# Analysis of the Relationship between Productivity and the Work Environment in Ecuador by 2022

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**Abstract**

In the present investigation, the topics related to the "Work Environment" and "Productivity" are reviewed, and all the literary and scientific productions that are focused on this field of study at the organizational level, where the theories and previous investigations are presented and described with greater relevance for the development of the proposed theme. In the scientific literature, when the terms "Work Environment" and "Productivity" are presented in the same investigation, they are usually related to the following terms: job satisfaction, Care, Value, comfort, success, and symptoms.

**Keywords**

Work environment, Productivity, Literature, Relevance

## 1. Introduction

Globalization has forced the economy to evolve towards services and information technology, generating new ways of working [1], making employees the organization's most valuable asset [2]. Since the employees are the ones who exploit the available resources in all the company's production stages [3]. This makes employees a determining factor of business competitive advantage, being essential to promote their performance for the company's development [3].

The organizational climate plays an important role for all company's members [4], which is why in recent years conventional offices have been transformed into activity-based workplaces to support both concentration and collaboration [1]. Therefore, companies need to build this work environment type that stimulates increased performance [3], and relationships between colleagues, directly affecting the organization's productivity [5, 6].

The work environment quality can determine the level of employee motivation, performance, and productivity [4], specifically focusing on communication, cooperation, and interdependence among coworkers as factors that affect quality. of their job performance [5]. The working life quality is important to preserve human talent, since in recent decades they have been ignored due to technological progress and its influence on economic growth and productivity [2].

For this reason, the work environment is a key factor in improving organizational performance [2], since a good work environment increases the company's ability to retain human talent; being a critical factor when employees accept and/or maintain jobs [4]. Therefore, a precarious work environment will leave the company without human resources to transform and produce goods and services, making the available resources unproductive [3].

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Authors such as Massoudi and Hamdi [4], agree that the company can positively influence through the work environment the "employee error rate, innovation level, collaboration with other employees, absenteeism and, ultimately, the period to remain at work". Keeping employees motivated, providing them with adequate facilities, labor benefits [1], better-paid salaries, and compensation benefits are the decisive factors when it comes to attracting human talent [4, 5, 7].

This work redesign practices and their work environment incorporate the potential to improve both the productivity and workers' well-being, which is reflected in the economic performance perceived by the organization [1]. Maintaining a healthy and productive workforce is increasingly challenging due to ongoing structural changes in the work environment, an aging workforce, and an increasing number of employees affected by stress at work [8], in the same way, the increase in business competition to attract its collaborators. As previously mentioned, productivity is one of the most important factors affecting the overall performance of any organization [9, 10]. Therefore, one of the factors that cause the decrease in labor productivity, can be caused by health problems, since this would cause absenteeism Brunner et al. [8] of employees, or be present but without the ability to concentrate necessary to properly perform their duties.

According to the Directorate of Sociodemographic Strategies of the Instituto Nacional de Estadísticas y Censos [11], the Adequate Employment Rate during the second quarter of 2022 is 33.8% at the national level, which means that only 1 third of the economically active population has a formal and stable job. However, this very low percentage continues to be below acceptable working levels, according to the report "Occupational Structures - Sector Minimum Wages and Salaries and Sector Minimum Wage Rates" of the Ministry of Labor, (2022) the current minimum wage is of $425, which is lower than the current basic basket of $793.33 dollars [11], 37.2% (1,080,353 workers) who have a suitable job INEC [11] correspond to professionals with a university education level, so the workforce trained in the various economic activities is reduced. On the other hand, at the national level, there are 211,169 companies SRI [12] in the private sector that need qualified employees, so they need to retain human talent. In most Ecuadorian companies, working conditions present problems such as lack of stability, health, comfort (inadequate lighting and ventilation), and excessive noise [4].

Brunner et al. [8], argue that these working conditions type, added to the lack of resources, generate stress among employees, causing a decrease in performance and motivation and, over time, generating serious health problems. These harmful factors cause costs to all related parties since health problems generate medical care costs and costs related to sick leave, which can be objectively estimated to quantify their economic effect on productivity business [9, 13].

It is important to define what, productivity is "fundamental for the individual worker of any status, for the organization, whether commercial or not, and for the national economy in general and, consequently, for the citizen well-being elevation and the reduction, not to say the total eradication of mass poverty" [14]. If timely measures are not taken, companies in Ecuador will lose their competitive advantage, as well as a decline in their productivity, therefore, the research to be developed aims to analyze the economic effect of the work environment on the productivity of small and medium-sized companies in Ecuador.

As shown in Figure 1, the Ecuadorian provinces that register a higher level of textile production are Pichincha, Guayas, Azuay, Tungurahua, Imbabura, and Manabí, which together represent 78.39% of national textile manufacturing [15]. This percentage corresponds to 16,633 companies out of a total of 21,218 registered throughout the Ecuadorian territory [15]. These companies in 2019 provided an average of 44,451 jobs, according to records from the Ecuadorian Institute of Social Security and INEC [15].

The province of Tungurahua represents 10.26% of the national textile production [15], whose merchandise is sold and consumed nationally or in turn is exported (Aguinda Guallo et al.[16] to other countries.

Additionally, companies in the textile sector face a globalized market that has companies that not only provide quality goods and services but also cover all the workers' labor needs, facilitating their positioning in the local market [17], in addition, they can meet national demand. Currently, few specific studies measure and economically estimate the environmental work impact or changes in work practices

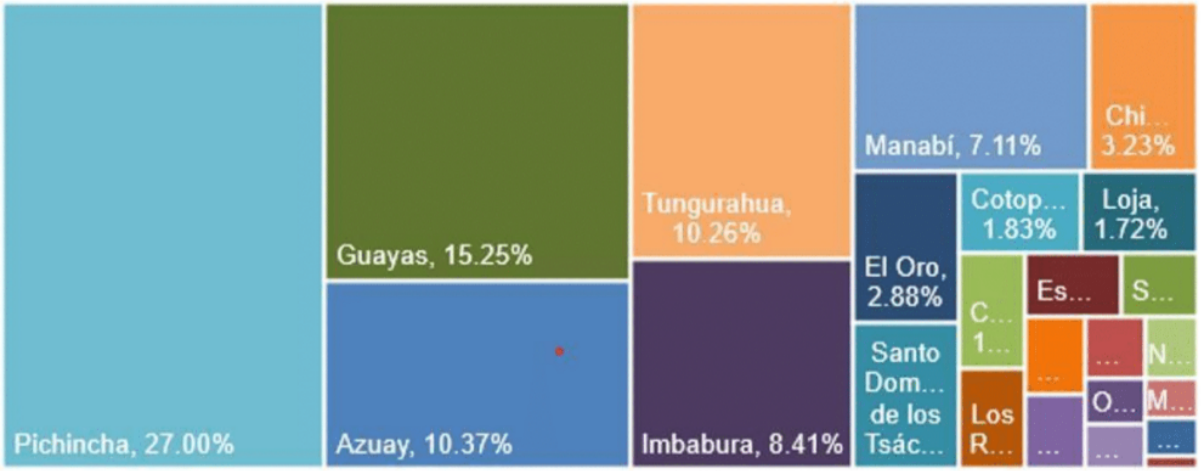


**Figure 1:** Level of textile production by provinces.

on knowledge work and organizational performance [1].

Currently, there are many publications and research that focus on the relationship that work environment has on the company productivity, where the causes, symptoms, and other factors with greater relevance in the work environment are described, and depending on the way that if executed, these can be beneficial or detrimental to the work environment, which directly affects the employees' productivity of and is ultimately reflected in business performance.

In the literary review carried out, we found around 2,500 academic Scopus[18] and scientific publications referring to the work environment and productivity, which will serve as a source of information for the research work.

In Figure 2, the terms and their respective relationships contained in scientific studies and research that deal with the work environment and productivity as a central research topic are shown. For example, the graph shows that job satisfaction is directly related to the leader, leadership, commitment, empowerment, job performance, workload, motivation, and value creation, among others. Having this

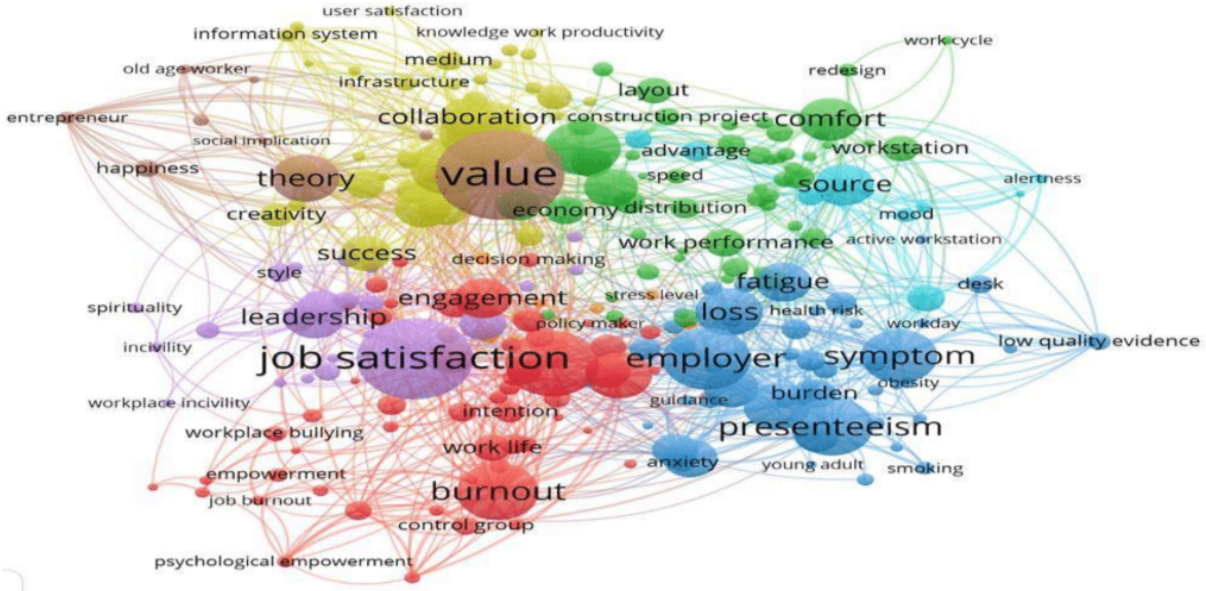


**Figure 2:** Main Issues Related to the Work Environment.

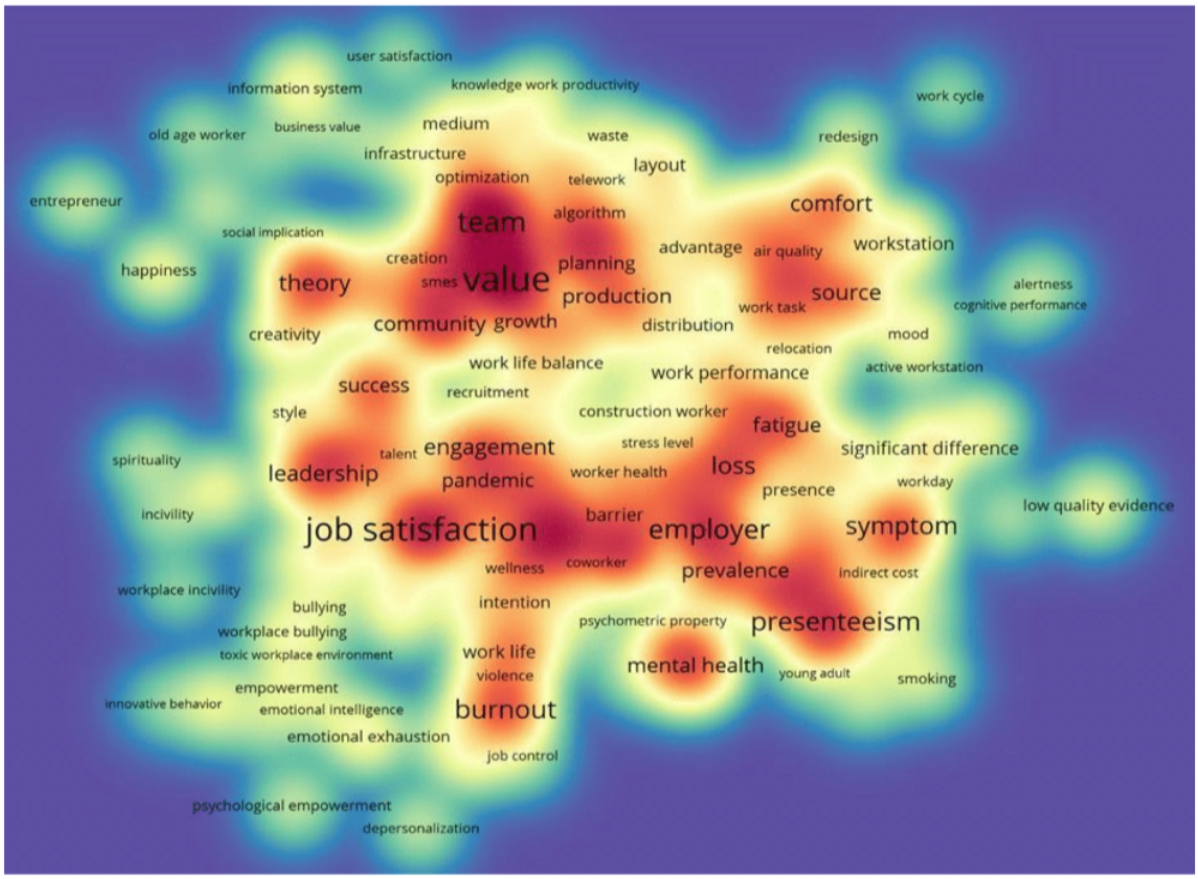


**Figure 3:** Focal Issues of the Work Environment and Productivity.

reference will allow us to build an adequate Theoretical Framework for the thesis that is proposed to be carried out in this document.

In the same way, we can observe that the main terms with the greatest occurrence are those that show larger nodes, that is, job satisfaction, value creation, employer, fatigue, work performance, and comfort are some of the main topics addressed in this type of academic research, by various authors versed in the research topic. Below is the density of previously featured topics.

In Figure 3, we can see that the majority of scientific publications are mainly focused on the topics that are shown in the red areas or with greater density, which correspond to the most relevant contents in academic publications concerning the work environment and the business productivity. As can be seen in the previous graph, the main factors that researchers address are the creation of value "value" and the work team "team", these are followed by issues of mental health, comfort, presenteeism, absenteeism, leadership, success, and fatigue among others.

The main themes shown in the graphs above have been gradually included in the academic and scientific literature over the years, as theories have evolved; and in a certain sense, it is essential to take into consideration which are the cutting-edge issues in the current workplace when conducting scientific research. For this reason, a chronological interest topic map in the labor and productive business environment is presented below.

In Figure 4, the terms are shown as they have been included in the scientific and academic literature, where we can see that the most recent topic included in the work environment and productivity is the pandemic, followed by happiness, emotional exhaustion, and work motivation. This last topic "pandemic" is of the utmost importance, since the work environment as it was known until now completely evolved due to the COVID-19 pandemic or better known as Coronavirus.

COVID-19 created the most severe global recession since the end of World War II [19], in which

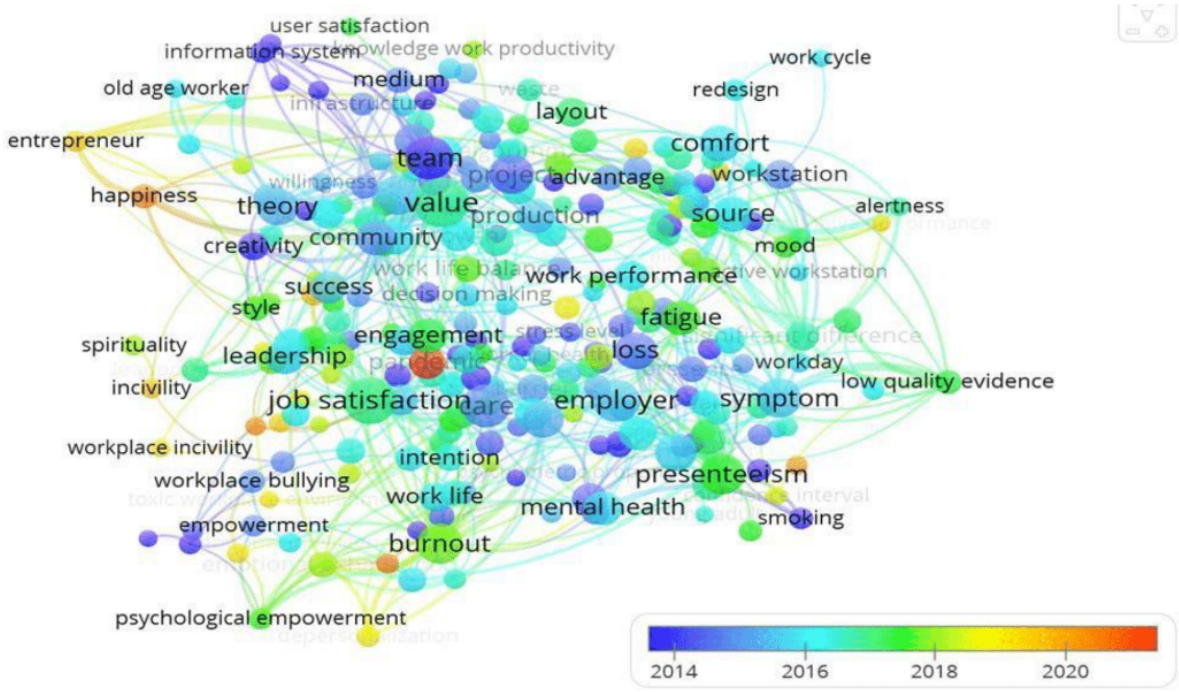


**Figure 4:** Chronological Map of Terms.

the world economy contracted by 3.5% in 2020 according to the Economic Outlook Report. World published by the International Monetary Fund (2021). For this reason, companies found themselves implementing biosafety needs measures in their workspaces and customer service due to the complexity and seriousness of the situation, which completely revolutionized work environments, as well as work modalities.

## 2. Methodology

A systematic total review of around 2500 academic Scopus [18] and scientific publications related to the work environment and productivity was carried out, of which 20 publications were selected, which were the ones that presented the highest citations number to analyze and demonstrate the scientific production in this study subject.

## 3. Results

The scientific production volume concerning the subject has grown exponentially in recent years, reaching its peak in 2020 with 211 scientific publications, followed by 208 publications in 2021, and so far in 2022 around 136 documents have been published focused on the research topic. Next, Figure 5 presents the annual scientific production articles published chronologically to date.

In Figure 5, we can see that academic publications begin to show exponential growth from 2000, where initially 27 articles were published annually on topics related to the work environment and productivity. However, the following year the registered production was 47 scientific articles, which represents 74% more scientific and academic articles compared to the previous year.

On the other hand, work environment issue and productivity has a greater impact or interest, either on the academic part, community or on the economic part sector, according to the specialization area in which it operates. For this reason, Figure 6 below presents the scientific research production topic delimited or segregated by specialization areas.

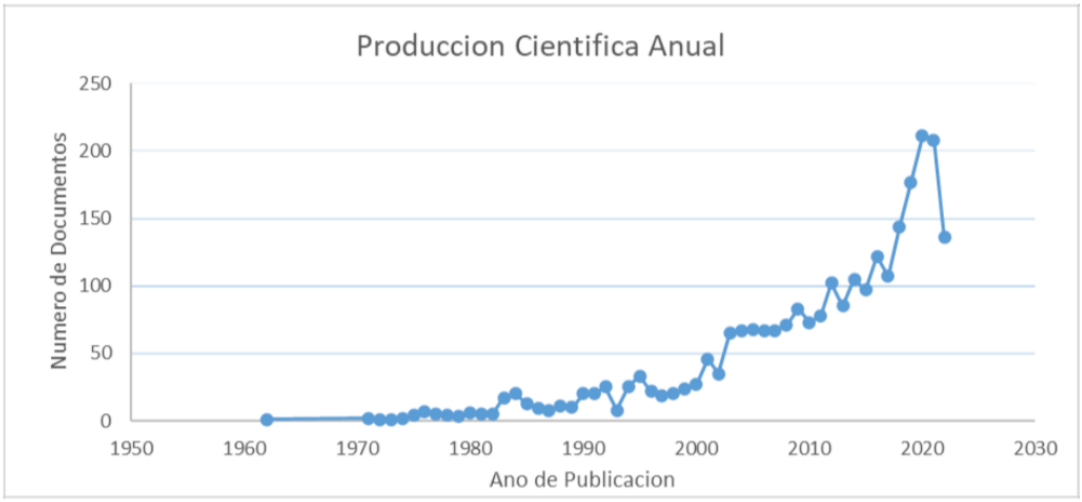


**Figure 5:** Annual Scientific Production.

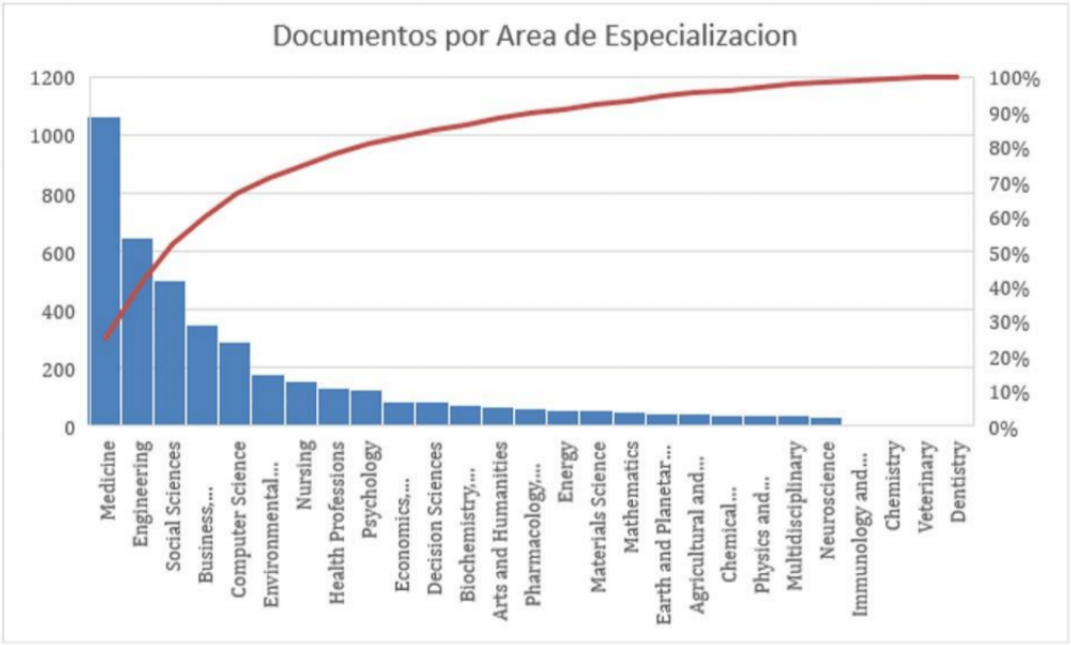


**Figure 6:** Documents by Specialization areas.

As we can see in Figure 6, the specialization area in which there is evidence of greater interest or focus in the work environment and its relationship with productivity is the medicine area. In this particular area, the work environment is of vital importance so that professionals in the health area have the highest possible productivity and most efficiency since any type of delay or error can be detrimental to all stakeholders.

For this reason, various organizations such as the Institute of Medicine (IOM) are in charge of carrying out studies and reports to identify important safety and quality problems in American medical care [20]. According to them, the final result (production) is the various derivation complex causes from the components and organizational processes of health care systems.

In this sense, the health area is essential in the population's life, as well as in the economy in general, since access to health services is necessary for economic development. For this reason, the health area focuses its efforts on constantly improving the work environment of its collaborators, to optimize access to services provided by the medical staff, as well as to achieve development objectives related to the

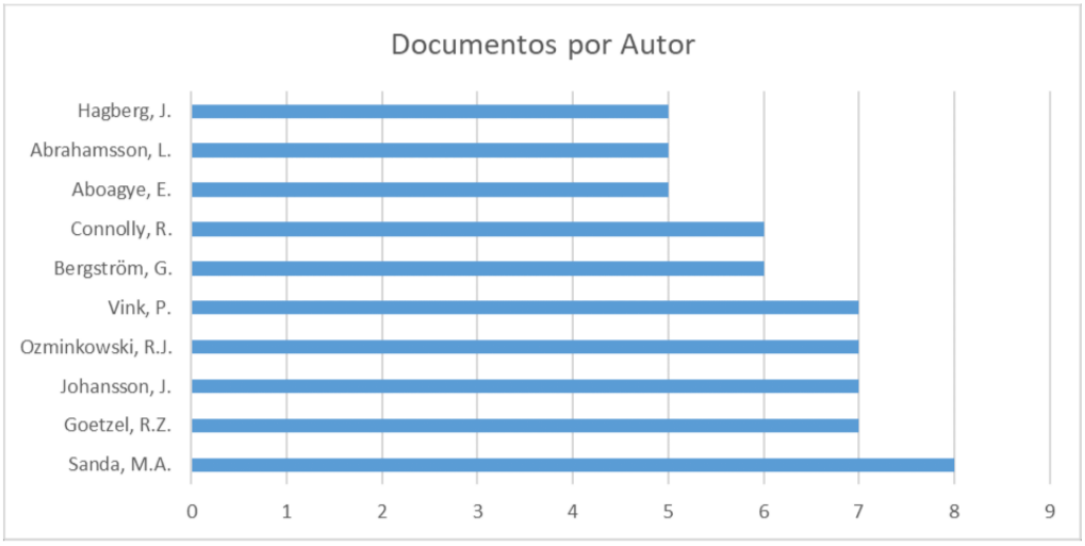


**Figure 7:** Number of Documents by Author.

field of health [21].

The authors agree that the best way to correct any failure type is to detect the causes that cause it and use this knowledge to design corrective measures to make errors less common and mitigate their effects when they occur [20]. As a result, the administration of each entity must be in charge of formulating policies and changing working conditions in a way that improves medical care for users.

However, it should be noted that there are many financial and human resource constraints, especially in developing countries, where workers are expected to do more without necessarily receiving the necessary support to do their job well [22]. On the other hand, in addition to the medical field, 3 specialization areas have a relevant focus in work terms of environment and productivity, which are engineering, social sciences, and business.

On the other hand, we must not only focus on the scientific and academic publications concerning the work environment and productivity, but we must also review who the authors behind these works were, as well as the influence that these investigations have had on exploration subject. For this reason, in Figure 7, we can find the most relevant authors with respect to the publication number that focuses on writing about the research topic.

In Figure 7, we can see that the author with the largest publications number is Mohammed-Aminu Sanda, who presents 8 scientific articles focused on the work environment and productivity. Her first article was published in 2019, with the topic “Influence of occupational stress on the mental health of Ghanaian professional women”; which explores the stress factors experienced by women in managerial positions, as well as the symptoms caused in organizational health [23].

From this publication in 2010, 7 more articles were published until 2020, the year in which its last publication is recorded, among the topics are recorded as "Problem-identification workshop as a future-oriented macroergonomic tool for managing the work environment", which deals with the challenges that organizations face when managing work environments, as well as the tools they have at their disposal for an adequate work’s environment management oriented towards decision making [24].

Another published topic by Sanda is: "Understanding social collaboration between actors and technology in an automated and digitized deep mining environment", in this article he intends to develop the necessary knowledge to establish an optimal way to automate organizational activities in a harmonious way between the human, technical and social resources to obtain greater business productivity, the latter already emphasizes the search to optimize the performance of business resources to seek economic increases in the profits of organizations [25].

"Towards the technological integration, organizations’ organizational and human subsystems to enhance productivity" on the contrary, seeks to analyze the challenges that organizations face in the

mining industry regarding human talent management as well as technologies throughout the supply chain value [26]. This article determines that employees are a very important resource for the company and that this must be managed correctly to achieve better results in corporate performance.

Subsequently, in his article "Digitization of Industrial Work Environments and the Emerging Challenges of Human-Digitized System Collaborative Work Organization Design", he takes a modern approach to how the work environment is affected by digitization and how it affects employee performance [27]. In this article, he emphasizes the possibility that there is a lack of computer knowledge to properly use digital tools to obtain efficient management in the organization.

Finally, Mohammed-Aminu Sanda [27], published her last article in 2020 with the title "Green Work Environments and Workforce Productivity Among Energy Organizations in Ghana", which explores green work practices, which refers to work practices friendly to the environment, which according to experts produce an increase in workforce productivity among organizations [28]. These types of work environments are sensitive to the environment, since they seek optimal resource management, avoiding waste as much as possible to reduce their environmental footprint.

This work environment type is a large-scale challenge for organizations since implementing this type of socially and environmentally responsible process requires a large amount of financial, human, and time resources. According to [28], these strategy types promote sustainable, efficient, and appropriate business practices for all related parties. This study type has been produced more frequently in recent years, since in addition to this author, we can show others who are also dedicated to making academic publications focused on the work environment and productivity, as shown in the previous graph.

It is relevant to take into account the amount of production carried out by the various authors, however, we should also consider the quality of the information presented, as well as which are those articles that influence in a certain way the scientific and academic production of our research topic. For this reason, the following shows the number of times that the scientific publications of our research topic were cited in each year to date, as well as which articles were most frequently referenced.

In Figure 8, we can see that the highest citations number by the authors was recorded in 2021 with a total of 5,380 citations made this year; On the other hand, we must take into account that 2022 could exceed this figure if we consider the appointments number so far this year, if the current trend continues. Table 1 below shows the scientific articles with the highest citation number in the environment area and productivity, which, as mentioned above, influenced the scientific and academic production in this field.

Table 1, shows the 20 articles with the highest citations number to scientific articles concerning the

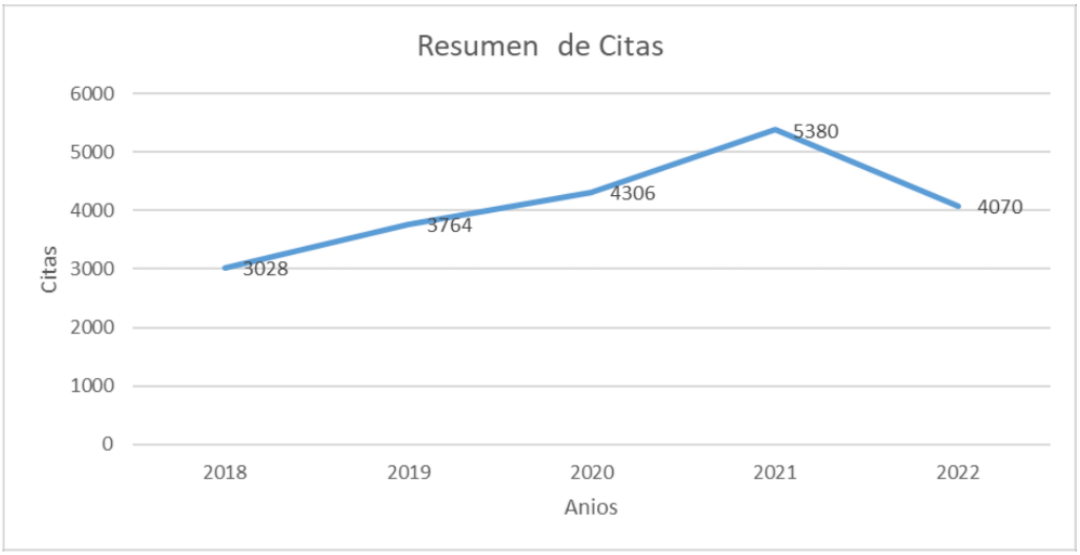


**Figure 8:** Number of Articles Citations.

work environment and productivity, that is, they are the investigations with the greatest influence on this research topic. In this sense, the article with the highest incidence is "The impact of research collaboration on scientific productivity" published by [29], which to date records 995 citations from various authors, which serves as the basis for all future research, since according to the authors, the individual characteristics and the workplace are endogenously related to both collaboration and productivity.

**Table 1**
Citation of Scientific Articles

| Year of Publication | Document title | Authors | Numbers of citations |
|---|---|---|---|
| (2017) | A review of the meanings and the implications of the Industry 4.0 concept | Pereira A.C. and Romero F. [30] | 329 |
| (2016) | Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis | West, C et al. [31] | 950 |
| (2015) | The quadruple aim: Care, health, cost and meaning in work | Sikka, R et al. [32] | 288 |
| (2012) | Application of a trapezoidal fuzzy AHP method for work safety evaluation and early warning rating of hot and humid environments | Zheng, G et al. [33] | 277 |
| (2011) | Comparison of user groups' perspectives of barriers and facilitators to implementing electronic health records: A systematic review | McGinn C.A, et al. [34] | 231 |
| (2010) | Temperatures and cyclones strongly associated with economic production in the Caribbean and Central America | Hsiang S.M. [35] | 386 |
| (2010) | Leadership styles and outcome patterns for the nursing workforce and work environment: A systematic review | Cummings G.G., et al. [36] | 478 |
| (2008) | The health and cost benefits of worksite health- promotion programs | Goetzel R.Z. and Ozminkowski R.J. [37] | 440 |
| (2007) | EEG correlates of task engagement and mental workload in vigilance, learning, and memory tasks | Berka C., et al. [38] | 611 |
| (2007) | The effect of high correlated color temperature office lighting on employee wellbeing and work performance | Mills et al. [39] | 248 |
| (2006) | Economic, neurobiological, and behavioral perspectives on building America's future workforce | Knudsen E.I., et al. [40] | 598 |
| (2006) | Operational failures and interruptions in hospital nursing | (Tucker, A and Spear, S. [41]) | 256 |
| (2006) | Common mental disorders in the workforce: Recent findings from descriptive and social epidemiology | Sanderson K. and Andrews G. [42] | 268 |
| (2005) | The impact of research collaboration on scientific productivity | Lee S. and Bozeman B. [29] | 995 |

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|---|---|---|---|
| (2005) | Sickness presenteeism: Prevalence, attendance- pressure factors, and an outline of a model for research | Aronsson G. and Gustafsson K. [43] | 386 |
| (2004) | The effects of indoor air quality on performance and productivity | Cheung, K.S and Chow, K.O [44] | 290 |
| (2001) | The impact of workplace empowerment, organizational trust on staff nurses' work satisfaction and organizational commitment | Laschinger, H.k et al. [45] | 299 |
| (1998) | Burnout as a clinical entity - its importance in health care workers | Felton, J.S [46] | 226 |
| (1996) | Psychosocial work environment and sickness absence among British civil servants: The Whitehall II study | North, F.M, et al. [47] | 331 |
| (1992) | Work-Related Cumulative Trauma Disorders of the Upper Extremity | Rempel, D.M, et al. [48] | 288 |

The study focuses on analyzing the collaboration effect between authors and their productivity with respect to the publication number in various scientific journals. For the data analysis obtained, the authors use the two-step least-squares analysis. The results corroborate that there is a strong relationship between articles' number published depending on the authors' number involved in its execution and that these results vary depending on both personal factors and the work environment.

The article with the second highest citations number is "Interventions to prevent and reduce physician burnout: a systematic review and meta-analysis" with a total of 950 citations, by West, C.P, et al. [31], in which it is stated that the Burnout negatively affects the doctors' productivity causing problems in patient care, professionalism and the health care systems viability. These types of failures directly affect the organization's performance, so they seek approaches to prevent and reduce the burnout of medical personnel.

## 4. Conclusions

As evidence, there are currently multiple investigations that focus on the work impact on climate and productivity, for example, traced that the work climate analysis was generated in the Industrial Revolution era. Where, it was detected that the workers perceived in a different way the conception they have of their workplace, as well as the effects that they produce due to the work environment and the repercussions that it has on their performance within the organization.

For the most part, the studies and investigations carried out have shown that the quality of working life is a great factor priority for companies, which must be taken into account if the organization is to be sustainable and sustainable over time [2]. Because of this, authors such as Hodgetts and Altman, in their book on organizational behavior, explain that people play an important role within organizations, since, without this human resource, the other resources that the organization has, cannot be taken advantage of become unproductive.

Additionally, the authors define the work environment as a set of characteristics that are perceived by the collaborators, which directly influence the workers' motivation. Among these aspects can be included from the workplace, interpersonal relationships, and intrinsic and extrinsic rewards among other aspects that can influence the company's personnel; Farfán (2017) on the contrary, deepens these aspects that influence the work environment, describing them as job satisfaction, internal environment, conflicts, development expectations, and salaries; These factors directly influence empowerment and competitiveness in the workplace.

It is for this reason that the organization must be committed to providing a good working life quality, and through a favorable work environment the organization's people can improve their performance,

and provide a feeling of self-commitment that will allow the company to obtain better economic results [2]. Another author such as Uriarte (2021), indicates that the organizational climate is: "A multidimensional component of elements that can be broken down in terms of organizational structures, organization size, communication modes, management leadership styles, among others" (p 67).

## 5. Discussion

Scholars agree that work-life quality is often related to hours and wages, compensation benefits, work environment, and career development relevant to worker satisfaction and motivation, work ethic, working conditions, and management concerns about production efficiency. In previous studies, Lawler (1982) defined that the work-life quality was related to the work's characteristics and the working conditions because, within the organization's objectives, the employees' well-being improvement and productivity support must be established.

Subsequently, Beukema (1987) referred to the work-life quality fact is how employees can measure and organize that their jobs are aligned with their options, interests, and needs within the organization. The work environment indicates the situation or company state; therefore, attention should be paid to the work state environment, which will surely have an impact on high productivity, which should help achieve the desired business goals [3].

The company must be aware that to improve the employees' productivity, an adequate work environment must be provided, this statement is supported by various authors such as: [3, 2, 14]. These authors indicate that if the work environment is accepted by an employee, he must be satisfied, therefore, the employee will be willing to improve labor productivity; On the contrary, if the work environment is not accepted by the employee, he will not be satisfied and therefore, labor productivity will be deficient [3].

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