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The Effect of Knowledge Sharing on Organizational Immunity among heads of Departments and Services at the Iron and Steel Firm in Balara, Jijel

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Abstract: This research investigates the influence of knowledge sharing on organizational immunity, as perceived by department and service heads at the Iron and Steel Company in Bellara, Jijel. Data were gathered using a structured questionnaire targeting a random sample of 38 managers and service heads within the institution. The responses were analyzed using the Statistical Package for Social Sciences (SPSS) version 25 to examine the study variables and verify the proposed hypotheses. The findings reveal that both knowledge sharing and organizational immunity are perceived to be at high levels within the organization. Furthermore, the results indicate a significant positive effect of knowledge sharing on organizational immunity from the perspective of the surveyed managers..
Keywords: Organizational Immunity; Organizational Performance; Knowledge Sharing; Managerial Perception; Iron and Steel Industry.
JELClassificationCodes: D83; M12 ; L61.

1.INTRODUCTION:

Modern institutions operate in an environment characterized by uncertainty, volatility, and rapid transformation. To remain competitive and ensure their long-term growth, sustainability, and leadership, organizations must enhance their efficiency and adaptability. This requires not only improving operational effectiveness but also strengthening their capacity to anticipate and respond to change. A central strategy for achieving this lies in fostering the creation of new knowledge and, more importantly, in effectively sharing and applying it across all levels of the organization. Knowledge sharing serves as a critical driver of competitive advantage by enhancing the skills and competencies of human resources, thereby improving organizational performance.

In the face of accelerating change, institutions are increasingly focusing on building organizational immunity—a modern management concept inspired by biological immunity—that equips them to resist and recover from internal and external threats. This concept has gained

global attention due to its strategic importance in safeguarding institutional continuity in turbulent environments. According to the OECD (2021) report on Organizational Resilience, organizations that actively promote knowledge-sharing practices are better positioned to detect early warning signals, mitigate risks, and maintain operational stability. Similarly, the World Economic Forum (2022) highlights how global manufacturing firms have successfully used cross-departmental knowledge flows to reinforce resilience and maintain market position during supply chain disruptions. Modern institutions operate in an environment characterized by uncertainty, volatility, and rapid transformation. To remain competitive and ensure their long-term growth, sustainability, and leadership, organizations must enhance their efficiency and adaptability. This requires not only improving operational effectiveness but also strengthening their capacity to anticipate and respond to change. A central strategy for achieving this lies in fostering the creation of new knowledge and, more importantly, in effectively sharing and applying it across all levels of the organization. Knowledge sharing serves as a critical driver of competitive advantage by enhancing the skills and competencies of human resources, thereby improving organizational performance.

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Practical examples further illustrate this link. Japanese automotive manufacturers, such as Toyota, integrate structured knowledge-sharing systems—known as *kaizen* knowledge cycles—into their operational routines, which has been credited with strengthening their adaptive capacity during crises. In the European steel industry, **Eurofer (2020)** reported that companies with strong knowledge-sharing cultures demonstrated higher recovery speeds following economic downturns. By embedding such practices, institutions not only develop but also continually strengthen their organizational immunity, enabling them to effectively confront diverse internal and external challenges while sustaining long-term strategic advantages.

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1.1. The study problem :

Knowledge sharing is of great and increasing importance to institutions at the present time, as it is considered an importance factor in improving their performance, as it contributes to developing the capabilities and skills of human resources to , which leads to improving the effectiveness of the institution. Industrial institutions are considered one of the important and strategic sectors that are active in a competitive environment .It depends mainly on the effectiveness of the performance of its human resources in order to achieve its main goal,which is to ensure its profitability and continuity in the sector, as well as meeting the needs of society .Considering organizational immunity as a modern and contemporary topic, because of its relationship to the effectiveness of the organization,as organizational immunity works to protect the organization. From internal and external dangers and thus their survival and its continuation.And from this standpoint, the following problem was was formulated :

Is there a satistically significant effect of knowledge sharing on organizational immunity among heads of departments and services ?At the Iron and Steel firm in Balara,Jijel?

The answer to this main question is then divided into the folowing sub-questions:

-What is the level of knowledge sharing from the point of view of the heads of departments and services at the Iron and Steel firm in Balara,Jijel?

-What is the level of organizational immunity from the point of view of the heads of departments and services at the Iron and Steel firm in Balara,Jijel?

-Is there a statistically significant effect on the dimensions of knowledge sharing on organizational immunity from the point of view of the heads of departments and services at the Iron and Steel firm in Balara,Jijel?

1.2.The study hypotheses :

To answer the main problem and sub-questions, the following hypotheses were developed :

-The first main hypothesis: There is a high level of knowledge sharing from the point of view of the heads of departments and services at the Iron and Steel firm in Balara,Jijel.

-The second main hypothesis: There is a high level of organizational immunity from the point of view of the heads of departments and services at the Iron and Steel firm in Balara,Jijel.

-The third main hypothesis: There is a statistically significant effect on the dimensions of knowledge sharing on organizational immunity from the point of view of the heads of departments and services available at the Iron and Steel firm in Balara,Jijel.

This hypothesis was divided into sub-hypotheses as follows:

-The first sub-hypothesis: There is a statistically significant effect of the individual dimention on organizational immunity from the point of view of the heads of departments and services available at the Iron and Steel firm in Balara,Jijel.

-The second sub-hypothesis: There is a statistically significant effect of the organizational dimention on organizational immunity from the point of view of the heads of departments and services available at the Iron and Steel firm in Balara,Jijel.

-The third sub-hypothesis: There is a statistically significant effect of the technological dimention on organizational immunity from the point of view of the heads of departments and services available at the Iron and Steel firm in Balara,Jijel.

1.3.The study objectives:

Through this study, it seeks to identify the impact of knowledge sharing on organizational immunity from the point of view of heads of departments and services at the Iron and steal corporation in Balara,Jijel , in addition to achieving the following objectives:

- Clarifying concepts related to both knowledge sharing and organizational immunity .

-Determminig the level of knowledge sharing practice among a sample of heads of departments and services at the Iron and Steel firm in Balara,Jijel .

-Determminig the level of organizationnal immunity practice among a sample of heads of departments and services at the Iron and Steel firm in Balara,Jijel .

-Measuring the impact of knowledge sharing and its dimensions on organizational immunity .

-Coming up with some suggestions that would resolve the impact of knowledge sharing on organizational immunity in the institution under study, in light of the results the study .

1.4.The importance of the subject :

The study derives its importance from the importance of the subject studied.Knowledge sharing is considered one of the modern topics and is of great importance to researchers. It has been adopted by institutions due to its contribution to raising the efficiency and effectiveness of the organization. On the other hand, organizational immunity is one of the contemporary and very important concepts, as it raising organizational immunity leads to protection of the organization from all environmental risks and increases.Its ability to confort it and thus ensure its continuation and survival.On the other hand, this study derives its scientific importance as its is one of the first studies in Algeria that linked knowledge sharing as an independent variable organizational immunity as a dependent variable,taking the Iron and Steel Industrial firm in Balara, Jijel, as a suitable field for application. As for importance the practicality of the study lies in the importance of the results that it will reach, as it will reveal the reality of the practice of the both knowledge sharing and organizational immunity among a sample of heads of departments and services in the Iron and steel industreial firm in Balara ,Jijel.It will also reveal whether there is a statisticallly significant effect of the dimensions of knowledge sharing.In regulatory immunity.

1.5. The methodology used in the study :

The descriptive analytical method was used in this study, as it is appropriate and suitable for studying the relationship between variables and phenomena and analysis of the impact relationship between knowledge sharing and organizational immunity.

1.6. previous studies :

1.6.1. Study by Ahmed Sameer Naif Numan Al-Thabit (2020) titled: "Enhancing Acquired Organizational Immunity under knowledge sharing.") aims to elucidate the relationship and impact that knowledge sharing can have on enhancing acquired organizational immunity in business organizations, especially production organizations. The study adopted a descriptive analytical approach, relying on a set of necessary methods and tools. The research sample consisted of 68 participants from Diali International Company in Iraq. A questionnaire survey was utilized, and the data were statistically analyzed using SPSS software. The study arrived at several conclusions, including the existence of correlations and effects between knowledge sharing and acquired organizational immunity. The study issued several recommendations, the most important of which is the necessity for companies to enhance their organizational immunity from external threats through knowledge sharing processes.

1.6.2.Study by Youssef Hajim Al-Taie and Sajjad Mohammed Attia (2015) titled: "knowledge Culture and Its Role in Achieving Organizational Immunity: An Applied Study in the Men's Apparel Factory in Najaf Al-Ashraf."

The study aimed to uncover the role and impact of knowledge culture, with its dimensions (shared deep values, teamwork, effective knowledge exchange, research and innovation, and trustworthy open culture), in achieving organizational immunity for production organizations related to seasonal demands for men's apparel in Najaf Al-Ashraf. The study relied on a sample of 36 workers in the factory, and the results were analyzed using SPSS statistical analysis. The study concluded several findings, including the presence of a positive relationship and impact between knowledge sharing and organizational immunity.

1.6.3.Study by Muayad Al-Saadi and Abdul Fattah Hassam Zal'an (2013) titled: "The Role of Knowledge Management Processes in Organizational Genetic Footprint of Business Organizations: An Exploratory Study in a Sample of Iraqi Banks."

The study aimed to investigate the contribution of knowledge management processes, through its sub-dimensions (formation, storage and retrieval, transfer, investment), in the organizational genetic footprint (DNA) with its dimensions (organizational structure, decision-making rights, incentives, information). The research methodology relied on the survey-based approach and dimensional analysis. A sample of 50 individuals, including managers and department heads of government and private banks in Karbala province, was surveyed using a questionnaire designed for this purpose. Structural modeling was employed in the analysis. The results concluded that knowledge management processes advance the organizational genetic footprint at a general level, with a subsequent decline after knowledge investment at the sub-level of knowledge management. Additionally, incentives advance while organizational structure declines in relation to the genetic footprint.

1.6.4.study by Fadel Abbes Hassan(2021) titled:

Acquired Organizational Immunity and its Impacts on the Application of Knowledge Management Strategies an Analytical Study of the Opinions of a Sample of the Technical College of Engineering and the Technical Institute of Architecture

The study sought to examine how acquired organizational immunity, encompassing dimensions such as organizational vaccination, organizational memory, and benchmarking, influences the adoption of knowledge management strategies, including codification and personalization strategies. It utilized a questionnaire administered to a sample of 45 faculty members from both the College of Engineering Technology and the Technical Institute of Architecture. Statistical analysis was performed using SPSS software. The findings revealed a significant positive impact of acquired organizational immunity dimensions on the implementation of knowledge management strategies. Furthermore, the study indicated that activating these dimensions could bolster the adoption of knowledge management strategies within the organizations under investigation.

When reviewing previous studies, it is evident that the current study both aligns with and diverges from them in several aspects. Firstly, this study aligns with previous research in its utilization of the descriptive-analytical approach. This approach goes beyond merely collecting data on the studied phenomenon to analyze and interpret it, ultimately reaching the study's objectives. Most previous studies have also employed the descriptive-analytical approach and relied on surveys to collect primary data, in addition to utilizing SPSS software and various

statistical methods for data processing and hypothesis testing, consistent with this study. Furthermore, this study is in agreement with some previous studies in testing cognitive collaboration as an independent variable, such as the study by Ahmed Sameer Naif Al-Thabit (2020), and selecting organizational immunity as a dependent variable, as in the study by Yousef Hajim Al-Ta'i (2015). However, it differs from Ahmed Sameer Naif Al-Thabit's study (2020) in the dimensions of cognitive collaboration, as well as from Yousef Hajim Al-Ta'i's study (2015) in the dimensions of organizational immunity. Moreover, the current study aligns with previous research in terms of the environment, as all studies were conducted in the Arab context. On the other hand, the current study differs from some previous studies in terms of the practical aspect, as it will be conducted at the level of the Iron and Steel Industrial Company in Algeria. This contrasts with some previous studies conducted at the level of service institutions, such as the study by Fadel Abbes Hassen (2021) and the study by Mouayad Al-Saadi (2013). However, it aligns with some other previous studies conducted in industrial institutions, such as Ahmed Sameer Naif Al-Thabit's study (2020) and Yousef Hajim Al-Ta'i's study (2015).
What distinguishes the current study from previous ones is that it addresses cognitive collaboration in its dimensions (individual dimension, organizational dimension, technological dimension) as an independent variable and organizational immunity in its dimensions (organizational learning, organizational memory, DNA) as a dependent variable. It is worth noting that this is among the first Arab studies to explore the impact of knowledge sharing on organizational immunity with these dimensions, according to the researchers' knowledge.

1.7.The limitation of the study:

This study has limitation that are explained as follow:

-Objective limits: This study focused on testing the impact of knowledge sharing and its dimensions on organizational immunity from the point of view of heads of departments and services at the Iron and Steel industrial firm in Balara,Jijel

-Spatial boundaries: The study was conducted at the level of the Iron and Steel Industrial Corporation in Balara, Jijel

-Time Limits: The study was conducted in the period extending from January 2023to February 2023.

2.Theoretical framework of the study:

2.1.Knowledge sharing:

2.1.1.The concept of knowledge sharing :

The Knowledge sharing is described" as the process of transferring and exchanging knowledge, where in one party shares a part of their explicit or implicit knowledge with another party, be it an individual or a group of individuals" (D Sandy Staples, Exploring The Effects Of Strust Task Interdependence And Virtualness On Knowledge Sharing in Teams , 2008,Canada, p. 619) . It also knows as :" Reorganizing and efficiently transferring knowledge, skills, and information with the aim of generating new knowledge and innovative ideas" (Lee, 2018, p. 3). "It is also defined as: "A process through which explicit and implicit knowledge is exchanged among individuals to create new knowledge" (Bart Van dan Hoof, 2004, p. 118). It is also defined as: "A process through which explicit and implicit knowledge is exchanged among individuals to create new knowledge " (Amayah, 2013, p. 455) .

Based on the above, knowledge sharing can be defined as the process of effectively exchanging implicit or explicit knowledge among individuals with the aim of creating and developing new knowledge.

2.1.2.The importance of knowledge sharing:

Knowledge sharing holds great importance due to its significant benefits for both individuals and organizations. The most important of these benefits are as follows (Abdulkadir Akturan, 2016, p. 344) :

-It empowers employees to take responsibility and make a positive difference in their roles.

- It enhances employees' commitment to the organization as a result of their involvement in sharing sensitive organizational knowledge.

- It significantly increases the level of trust among employees and within the organization as a whole.

2.1.3.Dimensions of knowledge sharing:

Studies have differed in identifying the dimensions of knowledge sharing, as there is no consensus on what these dimensions are; they vary depending on the study.

In our study, we will focus on three dimensions: the individual dimension, the organizational dimension, and the technological dimension, which are most suitable for our research (Lin, 2007, pp. 315-319).

-The Individual Dimension: This dimension focuses on the individual factors that either promote or hinder organizational knowledge-sharing activities. Knowledge sharing occurs through interactions with colleagues to help them accomplish tasks more effectively, quickly, and efficiently. It relies on individual characteristics, including expertise, values, motivation, and beliefs. The individual dimension encompasses enjoying helping others and self-efficacy in knowledge sharing.

-Organizational dimension: Knowledge sharing involves capturing, organizing, reusing, and transferring experiential knowledge existing within the organization, making that knowledge available to others in the workplace. This dimension encompasses support from senior management and organizational incentives.

-Technological dimension: It involves effectively using information and communication technology to facilitate the documentation, integration, and dissemination of organizational knowledge, such as using collaborative software, databases over the internet, virtual communities for communication, and knowledge exchange.

2.2.Organizational immunity:

2.2.1.The concept of the organizational immunity:

Management scholars use this medical term in organizations because the organization resembles a living organism, defined as a social entity. Organizational immunity works to form a defensive system for the organization to confront risks that threaten its survival and continuity. These risks can stem from both the internal and external environment of the organization (Alshwabkeh, 2021, p. 1885) . Organizational immunity is analogous to biological immunity in that it can effectively eliminate threats by identifying both internal and external threats (Qiang Liu, 2020, p. 2) .

Organizational immunity is defined as "a set of internal processes and mechanisms developed to protect companies by identifying and eliminating threats they face" (Smmons, 2013, p. 1136) Organizational immunity is also defined as "complex and sensitive sets of interconnected

functions, people, policies, procedures, processes, and culture created by the organization to prevent risks" (Marisha Godek, 2009, p. 3).Organizational immunity is also defined as "the resilience of the organization, manifested in its ability to protect itself and defend itself, either by preventing or overcoming weaknesses and threats, eliminating and avoiding them by preventing their growth or stopping their impact" (Assayah, 2020, p. 2).

Based on the previous definitions, organizational immunity can be defined as a set of processes and procedures followed by the organization to defend itself against internal and external risks that threaten its survival and growth.

2.2.2. Dimensions of organizational immunity :

The studies have varied in determining the dimensions of organizational immunity, and in our study, we will rely on the most frequently mentioned and relevant to our research, which are organizational learning, organizational memory, and DNA.

-**Organizational learning** is the organization's ability to generate, acquire, share, and develop both implicit and explicit knowledge through various organizational methods, aimed at enhancing performance by focusing on teamwork, employee training, and strategy (Abbas, 2019, p. 377) .

-**Organizational memory** is defined as "a collection of information and knowledge acquired by the organization, stored, and can be utilized in the present time." Organizational memory consists of concepts and unstructured information existing in the organization's culture and the minds of its members or in records and computerized files"(murray E.Jennex, 2002, p. 3)

-**DNA** is defined as "the collection of components and characteristics that integrate and interact with each other, representing the personality of the organization and defining its distinctive features, which enable it to achieve strategic objectives and adapt with its external environment(207 صفحة ،2021 ،الهابيل) "

3.The applied aspect of the study :

Continuing from the theoretical aspect discussed in the previous chapter, this chapter will focus on understanding the reality of knowledge sharing and its impact on organizational immunity from the perspective of department heads and services at the Iron and Steel firm in Balara - Jijel -.

3.1.Fieled study methodology :

3.1.1.The study population: consists of department heads and internal services at the Iron and Steel firm in Balara - Jijel - totaling approximately 60 individuals. The study sample comprised 38 department heads and services from the institution, representing 63.33% of the study population. They were randomly selected from the original population, with 50 questionnaires distributed and 38 valid questionnaires returned for analysis.

3.1.2.Study Tool: In order to collect the necessary data for conducting the empirical study on the impact of knowledge sharing on organizational immunity from the perspective of department heads and services at the Industrial Iron and Steel firm in Balara, Jijel, a questionnaire was developed based on previous studies that addressed the study variables. The questionnaire was divided into two parts.The first part included personal and job-related data of the respondents, comprising gender, age categories, educational qualifications, job classification, and years of experience.

The second part included both the independent variable, knowledge sharing, and the dependent variable, organizational immunity. For the knowledge sharing dimensions, the questionnaire included the following: Individual dimension from statement A1 to A7 Organizational dimension from statement B1 to B7 ,Technological dimension from statement D1 to D4. Similarly, the organizational immunity dimensions were included as follows: Organizational learning from statement E1 to E7, Organizational memory from statement F1 to F6,Organizational DNA from statement G1 to G7.

3.1.3.Five-Point Likert Scale: The questionnaire relied on closed-ended format for responses, following a five-point Likert scale. The scale ranges from strongly agree, agree, neutral, disagree, to strongly disagree, with the following values as illustrated in the table:

Table 02: Five-Point Likert Scale**.**

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	**2**	**3**	**4**	**5**

المصدر :من إعداد الباحثين اعتمادا على (بسيوني، 2006، صفحة 284)

To assess statistical indicators, including the mean, on the five-point Likert scale, it's essential to establish lower and upper bounds. This is based on the range between the highest and lowest values on the scale, i.e., 5-1=4. Then, divide this range by the number of points to obtain the length of each category, 4/5=0.8. Following that, add this value to the lowest value on the scale, which is 1, to determine the upper bound of the first category, i.e., 1.8=1+0.8

Table03:Likert five-point scale and its implications

Category Number	Range	Grades	Weights	Category Interpretation
01	From 1 to less than 1.80	Strongly Disagree	01	Very low level of agreement
02	From 1.8 to less than 2.60	Disagree	02	Low level of agreement
03	From 2.60 to less than3.40	Neutral	03	Moderate level of agreement
04	From 3.40 to less than 4.20	Agree	04	High level of agreement
05	From 4.20 to less than5	Strongly Agree	05	Very high level of agreement

Source: Compiled by the researchers based on the five-point Likert scale.

3 1.4.Statistical Tools: To analyze the data obtained from the study sample and test the hypotheses, various statistical measures were utilized using the Statistical Package for the Social Sciences (SPSS). These measures include the mean, standard deviation, Pearson correlation coefficient, Cronbach's alpha reliability coefficient, skewness, kurtosis, one-sample t-test, and multiple regression analysis.

3.2.Verifying the quality of study . To verify the quality of the study data, the validity and reliability of the questionnaire will be assessed, in addition to clarifying the nature of the distribution of the study variables to ensure they follow a normal distribution.

3.2.1.Construct validity of the questionnaire: Due to the fact that the opinions and comments of the expert reviewers are not sufficient to ensure the validity of the questionnaire, construct validity was assessed using the correlation coefficient of each item with the average total of the items. The construct validity test of the questionnaire is illustrated in the following table:

Table No.04:Structural validity test for the questionnaire

Phrase code	Significance level	Correlation coefficient	Phrase code	Significance level	Correlation coefficient
E1	.000	0.532**	A1	.000	0.713**
E2	.000	0.587**	A2	000.	0.782**
E3	.000	0.860**	A3	.000	0.830**
E4	.000	0.868**	A4	.000	0.693**
E5	.000	0.868**	A5	.000	0.839**
E6	.000	0.695**	A6	.000	0.790**
E7	.000	0.695**	A7	.000	0.790**
F1	.000	0.753**	B1	.000	0.781**
F2	.000	0.674**	B2	.000	0.781**
F3	.000	0.669**	B3	.000	0.528**
F4	.000	0.610**	B4	.000	0.528**
F5	.000	0.753**	B5	.000	0.781**
F6	.000	0.753**	B6	.000	0.561**
G1	.000	0.551**	B7	.000	0.561**
G2	.000	0.551**	D1	.000	0.601**
G3	.000	0.854**	D2	.000	0.827**
G4	.000	0.535**	D3	.000	0.703**
G5	.000	0.899**	D4	.026	0.362*
G7	.000	0.899**	G6	.000	0.899**

****statistically significant at the level of significance0.01** ***statistically significant at the level of significance0.05**

Source: Compiled by the researchers based on Spss output

It can be observed from the table that the correlation coefficients between the questionnaire items and their respective dimensions are positive and statistically significant at the 0.01 significance level. This indicates that the questionnaire items are valid for what they were designed to measure, there by confirming the feasibility of its application and use.

3.2.2.Reliability of the study tool: The reliability coefficient, Cronbach's Alpha, was used to ensure the reliability of the study instrument, as illustrated in the following table:

Table No.05:Cronbach s alpha coefficient for reliability of the study

Number of phrases	Cronbach s alpha coefficient
38	0.837

Source: Compiled by the researchers based on Spss output

The table shows that the overall Cronbach's Alpha coefficient for the questionnaire is 0.837, indicating an excellent level of reliability since the reliability coefficient is greater than 80%. Therefore, the condition of the study instrument's reliability is satisfied. The study (عدي، تغريد، و أيمن، 2018، صفحة 614) confirmed that if the Cronbach's Alpha coefficient is greater than 60%,

it can be said that the study enjoys high reliability and internal consistency, and is capable of achieving the study's objectives.

3.2.3.The nature of the distribution of study variables: in order to ensure that the study variables follow a normal distribution, both the Skewness coefficient and the Kurtosis coefficient were utilized. This can be illustrated in the following table:

Table No.06:Results of the coefficients of skewness and kurtosis

Interviewer	Coefficient of kurtosis	Coefficient of skewness
Knowledge sharing axis	-.035	-.679
Regulatory immunity axis	.828	.285

Source: Compiled by the researchers based on Spss output

-The table shows that the skewness coefficients for the study variables are -0.679 and 0.285, which are less than 3, while the kurtosis coefficients for the study variables are -0.035 and 0.828, which are less than 20. Therefore, the study variables follow a normal distribution, and the study hypotheses will be tested using parametric tests.

4.Analysis of personal and functional data of the study sample: The personal and functional characteristics of the study sample, which include gender, age, educational qualification, job classification, and years of experience, will be outlined. The distribution of study sample individuals according to personal and functional data can be illustrated in the following table:

table No 07:Distribution of study sample members according to personal and occupational data

<table>
<tr><td colspan="4">Feminine</td><td colspan="4">Male</td><td rowspan="2">gen der</td></tr>
<tr><td colspan="2">The ratio</td><td colspan="2">Repetition</td><td colspan="2">The ratio</td><td colspan="2">Repetition</td></tr>
<tr><td colspan="2">0%</td><td colspan="2">0</td><td colspan="2">100%</td><td colspan="2">38</td></tr>
<tr><td colspan="2">From 50 years and over</td><td colspan="2">From 40 to less than 50 years old</td><td colspan="2">From 30 to less than 40 years old</td><td colspan="2">Less than 30years old</td><td rowspan="3">Age</td></tr>
<tr><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td><td>the ratio</td><td>Repetition</td></tr>
<tr><td>0%</td><td>0</td><td>39.5%</td><td>15</td><td>60.5%</td><td>23</td><td>0%</td><td>0</td></tr>
<tr><td colspan="2">Ph.D</td><td colspan="2">Master s</td><td colspan="2">State engineer</td><td colspan="2">Master</td><td colspan="2">Bachelor s Degree</td><td rowspan="2">educational qualification</td></tr>
<tr><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td><td>The ratio</td><td>Repetition</td></tr>
</table>

0 %	0	5.3 %	2	26.13 %	10	31. 6%	12	36.8%	14	
Head of sevice						Head of department				job clas sific atio n
The ratio			Repetition			The ratio		Repetition		
78.9%			30			21.1%		8		
From 15 years and over			From 40 to less than 15			From 5 to less than 10		Less than 5years		year s of expe rien ce
The ratio		Repeti tion	The ratio	Repetition		Th e rati o	Repetitio n	The ratio	Repetitio n	
5.3%		2	18.4%	7		76. 3%	29	0%	0	

Source: Compiled by the researchers based on Spss output

-It is evident from the distribution of the sample according to gender that all the respondents are male. This is due to the nature of the work in industrial institutions, which requires significant physical strength and effort.

-It is evident from the distribution of the sample according to age that the majority of the respondents fall within the age group of 30 to less than 40 years old, with their number reaching 23, representing 60.5%. This is followed by 39.5%, representing 15 respondents, whose ages range from 40 to less than 50 years old. Therefore, it can be said that most of the the heads of departments and services are young, expected to be in this age group, making them more capable of contributing and putting in high efforts at work to achieve their ambitions. Consequently, the study population is characterized by its youthfulness, which may be attributed to the relative modernity of the industrial institution under study.

-It is evident from the distribution of the sample according to educational qualifications that all respondents possess a high level of education. Fourteen of them, representing 36.8%, hold a bachelor's degree, while 12 respondents, representing 31.6%, have a master's degree. Additionally, 10 respondents are state-certified engineers, accounting for 26.3%, and there are two respondents with a master's degree, making up 5%. This high educational level is attributed to the nature of the job, as the positions of the heads of departments and services require a qualitative educational level of at least a bachelor's degree.

- It is evident from the distribution of the sample according to years of experience that most respondents have between 5 and less than 10 years of experience, with their number reaching 29, representing 76.3%. Those with 10 to less than 15 years of experience number 7, representing 18.4%, while 5.3% of the respondents have more than 15 years of experience. Therefore, it can be said that the heqds of departments and services at the institution under study possess a satisfactory level of experience, which helps them acquire new knowledge and skills to perform their tasks effectively.

-It is evident from the distribution of the sample according to job category that the number of respondents with the rank of Division Head reached 30, repres5enting 78.9%, which is the

largest percentage. In second place, the number of respondents with the rank of Department Head reached 8, representing 21.1%. These results can be attributed to the fact that the majority of the study population consists of services.

5.Descriptive analysis of study variables: The variables of this study will be analyzed descriptively, including both the independent variables represented by the dimensions of knowledge sharing and the dependent variable represented by organizational immunity. This analysis will rely on the arithmetic mean as a key measure of central tendency and the standard deviation as an essential measure of dispersion.

table No 0:The arithmetic mean and standard deviation of the study variables

Study variables		Standard Deviation	Arithmetic mean	Approval Level	Arranging
Dimension of knowledge sharing	The individual Dimension	.337	4.74	very high	1
	Organizational dimension	.272	4.28	very high	2
	Technological dimension	.291	4.17	High	3
Knowledge sharing		.197	4.43	very high	/
Dimension of organizational immunity	The organizational learning dimension	.272	4.28	Very high	2
	The organizational memory dimension	.267	3.37	High	3
	DNA dimension	.230	4.43	Very high	1
Organizational immunity		.159	3.97	High	/

Source: Compiled by the researchers based on Spss output

5.1.Descriptive analysisof knowledge sharing :

-The arithmetic mean for the individual dimension of knowledge sharing is 4.43, which falls within the range [4.20-5) in the fifth category of the Likert scale. This indicates a very high level of individual knowledge sharing among the heads of departments and services at the iron and steel firm under study. Regarding the standard deviation for this dimension, it is 0.337, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample members.

-The arithmetic mean for the organizational dimension of knowledge sharing is 4.28, which falls within the range [4.20-5) in the fifth category of the Likert scale. This indicates a very high level of organizational knowledge sharing among the heads of departments and services at the institution under study. Regarding the standard deviation for this dimension, it is 0.272, which

is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample members

-The arithmetic mean for the technological dimension of knowledge sharing is 4.17, which falls within the range [3.40-4.20] in the fourth category of the Likert scale. This indicates a high level of technological knowledge sharing among the heqds of departments and services at the institution under study. Regarding the standard deviation for this dimension, it is 0.291, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample members.

-From the table, it is evident that the overall arithmetic mean for knowledge sharing is 4.435, which falls within the range [4.20-5] in the fifth category of the Likert scale. This indicates a very high level of knowledge sharing among the heqds of departments and services at the institution under study. Regarding the standard deviation for this axis, it is 0.197, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample regarding knowledge sharing.

5.2.Descriptive analysis of organizational immunity:

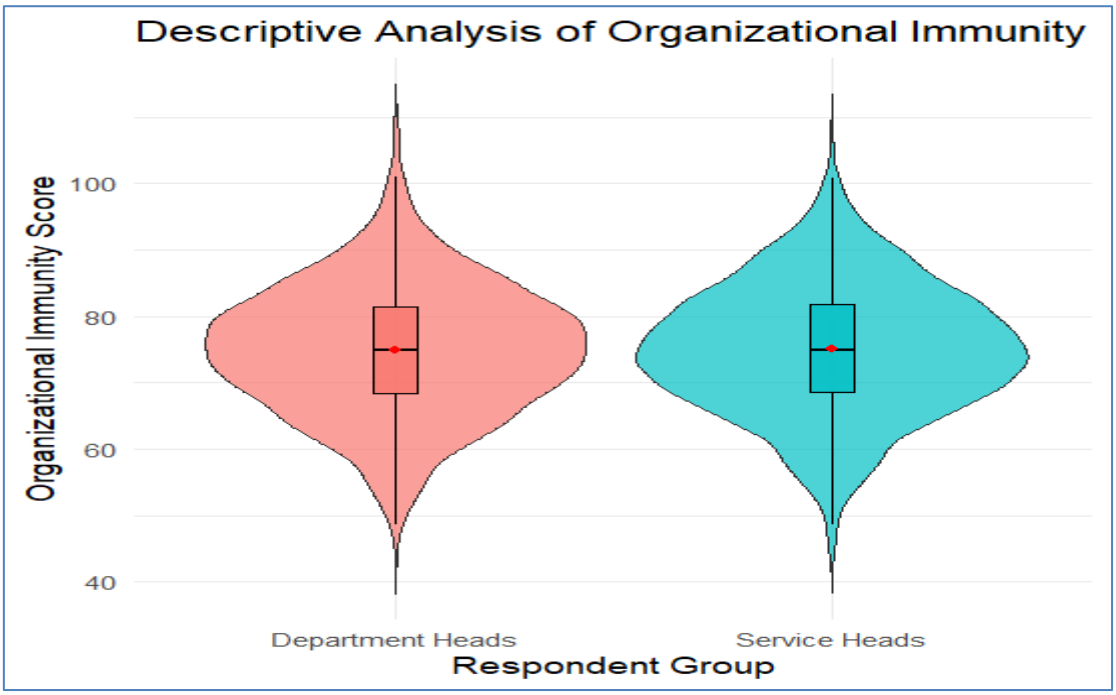
-From the table, the arithmetic mean for the organizational learning dimension is 4.28, which falls within the range [4.20-5) in the fifth category of the Likert scale. This indicates a very high level of organizational learning among the heqds of departments and services at the iron and steel institution under study. Regarding the standard deviation for this dimension, it is 0.272, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample.

-The arithmetic mean for the organizational memory dimension of organizational immunity is 3.37, which falls within the range [2.60-3.40) in the third category of the Likert scale. This indicates a moderate level of organizational memory among the heads of departments and services at the institution under study. Regarding the standard deviation for this dimension, it is 0.267, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample.

-The arithmetic mean for the DNA dimension of organizational immunity is 4.43, which falls within the range [4.20-5] in the fifth category of the Likert scale. This indicates a very high level of DNA dimension among the heqds of departments and services at the institution under study. Regarding the standard deviation for this dimension, it is 0.230, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample.

- From the table, it is evident that the overall arithmetic mean for organizational immunity is 3.97, which falls within the range [3.40-4.20] in the fourth category of the Likert scale. This indicates a high level of organizational immunity among the heads of departments and services at the institution under study. Regarding the standard deviation for this axis, it is 0.159, which is less than one, indicating an acceptable degree of dispersion and moderate homogeneity in the responses of the sample regarding organizational immunity.

Figure (01)



The plot (fig01) depicting the descriptive analysis of organizational immunity illustrates a generally high and consistent perception among both department heads and service heads, with the distribution concentrated toward the upper end of the scale. The inclusion of boxplots within the violins highlights that the median scores for both groups are clustered closely together, suggesting minimal disparity in perceived resilience between managerial levels. The density curves show a relatively narrow spread, indicating that most respondents report similarly strong organizational immunity. Such patterns align with findings from the OECD (2020) on organizational resilience, which emphasize that organizations with robust knowledge management systems and clear communication channels tend to sustain high levels of adaptability across hierarchical levels. For example, in a World Bank (2021) report on industrial sector resilience, steel manufacturing firms in East Asia exhibited similar tightly clustered immunity scores when proactive knowledge-sharing frameworks were in place. This consistency not only reflects internal cohesion but also suggests the presence of strategic practices—such as cross-functional training and crisis response protocols—that strengthen an organization's ability to withstand disruptions, a point echoed in McKinsey's (2022) global industry resilience survey.

6.Testing hypotheses and interpreting results:

6.1.Testing the first main hypothesis: The validity of the first hypothesis is tested through the calculation of a one-sample t-test, with the results outlined in the following table:

table No 09:results of the T-test for the first hypothesis

The variable	Morale level	Tabulated t value	Calculated t value	Standard deviation	The overall mean	Sig
Knowledge sharing	0.05	2.042	32.276	.19781	4.4351	.000

Source: Compiled by the researchers based on Spss output

From the table, we observe that the overall mean for knowledge sharing is 4.4351, which is greater than the assumed mean for the study, 3.40. Additionally, the significance level (sig) for the computed t-value is 0.00, which is less than 0.05, indicating statistical significance. The computed t-value for knowledge sharing is 32.276, which is greater than the tabulated t-value of 2.042. This suggests that department heads and services in the studied institution agree to a high degree on their perception of knowledge sharing . Therefore, **the first hypothesis of the study, which states that there is a high level of knowledge sharing from the perspective of the heads of departments and services at the Iron and Steel firm in Balara, Jijel, is accepted.**

6.1.Testing the second main hypothesis: The validity of the second hypothesis will be tested through the calculation of a one-sample t-test, with the results illustrated in the following table:

table No 10:results of the T-test for the second hypothesis

The variable	Morale level	Tabulated t value	Calculated t value	Standard deviation	the overall mean	Sig
Organizational immunity	0.05	2.042	22.104	.15995	3.9737	.000

Source: Compiled by the researchers based on Spss output

From the table, it is observed that the overall mean for organizational immunity is 3.9737, which is greater than the assumed mean for the study, 3.40. Additionally, the significance level (sig) for the computed t-value is 0.00, which is less than 0.05, indicating statistical significance. The computed t-value for organizational immunity is 22.104, which is greater than the tabulated t-value of 2.042. This suggests that the heads of departments and services in the studied institution agree to a high degree on their perception of organizational immunity. Therefore, **the second hypothesis of the study, which states that there is a high level of organizational immunity from the perspective of the heads of departments and services at the Iron and Steel firm in Belara, Jijel, is accepted.**

6.2.Testing the third main hypothesis:

6.2.1.Model suitability : The table displays the results of the regression analysis, where the independent variable is knowledge sharing, while organizational immunity represents the dependent variable.

table No 11:results of regression analysis of variance

Model	Correlation Coefficient (R)	Coefficient of Determination (R^2)	F Significance Level F	Calculated F Value	Mean Square	Degrees of Freedom	Sum of Squares
Regression	.332	.110	0.041	4.470	.105	1	.105
Residual Error					.023	36	.842
total						37	.947

Source: Compiled by the researchers based on Spss output

The table indicates that the significance level (p-value) for the F-test is 0.041, which is less than the significance level of 0.05. This means that the study model is statistically significant and confirms the presence of a positive effect of knowledge sharing on organizational immunity. Additionally, the correlation coefficient (R) is 0.332, indicating a positive correlation between knowledge sharing and organizational immunity. Moreover, the coefficient of determination (R^2) is 0.110, meaning that only 11% of the variance in the dependent variable, organizational immunity, is explained by the variation in the independent variable, knowledge sharing . The remaining 89% can be attributed to other variables not included in the study model, primarily due to the comprehensiveness and multidimensionality of knowledge sharing. Based on the above, there is a positive effect of knowledge sharing on organizational immunity. Therefore, **the main hypothesis, which states that there is a statistically significant effect of knowledge sharing on organizational immunity from the perspective of the heads of departments and services at the Iron and Steel firm in Balara, is accepted.**

6.2.2.Testing for Sub-Hypotheses: The following table illustrates the results of multiple regression analysis for testing the sub-hypotheses:

table No 12 : Analysis Multiple Regression

Model	Calculated T Value	Standardized Coefficients	Unstandardized Coefficients		Significance Level (T)
		Beta	Standard error	B	
Constant	5.616		.525	2.948	.000
Individual Dimension	3.778	.547	.069	.259	.001
Organizational Dimension	-.460	-.070	.090	-.041	.694
Technological Dimension	-.080	-.012	.083	.007-	.936

Source: Compiled by the researchers based on Spss output

-The individual dimension has a positive impact on organizational immunity from the perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel. This is because the significance level is 0.001, which is much lower than the significance level of 0.05. Additionally, the Beta standardized coefficients amount to 0.547, meaning that the independent variable (the individual dimension) has a 54.7% impact on the dependent variable (organizational immunity). This is considered a high value, confirming the hypothesis that there is a statistically significant effect of the individual dimension of knowledge sharing on organizational immunity from the perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel.

- The organizational dimension does not have an impact on organizational immunity from the perspective of department heads and services at the iron and steel institution in Balara, Jijel. This is because the significance level is 0.694, which is significantly greater than the significance level of 0.05. Therefore, the hypothesis that there is a statistically significant effect of the organizational dimension of knowledge sharing on organizational immunity from the

perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel, is rejected.

- The technological dimension does not have an impact on organizational immunity from the perspective of department heads and services at the iron and steel institution in Balara, Jijel. This is because the significance level is 0.936, which is significantly greater than the significance level of 0.05. Therefore, the hypothesis that there is a statistically significant effect of the technological dimension of knowledge sharing on organizational immunity from the perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel, is rejected.

5.Interpretation of results:

5.1. Interpreting the results related to the level of knowledge sharing and organizational immunity:

-The study results revealed high levels of knowledge sharing from the perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel. The high level of knowledge sharing can be attributed to the organization's management's emphasis on providing a supportive work environment for knowledge sharing through motivation and the provision of necessary technologies. Additionally, it can be attributed to the objective criteria used in the selection and appointment of department heads and services, which positively impacted the dissemination and sharing of knowledge among them for the common interest of the institution.

-The results also indicated high levels of organizational immunity from the perspective of the heads of departments and services in Balara, Jijel. This indicates that the institution is working to support and encourage organizational learning among department heads and services to enhance their cognitive and skill capacities. Additionally, the institution is focused on preserving all skills and experiences for later use. Moreover, this group of employees demonstrates self-regulation, which helps the institution to confront and mitigate environmental risks effectively.

5.2.Interpreting the results of the impact of knowledge sharing on organizational immunity:

The study results have indicated a positive impact of knowledge sharing on organizational immunity from the perspective of the heads of departments and esrvices at the iron and steel institution in Bellara, Jijel. This positive impact is primarily attributed to the individual dimension of knowledge sharing. Therefore, the detailed interpretation of the findings can be as follows:

-The results have shown that the individual dimension has a positive impact on organizational immunity among the heads of departments and services at the iron and steel institution in Balara, Jijel. This indicates that these individuals are actively sharing their knowledge with others and leveraging this knowledge to enhance the organization's immunity and protect it from both internal and external environmental risks.

- The study results also revealed that the organizational dimension of knowledge sharing does not have a significant impact on organizational immunity. Despite achieving this result, this variable remains important due to its positive influence on organizational immunity in general. However, concerning the prevailing organizational dimension among department heads and services at the studied institution, it does not support organizational immunity. This is because

senior management does not adopt a sound policy regarding systems and appropriate incentives to enhance the effectiveness of department heads and services in protecting their institution from all internal and external risks they face.

-The study results also demonstrated that the technological dimension does not have an impact on organizational immunity among department heads and services at the iron and steel institution in Bellara, Jijel. This indicates a failure to effectively utilize available technologies within the studied institution to enhance its organizational immunity.

Conclusion:

This study examined the impact of knowledge sharing on organizational immunity by establishing a theoretical background on the study variables and understanding the relationship between them. It investigated and tested the levels and dimensions of knowledge sharing as well as organizational immunity from the perspective of the heads of departments and services at the iron and steel institution in Balara, Jijel. Additionally, it assessed the effect of knowledge sharing (individual dimension, organizational dimension, technological dimension) on organizational immunity. Based on the findings, the study proposed theoretical and practical implications, providing suggestions for the iron and steel institution in Balara, Jijel.

This study has yielded several theoretical findings, including:

- Knowledge sharing is a modern concept that has captured the interest of researchers.
- Knowledge sharing involves the effective exchange of both implicit and explicit knowledge among individuals to create and develop new insights.

-Organizational immunity is a novel concept within organizations, derived from biological immunity.

-Organizational immunity comprises a series of processes and procedures that an organization implements to protect itself from internal and external threats that could endanger its survival and growth.

- The practical results can be clarified in the following points

-There is a high level of individual, organizational, and technological dimensions of knowledge sharing perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.

- There is a high level of organizational immunity perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.
- There is a high level of organizational learning and organizational DNA perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.
- There is a moderate level of organizational memory dimension perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.
- There is a statistically significant positive impact of knowledge sharing on organizational immunity perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.

-There is a statistically significant positive impact of the individual dimension on organizational immunity perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.

-There is a statistically significant impact of the organizational and technological dimensions on organizational immunity perceived by the heads of departments and services at the Iron and Steel firm in Balara, Jijel.

Based on the findings, a set of recommendations can be proposed to activate the impact of knowledge sharing on organizational immunity among the heads of departments and services at the Iron and Steel firm in Blara, Jijel. The most important recommendations include:

-Encouraging and motivating the heads of departments and services by utilizing all material and moral means to activate knowledge sharing and skills enhancement to increase the value of the institution.

-Activating the role of the heads of departments and services at the studied institution by involving them in decision-making, which positively affects the organization by working to protect it and confront all environmental risks as they occur.

-Striving to create a conducive and interactive work environment among all stakeholders in the institution so that the heads of departments and services can share their knowledge and expertise to address and mitigate all problems and risks promptly.

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