



REVIEW

Risks of greater incidence in the occurrence of work accidents and occupational diseases: a bibliographic review

Riesgos de mayor incidencia en la aparición de accidentes laborales y enfermedades ocupacionales: una revisión bibliográfica

Ruth Calderón Landívar, Daniela Elena Loja Llano, Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez-Arizala¹

¹Instituto Superior Tecnológico Adventista del Ecuador. Ecuador.

Cite as: Calderón Landívar R, Loja Llano DE, Tena García TJ, Quiñonez Castillo KA, Chávez Arizala JF. Risks of greater incidence in the occurrence of work accidents and occupational diseases: a bibliographic review. Health Leadership and Quality of Life. 2025;4:74. <https://doi.org/10.56294/hl202574>

Submitted: 29-03-2024

Revised: 19-06-2024

Accepted: 22-09-2024

Published: 01-01-2025

Editor: Neela Satheesh 

ABSTRACT

Introduction: the term occupational risk can be defined as the possibility that a worker suffers a certain injury derived from his work

Objective: to argue the importance of the prevention of work accidents and occupational diseases based on risk control and compliance with international standards.

Methods: a narrative bibliographic review was carried out, the search for information was carried out through the Google Scholar search engine in databases such as Scopus and Scielo, as well as in institutional thesis repositories, to guarantee access to applied studies with scientific validity. The terms used “occupational risk”, “work accident”, “occupational diseases” allowed access to more than 40 articles on the subject and 19 articles in Spanish were selected from official websites and with demonstrated credibility

Development: occupational risks can be of chemical, psychological, biological, physical and ergonomic origin. There are risks in every workplace, so it is vitally important to provide and use personal protective equipment to protect the different parts of the body, thus avoiding direct contact with the different risk factors that may affect safety and health and thus avoid any type of injury, fracture or fall. In addition, each company must have a minimum plan for the prevention of occupational risks, with different matrices.

Conclusions: it is essential for companies to have better systems for recording and reporting work accidents and occupational diseases, since adequate information is essential to establish priorities and improve the design of prevention strategies.

Keywords: Occupational Risk; Work Accident; Occupational Diseases.

RESUMEN

Introducción: el término riesgo laboral puede definirse como la posibilidad de que un trabajador sufra una determinada lesión derivada de su trabajo.

Objetivo: argumentar la importancia de la prevención de accidentes laborales y enfermedades ocupacionales a partir del control de riesgos y el cumplimiento de las normas internacionales.

Métodos: se realizó una revisión bibliográfica narrativa, la búsqueda de información se realizó a través del motor de búsqueda Google Scholar en bases de datos como Scopus y Scielo, así como en repositorios de tesis institucionales, para garantizar el acceso a estudios aplicados con validez científica. Los términos utilizados “riesgo laboral”, “accidente de trabajo”, “enfermedades ocupacionales” permitieron el acceso a más de 40 artículos sobre la temática y de ellos fueron seleccionados 19 artículos en idioma español provenientes de sitios web oficiales y con credibilidad demostrada.

Desarrollo: los riesgos laborales pueden ser de origen químico, psicológico, biológico, físico y ergonómico. En todo lugar de trabajo existen riesgos, por lo que es de vital importancia dotar y dar uso al equipo de protección personal para proteger las diferentes partes del cuerpo, evitando así el contacto directo con los diferentes factores de riesgos que puedan afectar la seguridad y salud y así evitar cualquier tipo de lesión, fractura o caída. Además, cada empresa debe contar con un plan mínimo para la prevención de riesgos laborales, con diferentes matrices.

Conclusiones: es esencial para las empresas contar con mejores sistemas de registro y notificación de accidentes de trabajo y enfermedades profesionales, ya que una información adecuada es esencial para establecer prioridades y mejorar el diseño de las estrategias de prevención.

Palabras clave: Riesgo Laboral; Accidente De Trabajo; Enfermedades Ocupacionales.

INTRODUCTION

According to a report by the World Health Organization (WHO) and the International Labour Organization (ILO), every year, some 317 million people are victims of occupational accidents worldwide, and 2,34 million people die as a result of accidents or occupational diseases. The ILO considers that prevention is key to improving occupational health and safety at work and has stressed the importance of ensuring that strategies to prevent occupational accidents and diseases are reinforced by a social dialogue involving governments and employers' and workers' organizations.⁽¹⁾

In the Americas region, there are major challenges related to health and safety. Available figures indicate 11,1 fatal accidents per 100 000 workers in industry, 10,7 in agriculture, and 6,9 in the services sector. Some of the most important sectors for the region's economies, such as mining, construction, agriculture, and fishing, are among those with the highest incidence of accidents.⁽¹⁾

It is vital that the countries of Latin America and the Caribbean have an adequate regulatory framework, that they have national policies and programs on occupational health and safety, and that they promote coordinated action by the different entities involved in these issues. It has also been suggested that an effective inspection system to ensure compliance with the standard is key.⁽¹⁾

At the national level in Ecuador, many people currently work as employees; however, the personnel do not have identified occupational risks, which could result in accidents or diseases. Therefore, it is necessary to identify and analyze risks to control them effectively. In Santo Domingo, according to the Ecuadorian Institute of Social Security (IESS),⁽²⁾ employers report occupational accidents and occupational diseases promptly; the employer has ten working days from the day of the accident to register the accident report of the injured worker, which the General Insurance of Labor Risks covers since the insurance must be registered from the first day of work under a dependency relationship or independent affiliation.

Barrios HN and Osejo JC⁽³⁾ in their research found that the highest rates are focused on ergonomic risks since the workers were standing during a long working day, as well as the physical environment and ventilation and chemical risks due to the handling of the products of the area.

Ortega J et al.⁽⁴⁾ in their research proved that there is a moderate relationship between occupational health and occupational hazards; with their dimensions and variables, it was possible to demonstrate that there is a direct and important relationship that should be part of the preventive work and be within the parameters of the research which the institutions should promote.

The study of occupational hazards is relevant because it contributes to the quality and excellence of companies; in turn, it favors the reduction of occupational hazards in workers. Guevara M⁽⁵⁾ states that companies need to prevent occupational hazards because, beyond compliance with standards, it helps to improve the conditions and avoid exposure to risks. Likewise, they would promote excellent health in workers, and this will be evidenced by lectures and training in emergencies that arise, as well as self-care and personal hygiene.

Taking into account the problems and the number of people reported each year as affected by occupational accidents or diseases resulting from them, it was decided to conduct this literature review to argue the importance of preventing occupational accidents and occupational diseases from risk control and compliance with international standards and then apply this knowledge in a study with workers of a company.

METHOD

A narrative bibliographic review was carried out to argue the importance of the prevention of occupational accidents and occupational diseases based on risk control and compliance with the international standards established for this purpose. The search for information was carried out through the Google Scholar search engine in databases such as Scopus and Scielo and institutional thesis repositories to guarantee access to

applied studies with scientific validity. The terms used, “occupational risk,” “occupational accident,” and “occupational diseases,” allowed access to more than 40 articles on the subject, and 19 articles in the Spanish language were selected from official websites with proven credibility.

DEVELOPMENT

The term occupational risk can be defined according to Mendoza AP and Lupaca P⁽⁶⁾ as the possibility that a worker suffers a certain injury derived from his work, that is to say, that a person, under certain circumstances, can suffer an occupational injury, to such a degree that he causes harm to himself and exposes himself to chemical, psychological, biological, physical and ergonomic risks, psychological, biological, physical and ergonomic risks, that using this it is possible to measure the occupational risks that exist in that company and that the most affected are the workers of the company, therefore, it is necessary to know the use of personal protective equipment (PPE) to avoid any injury, fracture and fall.

In order to have a minimum plan for the prevention of occupational risks, there are different matrices for occupational risks, for which it is necessary to have full knowledge of occupational safety and health in labor processes. According to Enriquez J. (2016),⁽⁷⁾ in every workplace, there is a risk that one or several accidents may be caused, so it is of vital importance to equip and give use to PPE to protect the different parts of the body, thus avoiding direct contact with the different risk factors that may affect safety and health. Therefore, It is also of utmost importance to comply with the laws on the use of PPE since every company has it, and it is up to the working personnel to make use of the company’s occupational risk regulations to protect and take care of the workers’ health.

According to Franco Enriquez JG et al.⁽⁷⁾, personal protective equipment (PPE) currently helps to prevent occupational hazards, which helps to control the danger that the company has not eliminated and thus ensures the welfare of workers since the company is constantly growing. The most common risk factor is mechanical risk, which is present in heavy objects such as machinery, equipment, and tools; therefore, it causes occupational accidents in workers because they do not have personal protective equipment or proper equipment maintenance.

According to these authors, biological risk includes all types of diseases in which the worker is exposed to organisms that cause allergic, toxic, or infectious diseases. According to the same author, the chemical risk is produced by not having control of chemical agents in the company, making it difficult for workers in the respiratory tract or partial destruction of tissues. Therefore, this can directly or indirectly harm people. Continuing with what the author says, the physical risk argues that it is one of the most serious within the labor sense since it causes biological and psychological effects and injuries in people; we have different forms of energies, such as noises, vibrations, altered temperatures, etc.

Conditions of employment

The Instituto Sindical de Trabajo Ambiente y Salud (ISTAS) understands working conditions in any aspect of labor, either with negative consequences for workers’ health, in addition to environmental and technological aspects and management of labor function. According to the same author, the conditions of employment affect the health of individuals, understanding as a working condition all the characteristics of this that may significantly influence the risks to the safety and health of the operator.⁽⁸⁾

Safety at work

According to Sánchez Pérez J⁽⁹⁾, accidents at work are those that require preventive norms, thus encouraging the collaboration of the workers, who must comply with the obligations and demands of commitment, collaborating with the participation in the elaboration of the documentation referring to safety and health at work. Therefore, an occupational accident is any risk workers suffer within the company. For this, risk can be qualified from the point of view of the severity of this, either by the misuse of PPE, machines that have not been maintained, lack of experience on the part of workers, or not receiving proper training to prevent occupational hazards.

Personal protective equipment

This is equipment intended to be worn or held by the worker to protect him/her from one or more risks that may threaten his/her safety or health at work and any other accessory intended for this purpose. PPE does not prevent accidents or contact with aggressive elements but helps to make the injury less serious, which can identify risks and hazards in the work environment. Using, maintaining, and properly disposing of the PPE is recommended. Otherwise, there will be dangers in the workplace that can damage health and physical integrity.⁽⁹⁾

Industrial Hygiene

According to Cabo-Salvador J⁽¹⁰⁾, industrial hygiene is a preventive discipline that evaluates and controls

those polluting environmental factors in the workplace that can cause diseases in workers or communities near the industry. Among the polluting agents in companies, the most important are chemical, physical, and biological; each derives a different affectation. Chemical agents, as such, are substances that, during manufacturing, handling, transport, and storage, can enter the environment in the form of dust, smoke, gas, vapor, and in quantities that can damage the health of people who come into contact with them.

Ergonomic Risk

According to the official website of the Universidad Nacional de la Plata⁽¹¹⁾, ergonomic risks originate when the worker interacts with his workplace and when the activities present labor movements, postures, or actions that affect the health of workers, classifying them as static postures, dynamic postures, lifting loads, total physical load, job design, etc., to prevent all of the above from affecting the worker's health, it is necessary to plan the lifting of loads, stable postures providing the separation of the feet temporarily, to get up smoothly; in case of not having mechanical aids, it is necessary to ask for help from colleagues when it is needed. These injuries appear slowly and gradually and seem harmless at first. Pain and fatigue first appear during working hours, but symptoms disappear outside working hours. As these injuries worsen, the pain and fatigue do not go away even during rest hours.

Overexertion

It can derive in musculoskeletal disorders or injuries, mainly due to forced postures, repetitive movements, manual use of weights, and force application, mainly caused by muscle contractures or nerve involvement, usually with irradiation towards the shoulders and head. It is said that the main symptoms are cervical pain, limitation of mobility, inflammation, and numbness in the lower and upper limbs, which are usually the result of sudden movements or overexertion. Rotator cuff tendonitis, epicondylitis, epitrochleitis, carpal tunnel syndrome, ganglion tear, supraspinatus. This disorder results from an excessive need to use the upper extremities. Overuse is multifactorial, but it is common in all fields involving manual labor.⁽¹²⁾

Forced postures

Positions assumed by an employee while performing tasks where one or more anatomical regions are no longer in a natural position to move to a position that causes increased blood pressure, hyperflexion, and hypermutation in various body parts. In its origins, the human cardiovascular system evolved in the fields of Africa, where obesity was a rare phenomenon, the consumption of salt and fat was moderate, and physical activity intense, at least 5 minutes before taking the pressure, avoiding isometric muscle activity, with the patient sitting with a straight back and good support, thus avoiding improper or forced postures that affect the physical health of the worker. Discomfort can be caused by forced postures, repetitive work, improper manual handling of weights, and improper use of force during work tasks, i.e., inflammatory or degenerative injuries of muscles, tendons, nerves, joints, ligaments, etc., mainly in the neck, back, shoulders, elbows, wrists, hands, fingers and feet.⁽¹²⁾

Repetitive movements

Repetitive work is any movement that is repeated for periods of less than 30 seconds or when more than 50 periods are used to perform the same movement. In addition, if a repetitive task is performed for at least 2 hours during the day, it is necessary to assess its risk level (INSHT identification criteria) since mechanical stresses occur when the soft tissues of the body are in contact during work with a hard or sharp object, or when a part of the body is used as a tool. Use of force: Force is applied when there are tasks during the workday that require Using controls where they must be pushed or pulled, manipulated upwards, downwards, inwards or outwards, and pedals or controls that must be used on the lower limbs and in a seated position; and pushing or pulling.⁽¹³⁾

Social Risk

Working conditions were hazardous to health, causing accidents and various health-related diseases. Times have changed in important ways, but working conditions remain alarming. Historically, concerns about work-related risks have focused on physical and environmental hazards, but psychosocial risks have received increasing attention. Working life has been affected by economic globalization and the development of science and technology. This generated changes in the structure of labor relations and working conditions, which in turn contributed to the emergence of new psychosocial risk factors that are considered dangerous for the safety of workers, as well as for health and productivity.⁽¹⁴⁾

Psychosocial risk factors

According to Muñoz-Rojas D et al.⁽¹⁵⁾, psychosocial factors are conditions present in the work area and even

in the environment, which can favor or harm the work activity and the quality of the work life of individuals. In this case, psychosocial risk is a source of occupational stress, as shown in Figure seven, which can cause psychological, physical, or social harm to individuals involved in the work area, and beyond being an individual problem, it can constitute a public health problem when its incidence rate is high. Although, indeed, exposure to this type of risk does not deteriorate the worker's health, although it is a source of risk, the individual must use functional coping strategies to manage the work situation and eliminate the risk that affects his behavior, cognitions or emotions in order to adapt to the situation and live with it.

Stress is one of the biggest problems that workers generally have, whether due to illness, family problems, poor relationships with colleagues, work area, etc. All this accumulates and causes them to have negative experiences related to the work context and organizational problems. These factors negatively disintegrate the worker in their daily work through interpersonal, emotional, and professional development factors, to such an extent that stress leads the worker to face the load that a person can not handle with skill and speed.⁽¹⁵⁾

Chemical risk

Chemical risk is the potential for a worker to suffer a particular injury due to exposure to chemicals. Such exposure is determined through worker-to-worker contact, inhalation, or skin contact. To classify a chemical hazard according to its severity, the probability and severity of injury must be evaluated together.⁽¹⁶⁾

The severity of the hazard depends not only on the nature of the chemical agent in question but also on the individual circumstances of the exposed worker and the characteristics of the exposure determined by job-specific factors (exposure time, generation), chemical agent, ventilation, among others and environmental conditions that may favor the absorption of the toxin, such as ambient temperature or the physical stress required for the job.⁽¹⁶⁾

Types of chemical risks⁽¹⁶⁾

Toxic Hazard

If a chemical substance is hazardous to human health, we speak of toxic risk; this hazard can materialize if exposure to the chemical substance is not controlled. The risk of toxicity of a chemical product depends on two factors: toxicity and absorbed dose, which are influenced by several factors: composition, properties, concentration, duration of exposure, form of entry into the organism, and load of the processed product.

Inhalation Risk

The main route of penetration of chemicals is through the respiratory tract. From the lungs, the chemicals enter the blood and can then affect other organs, such as the brain, liver, kidneys, etc., or cross the placenta and cause fetal malformations.

Risk of ingestion

The poisonous product enters through the mouth by contaminating food or drink, when the hand is put to the mouth to smoke after handling the chemical, or simply as an unconscious gesture. There is also the risk through the skin, in which some chemical products, such as irritants or corrosives, cause damage by contact with the skin, mucous membranes, or eyes or through small lesions on the skin.

Flammable risk

These substances react easily without using energy with the environment or themselves and emit very large amounts of heat or heat energy. They may also emit noxious and flammable vapors. Usually, it involves the creation of a flame or fire that can spread to other materials or living beings. For example, ethanol.

Explosive, oxidizing, and corrosive hazards

Materials that react rapidly and violently to combustion produce enormous amounts of heat, light, and kinetic energy (motion), either controlled and useful or uncontrolled and catastrophic. For example, nitroglycerin. On the other hand, oxidants can cause violent oxidation in flammable or combustible substances, cause a fire, or delay its extinction. For example, oxygen. Corrosives are compounds with a high capacity to react by oxidation and reduction with organic matter, producing an exothermic and highly destructive reaction that can cause burns and damage without a flame. Corrosive materials can oxidize metal or destroy organic tissue on contact. For example, Hydrochloric Acid.

Hazardous chemicals used in the work area

P.V.C. (polyvinyl chloride), the most widely used plastic in medical products, can be hazardous to patients, the environment, and public health. Therefore, there is a growing trend to look for alternatives to P.V.C. for clinical and other products, including certain construction materials. Pesticides and cleaners: Although

their role as health promoters, hospitals, and other healthcare facilities use a surprising number of highly toxic chemicals such as pesticides, cleaners, disinfectants and chemical fragrances in their facilities. These volatile organic compounds (V.O.C.s) cause poor indoor air quality and are linked to many health problems.

Occupational health

It is important to monitor and control the health status of workers through the detection of signs of diseases derived from work, taking into account the reduction of damage or alterations in the state of health, for it can take a routine health check that allows to know the health outcome of all workers to obtain a reduction of occupational risks, thus favoring workers to have good health and also favoring the company to avoid unnecessary legal proceedings by any legal problem between workers to the company.⁽¹⁵⁾

Importance of occupational risk prevention

According to Guevara-Lozano,⁽¹⁷⁾ all those who belong to the company or industry must be able to identify and evaluate the risks so that they can adopt preventive measures that help to correct risk situations that may harm the working conditions and the health of the personnel; it should be emphasized that all companies are responsible for caring for and protecting the health of their workers, which is why they must comply with all the rules or regulations, both the company and the worker. Technical and organizational aspects must be taken into account, as well as the dynamic process between coworkers, to achieve a perfect fit, improving the levels of safety and well-being of all.

Mendoza AP and Lupaca P,⁽⁶⁾ in their unpublished thesis on the level of occupational risk in the nursing professional of critical areas of the Centenario Peruvian-Japanese clinic for obtaining the academic degree of Licentiate in Nursing, published at the Universidad César Vallejo Lima - Peru. Their research aimed to determine the level of occupational risk in the nursing professionals working in critical areas of the Centenario - Peruvian-Japanese clinic in Lima - Peru. The methodology applied was quantitative at the objective level of non-experimental type, with 45 professionals from critical areas of the clinic participating in the study. Among the most important results, they found that 51,11 % of the sample had a medium level of occupational risks, 33,33 % of the sample had a high level, and 15,56 % had a low level, indicating that they did not suffer any discomfort or were at risk of suffering an accident in their work at the clinic, so they concluded that 62,5 % of those surveyed had an occupational risk and 37,5 % of those surveyed did not suffer any discomfort.

According to Noa Rojas CR,⁽¹⁸⁾ in his unpublished thesis entitled Implementation of an Occupational Health and Safety System in the El Genio E.I.R.L. Mining Unit Orcopampa 2019, for obtaining the academic degree of Engineer, published at the Continental University - Arequipa. The objective of his research was to implement a safety and occupational health system in the workshop of Maestranza El Genio E.I.R.L. Unidad Minera Orcopampa 2018; the methodology applied was quantitative of experimental type, 15 collaborators of the Taller de Maestranza el Genio E.I.R.L. participated in the study. According to the result of this pretest research, according to the survey, it was possible to observe the conformity where the employees of this company work of which the index of does not comply, does not apply is above 43 %, which evidenced the lack of implementations with systems in safety as occupational health in workshop Maestranza of maintenance in heavy machinery.

Ron Gonzabay DA,⁽¹⁹⁾ in his unpublished thesis on occupational hazards in the nursing staff, working in the trauma operating room area of a specialty hospital in the city of Guayaquil, for obtaining the academic degree of Bachelor of Nursing, published at the Catholic University of Santiago de Guayaquil - Ecuador. Their research aimed to establish the occupational risks in the nursing staff working in the trauma operating room of a Specialty Hospital in the city of Guayaquil; the methodology applied was the quantitative descriptive level of cross-sectional type, and the study involved 22 professionals in the nursing area. Among the most important results, they found that 38 % of the participants were mostly affected by biological and ergonomic risk and 48 % by mechanical risk, so they concluded that the most common disorder is low back pain due to inadequate body mechanics.

CONCLUSIONS

Organizational and productive changes have led to the incorporation of new technologies, which has led to an increase in efficiency but has also led to an increase in occupational risks. As a result, different occupational risk factors, such as psychosocial components and occupational stress derived from new forms of work organization, are becoming more and more important. Hence, companies need better systems for recording and reporting occupational accidents and diseases since adequate information is essential for establishing priorities and improving the design of prevention strategies.

REFERENCES

1. OMS/OIT. Seguridad y Salud en el Trabajo. Internet 2023 [citado 01/05/2023]. Disponible en: <https://>

www.ilo.org/es/resource/news/casi-3-millones-de-personas-mueren-por-accidentes-y-enfermedades

2. IESS. *Instituto Ecuatoriano de Seguridad Social*. Internet 2022 [citado 01/05/2023]. Disponible en: <https://www.iess.gob.ec/es/web/guest/prestaciones>
3. Barrios Gutiérrez HN, Osejo JC. Propuesta de un plan de prevención de riesgos laborales en materia de higiene y seguridad en el área ribera de la empresa Amaral Consulting Inc. Tenería La Fuente, en el período agosto a noviembre del año. Internet 2016 [citado 01/05/2023]. Disponible en: https://repositorio.unan.edu.ni/view/creators/Barrios_Gutiérrez=3AHeysell_Natalia=3A=3A.html
4. Ortega Aliaga J, Mauricio Ávalos RM, Macedo Bedoya JE, Yumpo Chuquilin CO. Gestión de seguridad y salud ocupacional y riesgos laborales en una empresa constructora del Perú. *South Florida Journal of Development*, Miami. Internet 2021 [citado 01/05/2023]; 2(4). Disponible en: <https://doi.org/10.46932/sfjdv2n4-018>
5. Guevara M. La importancia de prevenir los riesgos laborales en una organización. (Trabajo de pregrado). Universidad Militar Nueva Granada. Internet 2015 [citado 01/05/2023]. Disponible en: <https://repository.unimilitar.edu.co/items/25b8bbba-5396-40a0-bf5b-05fd71886b70>
6. Mendoza Yalan AP, Lupaca Huanacuni P. Nivel del riesgo laboral en el personal de enfermería de áreas críticas de la Clínica Centenario Peruano Japonesa, Pueblo Libre. Internet 2020 [citado 01/05/2023]. Disponible en: <https://hdl.handle.net/20.500.12692/62106>
7. Franco Enríquez JG, Meléndez Ortiz L, Valdovinos Carrasco N, Gómez González MA, Gaona E. Análisis de la salud en el trabajo en una empresa de cosméticos en México. *Trabajadores* Internet 2016 [citado 01/05/2023]; 24 (2). Disponible en: http://ve.scielo.org/scielo.php?script=sci_arttext&pid=S1315-01382016000200005
8. Condiciones de trabajo y salud. Instituto Sindical de Trabajo, Ambiente y Salud Internet 2022 [citado 01/05/2023]. Disponible en: <https://istas.net/salud-laboral/danos-la-salud/condiciones-de-trabajo-y-salud>
9. Sánchez-Pérez J. Accidentes de trabajo. Dauro Ediciones, España. Internet 2017 [citado 01/05/2023]. Disponible en: <https://www.naoslibros.es/libros/accidentes-de-trabajo/978-84-947830-0-5/>
10. Cabo-Salvador FJ. Gestión Sanitaria Integral: Pública y Privada. Prevención de riesgos laborales en el sector sanitario. 18 pg. 7 Higiene industrial. Madrid, España. Internet [citado 01/05/2023]. Disponible en: <https://www.gestion-sanitaria.com/gestion-sanitaria-integral-publica-privada.html>
11. Riesgos ergonómicos. Universidad Nacional de la Plata. Buenos Aires, Argentina Internet 2022 [citado 01/05/2023]. Disponible en: https://unlp.edu.ar/gestion/obras/seguridad_higiene/riesgos-ergonomicos-8677-13677/
12. Morales XE, Bonilla EV, Roldán MG. Evaluación del riesgo ergonómico por posturas forzadas en fisioterapeutas. *Cambios rev. méd.* Internet 2021 [citado 01/05/2023]; 20(1): 67-73. Disponible en: <https://doi.org/10.36015/cambios.v20.n1.2021.000>
13. Villar Fernández MF. Posturas de trabajo: evaluación del riesgo. España: INSHT Internet 2015 [citado 01/05/2023]. Disponible en: <https://www.insst.es/documents/94886/4155701/Tema%207.%20Posturas%20de%20trabajo.pdf>
14. Faugier-Contreras LE. *Migración del espacio laboral a entornos digitales: riesgos psicosociales ocasionados por la desvinculación social organizacional*. PAAKAT: Revista de Tecnología y Sociedad. Internet 2022 [citado 01/05/2023]; 12(22). Disponible en: https://www.scielo.org.mx/scielo.php?pid=S2007-36072022000100009&script=sci_arttext
15. Muñoz-Rojas D, Orellano N, Hernández-Palma H. Riesgo psicosocial: tendencias y nuevas orientaciones laborales. *Psicogente*. Internet 2018 [citado 01/05/2023]; 21(40). Disponible en: https://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S0124-01372018000200532
16. López-Sinisterra LG, Cumbreira-Ortega A. Percepción de riesgo laboral del personal de salud en la Región Metropolitana de Salud. Panamá. *Rev. Méd. Panamá*. Internet 2019 [citado 01/05/2023]; 39(3). Disponible en:

<http://dx.doi.org/10.37980/im.journal.rmdp.2019815>

17. Guevara Lozano, del Pilar M. La importancia de prevenir los riesgos laborales en una organización. [Internet]. 2015. [Citado: 2024, septiembre] Disponible en: <http://hdl.handle.net/10654/6499>

18. Noa Rojas CR. Implementación de un sistema de seguridad y salud ocupacional en el Taller de Maestranza El Genio E.I.R.L. Unidad Minera Orcopampa. Trabajo de investigación para optar el grado académico de Bachiller en Ingeniería Mecánica, Escuela Académico Profesional de Ingeniería Mecánica, Universidad Continental, Arequipa, Perú. [Internet] 2019 [Citado: 2024, septiembre] Disponible en: <https://hdl.handle.net/20.500.12394/9760>

19. Ron Gonzabay, DA. Riesgos laborales en el personal de enfermería que trabaja en el área de quirófano de traumatología de un hospital de especialidades en la ciudad de Guayaquil. Trabajo de investigación para optar por el grado académico de Enfermería. Universidad Católica de Santiago de Guayaquil, Ecuador. Internet] 2018 [Citado: 2024, septiembre] Disponible en: <http://repositorio.ucsg.edu.ec/handle/3317/10053>

FINANCING

Unfunded.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Ruth Calderón Landívar, Daniela Elena Loja Llano, Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez Arizala.

Data curation: Ruth Calderón Landívar, Daniela Elena Loja Llano.

Research: Tito Javier Tena García, Karla Anai Quiñonez Castillo.

Methodology: Jenrry Fredy Chávez Arizala.

Project Administration: Ruth Calderón Landívar.

Resources: Ruth Calderon Landivar, Daniela Elena Loja Llano.

Supervision: Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez Arizala, Jenrry Fredy Chávez Arizala.

Validation: Ruth Calderón Landívar, Daniela Elena Loja Llano, Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez Arizala, Tito Javier Tena García, Karla Anai Quiñonez Castillo.

Visualization: Ruth Calderón Landívar, Daniela Elena Loja Llano, Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez Arizala.

Editing - original draft: Ruth Calderón Landívar, Daniela Elena Loja Llano.

Writing - revision and editing: Ruth Calderón Landívar, Daniela Elena Loja Llano, Tito Javier Tena García, Karla Anai Quiñonez Castillo, Jenrry Fredy Chávez Arizala.