant, as evidenced by the calculated F-statistic of 26.628 with an associated significance level (Sig.) of 0.000, which is substantially lower than the alpha level of 0.05. Consequently, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. It can be confidently concluded that there is a statistically significant impact of top management commitment on improving job performance at the $\alpha \leq 0.05$ level.

Testing the Second Sub-Hypothesis: There is no statistically significant impact of training and awareness on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$).

Table 11. Simple Linear Regression Results for the Impact of Training and Awareness on Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Training and Awareness	Job Performance	0.394	0.155	2.716	0.348	32.728	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

The empirical data in Table 11 indicate that the correlation coefficient (R) stands at 0.394, which reflects a weak positive correlation between training and awareness and job performance. Moreover, the coefficient of determination (R²) is 0.155, denoting that 15.5% of the variance in job performance is explicitly explained by training and awareness practices, while the remaining 84.5% of the variance is due to other explanatory factors not included in the model. The regression coefficient (β) reached 0.348, indicating that a single-unit increase in training and awareness yields a 0.348 increase in job performance. Furthermore, the overall model's predictive power is highly significant, with an F-statistic of 32.728 and a significance level (Sig.) of 0.000, which is well

below the standard statistical threshold ($\alpha=0.05$). Consequently, these empirical findings justify the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1). Therefore, it can be concluded that there is a statistically significant impact of training and awareness on improving job performance at the $\alpha \leq 0.05$ level.

Testing the Third Sub-Hypothesis: There is no statistically significant impact of employee healthcare on improving job performance in the cement company at the significance level ($\alpha \leq 0.05$).

Table 12. Simple Linear Regression Results for the Impact of Employee Healthcare on Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Employee Healthcare	Job Performance	0.385	0.148	3.080	0.255	30.932	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

The empirical evidence compiled in Table 12 reveals that the correlation coefficient (R) stands at 0.385, indicating a weak positive correlation between employee healthcare and job performance. Furthermore, the coefficient of determination (R²) is 0.148, demonstrating that 14.8% of the total variance in job performance is explicitly accounted for by the provision of employee healthcare. Consequently, the remaining 85.2% of the variance is explained by other exogenous variables not embedded within the scope of this model. The regression coefficient (β) was calculated at 0.255, which means that a single-unit increase in employee healthcare practices leads to a proportional increase of 0.255 units in job performance. In terms of overall model significance, the computed F-statistic reached 30.932 with a corresponding significance level (Sig.) of 0.000. Since this value is strictly below the standard significance threshold ($\alpha=0.05$), the model demonstrates robust explanatory power. Therefore, these statistical findings provide empirical grounds to reject the null hypothesis (H_0) and accept the alternative hypothesis (H_1). It can be established with statistical confidence that there is a significant impact of employee healthcare on improving job performance at the $\alpha \leq 0.05$ level.

Fourth Sub-Hypothesis: there is no statistically significant impact of employee responsibilities on enhancing job performance within the cement enterprise at the $\alpha \leq 0.05$ significance level.

Table 13. Simple Linear Regression Analysis for the Impact of Employee Responsibilities on Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Employee Responsibilities	Job Performance	0.369	0.136	3.052	0.256	28.137	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

As detailed in Table 13, the correlation coefficient (R) stands at 0.369, indicating a weak yet positive correlation between employee responsibilities and job performance. The coefficient of determination (R²) is 0.136, implying that employee responsibilities account for 13.6% of the variance observed in job performance, while the remaining 86.4% is attributable to other exogenous variables omitted from this model. Furthermore, the unstandardized regression coefficient (Beta) is 0.256, demonstrating that a single-unit increase in employee responsibilities yields a corresponding increase of 0.256 units in job performance. The statistical significance of the model is validated by the calculated F-statistic of 28.137, with an associated p-value (Sig.) of 0.000. Given that the p-value falls well below the designated significance threshold (0.05), the null hypothesis is rejected in favor of the alternative hypothesis. Consequently, it is empirically established that employee responsibilities

exert a statistically significant positive impact on enhancing job performance within the investigated cement enterprise at the 0.05 level.

Fifth Sub-Hypothesis: there is no statistically significant impact of machinery and equipment safety on enhancing job performance within the cement enterprise at the $\alpha \leq 0.05$ significance level.

Table 14. Simple Linear Regression Analysis for Machinery and Equipment Safety Predicting Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Machinery & Equipment Safety	Job Performance	0.364	0.133	3.186	0.218	27.235	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

As detailed in Table 14, the correlation coefficient (R) stands at 0.364, indicating a weak yet positive correlation between machinery and equipment safety and job performance. The coefficient of determination (R²) is 0.133, implying that machinery and equipment safety accounts for 13.3% of the variance observed in job performance, while the remaining 86.7% is attributable to other exogenous variables omitted from this model. Furthermore, the unstandardized regression coefficient (B) is 0.218, demonstrating that a single-unit increase in machinery and equipment safety yields a corresponding increase of 0.218 units in job performance. The statistical significance of the model is validated by the calculated F-statistic of 27.235, with an associated p-value (Sig.) of 0.000. Given that the p-value falls well below the designated significance threshold ($\alpha \leq 0.05$), the null hypothesis is rejected in favor of the alternative hypothesis. Consequently, it is empirically established that machinery and equipment safety exerts a statistically significant positive impact on enhancing job performance within the investigated cement enterprise at the 0.05 level.

Sixth Sub-Hypothesis: there is no statistically significant impact of environmental conditions quality on enhancing job performance within the cement enterprise at the $\alpha \leq 0.05$ significance level.

Table 15. Simple Linear Regression Analysis for Environmental Conditions Quality Predicting Job Performance

Independent Variable	Dependent Variable	Correlation Coefficient (R)	Coefficient of Determination (R ²)	Constant value b	Regression Coefficient (β)	F-Value	Sig. (p-value)
Environmental Conditions Quality	Job Performance	0.575	0.330	2.386	0.422	87.788	0.000

Source: Prepared by the authors based on SPSS (v.22) outputs.

As detailed in Table 15, the correlation coefficient (R) stands at 0.575, indicating a moderate and positive correlation between environmental conditions quality and job performance. The coefficient of determination (R²) is 0.330, implying that environmental conditions quality accounts for 33.0% of the variance observed in job performance, while the remaining 67.0% is attributable to other exogenous variables omitted from this model. Furthermore, the unstandardized regression coefficient (B) is 0.422, demonstrating that a single-unit increase in environmental conditions quality yields a corresponding increase of 0.422 units in job performance. The statistical significance of the model is validated by the calculated F-statistic of 87.788, with an associated p-value (Sig.) of 0.000. Given that the p-value falls well below the designated significance threshold ($\alpha \leq 0.05$), the null hypothesis is rejected in favor of the alternative hypothesis. Consequently, it is empirically

established that environmental conditions quality exerts a statistically significant positive impact on enhancing job performance within the investigated cement enterprise at the 0.05 level.

6.Result and Discussion

Based on the empirical study conducted at the Algerian Cement Company, the statistical evidence shifts the paradigm of occupational health and safety (OHS) expenditures from mere operational costs or regulatory compliance into a strategic capital investment that directly optimizes productivity and human capital outcomes. Given that a single-unit improvement in environmental quality yields the highest marginal performance gains, the enterprise must prioritize capital investment in the physical work environment. Consequently, this provides empirical evidence for the pivotal role of safe working conditions in stabilizing human capital and enhancing productive efficiency within heavy industries—such as cement manufacturing—by mitigating hazards, reducing absenteeism and turnover, and boosting employee morale.

7.Findings

- General Finding (Rejection of the Main Hypothesis): There is a statistically significant impact of the overall Occupational Health and Safety (OHS) system on job performance, as the system accounts for 32.4% of the positive variance in performance. Additionally, a significant, moderate-to-strong positive correlation exists ($r = 0.569$, at a significance level of $\alpha \leq 0.05$). Thus, the main null hypothesis is rejected.
- Finding Relevant to Sub-hypothesis 6 (Quality of Working Conditions): Regression analysis revealed that the "quality of environmental conditions" is the primary driver of job performance, explaining 33% of its variance ($R^2 = 0.330$) with a strong regression coefficient ($\beta = 0.422$). Thus, Sub-hypothesis 6 is rejected.
- Based on the simple linear regression analysis executed via SPSS (v.22) to test the first, second, third, fourth, and fifth sub-hypotheses, all corresponding null hypotheses were statistically rejected in favor of their alternative hypotheses at the designated significance threshold $\alpha \leq 0.05$. The empirical results confirm that Top Management Commitment, Training and Awareness, Employee Healthcare, Employee Responsibilities, and Machinery and Equipment Safety each exert a statistically significant positive impact on improving job performance within the Algerian cement Company at the $\alpha \leq 0.05$ significance level.

8.Limitations and Research Gaps

Despite its significant empirical contributions, this study is subject to several conceptual and contextual limitations that open promising avenues for future inquiry. Structurally, the scope of this investigation was restricted to the six specific OHS dimensions operationalized within the proposed model, and its empirical boundaries were confined to a single-site case study of a cement factory, which may inherently limit the generalizability of the findings to other industrial sectors. To overcome these constraints, future researchers are strongly encouraged to expand the contextual scope by conducting comparative, multi-site studies across diverse industrial domains. Furthermore, advancing the current conceptual framework by incorporating critical mediating or moderating variables—such as "job satisfaction" or "organizational safety culture"—would yield a deeper, more nuanced understanding of the underlying socio-psychological mechanisms driving employee job performance.

9.Conclusion

This study investigated the empirical relationship between the occupational health and safety (OHS) of human capital and job performance within a major Algerian cement enterprise, evaluating a comprehensive framework across task, contextual, and adaptive performance based on survey data from 180 workers. The diagnostics confirm that the enterprise's robust application of safety measures directly aligns with elevated employee outputs.

Theoretically, this research bridges the gap between proactive safety compliance and strategic human capital optimization in developing economies. Practically, the results provide actionable insights for industrial executive leadership, confirming that institutional investment functions as a strategic asset. Embracing this holistic approach impactively mitigates costly workplace accidents, fosters a highly motivating secure environment, and drives sustainable productivity and operational excellence.

10. References

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