

ORIGINAL

Effects of stress on employees

Efectos del estrés en los colaboradores

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ABSTRACT

In recent years, the term stress has been gaining strength within organizations, affecting in a remarkable way the personal and work development of collaborators, the causes are generated by various situations faced by workers and its consequences can be irreversible. In this sense, this article is the result of a qualitative research with a documentary review method where the effects of stress on the human talent of the organizations are identified, basically raised in three approaches: at a biological level, at a social level and at an organizational level.

Keywords: Occupational Disease; Labor Productivity; Worker; Service.

RESUMEN

En los últimos años, el término estrés ha venido tomando fuerza dentro de las organizaciones afectando de manera notable el desarrollo personal y laboral de los colaboradores, las causas se generan por diversas situaciones a las que se enfrentan los trabajadores y sus consecuencias pueden ser irreversibles. En tal sentido, el presente artículo es el resultado de una investigación cualitativa con un método de revisión documental en donde se identifican los efectos en el talento humano de las organizaciones a causa del estrés, básicamente planteados en tres enfoques: a nivel biológico, a nivel social y a nivel organizacional.

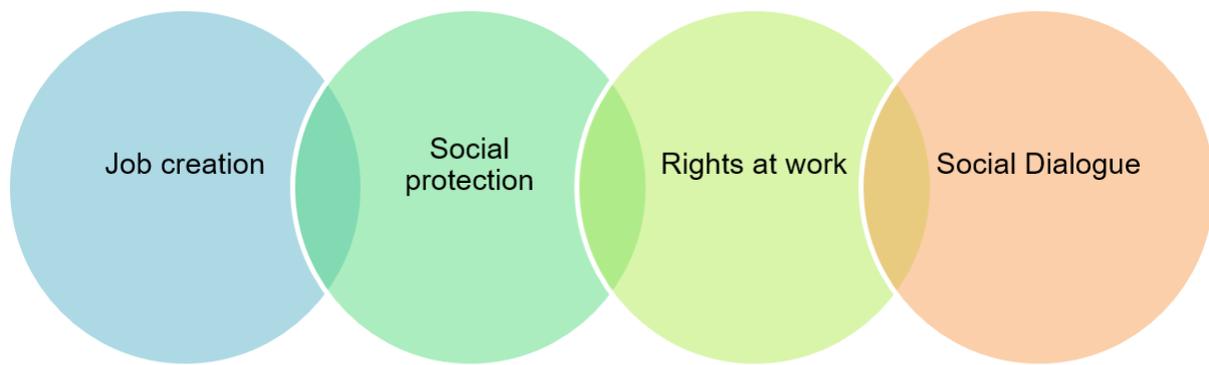
Palabras clave: Enfermedad Profesional; Productividad Laboral; Trabajador; Servicio.

INTRODUCTION

Throughout time, human beings have been facing drastic changes in all dimensions due to the evolution of the world, one of which is work, which individuals perform as a factor of security, survival, and self-realization; this can be understood in general terms as the transformation of nature to meet human needs. However, it is becoming increasingly challenging and complicated due to technological, social, cultural, and other external and even internal factors to which individuals are exposed on a daily basis.^(1,2,3)

Beyond the theoretical conceptualization, it is important to emphasize that work is a right and a social obligation and enjoys, in all its forms, the special protection of the State.⁽⁴⁾ Everyone has the right to work in decent and fair conditions; it is a fundamental part of the personal, professional, and social growth of every individual and has regulatory support to be developed in decent conditions. Hence, the International Labor Organization reveals through its Decent Work program four pillars:⁽⁵⁾

Its objective is to promulgate and raise awareness in a certain way so that jobs are granted an opportunity, that they are productive, and that people have fair remuneration and freedom of development and social integration.^(6,7)



Note: Four pillars within the "Decent Work" program promoted by the International Labor Organization (ILO).

Figure 1. Pillars of decent work

Now, human talent, as an essential part of organizations, are those who execute the different processes aimed at achieving the objectives set from the direction; therefore, the tasks are due to their human skills combined with the skills they have acquired through their training and experience in their work transcend, however, some factors can influence their motivation and performance to meet the demands of the work complicating their adaptation to working conditions and somehow impeding their development to find the effectiveness leading to the occurrence of episodes of stress.⁽⁸⁾ Thus, the well-being and productivity of an employee depend not only on personal effort but also on the working conditions and organizational climate offered by the company, hence the close relationship between work and stress.⁽⁹⁾

In this sense, the World Health Organization (WHO) and the International Labor Organization (ILO) agree that governments must implement measures and policies for employers to protect their employees; in Colombia, the National Government published Decree 1443 of 2014, now the only Decree of the Labor sector 1072 of 2015, established in its Book 2, Part 2, Title 4, Chapter 6, the provisions for the implementation of the Management System for Safety and Health at Work (SG-SST).^(10,11,12)

Its purpose is to require public and private entities, small, medium, and large companies, to adopt strategies and guidelines to prevent situations that affect the welfare of employees, such as reducing stress levels. However, what does the word stress mean?

Stress is the process that is set in motion when the individual perceives a threatening situation or event from which he/she must react appropriately; the ability to deal with situations can determine whether it is positive or negative so that, if the physiological overstimulation that produces stress is correctly redirected to the organism and keeps it under control, it turns out to be beneficial for the person. However, it is necessary to take into account that stress is a mental creation that can be difficult to detect if it is not externalized. For that reason, the person must distinguish the external stimulus so that he can feel good stress; for example, when a new challenge or project is presented, it motivates to execute it with all dedication until it is achieved, or the competitiveness at work seeks that the person gives the best of him/herself. Stress goes through three phases:^(13,14)

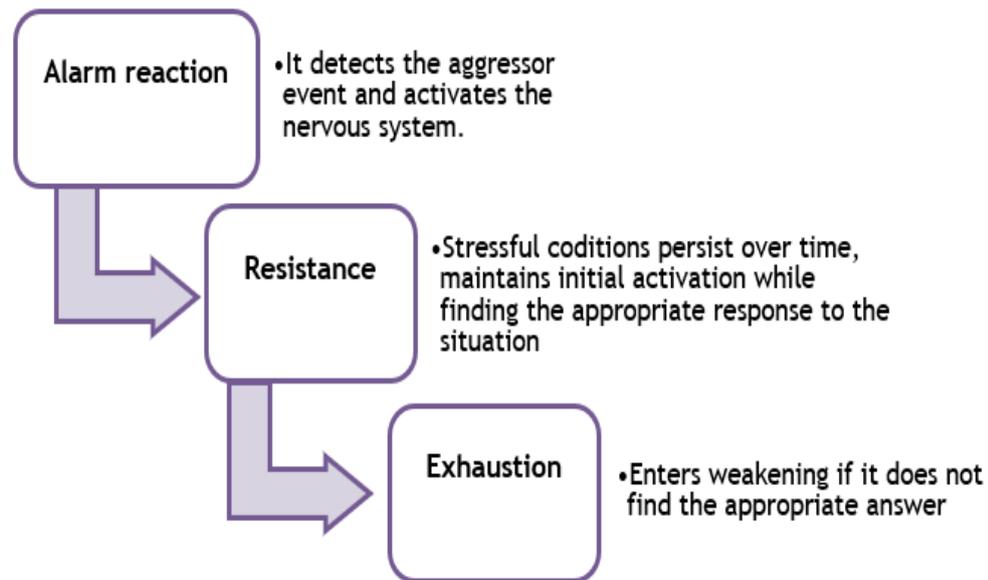
As shown in the figure, in the first phase, the person noticing the situation is placed in a state of alert, and the body is activated moderately; in the second phase, the individual prepares either to face or flee from the situation that is causing the stress, finally, by not deciding to deal with the problem the body is exhausted and this makes it return to the first phase, but with more intensity.⁽¹⁵⁾

In short, the key to enjoying the quality of life in any environment is to be clear about what causes the harmful alterations in the normal functioning of the body that lead to an imbalance in order to establish measures to address them and prevent stress from being negative. Two types of stress are identified as follows: Acute and Chronic.⁽¹⁶⁾

Types of stress

Acute stress: manifested by exposure to a traumatic event can last for relatively short periods, for example:⁽¹⁷⁾

- A medical emergency
- Unexpected news
- Waiting for a promotion
- The expectation of a new job
- New job responsibilities



Note: The three phases through which stress passes are explained.

Figure 2. Phases of stress

In general, any situation that the person perceives as a threat or challenge can cause acute stress.

Chronic stress: arises when stressors remain for long periods and can become uncontrollable, triggering drastic changes in lifestyles; the causes are presented by different situations, for example:⁽¹⁸⁾

- Problems at work due to conflicts with co-workers or the boss
- Economic crisis due to debts or unemployment
- Family conflicts
- Trauma
- Health problems such as disability
- Demanding job
- Death of a loved one

Unlike acute stress, which disappears once it has been resolved, chronic stress can be repetitive or permanent.^(19,20,21,22) Thus, stress was not considered a significant factor affecting human beings; on the contrary, it was part of their nature to survive, but nowadays, it can be considered a problem if it is not attended to, controlled, and correctly addressed to counteract it.⁽²³⁾

This article aims to generate an illustration of stress, its conceptualization, and how it can affect individual performance in any work and personal space.

METHOD

The present manuscript is a documentary review; its construction was carried out under a qualitative approach, through a documentary and descriptive method, using search engines for information published on the web, with a time range from the years 2018 to 2023 of documents such as theses, articles, books, among others; which allowed the inclusion at convenience of relevant information on the effects of stress on collaborators. The following phases:⁽²⁴⁾ supported the procedure

- Search phase: Search engines, such as Google Academic Dialnet and Redalyc, among others, were used to extract reliable sources of information based on publications, mostly from 2018, which were related to the object of study. As secondary sources, information was taken from videos published on YouTube and laws. Books that still needed to have complete publications on their pages were excluded.
- Classification and systematization phase: The results of the previous phase were consolidated in an Excel matrix where the information was organized and classified into two categories: introduction and content.
- Results and conclusions phase: With the information categorized, the production of the manuscript began with the defined sections, and the final reflections embodied in the conclusions were constructed.

The documentary review presented in this manuscript proposes, according to the authors Orozco and Diaz (2018), a challenge to clarify concerns and provide a point of view on the reality of the effects of stress suffered by employees within organizations.

RESULTS AND DISCUSSION

Uncontrolled stress can have a significant impact on people, and work is usually a source of stressors that activates the employee's reaction to work demands and pressures, revealing whether the worker can handle the situations that arise; logically, stress is subjective because it depends on the perception and confrontation that each individual has against the eventualities that occur. Therefore, this can affect different contexts, for example, at the biological level, social level, and organizational level.^(25,26,27,28,29)



Note: The effects of stress on workers are classified into three levels

Figure 3. Effects of stress by levels.

Effects of stress at the biological level

The consequences of stress can have negative effects on the health of workers, so much so that it has become a widespread problem worldwide,^(30,31,32) and is a risk factor for various physical and psychological diseases in the short, medium, and long term; Basically, what prolonged stress produces in humans is an increase in the hormone cortisol, which damages the brain, seriously affecting an area called the hippocampus, reducing its size and killing its cells.⁽³³⁾ It also affects the process of neuroplasticity, which is the brain's ability to adapt to new situations as well. Stress attacks several systems of the body, forcing it to give a fight or flight response, and that is where the heart rate increases, blood pressure rises, breathing increases and muscles contract; The point is that doing this process several times or permanently brings serious problems in the organism.^(34,35,36,37)

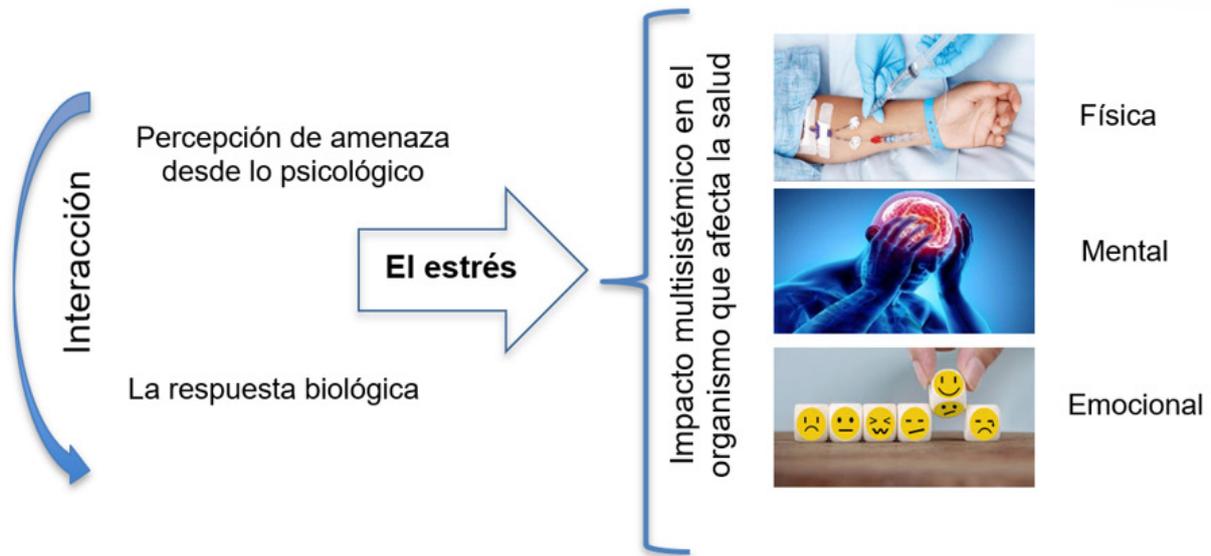
The main pathologies that can occur as a result of stress in employees are the following:^(38,39,40,41)

- Cardiovascular problems: Psychological stress can increase cardiovascular reactivity, which is the ability of the heart and blood vessels to respond to stimuli, so patients are prone to suffer this type of disease when stress appears.
- Digestive problems: The nervousness generated by stress causes the stomach walls to become inflamed and causes the formation of ulcers; there are also other types of diseases, such as irritable bowel syndrome due to constipation.
- Diabetes: Stress tends to aggravate blood glucose levels. Hence, people who already suffer from this disease can produce high levels of sugar and stress and deviate from their self-care.

Other diseases include headaches, muscle tension, weakness in the immune system, cerebrovascular problems, overweight, sleep disorders, and even fertility problems; in short, a number of ailments that cause abnormalities in the body and, in some cases, are irreversible. Psychologically, it produces other types of situations such as:^(42,43,44,45,46)

- Anxiety: It is produced by the perception of a threat and manifests itself at a cognitive, emotional, physiological, and motor level.
- Depression: Some authors indicate that it is a mental disorder and not a disease; it produces feelings of sadness.
- Irritability: It is a very particular response when the person is threatened; it is a kind of annoyance

or anger in some circumstances and can be constant.



Note: The interaction between psychological threat perception and biological response illustrates the impact of stress on human physical, mental, and emotional health.

Figure 4. Multisystemic impact of stress

In addition, stress promotes unhealthy habits such as smoking, overeating, drinking alcoholic beverages, consuming stimulants, and not exercising; these bad habits lead to the accentuation of diseases that have not been externalized or generate new health complications.^(47,48,49)

There are some valid measures to prevent stress in this regard:⁽⁵⁰⁾

- **Balanced diet:** Healthy foods provide energy and nutrients that can be barriers to preventing stress from attacking physical health.
- **Physical exercise:** It is very important to exercise the body regularly because it releases all the pressure that has been installed in the muscles; this allows relaxation.
- **Sleep well:** If you stay active during the day, you will likely be able to fall asleep, and therefore, the body will be able to rest.

Logically, many alternatives can be found for the prevention and even treatment of diseases caused by stress.⁽⁵¹⁾

Effects of stress at the organizational level

Stress at the organizational level can have a negative impact on a company in several ways; some effects are:

Reduced productivity

Difficulty in concentration increases the possibility of error in the activities they perform.

Cost increase

A stressed worker tends to be absent and may even resign; this leads to costs in personnel recruitment and training (induction).

Affecting the work environment

The employee who suffers from stress is irritable which does not allow good communication and the work environment becomes heavy.

Note: The illustration shows the main effects that work-related stress can cause in organizations.

Figure 5. Main effects of stress at the organizational level

The responsibility and commitment of the employee are important for the organization to be productive and to achieve its proposed objectives in addition to their behavior and motivation are the basis for a good organizational climate,^(52,53,54,55,56) However, due to the demands of the individual, the work pressure due to high business competitiveness and poor conditions in the work area increase the risk of stress in employees in a negative way affecting their mental and physical health; these consequences can be classified at the individual and organizational level.^(57,58,59,60,61)

At the individual level, the employee's self-esteem is reduced to such an extent that he/she will not have the capacity to carry out his/her activities; likewise, his/her negative thinking will always be one of failure, he/she self-qualifies himself/herself in advance as "I will do it badly," "I will do it badly".^(62,63,64,65) From the organizational point of view, several factors lead to stress, and one of them is the physical conditions in which the employees find themselves; for example, their workplace does not have good ventilation,⁽⁶⁶⁾ small spaces, exposure to constant noise, etc.; another very important aspect is the work environment, a concept that encompasses different aspects such as organizational culture,⁽⁶⁷⁾ assertive communication, respect, teamwork and if the employee perceives a negative environment it can generate certain discomfort that will not allow good performance.⁽⁶⁸⁾

When the organizational climate is positive, and employees feel supported and motivated, they are better able to cope with the daily challenges of work.^(69,70,71) Conversely, when the organizational climate is negative, and employees feel stressed and overloaded, they are more likely to experience job stress; therefore, improving the organizational climate is an important way to reduce job stress and improve the health and well-being of employees.^(72,73,74,75)

On the other hand, the internal demands and pressures, including those to excel as a personal challenge, make the person reach the point of exceeding the workload or overtime,⁽⁷⁶⁾ going from being a motivating factor to an addiction that finally turns into frustration because he/she does not enjoy his/her job, facets that promote personal growth and, logically, greater productivity.^(77,78,79)

Incentives and rewards are important to make them feel motivated; social support through programs provides an adequate and convenient work environment for the organization.⁽⁸⁰⁾

Effects of stress at the social level

Stress not only affects the health of workers; their ability to relate their participation in activities decreases significantly; all this is due to the fact that stress produces depression and irritability, which makes it difficult for the worker to have normal development in his personality and transmits it not only in the workplace but in all areas of which it is part, such as family, sports groups and circles of friends, etc.⁽⁸¹⁾ Socially and at a general level, stress can cause isolation, difficulty in relating to others, inability to work in a team, increased violence, delinquency and social disorganization.^(82,83)

The social effects of stress can be particularly problematic for people who are already in a vulnerable social situation, such as people with low income or people with disabilities.

CONCLUSIONS

The human factor in organizations is relevant, considering that they are the ones who perform the activities of the company, manage the different processes, follow instructions, and also make decisions; today, technology has covered a large part in the labor aspect, especially in industrial companies. However, people are still the essence of the humanization of companies; although the world is in turmoil for creativity and innovation, the intervention of man has not been replaced in its entirety.

Stress can be cataloged as a silent generator of many diseases that, if not detected in time, can cause serious and catastrophic health situations; the worker must be aware of the importance of taking care of his health and therefore, is the first to seek ways to help reduce the symptoms caused by stress, hence the importance of controlling and knowing how to manage this type of threat; It is essential to adopt healthy habits such as exercising, eating healthy, participating in recreational activities, having medical check-ups for prevention, seeking relaxation spaces, staying active but without overdoing it.

In relation to the effects of stress on organizations, they have tools and standards to implement risk management and occupational health and safety systems, but it is not only a matter of remaining on paper but also of executing and monitoring them; employers must be more committed to the welfare of their employees because in the end companies also suffer the consequences of stress and may lose prestige and profitability.

Socially, the effects are significant for the person and the surrounding environment because there are family members and friends who feel what they are going through; however, emotional support is essential for them to overcome stress, return to their normal spaces, and obtain the quality of life they need so much.

In conclusion, stress is an aspect that affects all humanity and, therefore, must be addressed in a timely manner to avoid serious situations for workers.

BIBLIOGRAPHIC REFERENCES

1. Calzada A, Oliveros YC, Acosta Y. Trastorno por estrés agudo. Presentación de un caso. *Cuad Med Forense*. 2012;18(1):27-31. Disponible en: <https://dx.doi.org/10.4321/S1135-76062012000100004>
2. Ganán K, Chasillacta F. La comunicación en el cuidado humanizado brindado por el profesional de enfermería. *Salud, Ciencia y Tecnología* 2023;3:505-505. <https://doi.org/10.56294/saludcyt2023505>.
3. Pérez BNP, Miranda GLH, Horta GAH, Vitón-Castillo AA. Tendencias del proceso de gestión del trabajo metodológico en la carrera de medicina. *Salud, Ciencia y Tecnología - Serie de Conferencias* 2023;2:487-487. <https://doi.org/10.56294/sctconf2023487>.
4. Carmiña C. Estrés crónico: ejemplo de interacción entre sistemas nervioso, inmuno y endocrino. *Rev Conciencia*. 2018;2(6):97-108. Disponible en: <https://shorturl.at/qEO09>
5. Morgner MI, Djament L. Impact of Preventive and Mandatory Social Isolation in the control of type I diabetes in adults in the Buenos Aires Metropolitan Area. *Community and Interculturality in Dialogue* 2023;3:82-82. <https://doi.org/10.56294/cid202382>.
6. Gavilan NE, Paquiyauri YY, Meneses-Claudio B, Lopez-Curasma A, Romero-Sandoval J. Pedagogical Management and Managerial Leadership in the Secondary Educational Institutions of Network 6, UGEL 06, Ate, 2020. *Data and Metadata* 2023;2:172-172. <https://doi.org/10.56294/dm2023172>.
7. Castillo D. Factores psicosociales que influyen en el tratamiento de diabetes mellitus tipo 2 Riobamba, 2019 [Tesis de pregrado]. Universidad Nacional de Chimborazo; 2019. Disponible en: <http://dspace.unach.edu.ec/handle/51000/6831>
8. Moreno AMA, Paredes BAO, Guardias HPT, Palmera BV. Análisis estratégico para la empresa Imbocar, seccional Valledupar - Colombia. *Región Científica* 2023;2:202395-202395. <https://doi.org/10.58763/rc202395>.
9. Suárez EJC. Cursos de calidad para una educación superior virtual de calidad. *Salud, Ciencia y Tecnología - Serie de Conferencias* 2023;2:575-575. <https://doi.org/10.56294/sctconf2023575>.
10. Bory E de JP, Naranjo OV, Herrero LB, Flores LGA, Fuentes MGB. Pertinence of the teaching use of virtual classroom by Basic Biomedical Science Department. *Seminars in Medical Writing and Education* 2023;2:31-31. <https://doi.org/10.56294/mw202331>.
11. Llana AJO, Ruiz JAZ, Claudio BAM. Quality of service and citizen satisfaction in a Lima district municipality. *Southern Perspective / Perspectiva Austral* 2023;1:17-17. <https://doi.org/10.56294/pa202317>.
12. Constitución Política de Colombia [C.P]. 1991. Artículo 25 [Título II]. Disponible en: <https://shorturl.at/twGJ3>
13. Florentin GNB. The human dimension in nursing. An approach according to Watson's Theory. *Community and Interculturality in Dialogue* 2023;3:68-68. <https://doi.org/10.56294/cid202368>.
14. Chuchuca J, Mora A. El estrés laboral y el impacto en el desempeño del personal en el Hospital Aida León de Rodríguez Lara. Girón-Azauay, Junio-Noviembre 2020 [Tesis de pregrado]. Universidad Politécnica Salesiana; 2020. Disponible en: <http://dspace.ups.edu.ec/handle/123456789/19734>
15. Montano-Silva RM, Fernández-Breffé T, Abraham-Millán Y, Céspedes-Proenza I, Pantoja-García E. «Tooth fairy» educational strategy for infants in the fifth year of life. *Community and Interculturality in Dialogue* 2023;3:77-77. <https://doi.org/10.56294/cid202377>.
16. Ñañez-Silva M, Meneses-Claudio B. University academic tutoring in times of COVID-19. Proposal of strategies from the perspective of the tutor and tutored. *Data and Metadata* 2023;2:165-165. <https://doi.org/10.56294/dm2023165>.
17. Viera EJM, Meléndez NMN, Claudio MCM, Ruiz JAZ. Selection process in the Operations area of a company in the ecological sector. *Southern Perspective / Perspectiva Austral* 2023;1:13-13. <https://doi.org/10.56294/>

pa202313.

18. Cruz G. Desestigmatizando la función del estrés. *Rev electrón psicol Iztacala*. 2018;21(2):604-620. Disponible en: <https://shorturl.at/lpuV7>

19. Gonzalez-Argote D, Gonzalez-Argote J. Generation of graphs from scientific journal metadata with the OAI-PMH system. *Seminars in Medical Writing and Education* 2023;2:43-43. <https://doi.org/10.56294/mw202343>.

20. Jeronimo CJC, Basilio AYP, Claudio BAM, Ruiz JAZ. Human talent management and the work performance of employees in a textile company in Comas. *Southern Perspective / Perspectiva Austral* 2023;1:5-5. <https://doi.org/10.56294/pa20235>.

21. Da Rosa S, Chalfin M, Baasch D, Soares J. Sentidos y significados del trabajo: un análisis con base en diferentes perspectivas teórico-epistemológicas en Psicología. *Rev Univ Psychol*. 2011;10(1):175-188. Disponible en: <https://www.redalyc.org/pdf/647/64719284015.pdf>

22. Aveiro-Róbaló TR, Pérez-Del-Vallín V. Gamification for well-being: applications for health and fitness. *Gamification and Augmented Reality* 2023;1:16-16. <https://doi.org/10.56294/gr202316>.

23. Lobato KJT, Pita DLR, Ruiz GEZ, Claudio BAM. The impact of job performance and performance on workers in northern Lima. *Health Leadership and Quality of Life* 2023;2:30-30. <https://doi.org/10.56294/hl202330>.

24. Horta GAH, García ZG. Resultados del tratamiento de rehabilitación física en niños con retardo en el desarrollo psicomotor. *Interdisciplinary Rehabilitation / Rehabilitacion Interdisciplinaria* 2023;3:28-28. <https://doi.org/10.56294/ri202328>.

25. Sánchez RM. Transformando la educación online: el impacto de la gamificación en la formación del profesorado en un entorno universitario. *Metaverse Basic and Applied Research* 2023;2:47-47. <https://doi.org/10.56294/mr202347>.

26. Fernández LD, Parrado RP, Cisneros JDD. La gestión del componente laboral a través del acompañamiento a estudiantes en formación. *Región Científica* 2023;2:202383-202383. <https://doi.org/10.58763/rc202383>.

27. Escobedo J. Estrés y enfermedad mental: la otra epidemia. *Rev Méd Univ Veracruzana*. 2020;19(2):15-20. Disponible en: https://www.uv.mx/rm/num_anteriores/revmedica_vol19_num2/articulos/Estres.pdf

28. Barrios CJC, Hereñú MP, Francisco SM. Augmented reality for surgical skills training, update on the topic. *Gamification and Augmented Reality* 2023;1:8-8. <https://doi.org/10.56294/gr20238>.

29. Lepez CO. Invisible challenges in healthcare leadership. *Health Leadership and Quality of Life* 2023;2:35-35. <https://doi.org/10.56294/hl202335>.

30. Espinosa-Castro JF, Hernández-Lalinde J, Rodríguez J, Chacín M, Bermúdez-Pirela V. Influencia del estrés sobre el rendimiento académico. *Rev AVFT-Archivos Venezolanos De Farmacología y Terapeuta*. 2020;39(1):63-69. Disponible en: http://saber.ucv.ve/ojs/index.php/rev_aavft/article/view/18707

31. Parra AL, Escalona E, Gollo O. Estudio piloto comparativo de medidas antropométricas en bipedestación entre Tablas antropométricas y un Antropómetro Harpenden. *Interdisciplinary Rehabilitation / Rehabilitacion Interdisciplinaria* 2023;3:48-48. <https://doi.org/10.56294/ri202348>.

32. López-Belmonte J, Pozo-Sánchez S, Moreno-Guerrero A-J, Marín-Marín J-A. We've reached the GOAL. Teaching Methodology for Transforming Learning in the METAVERSE. A teaching innovation project. *Metaverse Basic and Applied Research* 2023;2:30-30. <https://doi.org/10.56294/mr202330>.

33. Fagua G, De Hoz Y, Jaimes M. Sistema de gestión de seguridad y salud en el trabajo: una revisión desde los planes de emergencia. *Rev Cient Multidisciplinaria*. 2018;3(1):23-29. Disponible en: <https://doi.org/10.25214/27114406.920>

34. Vanoy RJA. Transformación Educativa: Optimización en la Enseñanza de Logística en los Negocios

Internacionales mediante la Aplicación de Inteligencia Artificial en Instituciones de Educación Superior. Salud, Ciencia y Tecnología - Serie de Conferencias 2023;2:422-422. <https://doi.org/10.56294/sctconf2023422>.

35. Bory E de JP, Naranjo OV, Herrero LB, Flores LGA, Fuentes MGB. Enseñanza híbrida: una innovación docente departamental participe de la transformación digital universitaria. *Seminars in Medical Writing and Education* 2023;2:28-28. <https://doi.org/10.56294/mw202328>.

36. Gabriel J, Pérez-Fuentes M, Del Mar M, Tortosa M, González A. Beneficio de las intervenciones psicológicas en relación al estrés y ansiedad: Revisión sistemática y metaanálisis. *Eur J Educ Psychol.* 2019;12(2):191-205. Disponible en: <https://www.redalyc.org/journal/1293/129365934007/129365934007.pdf>

37. García E. Nivel de cólera, irritabilidad y agresión en estudiantes de la institución educativa José Abelardo Quiñones y José Carlos Mariátegui de Huancayo 2019 [Tesis de pregrado]. Universidad de Huanuco; 2019. Disponible en: <http://repositorio.udh.edu.pe/123456789/3351>

38. Rasheed Z, Ghwanmeh S, Abualkishik AZ. Harnessing Artificial Intelligence for Personalized Learning: A Systematic Review. *Data and Metadata* 2023;2:146-146. <https://doi.org/10.56294/dm2023146>.

39. Auza-Santiváñez JC, Díaz JAC, Cruz OAV, Robles-Nina SM, Escalante CS, Huanca BA. Bibliometric Analysis of the Worldwide Scholarly Output on Artificial Intelligence in Scopus. *Gamification and Augmented Reality* 2023;1:11-11. <https://doi.org/10.56294/gr202311>.

40. León M, García Y, Álvarez R, Morales C, Regal M, González H. Influencia del estrés psicológico y la actividad física moderada en la reactividad cardiovascular. *Rev Finlay.* 2018;8(3):224-233. Disponible en: <http://scielo.sld.cu/pdf/rf/v8n3/rf07308.pdf>

41. Velasco ASD, Ccama FLM, Claudio BAM, Ruiz GEZ. Transformational Leadership as a Driver of Business Success: A Case Study in Caquetá. *Health Leadership and Quality of Life* 2023;2:37-37. <https://doi.org/10.56294/hl202337>.

42. Carestia DR, Beltran AF, Cerdera F, Sanchez ML, Ibáñez F. Impacto fisiológico de la respiración, en la salud y en el nivel del estrés. *Interdisciplinary Rehabilitation / Rehabilitacion Interdisciplinaria* 2023;3:46-46. <https://doi.org/10.56294/ri202346>.

43. Loayza G, Troya L, González-Ramón E, Sánchez L. La sobrecarga y el estrés en el ámbito laboral, analizado desde la óptica del trabajador. *Rev Multidiscipl Ciencia Latina.* 2022;6(3):3569-3586. Disponible en: https://doi.org/10.37811/cl_rcm.v6i3.2485

44. López J, Chinchilla-Giraldo N, Bermúdez I, Álvarez A. Dislipidemia y estrés en estudiantes universitarios: Un enemigo silencioso. *Rev Cienc Soc (Ve).* 2021;27(3):50-61. Disponible en: <https://www.redalyc.org/articulo.oa?id=28068276006>

45. Lichtensztejn M, Benavides M, Galdona C, Canova-Barrios CJ. Knowledge of students of the Faculty of Health Sciences about Music Therapy. *Seminars in Medical Writing and Education* 2023;2:35-35. <https://doi.org/10.56294/mw202335>.

46. Dionicio RJA, Serna YPO, Claudio BAM, Ruiz JAZ. Sales processes of the consultants of a company in the bakery industry. *Southern Perspective / Perspectiva Austral* 2023;1:2-2. <https://doi.org/10.56294/pa20232>.

47. Ministerio del Trabajo. Sistema de Gestión de la Seguridad y Salud en el Trabajo (SG-SST) Guía técnica de implementación para mipymes. 1-43. Disponible en: <https://shorturl.at/xPSUY>

48. Haro AMZ, Mora ÁSR. Malnutrition prevention strategy based on neonatal screening through the metcoff clinical method. *Salud, Ciencia y Tecnología* 2023;3:555-555. <https://doi.org/10.56294/saludcyt2023555>.

49. Karthikeyan J, Vasanthan R, Dzuwichu K. A sociolinguistic discourse analysis of assimilated English words: a usage-based model of language acquisition. *Salud, Ciencia y Tecnología - Serie de Conferencias* 2023;2:600-600. <https://doi.org/10.56294/sctconf2023600>.

50. Organización Internacional del Trabajo. Trabajo decente. Disponible en: <https://www.ilo.org/global/topics/decent-work/lang-es/index.htm>
51. Yauri-Paquiyaury Y, Enriquez-Gavilan N, Meneses-Claudio B, Lopez-Curasma A, Romero-Sandoval J. Aggressiveness and school coexistence in students of the 6th grade of the educational institution N° 20595 «José Gabriel Condorcanqui», San Mateo 2021. *Data and Metadata* 2023;2:169-169. <https://doi.org/10.56294/dm2023169>.
52. Orozco J, Diaz A. ¿Cómo redactar los antecedentes de una investigación cualitativa? *Rev electrón conocim saberes prácticas*. 2018;1(2):66-82. Disponible en: <https://doi.org/10.30698/recsp.v1i2.13>
53. Castillo-Gonzalez W, Lepez CO, Bonardi MC. Augmented reality and environmental education: strategy for greater awareness. *Gamification and Augmented Reality* 2023;1:10-10. <https://doi.org/10.56294/gr202310>.
54. Leon E, Rodriguez C, Martínez MDC, Ron M. Hearing injuries due to atmospheric pressure changes in air and water survival training instructors. *Health Leadership and Quality of Life* 2023;2:39-39. <https://doi.org/10.56294/hl202339>.
55. Ortíz A. El estrés laboral: Origen, consecuencias y cómo combatirlo. *Daena: Int J Good Conscience*. 2020;15(3):1-19. Disponible en: [http://www.spentamexico.org/v15-n3/A8.15\(3\)1-19.pdf](http://www.spentamexico.org/v15-n3/A8.15(3)1-19.pdf)
56. Vallejo RG. Metaverso, sociedad y educación. *Metaverse Basic and Applied Research* 2023;2:49-49. <https://doi.org/10.56294/mr202349>.
57. Centon JMG, Cubas WC, Huillcacuri JB, Maldonado ABS. El crecimiento empresarial y su relación en la rentabilidad de una MYPE del rubro comercial en Arequipa, Perú. *Región Científica* 2023;2:202387-202387. <https://doi.org/10.58763/rc202387>.
58. Pando-Moreno M, Gascón-Santos S, Varillas-Vilches W, Aranda-Beltrán C. Exposición a factores psicosociales laborales y sintomatología de estrés en trabajadores peruanos. *Rev Ciencia UNEMI*. 2019;12(29):1-8. Disponible en: <https://www.redalyc.org/journal/5826/582661250001/582661250001.pdf>
59. Rodríguez-Martínez C, Alvarez-Solano J, Pérez-Galavís AD, Ron M. Distance education during the COVID-19 pandemic: experience at a public university. *Seminars in Medical Writing and Education* 2023;2:32-32. <https://doi.org/10.56294/mw202332>.
60. David BGM, Ruiz ZRZ, Claudio BAM. Transportation management and distribution of goods in a transportation company in the department of Ancash. *Southern Perspective / Perspectiva Austral* 2023;1:4-4. <https://doi.org/10.56294/pa20234>.
61. Patlán J. ¿Qué es el estrés laboral y cómo medirlo? *Rev Salud Uninorte*. 2019;35(1):156-184. Disponible en: <http://www.scielo.org.co/pdf/sun/v35n1/2011-7531-sun-35-01-156.pdf>
62. Peña MG, Ocmin LSL, Romero-Carazas R. Control interno de inventario y la gestión de resultados de un emporio comercial de la región de San Martín - Perú. *Región Científica* 2023;2:202392-202392. <https://doi.org/10.58763/rc202392>.
63. Freire-Palacios V, Jaramillo-Galarza K, Quito-Calle J, Orozco-Cantos L. La inteligencia artificial en la gamificación para promover la salud mental de los estudiantes universitarios: una revisión de alcance. *Salud, Ciencia y Tecnología* 2023;3:639-639. <https://doi.org/10.56294/saludcyt2023639>.
64. Pereyra C, Páez N, Ronchieri C, Agustina D. Validación de la escala de autoeficacia para el afrontamiento del estrés en estudiantes universitarios. *Rev Psicol*. 2019;37(2):473-493. Disponible en: <https://dx.doi.org/10.18800/psico.201902.005>
65. Salvador VKA, Barrera MJ, Olvera JLC, Chavez MTC, Riva MEM-L. Formación del docente de enfermería en el uso de Innovación educativa en la Atención Primaria Salud: Revisión literaria. *Salud, Ciencia y Tecnología* 2023;3:471-471. <https://doi.org/10.56294/saludcyt2023471>.

66. Asencios-Trujillo L, Asencios-Trujillo L, Rosa-Longobardi CL, Gallegos-Espinoza D, Piñas-Rivera L. Inteligencia emocional en estudiantes del último año de un programa de educación de una universidad privada en Lima. *Salud, Ciencia y Tecnología - Serie de Conferencias* 2023;2:406-406. <https://doi.org/10.56294/sctconf2023406>.
67. Pianda M. Estrés factor predisponente para gastritis nerviosa. *Bol Inf CEI*. 2021;8(2):60-64. Disponible en: <https://revistas.umariana.edu.co/index.php/BoletinInformativoCEI/article/view/2677/2966>
68. Torres MER, Espriella PGDL. Creación de un modelo tecno-pedagógico para el fortalecimiento de la lengua Emberá Katío mediante las costumbres ancestrales en la institución educativa el Rosario de Tierralta. *Región Científica* 2023;2:202398-202398. <https://doi.org/10.58763/rc202398>.
69. Estrella NLC, Pérez GPL. Atención de enfermería en pacientes oncológicos con cuidados paliativos. *Salud, Ciencia y Tecnología* 2023;3:488-488. <https://doi.org/10.56294/saludcyt2023488>.
70. Piligua C, Arteaga F. El clima laboral como factor clave en el rendimiento productivo de las empresas. Estudio caso: Hardepex Cía. Ltda. *Cuad Latinoam Administr.* 2019;15(28):1-25. Disponible en: <https://www.redalyc.org/articulo.oa?id=409659500007>
71. Ron M, Pérez A, Hernández-Runque E. Nivel de riesgo para la salud y predicción del dolor musculoesquelético en trabajadores en condiciones de teletrabajo: Un enfoque matricial. *Interdisciplinary Rehabilitation / Rehabilitacion Interdisciplinaria* 2023;3:40-40. <https://doi.org/10.56294/ri202340>.
72. Castillo-González W. The importance of human supervision in the use of ChatGPT as a support tool in scientific writing. *Metaverse Basic and Applied Research* 2023;2:29-29. <https://doi.org/10.56294/mr202329>.
73. Portero S. Estrés laboral, burnout, satisfacción, afrontamiento y salud general del personal sanitario de urgencias [Tesis de doctorado]. Universidad de Córdoba; 2019. Disponible en: <https://helvia.uco.es/xmlui/handle/10396/18579>
74. Torres A, Pérez-Galavís A, Ron M, Mendoza N. Factores Psicosociales Laborales y Estrés en el Personal Médico Asistencial. *Interdisciplinary Rehabilitation / Rehabilitacion Interdisciplinaria* 2023;3:42-42. <https://doi.org/10.56294/ri202342>.
75. Cano CAG, Castillo VS, Rojas EEM. Strategy for improving learning in the Financial Tools and Project Management Course through the use of Second Life-SL. *Metaverse Basic and Applied Research* 2023;2:31-31. <https://doi.org/10.56294/mr202331>.
76. Reig-Botella A, Cabarcos A. El impacto de la adicción al trabajo en las organizaciones: causas y repercusiones en el bienestar laboral de los trabajadores. *Rev Investig del Departamento de Humanidades y Ciencias Sociales*. 2020;17(9):3-24. Disponible en: <https://www.redalyc.org/articulo.oa?id=409659500007>
77. Romero-Carazas R. Prompt lawyer: a challenge in the face of the integration of artificial intelligence and law. *Gamification and Augmented Reality* 2023;1:7-7. <https://doi.org/10.56294/gr20237>.
78. Cantaro JCC, Tello JDLCH, Ruiz GEZ, Claudio BAM. Leadership styles and organizational climate among employees in Lima, Peru. *Health Leadership and Quality of Life* 2023;2:36-36. <https://doi.org/10.56294/hl202336>.
79. Sánchez D. El estrés en las organizaciones laborales del siglo XXI en Colombia [Tesis de maestría]. Universidad Externado de Colombia. Departamento de Derecho Laboral Centro de Investigaciones Laborales; 2020. Disponible en: <https://doi.org/10.57998/bdigital.handle.001.2904>
80. Pérez-Hernández G, Téllez NR, C JJR, S LGL, L OG. Use of videos as a method of learning in social service projects. *Community and Interculturality in Dialogue* 2023;3:100-100. <https://doi.org/10.56294/cid2023100>.
81. Ezzaim A, Dahbi A, Haidine A, Aqqal A. Enhancing Academic Outcomes through an Adaptive Learning Framework Utilizing a Novel Machine Learning-Based Performance Prediction Method. *Data and Metadata* 2023;2:164-164. <https://doi.org/10.56294/dm2023164>.

82. Diario El Comercio. Este es el daño que le hace el estrés a tu cerebro [video]. YouTube. 2020, septiembre 8. Disponible en: <https://www.youtube.com/watch?v=s5PmlhPJvkc>

83. Cánovas LPL, Cánovas LBL, Rodríguez YP, Hernández BG, Martín MMP, Montano AL. Evaluation of Burnout Syndrome and associated factors in primary care health personnel. *Community and Interculturality in Dialogue* 2023;3:73-73. <https://doi.org/10.56294/cid202373>.

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