

REVIEW

Occupational risks for the personnel of agricultural production companies in Ecuador

Riesgos laborales para el personal de empresas productoras agrícolas del Ecuador

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ABSTRACT

Introduction: occupational risk is one of the problems that persist in public and private institutions. Today, occupational health and safety at work have become a global concern within work activities. Occupational risk is the proximity, contiguity or imminence of a possible work-related occupational injury, which implies a correlation between the worker and the employer.

Objective: to determine the main risk factors to which agricultural workers are exposed.

Method: a literature review was carried out from databases such as SciELO, Scopus, ClinicalKey. Filters were used for the selection of articles in English and Spanish, empirical methods such as logical history and analysis and synthesis were used for the collection and understanding of the information obtained. A total of 20 bibliographic references were selected that addressed different considerations on the subject.

Development: occupational hazards are dangerous situations present in the work environment that can cause incidents or accidents, resulting in physical injuries, psychological damage and trauma, the main objective is to eliminate or reduce the probability of these events through the planning and adaptation of preventive measures.

Conclusions: the relevance of the study on occupational risk prevention lies in its potential to reduce occupational diseases and promote the adoption of preventive measures that mitigate accidents in the workplace and in other related areas.

Keywords: Risk Factors; Occupational Risk; Agricultural Workers; Occupational Health.

RESUMEN

Introducción: el riesgo laboral es uno de los problemas que persisten en las instituciones públicas y privadas. Hoy en día, la salud ocupacional y la seguridad en el trabajo se han convertido en una preocupación a nivel mundial dentro de las actividades laborales. El riesgo laboral es la cercanía, contigüidad o inminencia de un posible daño laboral relacionado con el trabajo, el cual implica una correlación entre el trabajador y el empleador.

Objetivo: determinar los principales factores de riesgo a los que están expuestos los trabajadores agrícolas

Método: se realizó una revisión de la bibliografía desde las bases de datos como SciELO, Scopus, ClinicalKey. Se emplearon filtros para la selección de artículos en los idiomas inglés y español, se utilizaron métodos empíricos como el histórico lógico y de análisis y síntesis para la recopilación y comprensión de la información obtenida. Se seleccionaron un total de 20 referencias bibliográficas que abordaban diferentes consideraciones sobre el tema.

Desarrollo: los riesgos laborales son situaciones peligrosas presentes en el entorno de trabajo que pueden causar incidentes o accidentes, resultando lesiones físicas, daños psicológicos y traumatismos, el objetivo

principal es eliminar o reducir la probabilidad de estos eventos a través de la planificación y adaptaciones de medidas preventivas.

Conclusiones: la relevancia del estudio sobre la prevención de riesgos laborales reside en su potencial para reducir las enfermedades ocupacionales y fomentar la adopción de medidas preventivas que mitiguen los accidentes en el ámbito laboral y en otras áreas relacionadas.

Palabras clave: Factores de Riesgo; Riesgo Laboral; Trabajador Agrícolas; Salud Ocupacional.

INTRODUCTION

In the past, the responsibility for the safety and health of workers rested solely with the workers themselves. They were considered solely to blame if they suffered any injury, whether partial or lethal. This situation was because the main objective was to obtain results quickly and minimize costs. This led to not assuming responsibility for any illness or injury that might occur in the workplace. Unfortunately, this reality is still in force today in many small, medium, and large companies, where the integrity of workers is not protected.⁽¹⁾

Occupational risk is a problem that persists in public and private institutions. Occupational health and safety at work have become a worldwide concern within labor activities. Increasingly, employees are prioritizing compliance with Article 410 of the Labor Code, Obligations regarding risk prevention, which states that “employers are obliged to ensure working conditions for their workers that do not present hazards to their health or life.”⁽²⁾

Occupational health promotes and maintains workers’ highest physical, mental, and social well-being. This is achieved by preventing health disorders, controlling risks, and adapting work to people and people to their jobs. It focuses on control and prevention measures to protect workers’ health in their respective jobs. Its main objectives include maintaining and promoting employees’ health, adapting working conditions to promote health and well-being, and creating organizational systems that promote health and safety in the workplace.⁽³⁾

Occupational risk is the proximity, contiguity, or imminence of a possible work-related occupational injury, which implies a correlation between the worker and the employer. Likewise, Jaime et al. define *occupational risk* as the hazards existing in work tasks or in the work environment or workplace itself, which can cause accidents or any accidents that, in turn, are factors that can cause injuries, physical or psychological damage, trauma, etc. Their effect is always negative for health.⁽⁴⁾

Worldwide, 2,9 billion workers are exposed to hazardous risks in their workplaces, according to the International Labor Organization (ILO). Every year, 2,78 million workers die from occupational diseases and accidents, of which 374 million correspond to non-fatal occupational accidents and 2.4 million are related to occupational diseases.⁽⁵⁾

Likewise, in Latin America, the International Labor Organization 2018 recorded fatal accidents 11,1 per 100,000 workers in industries, 10,7 in agriculture, and 6,9 million in services, the construction area where many of the incidences are found.⁽⁵⁾

At the national level, in Ecuador, for the year 2019, according to the statistics of the National Traffic Agency (ANT), 199 deaths, 1 443 accidents, and 2 095 injured persons were registered, products work-related traffic accidents, as indicated under resolution C. D513, regarding Work Accidents In Itinere (AT In Itinere).⁽⁶⁾

The General Insurance of Labor Risks of Ecuador, in a bulletin entitled “Statistical Bulletin of Occupational Accidents and Occupational Diseases” of 2018, specified that the branches of activities where more accidents occur in Santo Domingo are agriculture, hunting, forestry, and fishing, with 32,1 % of accidents per branch, and 3,8 % of occupational diseases. Among the occupational diseases that occur are occupational asthma, chronic cervicgia, contact dermatitis, dysphonia, herniated disc, hyperacusis, hyperacusis plus rhinitis, painful shoulder plus tendinitis, lumbago, lumbalgia, and herniated disc, among others. These statistics correspond to a cut-off between November and December 2018.⁽⁷⁾

According to the Ecuadorian Institute of Social Security⁽⁷⁾ the causes by which the factors that cause deaths, injuries, or psychological damage arise are, among others, the lack of adequate supervision, inadequate engineering designs for the process, deficiencies in the acquisition of inadequate products, tools and equipment, use, and wear of equipment, machinery or tools, and abuse or mistreatment, so it is intended to determine the main risk factors to which agricultural workers are exposed.

METHOD

The available bibliography was reviewed using articles retrieved from databases such as SciELO, Scopus, and ClinicalKey. Filters were used to select articles in English and Spanish, and empirical methods such as logical history, lysis, and synthesis were used to collect and understand the information obtained. The terms occupational risk, agricultural, and risk factors were used as keywords in the article. A total of 20 bibliographic

references addressing different considerations on “Occupational risks for the personnel of agricultural production companies in Ecuador” were selected.

DEVELOPMENT

Occupational risks are dangerous situations in the work environment that can cause incidents or accidents, resulting in physical injuries, psychological damage, and trauma; the main objective is to eliminate or reduce the likelihood of these events through planning and adaptations of preventive measures. This is based on the evaluation of working conditions, machinery, products, exposure time, and severity of damage, using preventive disciplines such as occupational safety, industrial hygiene, ergonomics, occupational psychology, and occupational medicine. It is necessary to evaluate the risks in different areas of work, reduce avoidable risks, and minimize them to ensure a safe environment in the company.⁽⁸⁾

Occupational risk factors.

They are defined as the following phenomena, elements, or behaviors: physical, chemical, organic, psychological, or social characteristics, by their existence or that their presence or absence from work is related to the presence of traumatic events and the impact of traumatic events on the worker's health, type of accident or type of chronic non-traumatic affect disease. Occupational risks are defined “as the proximity of a damage, in the context of risk prevention, we must understand it as the probability that, in the face of a certain hazard, a certain damage will occur and can therefore be quantified.” Therefore, risk is the probability of an event or negative characteristics. In contrast, risk factors act as the causal state, in which both must occur at certain places and times so that they cease to be a possibility and become clearly defined conditions for employees.⁽⁹⁾

Classification of occupational risk factors

To determine the classification of risk factors, there is no single form or approach, but several authors and institutions offer different criteria and orientations. The interrelationships between people and their workplaces form a unit, also called a “man-machine system.” Many factors influence the relationship between people and work, which shapes the work situation and causes many dangerous situations that people try to avoid. They can be classified into five major groups.⁽¹⁰⁾

Ergonomic risk

Ergonomic hazards in the workplace can cause injuries or health problems due to incorrect postures or uncomfortable conditions. Work ergonomics focuses on objects, work environment, and work systems, as they can contribute to these risks; for example, work chairs that do not provide enough support or do not fit each employee are an example of ergonomic risk; in addition, factors such as too bright lighting or noisy equipment can also be ergonomic risks, causing headaches and visual fatigue, working in a sedentary manner for prolonged periods can also increase the risk of problems such as back pain and muscle stiffness.⁽¹¹⁾

Ergonomic risk prevention

Several workers are affected by adopting bad static postures, dynamic postures, lifting loads, total physical load, job design, etc. To prevent all of the above from affecting the worker's health, the lifting of loads should be planned, stable postures providing the separation of the feet temporarily, get up gently; in case of not having mechanical aids, help should be requested from colleagues when it is needed.⁽¹²⁾

Physical risks

They all depend on the physical properties of the body, such as noise, lighting, vibration, etc., that act on the worker's tissues and organs. They can produce harmful effects according to intensity, exposure, and concentration. It occurs when extremities are exposed to low temperatures for long periods without skin freezing. Factors that contribute to the development of these lesions are low temperature, limb sluggishness, and humidity.⁽⁹⁾

Noise: exposure to high noise levels in the work environment can cause a variety of problems in addition to hearing loss; one of these complications is the eardrum, which is characterized by ringing, hissing, buzzing, or humming in the ears, which can cause sleep disorders and be annoying, noise at work can hinder communication and make it difficult to hear important notices. In addition, it can decrease a person's awareness of what is happening around them, and these factors can create safety hazards, which can lead to injury or even death.⁽¹³⁾

Lighting: as stated by the National Institute of Safety and Hygiene at Work, lighting in the workplace is crucial for the safety and welfare of workers; inadequate lighting can affect vision and cause visual fatigue, errors, and accidents; proper lighting in the workplace should allow distinguishing shapes, colors, moving objects and reliefs, in addition to ensuring visual comfort. Legislation establishes minimum lighting levels that

must be complied with, and glare and reflections on work material must be avoided. The perception of color and its emotional and psychic effects must also be considered when planning lighting at work.⁽¹⁴⁾

Vibrations: mechanical vibrations are movements transmitted to the body by structures capable of producing harmful effects or discomfort in workers; these movements generate energy that the body absorbs and can cause injuries and disorders, depending on their intensity and area of incidence. Therefore, evaluating the mechanical vibrations the worker faces is crucial, considering aspects such as magnitude, frequency, direction, and duration of exposure. Vibrations are classified into whole-body and upper-extremity vibrations and are divided according to intensity and frequency into low, medium, and high. It can also cause a variety of disorders, from musculoskeletal injuries to effects on the respiratory, nervous, and cardiovascular systems.⁽¹⁵⁾

Extreme temperatures (high and low): The episodes address high and low temperatures by highlighting hot conditions that exceed the local climatological normality, affecting both regions with generally hot summers and those with cooler summers; these episodes increase the risks for the working population, multiplying occupational health hazards. Furthermore, it highlights the importance of considering heat waves as an emerging occupational hazard and the need for specific policies to protect workers from these conditions.⁽¹⁶⁾

Psychosocial risks

The joint ILO/WHO committee defines psychosocial risks as the interaction between work and the environment, such as job satisfaction and organizational conditions, on the one hand, and the capabilities, culture, needs, and skills of employees outside work on the other. Interaction between individual circumstances. More specifically, the INSHT follows the ILO, which defines it as the conditions of the work situation that are directly related to work organization, work content, and task performance and which contain the potential to influence the development of “work and occupational health,” which are currently considered psychosocial risks.⁽¹⁷⁾

Chemical risk

Chemical hazards are environmental substances that permeate the air. They can enter the body through the respiratory, skin, and gastrointestinal tract, where they can develop. Occupational diseases include dust, gas, vapor, mist, fog, metal, or smoke. Chemical processes and the environment produce them. Diseases such as allergies, asphyxiation, or viruses are caused by inhalation, absorption, or ingestion. It must be protected with masks and gloves and delimit the work area.⁽⁸⁾

Biohazard

Biological hazards are composed of microorganisms, toxins, biological secretions, human tissues, and organs in the workplace. These cause the suffering of infectious-contagious diseases or other diseases when in contact with the worker's organism. It is generated due to the worker's exposure to fungi, insects, microorganisms, viruses, toxins, and vectors that can cause any type of infection, allergy, or toxicity.^(18,19)

Insurance systems for occupational risks

The occupational hazard insurance system aims to ensure that employees are compensated for losses caused by their work. The occupational hazard insurance system is to provide compensation for injuries suffered by employees as a result of work. In most countries, this choice is considered an occupational accident and occupational disease, which means that insurance coverage is determined in practice by legal definitions of these unexpected events.^(20,21)

Occupational accidents require preventive regulation, thus encouraging the collaboration of workers, giving part of the obligations and commitments required, and collaborating with participation in the preparation of documentation on safety and health at work. Therefore, occupational accidents will be understood as all risks experienced by workers in the company. Therefore, these risks can be classified according to their severity, either by misuse of PPE, machines that do not receive maintenance, lack of workers' experience, or not receiving adequate training to prevent occupational hazards.⁽²²⁾

Personal protective equipment

Personal protective equipment does not eliminate the occupational hazards that workers face daily. However, they care for and protect workers, reducing the risk that exists in the work area and giving positive results for workers due to the correct use and operation. Also, any damage to the worker and the company is avoided in case of an accident. Due to misuse of personal protective equipment, the company will not bear the cost because workers do not use it properly. Therefore, it is mandatory to use personal protective equipment to protect their bodies, their safety, and their health at work.^(23,24)

CONCLUSIONS

The agricultural worker is significantly exposed to physical risks that require a review and improvement of working conditions, including noise and temperature control, the need to reinforce safety measures and training in the handling of chemicals, exposure to biological risks that highlight the importance of strengthening biosafety practices to ensure a safe working environment. The study's relevance to occupational risk prevention lies in its potential to reduce occupational diseases and encourage the adoption of preventive measures to mitigate accidents in the workplace and other related areas. The implementation of safety practices, such as the proper use of personal protective equipment and the safe handling of chemicals, is based on knowledge of the causes of occupational hazards. This understanding contributes to preventing incidents and improving worker productivity, which can increase company sales. In addition, compliance with the regulations established in the Labor Code, specifically Article 410, is essential to ensure a safe working environment.

REFERENCES

1. Santana C, Gómez M, Altamirano B, & Dolores M. Factores de riesgo en el personal de enfermería en un hospital de segundo nivel. *Ciencias Latina Revista Multidisciplinar*. (2021); 5 (4). doi: <https://doi.org/10.37811/clrcm.v5i4.640>
2. Espinoza E. Riesgo laboral en los colaboradores de la empresa grupo Santa Elena S.A Chancay-2019. UNIVERSIDAD NACIONAL JOSÉ FAUSTINO SÁNCHEZ CARRIÓN FACULTAD DE CIENCIAS SOCIALES ESCUELA PROFESIONAL DE TRABAJO SOCIAL, Perú. (2022). Obtenido de <https://repositorio.unjfsc.edu.pe/bitstream/handle/20.500.14067/5917/ELVIRA%20DIANA%20ESPINOZA%20LUCAS.pdf?sequence=1>
3. Delgado D, & Zambra no, K. Covid-19 y la salud ocupacional en el personal sanitario del Centro de Salud Chone. Universidad Estatal del Sur de Manabí Facultad Ciencias de la Salud, Ecuador. (2022). Obtenido de <https://repositorio.unesum.edu.ec/handle/53000/3915> .
4. Rodríguez E, & Caicedo F. Los riesgos laborales en personas con capacidades especiales. Universidad Regional Autónoma de los Andes, Ecuador. (2020); Obtenido de <http://dspace.uniandes.edu.ec/handle/123456789/11169>
5. Llagua A. Riesgos laborales: Análisis exploratorio de los indicadores más comunes en Ecuador Universidad Tecnológica Indoamérica Facultad de Ciencias Humanas y de la Salud, Ecuador. (2020). Obtenido de <https://repositorio.uti.edu.ec/bitstream/123456789/2105/1/LLAGUA%20AREVALO%20ANDRES%20SEBASTIAN.pdf>
6. Muñoz W, Tapia O, Hernández M, & Campos Y. Accidentalidad de la Población Trabajadora Ecuatoriana: Análisis de Variables para su Calificación. *Revista Cuatrimestral "Conecta Libertad"*. (2020); 4(1), 22-31. Obtenido de <https://repositorio.uisek.edu.ec/bitstream/123456789/3916/1/26616904%20CAMPOS%20YOLIS%202020-03-27.pdf>
7. Instituto Ecuatoriano De Seguridad Social. (2018, octubre, 09) Obtenido de SEGURO GENERAL DE RIESGOS DEL TRABAJO: https://www.iess.gob.ec/documents/10162/51889/Boletin_estadistico_2018_nov_dic.df
8. Pantoja J, Vera S, & Avilés T. Riesgos laborales en las empresas Occupational hazards in companies Risks professional companies. *Polo del Conocimiento*. (2017); 2 (5). doi:10.23857/pc. v2i5.98
9. Morino J, & Vinicio A. "LA SEGURIDAD E HIGIENE INDUSTRIAL Y LA CALIDAD DEL AGUA Y SU INCIDENCIA EN LA GESTIÓN DE RIESGOS LABORALES Y AMBIENTALES EN EL CENTRO DE FAENAMIENTO OCAÑA". UNIVERSIDAD TÉCNICA DE AMBATO FACULTAD DE INGENIERÍA EN SISTEMAS, Ecuador. (2014); Obtenido de https://repositorio.uta.edu.ec/bitstream/123456789/6986/1/Tesis_t870mshi.pdf
10. Gómez, B. Manual de prevención de riesgos laborales. (2017). (2. MARGE BOOKS, Ed.)
11. Cercado M, Chinga G, & Soledispa X. Riesgos ergonómicos asociados al puesto de trabajo del personal administrativo. *Dialnet*. (2021); 8(32). Obtenido de <https://dialnet.unirioja.es/servlet/articulo?codigo=8118323>
12. Huamán S, & Augusto C. Propuesta de sistema ergonómico para mejorar el procedimiento de reparación y mantenimiento de válvulas de baleo para pozos petroleros en la Empresa Corporación Cruz - El Alto 2019. Universidad César Vallejo. (2020); Obtenido de <https://hdl.handle.net/20.500.12692/63462>
13. Organización Internacional del Trabajo. (1996 -2024). Obtenido de Ruido (Administración e Inspección

del Trabajo): <https://www.ilo.org/global/topics/labour-administration-inspection/resources-library/publications/guide-for-labour-inspectors/noise/lang-es/index.html>

14. (INSHT), I. N. Iluminación en el puesto de trabajo. Criterios para la evaluación y acondicionamiento de los puestos (Madrid, diciembre 2015 Ed). (2015); Obtenido de <https://www.insst.es/documents/94886/96076/Iluminacion+en+el+puesto+de+trabajo/9f9299b8-ec3c-449e-81af-2f178848fd0a>

15. Lascano A, & Sánchez J. Análisis y medidas de control de las vibraciones mecánicas transmitidas al cuerpo humano para disminuir los riesgos en trabajadores de la empresa Molinos Miraflores. Universidad Técnica de Ambato. (2024); Obtenido de <https://repositorio.uta.edu.ec/jspui/handle/123456789/40648>

16. Narocki C. Los episodios de altas temperaturas como riesgo laboral. ETUI aisbl, Bruselas. (2021). Obtenido de <https://istas.net/sites/default/files/202206/Los%20episodios%20de%20altas%20temperaturas%20como%20riesgo%20laboral-2022.pdf>

17. Observatorio de Riesgos Psicosociales. (2022). Obtenido de Qué es un riesgo psicosocial: <https://observatorioriesgospsicosociales.com/que-es-un-riesgo-psicosocial/>.

18. Benavides F, Gracia A, & Ruiz C. Salud laboral. Conceptos y técnicas para la prevención de riesgos laborales. Revista Española de Salud Pública. (2006); doi:10.1590/S1135-57272007000300009.

19. Wolfenson ED, Bustos CA. Micro(nano)plastics, an emerging health problem. Environmental Research and Ecotoxicity 2025;4:153-153. <https://doi.org/10.56294/ere2025153>.

20. Landívar RC, Moreano ALC, Valle VMRD, Chávez-Arizala JF. Risk factors for high blood pressure in older adults of the Provincial Directorate of the MIES of Santo Domingo de los Tsáchilas. Multidisciplinar (Montevideo) 2025;3:62-62. <https://doi.org/10.62486/agmu202562>.

21. Sánchez A, & Narciza M. La seguridad industrial y los accidentes laborales de los trabajadores de la empresa “cavimar”, de la ciudad de Ambato provincia de Tungurahua. Universidad Técnica de Ambato. (2017); Obtenido de <https://repositorio.uta.edu.ec/bitstream/123456789/25004/1/Tesis%20Adriana%20Carolina%20Sanchez.Pdf>

22. Enríquez J, & Romero M. Los equipos de protección personal y su incidencia en los riesgos laborales de los trabajadores del Gobierno Autónomo Descentralizado del cantón Salcedo, provincia de Cotopaxi. Universidad Técnica de Ambato. (2016); Obtenido de <https://repositorio.uta.edu.ec/jspui/handle/123456789/20268>

23. Araujo MP, Carnovale S. Distribution of Dengue Serotypes in Argentina in the Last 2 Years. Multidisciplinar (Montevideo) 2025;3:57-57. <https://doi.org/10.62486/agmu202557>.

24. Fidel WWS, Cuicapusa EEM, Espilco POV. Managerial Accounting and its Impact on Decision Making in a small company in the food sector in West Lima. Edu - Tech Enterprise 2024;2:8-8. <https://doi.org/10.71459/edutech20248>.

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