

The Role of Ergonomics in Improving the Workplace Environment and Enhancing Productivity: A Field Study at the 'Hamdan Hadjaji' Main Public Reading Library in Ain Defla Province

دور علم الأرغونوميا في تحسين بيئة العمل وتعزيز الإنتاجية:
دراسة ميدانية بالمكتبة الرئيسية للمطالعة العمومية 'حمدان حجاجي' بولاية عين الدفلى

SAIDI Samira¹
s.saidi@univ-dbkm.dz

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Abstract:

This study explores the applications of ergonomics at the 'Hamdan Hadjaji' Main Public Reading Library in Ain Defla Province, scrutinizing the ergonomic configuration of both the physical aspects, like lighting, ventilation, and acoustics, and the broader workspace encompassing furniture, equipment, and safety mechanisms. The objective is to evaluate these elements' influence on staff performance and service excellence, pinpointing hurdles such as occupational ailments. A descriptive approach, employing questionnaire technique with a cohort of 40 staff members, underpins this study. Findings underscore the critical need for implementing ergonomic standards to bolster the work setting, thereby augmenting staff productivity, elevating service quality, and securing the library's consistent fulfillment of its objectives.

Key words : Ergonomics; Ergonomic design; Physical environment; Material environment; Library work environment; Public library; Ain Defla Public Reading Library.

ملخص:

تناولت هذه الدراسة تطبيقات علم الأرغونوميا في المكتبة الرئيسية للمطالعة العمومية "حمدان حجاجي" بولاية عين الدفلى، وذلك من خلال تحليل التصميم الأرغونومي للبيئة الفيزيائية، مثل الإضاءة، التهوية، والضوضاء، بالإضافة إلى البيئة العامة التي تشمل الأثاث، التجهيزات، وأجهزة الأمن والسلامة. هدفت الدراسة إلى تقييم تأثير هذه العوامل وتحديد المعوقات، كالأضرار المهنية، على أداء العاملين وجودة الخدمات. اعتمدت الدراسة على المنهج الوصفي واستخدمت أداة الاستبيان، وشملت عينة من 40 موظفًا. وخلصت النتائج إلى أهمية تطبيق معايير الأرغونوميا لتحسين بيئة العمل، بما يساهم في رفع كفاءة العاملين، تحسين جودة الخدمات، وضمان استمرارية المكتبة في تحقيق أهدافها.

كلمات مفتاحية: الأرغونوميا؛ التصميم الأرغونومي؛ البيئة الفيزيائية؛ البيئة المادية؛ بيئة عمل المكتبة؛ المكتبة العمومية؛ مكتبة المطالعة العمومية - عين

الدفلى.

¹ - Djillali Bounaama University, Khemis Miliana



Introduction

Ergonomics, a scientific discipline dedicated to enhancing the work environment, focuses on tailoring physical elements to meet individual requirements, thus boosting productivity and mitigating occupational stress. Its relevance is especially pronounced in contemporary settings like public libraries, where it fosters improved seating arrangements, optimal lighting, suitable furniture selection, and the incorporation of cutting-edge technologies. This creates a conducive and efficient atmosphere for both staff and patrons.

To optimize the workspace, it is imperative to align the environment with the physical and psychological capacities of individuals, promoting ergonomically sound postures and minimizing repetitive tasks. Such adjustments diminish exertion, enhance performance quality, and uplift employee morale, which collectively propel productivity and operational efficiency.

Research indicates that the neglect of ergonomic principles can precipitate health and psychological issues among staff, such as occupational stress stemming from the discrepancy between job demands and personal capabilities. The National Institute of Occupational Safety and Health (NIOSH, 1999, p. 6) characterizes job stress as the physical and emotional adverse reactions triggered by unsuitable work conditions, which detrimentally affect productivity and escalate absenteeism. Further, a 2009 report from the Occupational Safety and Health Center corroborates that a significant portion of workplace grievances are attributed to ergonomic risks, emphasizing the necessity for meticulously designed workspaces and adequate employee training.

Within the realm of public libraries, the strategic application of ergonomics is vital for ameliorating the work environment and ensuring the comfort and efficiency of both employees and visitors, particularly with the increasing integration of sophisticated technological systems. This study aims to dissect the effects of ergonomic practices on the work conditions and staff performance at the 'Hamdan Hadjaji' Main Public Reading Library in Ain Defla Province, concentrating on boosting operational efficacy and fostering a sustainable working environment.

1. Conceptual Framework

1.1 Problem Statement:

The 'Hamdan Hadjaji' Main Public Reading Library in Ain Defla Province epitomizes a cultural and social hub designed to cater to the community's varied needs. Nonetheless, the library confronts several challenges related to its environmental, physical, and material conditions, such as poor ventilation, inadequate lighting, and excessive noise, alongside limited resources. These factors adversely affect employee health and productivity. In this scenario, ergonomics emerges as a crucial instrument for scrutinizing and enhancing work conditions by designing physical and material settings that optimize employee comfort and efficiency.

In this context, ergonomics emerges as a pivotal discipline for analyzing and optimizing work environments by refining physical and material conditions to maximize employee comfort, efficiency, and overall well-being. Given the scarcity of research on the integration of ergonomics in public libraries, this study seeks to address this gap by assessing the extent to which the library's environment

adheres to ergonomic principles and examining its influence on service quality. Accordingly, this research is guided by the following core question:

To what extent does the work environment of the Main Public Reading Library in Ain Defla align with ergonomic standards to enhance operational efficiency and ensure the delivery of high-quality services?

The study examines the following sub-questions:

- _ To what degree do the library's physical aspects (natural and artificial lighting, ventilation, noise levels) meet ergonomic standards?
- _ In what ways does the layout and furnishing of the library influence employee comfort and task efficiency, as well as the overall service quality provided to patrons?
- _ What are the primary environmental and material obstacles encountered in implementing ergonomic principles at the library, how do these challenges affect service quality and user satisfaction, and what solutions can be proposed to mitigate these issues?

1.2 Study Objectives:

This investigation aims to:

- _ Analyze the influence of physical factors (natural and artificial lighting, ventilation, and noise) on the work environment at the Hamdan Hadjaji Main Public Reading Library in Ain Defla Province, and assess their compliance with ergonomic standards.
- _ Assess the adequacy of the library's internal design and facilities (furniture, work tools) in meeting employees' comfort and efficiency needs, and the extent to which they contribute to service quality from an ergonomic perspective.
- _ Identify the main environmental and physical challenges that hinder the implementation of ergonomic principles in the library, examine their impact on service quality and user satisfaction, and propose practical solutions to address them.

1.3 Study Significance:

This research highlights the role of ergonomics in enhancing work conditions in public libraries, examining how physical and material factors impact employee efficiency and service quality. It fills scholarly gaps in ergonomic applications within cultural institutions and provides practical insights for workplace improvements, benefiting similar institutions locally and globally.

1.4 Study Terminology:

To ensure clarity and consistency, the key terms used in this study are defined below, as their meanings may vary across disciplines and literature.

A. Ergonomics

Ergonomics, derived from the Greek *Ergon* (work) and *Nomos* (law), focuses on optimizing work conditions. Historically, early humans applied ergonomic principles by shaping tools for better usability. Zunjic (2017) notes that "human factors" is synonymous with ergonomics in the U.S., while the term has European origins. This multidisciplinary field integrates various human factors to enhance workplace comfort, safety, and efficiency.

Operationally, this study applies ergonomic principles at the *Hamdan Hadjaji* Main Public Reading Library in Ain Defla, optimizing lighting, ventilation, noise, and workspace design to improve employee and user experience.

Figure 01: The Concept of Ergonomics



Source : Saidi, 2024

B. Physical Environment

Chehata (2010) defines the physical environment as factors like temperature, humidity, lighting, and noise, which influence productivity. Sekiou et al. (2001) expand this to include leadership and teamwork, essential for workplace organization.

C. Material Environment

According to ISO standards, the material environment includes workspaces, tools, and equipment vital for productivity. Abdel Rahman & Majid (2012) describe it as the tangible elements designed to enhance safety, efficiency, and comfort.

D. Public Libraries

Badr (1996) defines public libraries as state-funded institutions preserving cultural and intellectual heritage. They serve diverse populations, fostering knowledge and cultural development.

1.5 Previous Studies:

This section presents the most relevant studies that have addressed the same research problem, highlights the gaps in the literature, and demonstrates the contribution of the current study to the field."

A study by Radia Tambout at the National Multitechnical School Library in Constantine examined ergonomic implementation concerning furniture, work equipment, and safety measures. The findings revealed a poor application of ergonomic standards, leading to significant employee fatigue and a decline in library patronage (Tambout, 2016).

Similarly, Zarari and Bounaama investigated physical ergonomics in the New Complex Libraries at the University of May 8, 1945, in Guelma. Their study found that the absence of preventive ergonomic designs compromised worker comfort and safety. The lack of prior planning in safety and security



measures underscored the need for improving the physical work environment to enhance efficiency and safety (Zarari & Bounaama, 2019).

In her study "Ergonomic Conditions in the Libraries of Alexandria University and the New Alexandria Library: A Field Study," Rania Marei evaluated the impact of furniture design and environmental factors, such as lighting and ventilation, on staff and patrons. Using case studies, questionnaires, and checklists, she found that while Alexandria University libraries had furniture that did not meet ergonomic standards, causing health issues like lower back pain, the New Alexandria Library featured ergonomically compliant furniture. Additionally, older university libraries had poor ventilation, whereas the new library had modern air conditioning and better lighting. (Marei, 2017).

Adding to the discussion, Sabaghinejad, Neisi, and Parvin explored the relationship between ergonomic conditions, job satisfaction, and librarians' performance at state universities in Ahvaz. Surveying 84 librarians from Shahid Chamran and Jundishapur University of Medical Sciences, the study found a direct correlation between ergonomic conditions and job satisfaction, which positively influenced professional performance. An indirect relationship also emerged, where job satisfaction mediated the link between ergonomic conditions and performance.

The study recommended improving both physical and professional environments to enhance job satisfaction and efficiency while emphasizing the importance of investing in proper work equipment for a safer workplace (Sabaghinejad, Neisi, & Parvin, 2018).

Lastly, Vahideh Zarea and colleagues examined the impact of ergonomic factors on librarians' health in public libraries in Hamedan, Iran. Using the Nordic questionnaire and a checklist based on OSHA and NAYOSH standards, the study surveyed 112 librarians and found that 71.5% experienced musculoskeletal disorders, particularly in the neck and back. The study highlighted a significant correlation between these disorders and variables such as age and years of employment. (Zarea, Jalil, Mohammad Asghari, & Fatemeh, 2013).

Research confirms that ergonomic factors like furniture, ventilation, and lighting significantly impact employee health and performance. Poor ergonomic conditions lead to musculoskeletal disorders, while improved environments enhance job satisfaction and efficiency.

Our study is distinct in its focus on Ain Defla's 'Hamdan Hadjaji' Library, its analysis of budget constraints, and its emphasis on physical exercise for employee well-being, aspects often overlooked. Additionally, it employs simpler, more practical tools suited to Algerian library conditions rather than complex questionnaires used in previous studies.

2. Methodological Procedures

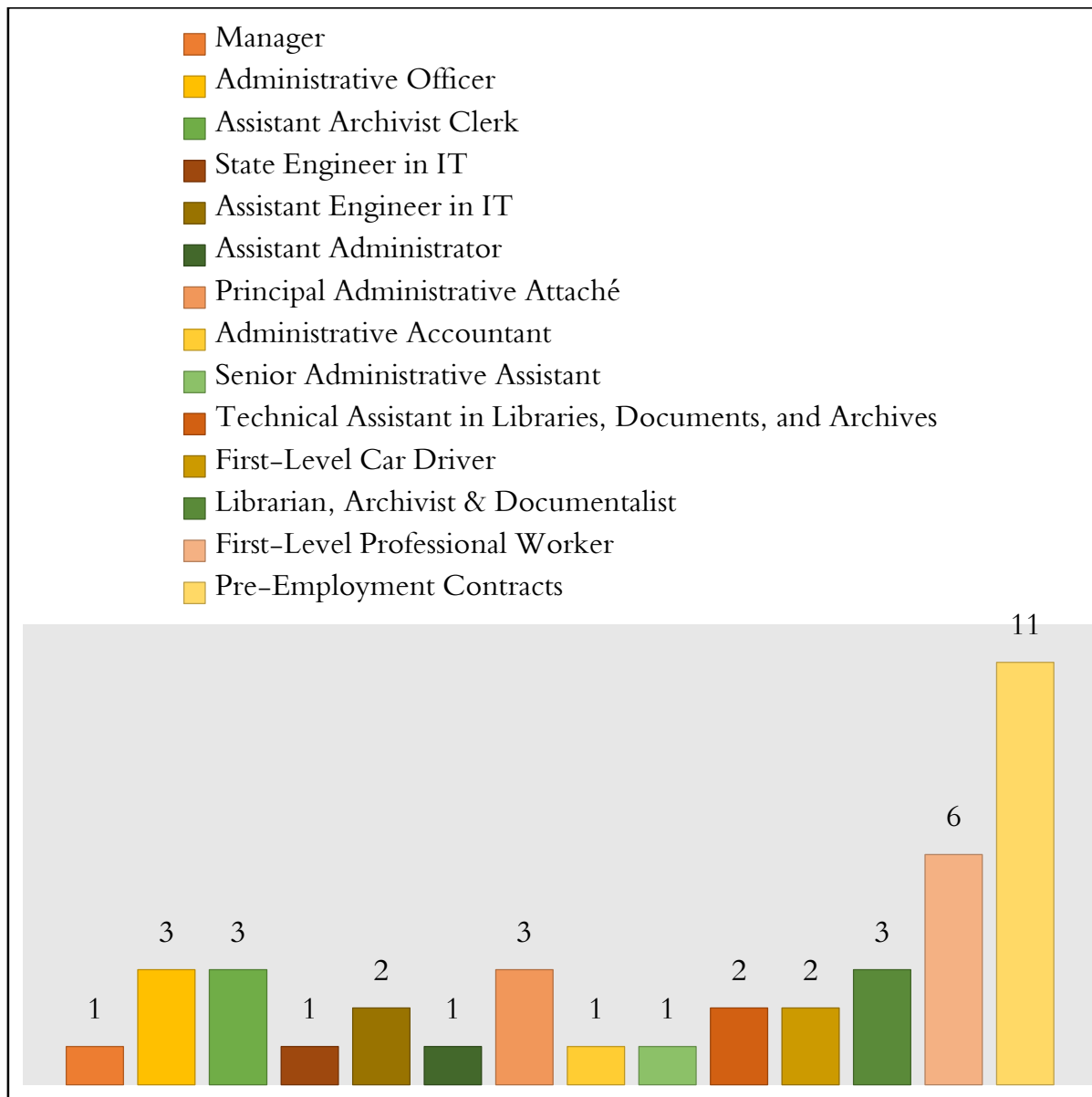
2.1 Study Methodology:

Our research adopted a descriptive methodology, which proved to be the most effective for evaluating the current state of the 'Hamdan Hadjaji' Main Public Reading Library and its ergonomic compatibility. This approach facilitated a detailed examination of physical factors and material equipment and their impacts on employee efficiency and service quality, alongside identifying the ergonomic implementation challenges.

2.2 Population of the Study:

The study included 40 employees from the *Hamdan Hadjaji* Main Public Reading Library, drawn from an original population of 43, excluding three night shift guards who were unavailable during the study period. This approach ensured comprehensive coverage and personal engagement with the participants within the library setting.

Figure 01: Human Resources at the Main Public Reading Library in Ain Defla



Source: Guide to the Main Public Reading Library 'Hamdan Hadjaji,' Algeria, 2024

2.3 Data Collection Tools:

A printed questionnaire comprising both open and closed questions was distributed across three main axes to gather detailed information about the library's work environment and ergonomic conditions.

- **Axis 1:** Ergonomic Design in the Physical Environment, comprising five sub-questions.

- **Axis 2:** Ergonomic Design in the Material Environment of the library comprising 18 sub-questions.
- **Axis 3:** Barriers to the Implementating of Ergonomics in the Library, comprising seven sub-questions.

3. Presentation and Analysis of Field Study Results

3.1 First Axis: Analysis of Ergonomic Design in the Physical Environment

A. General Climate (Lighting, Ventilation, Air Conditioning in the Library)

Table 1: Assessment of Lighting in the Library

Level	Frequency	Percentage (%)
Adequate	10	25%
Inadequate	30	75%
Total	40	100%

The data from Table 1 reveal a significant disparity in lighting conditions within the library, with 75% of employees finding the lighting inadequate. This issue predominantly affects reading halls, processing areas, and storage spaces, where the use of large, cumbersome lamps contributes to prolonged maintenance delays (10-15 days). Conversely, administrative offices benefit from adequate lighting facilitated by smaller, easily replaceable lamps. This uneven distribution of light quality not only impacts the comfort of employees in poorly lit areas but also underscores the need for a lighting system overhaul to achieve a uniformly comfortable and efficient work environment.

Table 2: Assessment of Ventilation in the Library

Level	Frequency	Percentage (%)
Satisfactory	12	30%
Unsatisfactory	28	70%
Total	40	100%

The data indicate that a significant 70% of employees perceive the library's ventilation as unsatisfactory, with only 30% regarding it as adequate. The disparity in ventilation quality is pronounced across various sections of the library. Specifically, the basement's processing department struggles with poor ventilation, as opening windows is avoided to protect against dust and pests. Furthermore, the inventory and activities offices suffer from a complete absence of windows. Although reading halls and the lending department are equipped with windows, noise from an external car wash impairs the effective use of natural ventilation. In contrast, the administrative section reports satisfactory ventilation due to the presence of windows that facilitate proper air circulation.

Table 3: Assessment of Air Conditioning Quality

Level	Frequency	Percentage (%)
Satisfactory	2	5%
Unsatisfactory	38	95%
Total	40	100%

Analysis shows that 95% of employees rate the air conditioning within the library as unsatisfactory, particularly problematic during warmer periods. Although air conditioning units exist, their frequent malfunction contributes to discomfort, diminishing both comfort and productivity.

Efforts by the library administration to repair existing units are often thwarted by financial constraints, preventing the acquisition of new equipment or upgrades to the existing infrastructure. Addressing this requires a commitment to regular maintenance and the strategic allocation of funds for technological updates to ensure a more reliable and effective air conditioning system.

B. Library Work Environment

Table 4: Estimation of Noise and Quietness in the Library

Level	Frequency	Percentage (%)
Somewhat Quiet	18	45%
Not Quiet Enough	—	0%
Noisy	—	0%
Somewhat Noisy	22	55%
Total	40	100%

The results in Table 4 show significant variation in noise levels within the library. 45% of employees consider the work environment somewhat quiet, while 55% describe it as somewhat noisy.

Administration staff and the internet room enjoy a quiet environment, while employees in the reading hall and children's section experience high noise levels, especially during exam periods. Additionally, the nearby car wash station contributes to increased external noise.

Based on these findings, measures should be taken to reduce noise, such as improving internal sound insulation and minimizing external disturbances, to ensure a comfortable work environment that supports employee productivity and user satisfaction.

C. Wall Colors and Their Impact on Employees' Feelings

Table 5: Workers' Feelings Towards Library Colors

Level	Frequency	Percentage (%)
Stress	—	0%
Anxiety	—	0%
Tranquility	40	100%
Total	40	100%

The unanimous feedback from employees (100%) indicates that the library's white walls contribute significantly to a sense of tranquility, enhancing the psychological well-being of the staff. This color choice not only maximizes natural light within the space but also visually enlarges the environment, fostering an atmosphere conducive to focus and productivity. Such strategic design decisions underscore the administration's dedication to fostering a work setting that bolsters employee well-being and operational efficiency.

3.2 Second Axis: Ergonomic Design in the Material Environment of the Library

A. Furniture:

Table 6: Assessment of Seat Quality

Level	Frequency	Percentage (%)
Yes	25	62.5%
No	15	37.5%
Total	40	100%

The findings from Table 6 show that the majority of employees (62.5%) are satisfied with the seating arrangements, attributable to the acquisition of new chairs in 2022. These modern chairs have benefited staff in administration, lending, and the internet hall. Conversely, the remaining 37.5% of employees, particularly those in the processing department, report discomfort due to outdated chairs that do not align with the ergonomics of computer tables. This discrepancy highlights the need for upgrading furniture across all departments to ensure uniform comfort and reduce strain during extended sitting periods.

Figure 2: Ergonomic Standards Necessary for Library Chairs



Source: International Labour Organization, n.d., p.7.

Table 7: Assessment of Desk Quality

Level	Frequency	Percentage (%)
Yes	17	42.5%
No	23	57.5%
Total	40	100%

The findings reveal that 57.5% of library employees are dissatisfied with the desk quality, citing issues such as cramped space at lending department desks which complicates book organization during lending and retrieval. In the processing department, the use of narrow computer tables, which fit only one or two books, increases physical movement and consequently, fatigue. In contrast, the administrative staff report that their desks adequately meet their requirements.

Table 8: Assessment of Shelf Quality

Level	Frequency	Percentage (%)
Yes	—	0%
No	40	100%
Total	40	100%

According to the data, all employees find the library shelves too high, complicating access to books on upper shelves. Staff often resort to using tiptoes, short ladders, or chairs, and in some instances, climb directly onto the shelves to retrieve books quickly. The commonly used heavy wooden ladder exacerbates physical strain, especially when moving it between departments. Moreover, retrieving

books from lower shelves frequently causes back, waist, and foot pain, particularly when handling large or multi-volume books without proper ergonomic postures.

Figure 1: Correct Postures for Retrieving Books



Source: International Labour Organization, n.d., p.10.

B. Equipment:

Table 9: Use of Computers in the Library

Level	Frequency	Percentage (%)
Always	20	50%
Sometimes	10	25%
Rarely	4	10%
Never	6	15%
Total	40	100%

This table shows significant variability in computer usage among library staff. Half of the employees use computers constantly for clerical tasks, particularly in administrative and technical departments, indicating high technical proficiency. Meanwhile, 25% use computers occasionally, such as in the children's hall for manual lending entries. The remaining 25% use computers rarely or not at all, mainly those in non-technical roles like security or book arrangement, highlighting a need for improved technological training and equipment distribution to boost efficiency across all departments.

Table 10: Assessment of Eye Strain from Prolonged Computer Use

Level	Frequency	Percentage (%)
Always	18	45%
Sometimes	12	30%
Rarely	4	10%
Never	6	15%
Total	40	100%

Approximately 45% of employees consistently experience eye strain from prolonged computer use, a condition exacerbated by the lack of screen protectors which could mitigate visual stress. Another 30% occasionally suffer from eye strain, linked to intermittent computer usage. These findings stress the importance of improving the technical workspace by equipping computers with screen protectors, educating employees on optimal visual ergonomics, and instituting regular breaks to reduce the risk of eye strain and enhance overall workplace well-being.

Table 11: Assessment of the Presence of the Screen, Keyboard, and Mouse Directly in Front of the Employee

Level	Frequency	Percentage (%)
Yes	40	100%
No	—	0%
Total	40	100%

The data reveal that all employees recognize the importance of positioning computer screens, keyboards, and mice directly in front of them to facilitate search operations, information retrieval, material processing, patron registration, and administrative tasks. However, field observations highlight a shortage of computers, resulting in device sharing among employees, particularly in the processing department. This limitation disrupts workflow and negatively impacts efficiency, underscoring the urgent need to increase the number of available devices and distribute them effectively to optimize operational performance.

Table 12: Regular Change of Sitting Position Throughout the Day

Level	Frequency	Percentage (%)
Yes	29	72.5%
No	11	27.5%
Total	40	100%

The results indicate that 72.5% of employees actively change their sitting positions throughout the day by standing, walking in the library corridors, or briefly stepping out for personal tasks, which helps reduce physical fatigue and monotony, thereby enhancing comfort during work. Conversely, 27.5%, notably in the lending department, find it difficult to alter their positions due to the nature of their tasks, which require continuous movement between shelves.

Table 13: Employees Experiencing Neck, Shoulder, and Back Pain from Computer Use

Level	Frequency	Percentage (%)
Always	25	62.5%
Sometimes	5	12.5%
Never	10	25%
Total	40	100%

The findings reveal that 62.5% of employees frequently suffer from neck, shoulder, and back pain due to prolonged sitting and repetitive movements associated with computer work. An additional 12.5% report occasional discomfort, while 25% experience no such issues, typically employees whose tasks do not require prolonged computer use.

C. Security and Safety Devices

Table 14: Availability of Security and Safety Devices in the Library

Level	Frequency	Percentage (%)
Yes	40	100%
No	—	0%
Total	40	100%

The data confirm that the 'Hamdan Hadjaji' Library is fully equipped with necessary security and safety devices, demonstrating a strong commitment to maintaining a secure work environment. Safety measures include fire detectors, handheld fire extinguishers, theft alarm sirens, and surveillance cameras strategically covering all library facilities.

Table 15: Emergency Exits in the Library

Level	Frequency	Percentage (%)
Yes	40	100%
No	—	0%
Total	40	100%

The findings indicate that emergency exits are well-distributed across the library, ensuring quick and safe evacuation when needed. The designated emergency exits include access points through the staff parking lot, the library garden, lecture halls, and the main library entrance. While these exits contribute to a high level of preparedness and safety, regular evacuation drills and periodic assessments of their accessibility are recommended to maintain the highest safety standards for employees and patrons.

Table 16: Presence of Instructional Guidelines for Security and Safety Rules in Emergencies

Level	Frequency	Percentage (%)
Yes	9	22.5%
No	31	77.5%
Total	40	100%

The results indicate that 77.5% of employees acknowledge the absence of instructional guidelines for emergency security and safety procedures in the library, while only 22.5% believe they are present.

However, field observations revealed that those reporting the presence of guidelines mistakenly identified the general information panel at the reception desk as an emergency instruction panel.

Table 17: Assessment of Anti-slip Flooring in the Library

Level	Frequency	Percentage (%)
Yes	17	42.5%
Somewhat	16	40%
No	7	17.5%
Total	40	100%

Opinions on the safety of the library's flooring vary, with 42.5% considering it safe, 40% stating it is somewhat safe, and 17.5% regarding it as unsafe. The general library flooring consists of old, non-slip tiles, which provide adequate traction for daily use. However, recently renovated bathroom floors have been fitted with slippery tiles, posing a significant risk, particularly in the presence of water leaks.

Table 18: Safety of Electrical Outlets in the Library

Level	Frequency	Percentage (%)
Unsafe	7	17.5%
Somewhat Safe	20	50%
Safe	13	32.5%
Total	40	100%

Findings reveal that 50% of employees perceive electrical outlets as somewhat safe, 32.5% consider them completely safe, while 17.5% find them unsafe. Concerns regarding electrical safety stem from a past incident where a low-quality electrical plug caused damage to a computer. In response, library management has updated some electrical equipment, but regular maintenance of the electrical system and increased employee awareness are necessary to ensure ongoing safety and mitigate potential hazards.

3.3 Third Axis: Barriers to Implementing Ergonomics in the Library

Table 19: Job-Related Stress

Level	Frequency	Percentage (%)
Yes	18	45%
No	22	55%
Total	40	100%

The data show that 45% of employees experience job-related stress, while 55% do not. Stress levels vary across departments, with employees in the lending section and children's hall reporting high levels of stress, particularly during exam periods and peak hours, which significantly increases their

workload. Additionally, the continued malfunction of the book elevator exacerbates their strain, as they must frequently use stairs to transport books.

Table 20: Worker Satisfaction with Working Days at the Library

Level	Frequency	Percentage (%)
Satisfactory	33	82.5%
Unsatisfactory	7	17.5%
Total	40	100%

The findings indicate that the majority of employees are satisfied with the work schedule from Saturday to Thursday. Saturdays are designated for employees in the lending service and children's hall to meet readers' needs, with compensation through alternate days off. However, a minority of employees expressed dissatisfaction, likely due to personal or family-related circumstances.

Table 21: Worker Satisfaction with Working Hours

Level	Frequency	Percentage (%)
Satisfactory	34	85%
Unsatisfactory	6	15%
Total	40	100%

The results demonstrate that most employees consider the current working hours fair and suitable. However, a small proportion expressed dissatisfaction, advocating for a continuous work schedule from 8:00 AM to 3:00 PM, similar to systems implemented in some Arab countries. This adjustment, they argue, would allow greater flexibility for personal matters or additional work opportunities.

Table 22: Employee Health Issues After Joining the Library

Level	Frequency	Percentage (%)
Yes	25	62.5%
No	15	37.5%
Total	40	100%

The data reveal that 62.5% of employees report developing health issues since joining the library, including back and neck pain from prolonged sitting and computer use, as well as frequent headaches caused by continuous noise exposure. Some employees also suffer from joint pain due to excessive stair climbing necessitated by the malfunctioning book elevator. Additional health concerns include vitamin D deficiency and anemia.

Table 23: Occupational Injuries of Library Workers

Injury Type	Frequency	Percentage (%)
Fractures	—	0%
Slips	—	0%
Electrical Accidents	—	0%
Total	—	0%

The absence of recorded occupational injuries among library employees underscores adherence to workplace safety standards. This outcome reflects the effectiveness of existing safety measures and employees' awareness of following proper procedures to maintain a secure working environment.

4. General Results of the Study

4.1. Ergonomic Design in the Physical Environment

- Lighting, ventilation, and air conditioning are inadequate, contributing to fatigue and reduced job performance, necessitating upgrades in line with modern ergonomic standards.
- Noise pollution, both internal and external, remains a significant challenge. Effective soundproofing measures are recommended to minimize disturbances.

4.2. Ergonomic Design in the Material Environment, of the library

- Workstations need improvement, as unsuitable desks negatively affect employees' comfort, while comfortable chairs have shown a positive impact on productivity.
- Bookshelves are a source of physical strain; high shelves are difficult to access, requiring employees to climb or stretch, while lower shelves necessitate frequent bending, leading to back pain.
- Technology integration is relatively advanced, but the absence of screen protectors increases the risk of eye strain and visual discomfort.
- Postural awareness is sufficient, with employees recognizing the importance of changing positions to mitigate the adverse effects of prolonged sitting.

4.3. Barriers to the Implementating of Ergonomics in the Library

- Common health concerns include musculoskeletal disorders, allergies, and vitamin D deficiency, emphasizing the need for a healthier and ergonomically optimized workspace.
- Workplace safety measures are well-established, as evidenced by the absence of occupational injuries. However, the lack of clear instructional guidelines for emergencies could lead to confusion during critical situations.



- Work-related stress affects employees in certain departments due to imbalanced task distribution, impacting job satisfaction.
- Work schedules and hours are generally perceived as fair and well-distributed among employees.

Conclusion and Suggestions

The present study has highlighted significant ergonomic shortcomings within the Hamdan Hadjaji Main Public Reading Library in Ain Defla. These issues—ranging from inadequate environmental conditions to structural design flaws and organizational inefficiencies—pose direct challenges to employee well-being, productivity, and the overall quality of services provided to users. Addressing these gaps is not merely a matter of workplace comfort; it is a prerequisite for fostering a functional and sustainable library environment. Based on the findings, the following tailored suggestions are proposed:

1. Environmental Enhancements

- Replace current lighting with energy-efficient fixtures that closely replicate natural daylight to reduce visual fatigue.
- Modernize ventilation and air conditioning systems to maintain stable airflow and thermal comfort, particularly in closed or high-traffic areas.
- Introduce targeted acoustic solutions such as sound-absorbing panels to mitigate both external and internal noise disturbances.

2. Furniture and Layout Redesign

- Adjustable desks should be introduced to allow variation in posture and reduce musculoskeletal stress.
- Bookcases should be redesigned to prioritize accessibility, limiting the need for excessive bending or stretching.
- Ergonomic seating—supporting proper spinal alignment—must be made available to all staff, especially those in sedentary roles.

3. Integration of Digital Ergonomics

- All digital workstations should be fitted with anti-glare screen protectors to minimize eye strain.
- Institutional guidelines for healthy screen use—including regular screen breaks and workspace adjustments—should be developed and implemented.

4. Health and Safety Measures

- Periodic medical check-ups focusing on musculoskeletal health should be offered.
- Clear and accessible emergency response protocols should be made available to all staff.
- Environmental adjustments should also consider allergy triggers and vitamin D deficiency risks due to insufficient exposure to natural light.

5. Organizational Adjustments



- A reassessment of task distribution is necessary to ensure equity and reduce department-level stress.
- Ergonomics awareness training should be provided on a regular basis to cultivate healthy work habits and long-term physical resilience.

Implementing these recommendations is expected to contribute significantly to improving staff well-being, enhancing service quality, and ensuring the long-term sustainability of ergonomic practices within the library environment.

References

- Abdel Rahman, Fouad Yousef, & Majid, Soumia Abbas. (2012). The physical work environment and its impact on employee performance: A survey study in the General Company for Electrical Industries. *Journal of Management and Economics*, 9.
- Badr, Ahmed. (1996). *Basics in information science and libraries*. Riyadh: Dar Al Mareekh Publishing.
- Chahata, Mohamed Rabie. (2010). *Industrial psychology*. Alexandria: Dar Al Masira for Publishing and Distribution.
- International Ergonomics Association. (2000). Executive Council definition. Retrieved July 26, 2024, from <http://www.iea.cc>.
- Marei, Rania Majdy Taha. (2017). Ergonomic conditions in Alexandria University libraries and the New Library of Alexandria: A field study. *International Journal of Library and Information Sciences*, 4(3), 293-296. Retrieved November 3, 2024, from <https://search.emarefa.net/detail/BIM-774760>.
- National Institute of Occupational Safety and Health (NIOSH). (1999). *Stress of work*. Centers for Disease Control and Prevention, U.S. (Ed.), (pp. 99-101). Retrieved October 27, 2024, from www.statcan.gc.ca.
- Sabaghinejad, Z, Neisi, A, & Parvin, S. (2018). Study of ergonomic conditions of university libraries and its impact on librarians' performance by mediating job satisfaction in order to provide a model. *Journal of Ergonomics*, 6(3), 75-85. <https://doi.org/10.30699/jergon.6.3.8>.
- Sudhir, P. N., & Ravindra, D. S. (2018, March–April). Importance of ergonomics in academic libraries. *Knowledge Librarian: An International Peer Reviewed Bilingual E-Journal of Library and Information Science*, 5(2). Retrieved October 12, 2024, from <http://www.klibjlis.com/5.2.3.pdf>.
- Tambout, Radia. (2016). *Applications of ergonomics in university libraries: A case study at the National Polytechnic School Library in Constantine*. (Master's thesis, Constantine 2 University Abdelhamid Mehri).
- Vahideh, Zarea G., Jalil, N., Mohammad Asghari, J., & Fatemeh, R. (2013). Is librarians' health affected by ergonomic factors at the workplace? *Library Philosophy and Practice (e-journal)*, 893. Retrieved November 5, 2024, from <https://digitalcommons.unl.edu/libphilprac/893>.
- Wahid, Zarari, & Souhila, Bounama. (2019). The reality of physical ergonomics in university libraries: A field study at the New Complex of May 8, 1945 Guelma. (Master's thesis, University of Guelma).
- Zafir, M., Durrishah, Id, & Mat Rebi, A. (2007). Ergonomics design on the work stress outcomes. *Journal Kemanusiaan*, 9, 50-53. Retrieved September 17, 2024, from <http://eprints.utm.my>.
- Zunjic, A (2017). A new definition of ergonomics. *Transactions on Engineering and Sciences*, 1(1), 1-6. Retrieved October 26, 2024, from <https://www.ieti.net/tes/2017V1I1/IETI%20TES%20V1%20I1%201-6.pdf>