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Difference Between Psychosocial Risk Factors of Operating Staff According to Work Shift: Peruvian Logistics Operator

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ABSTRACT

The study sought to determine if there was a difference in the exposure to psychosocial risk factors between operating staff who work in two non-rotating work shifts in a Peruvian logistics operator. The standardized questionnaire of the CoPsoq-Istas21 method was applied to determine the level of exposure prevalence of shift workers, complemented by a non-parametric inferential statistical analysis. In the day shift, five unfavorable psychosocial risk factors for health and nine favorable factors were found, while in the night shift, four unfavorable factors for health and nine favorable factors were found. It was concluded that the psychosocial risk factor "influence" presents differences in the operating staff of both work shifts, it was also determined that there are 13 coincidence factors between both shifts and another six factors are inconclusive.

Keywords: Risk factors; occupational risks; occupational exposure; shift work schedule.

INTRODUCTION

To be operational 24 hours a day, 7 days a week, and meet the demand for products or services offered to clients, companies have developed work schemes with various work shifts (Ortiz, 2019). In some cases, collaborators work in rotating shifts, which means that their work hours change from morning to afternoon or from day to night; in contrast, in other cases, collaborators work in the afternoon or night shift permanently (Instituto Nacional para la Seguridad y Salud Ocupacional [NIOSH], 1997). This work condition may cause health safety or work capacity effects. Table 1 shows the health effects of shift work (NIOSH, 1997; Unión General de Trabajadores [UGT], 2012).

The work market is a complex and changing phenomenon, so in the last decades, the origin of work accidents and occupational illnesses has changed with a greater presence of psychosocial risks (Gil-Monte, 2012). Changing and unpredictable shifts, the number of working hours, and work rhythm intensity, among other components, are considered psychosocial risk factors (Moreno,

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Table 1. *Health Effects of Shift Work.*

Immediate Effects	Prolonged Effects
Sleep disturbances	Gastrointestinal disorders
Alteration of circadian rhythm, performance, and safety	Nervous disorders
Effects on social and family life	Cardiovascular disorders

Source: Prepared by the authors.

2011) since they act as triggering factors of work stress, which means that they have the potential to generate harmful effects on the health of workers. The presence of psychosocial risk factors may not only affect the health and well-being of collaborators but may also lead to economic loss in production and affect productivity as a consequence of absenteeism and increased frequency of accidents (Ministerio de Salud, 2005). Psychosocial factors include those risk factors related to health that originate in work organization and cause physiological, cognitive, behavioral, and emotional responses, commonly known as "stress" (Moncada et al., 2014). It is necessary to differentiate psychosocial risk factors from psychosocial risks since Cox and Griffiths (1996) consider psychosocial risks like the events, situations, facts, or physical conditions that present a high probability of affecting a worker's health (stress is the most common). The consequences are usually significant but depend on the vulnerability of the worker. Therefore, psychosocial risk factors are the potential cause while the effect of exposure to psychosocial risk factors is psychosocial risk (Castaño et al., 2017). To illustrate this relationship, work organization (psychosocial risk factor) is the origin, and stress (psychosocial risk) is the predecessor or precursor of the effect (health disorder or disease) that is intended to and must be avoided. Therefore, it is necessary to identify, locate, and measure psychosocial risk factors to plan preventive measures, monitor their implementation, and evaluate them. (Moncada et al., 2014).

Several studies conducted in Spain, Colombia, and Chile have shown that shiftwork, especially when extended or irregular, represents a risk factor for the health and well-being of employees (Juárez y Cárdenas, 2006) since it causes a higher incidence of sleep disorders, such as insomnia and drowsiness, psychic alterations and alterations of the musculoskeletal and gastrointestinal system (Carbajal et al., 2005). As a result, attention and decision-making abilities are reduced, as well as the speed and precision of movements (Guevara et al., 2004), and the perception of job stress is influenced (García et al., 2015; Güilgüiruca et al., 2015). However, these studies differ in their conclusions on whether there is a difference or not in the exposition to risk factors between day and night shiftwork.

For a long time, worldwide legislation on occupational risk prevention focused on the threat to health from physical, chemical, and environmental hazards at work. (Moreno, 2011) because they have an impact on direct damage to health and cause a great number of occupational accidents and diseases. At present, numerous countries are addressing the psychosocial aspects in their legislative framework, since they impact the fundamental rights of workers. In this context, Act N.° 29783, Occupational Safety and Health Act, states that employers must monitor psychosocial risk factors (Ministerio de Trabajo y Promoción del Empleo, 2011). However, until the end of 2022, methodological guides were lacking to identify and evaluate psychosocial risk factors (Gutiérrez, 2017).

As with any employer, the company under study has the responsibility to monitor psychosocial risk factors. This company has implemented a shiftwork system without rotation, which means that their personnel are permanently assigned to a shift. Thus, the objective of this study is to determine whether there is a difference in the level of exposure prevalence to psychosocial risk factors between non-rotating work shifts in a Peruvian logistics operator. Considering that the workers of the company under study are exposed to several risk factors present in both shifts, the hypothesis that there is a difference in the level of exposure prevalence to risk factors between non-rotating work shifts has been formulated.

The novelty of this study lies in the fact that it is conducted in a company with non-rotating shifts in contrast to previous studies that included companies with traditional work systems with rotating shifts. Moreover, this study is relevant because it provides findings that can be applied to companies with similar characteristics to elaborate psychosocial risk intervention plans with preventive purposes.

METHODOLOGY

Company Under Study

The company under study is responsible for the representation, distribution of goods, and management at the point of sale. It has four locations in Lima Metropolitana (one administrative office and three warehouses) and four warehouses in the provinces.

The personnel working for the company under study were selected as the unit of analysis, however, inclusion and exclusion criteria were established to reduce the study population (Table 2). Thus, the scope of the investigation was limited to the operating staff of the locations in San Luis, Nicolas Ayllón, and Los Olivos.

These locations have a total of 63 workers (Table 3) whose job is the reception and storage of products. They cover two shifts: the day shift, from 8:00 a.m. to 6:00 p.m., and the night shift from 8:00 p.m. to 6:00 a.m.

It was determined that the sample size for a finite population is 54 workers (confidence level of 95% / error 5%), however, the method CoPsoQ-Istas21 requires that the standardized questionnaire is applied to all the employees (Moncada, et al., 2014), that is to say, it must be applied to all 63 employees.

Data Collection Instrument

The coPsoQ-Istas21 method was used to identify and evaluate the psychosocial risk factors. Although this method is the Danish COPSOQ method adapted and validated for Spain, (Moncada et al., 2014), its use has been documented in other countries such as Peru (Navarrete et al., 2017; Gutiérrez, 2017; Arredondo et al., 2019).

The questionnaire of the CoPsoQ-Istas21 method medium version for companies with more than 25 employees consists of six dimensions and 20 psychosocial risk factors with a total of 69 questions. In person, the operating staff of both shifts answered the standardized questionnaire according to the following:

- Groups of five to ten workers per shift were formed.
- Each group received an induction about psychosocial risks.
- The day shift workers were located in the training room.
- The night shift workers were located in the freight yard.
- The results of the standardized questionnaires were processed by the software application of the CoPsoQ-Istas method21 to obtain the level of exposure prevalence to the psychosocial risk factors.l.

It is important to mention that the standardized questionnaire was applied during the state of emergency period dictated by the Peruvian Government due to the COVID-19 pandemic (in 2020). The questionnaire uses a Likert scale to rate the frequency of exposure to psychosocial risk factors.

Analysis and Interpretation

The following procedure was applied using SPSS (version 25) for the analysis and interpretation of the data collected:

Table 2. *Inclusion and Exclusion Criteria.*

Inclusion Criteria	Exclusion Criteria
Personnel working in the operating area - warehouse Personnel working in Lima Metropolitana locations	Remote workers

Source: Prepared by the authors.

Table 3. *Distribution of the Study Population.*

Shift	Quantity	Rate
Day	36	57%
Night	27	43%
Total	63	100%

Source: Prepared by the authors.

- Reliability analysis of the data collected in the standardized questionnaire using Cronbach's alpha;
- normality test of the data collected in the standardized questionnaire; and
- Chi-square test for homogeneity of level of exposure prevalence samples.

RESULTS

Employees Participation

A total of 57 employees answered the standardized questionnaire, which represents a response rate of 90% (Table 4), above the acceptable response rate of 60% (Moncada et al., 2014). Six employees did not participate due to non-attendance for personal reasons, leaves of absence, and medical leave.

Reliability Analysis

Cronbach's alpha value was determined to be 0.872 for the reliability analysis of the results of 69 questions from the standardized questionnaire related to the prevalence of the 20 psychosocial risk factors.

Normality of the Data

As the sample size per shift is over 50 observations, the Kolmogorov-Smirnov test was applied to determine the normality of the data collected in the standardized questionnaire and the following hypotheses were proposed:

- H_0: The answers follow a normal distribution.
- H_1: The answers follow a distribution different from normal.

According to the results shown in Table 5, H_0 is rejected (p-value < alfa = 0.05), therefore the data collected in the standardized questionnaire per shift do not correspond to a normal distribution.

Sample Homogeneity Test

The CoPsoQ-Istas21 method software calculates the exposure prevalence to psychosocial risk factors by relating the answers to the standardized questionnaire to the reference values that correspond to the cutoff points of the population terciles of the reference population (salaried population in Spain).

Table 6 shows the exposures per shift and of the general population of the company under study based on the highest proportion of workers exposed to an unfavorable (red color), intermediate (yellow color), or more favorable (green color) health situation.

To determine whether there is a difference between the psychosocial risks between both work shifts at the company under study, statistical hypotheses were proposed applying the chi-square test since the results of the questionnaire did not present a normal distribution.

Hypothesis Testing

Considering the hypothesis of the study that says that there is a difference in the level of exposure prevalence to risk factors between non-rotating work shifts, the following specific hypotheses have been proposed for each psychosocial risk factor:

- H_0: There is no difference in the level of exposure prevalence to the risk factor between non-rotating work shifts.

Table 4. *Distribution of Personnel by Gender and Age.*

	Day Shift	Night Shift	Total	Rate
Gender				
Female	1	0	1	2%
Male	35	21	56	98%
Total	36	21	57	100%
Age Range				
Less than 31	17	16	33	58%
Between 31 and 45	11	5	16	28%
Over 45	8	0	8	14%
Total	36	21	57	100%

Source: Prepared by the authors.

- H_0: There is a difference in the level of exposure prevalence to the risk factor between non-rotating work shifts.

Based on the results shown in Table 6, it can be seen that the psychosocial risk factors Influence and Recognition have a *p*-value less than alpha =0.05. Therefore, H_0 is rejected for these factors, which means that there is a difference in the level of exposure prevalence between non-rotating work shifts for psychosocial risk factors Influence and Recognition. However, it should be noted that only the psychosocial risk factor Influence shows different results in terms of exposure prevalence between the two shifts: The situation for the day shift is intermediate (yellow color) and for the night shift it is more favorable for health (green).

Since it was found that 1 of the 20 psychosocial risk factors presents differences in the level of prevalence between non-rotating work shifts in the Peruvian logistics operator, it can be inferred that the hypothesis of the study is accepted, although not significantly.

Table 5. *Normality Test.*

Psychosocial Risk Factor	Question	Significance Level (*p*-value)		Psychosocial Risk Factor	Question	Significance Level (*p*-value)	
		D	N			D	N
Quantitative demands	24c	0.000	0.000	Role conflict	26c	0.001	0.000
	24e	0.000	0.000		26f	0.001	0.007
	24g	0.000	0.000		26i	0.000	0.026
	24p	0.000	0.000		26j	0.000	0.026
Work pace	24a	0.002	0.001	Social support from colleagues	27a	0.000	0.001
	25f	0.000	0.002		27b	0.001	0.008
	25m	0.005	0.002		27c	0.001	0.049
Emotional demands	24b	0.001	0.001	Sense of group	27d	0.000	0.000
	24q	0.000	0.000		27e	0.000	0.000
	25d	0.000	0.000		27f	0.000	0.000
	25i	0.002	0.000	Social support from superiors	27g	0.000	0.000
Demands to hide emotions	24d	0.000	0.000		27h	0.000	0.000
	24f	0.000	0.000		27i	0.000	0.002
	25j	0.001	0.001	Quality of leadership	29k	0.000	0.001
	25k	0.000	0.008		29l	0.000	0.000
Double presence	24o	0.000	0.002		29m	0.003	0.000
	24l	0.000	0.000		29n	0.001	0.000
	24m	0.000	0.000	Predictability	26a	0.001	0.001
	24n	0.000	0.011		26e	0.000	0.000
Influence	24i	0.003	0.011	Recognition	29a	0.002	0.000
	24j	0.007	0.000		29b	0.000	0.005
	24h	0.000	0.003		29c	0.000	0.000
	24k	0.000	0.000	Job insecurity	28d	0.000	0.000
Development opportunities	25a	0.000	0.000		28f	0.000	0.000
	25e	0.000	0.000	Insecurity about working conditions	28a	0.000	0.000
	25h	0.000	0.000		28b	0.001	0.008
	25l	0.000	0.000		28c	0.000	0.001
Meaningfulness of work	25b	0.000	0.002		28e	0.000	0.008
	25c	0.000	0.000	Vertical trust	29d	0.000	0.000
	25g	0.000	0.002		29e	0.000	0.006
Role clarity	26b	0.000	0.000		29i	0.001	0.017
	26d	0.000	0.000	Justice	29f	0.001	0.006
	26g	0.000	0.001		29g	0.001	0.000
	26h	0.000	0.017		29h	0.004	0.001
					29j	0.001	0.000

Key: D: Day shift / N: Night shift.
Source: Prepared by the authors.

Table 6. *Exposure to Psychosocial Risk Factors and Chi-Square test (p-value).*

Psychosocial Risk Factors	Shift	Exposure Prevalence			*p*-value
Quantitative demands	D	8	16	12	0.086
	N	4	15	2	
Work pace	D	31	1	4	0.202
	N	21	0	0	
Emotional demands	D	7	14	15	0.611
	N	2	9	10	
Demands to hide emotions	D	4	8	24	0.228
	N	0	7	14	
Double presence	D	5	20	11	0.201
	N	7	10	4	
Influence	D	11	17	8	0.001
	N	2	4	15	
Development opportunities	D	5	13	18	0.673
	N	4	9	8	
Meaningfulness of work	D	5	8	23	0.484
	N	4	7	10	
Role clarity	D	13	17	6	0.364
	N	11	6	4	
Role conflict	D	16	11	9	0.259
	N	9	10	2	
Social support from colleagues	D	8	10	18	0.681
	N	6	7	8	
Sense of group	D	7	17	12	0.321
	N	2	8	11	
Social support from superiors	D	7	10	19	0.529
	N	2	8	11	
Quality of leadership	D	12	14	10	0.100
	N	2	9	10	
Predictability	D	17	7	12	0.519
	N	7	4	10	
Recognition	D	0	10	26	0.008
	N	0	0	21	
Job insecurity	D	15	11	10	0.850
	N	10	5	6	
Insecurity about working conditions	D	23	9	4	0.352
	N	13	3	5	
Vertical trust	D	0	4	32	0.851
	N	0	2	19	
Justice	D	5	3	28	0.202
	N	0	2	19	

Key: D: Day shift / N: Night shift.

Source: Prepared by the authors.

DISCUSSION

The reliability analysis was applied to the answers to the 69 questions of the standardized questionnaire related to the prevalence of the 20 psychosocial risk factors. A Cronbach's alpha value of 0.872 was obtained, which according to George and Mallery (2010) can be considered as good. Besides, the CoPsoQ-Istas21 method considers that to ensure that the evaluation data are valid, a high level of worker participation, above a 60% response rate, is required; in this case, the response rate is 90%, so it can be said that the results are valid and have good reliability.

For the day shift, five psychosocial risk factors unfavorable to health were identified:

- Work pace. It is associated with poor planning regarding the timing of assigned tasks. It could also be related to the management of technology in daily activities.
- Rol conflict. It is related to the solution activities that cause ethical conflicts.
- Predictability. It is related to inadequate information or the lack of it. It is also related to communications focused on superfluous issues and not on the daily and relevant job issues.
- Job insecurity and insecurity about working conditions. They may be related to the context of the COVID-19 pandemic that has generated mass dismissals, temporary layoffs, closure of companies, or changes in jobs.

Nine psychosocial risk factors favorable to health were also identified:

- Emotional demands and demands to hide emotions. In difficult work situations, workers have a good ability to control their emotions.
- Development opportunities and meaningfulness of work. The workers are satisfied with the salaries and additional income generated by the company, which is in line with their skills, knowledge, and experience.
- Social support from colleagues and superiors. These are related to effective communication both horizontally and vertically.
- Recognition, justice, and vertical trust. They show the existence of effective management through recognition, respect, and fair treatment of personnel.

For the night shift, four psychosocial risk factors that are unfavorable to health were identified:

- Work pace. It is associated with the planning regarding the timing of assigned tasks; however, according to feedback from employees in the company under study, they speed up their work pace to finish tasks earlier, aiming to have more time for rest (sleep) during their shift.
- Role clarity. The tasks to be performed, objectives, available resources, and autonomy levels are not clearly defined at work.
- Job insecurity and insecurity about working conditions. Similarly to what was identified in the morning shift, this could be related to COVID-19.

Additionally, nine psychosocial risk factors were identified as favorable to health:

- Emotional demands and demands to hide emotions (43%). They are related to the employees' ability to control their emotions effectively in challenging work situations.
- Influence, meaningfulness of work, social support from colleagues, sense of group, support from superiors, quality of leadership, and predictability. They show that there is effective communication both horizontally and vertically. Employees are also satisfied with their leaders, teams, salaries, and additional income provided by the company that aligns with the workers' skills, knowledge, and experience.
- Recognition, justice, and vertical trust. They reflect effective management by the management through the recognition, respect, and fair treatment of personnel.

These results are aligned with those of previous studies (Arredondo et al., 2019; García et al., 2015) that show that the day shift presents a greater number of psychosocial risk factors that increase the possibility of stress risk and, in consequence, its impact on workers' health. However, Cuadrado (2016) differs by suggesting that negative consequences are present in the night shift due to the disregard of basic criteria and alterations in life quality.

Based on the level of exposure prevalence to psychosocial risk factors, determined using the CoPsoQ-Istas21 method software, seven factors were identified as differing between the two shifts: influence, development opportunities, role clarity, role conflict, sense of group, quality of leadership, and predictability. However, after the inferential statistical analysis using the chi-square test, only the psychosocial risk factor Influence showed a significant difference in prevalence between the shifts. Regarding the other six psychosocial risk factors initially identified, it cannot be concluded that they differ between shifts, as the results are inconclusive when comparing levels of exposure prevalence with the results of the inferential statistical analysis. This situation aligns with the study by Juárez and Cárdenas (2006), in which the eight dimensions of the SF-36 were applied revealing that seven dimensions did not present significant results.

These results are part of the diagnostic stage and provide information for the development of a preventive intervention plan (Arredondo et al., 2019) that addresses various aspects, as proposed by Moya (2016):

- strategies for each psychosocial risk factor especially those unfavorable to health, and
- activities to improve working conditions that may be affecting employees' health.

CONCLUSIONS

It was determined that the psychosocial risk factor Influence differs among operating staff working different shifts at the company under study. For night shift operating staff, the exposure prevalence is at a level favorable to health, while for day shift operating staff, the situation is intermediate.

When comparing the level of exposure prevalence with the results of the inferential statistical analysis, it was found that the results are inconclusive in determining whether the psychosocial risk factors of development opportunities, role clarity, role conflict, sense of group, quality of leadership, and predictability differ for operating staff of both shifts. Therefore, it is advisable to expand the scope of the study population.

For both shifts, the following psychosocial risk factors were identified as either unfavorable, intermediate, or favorable to health:

- Three factors unfavorable to health: work pace, job insecurity, and insecurity about working conditions.
- Two factors at an intermediate level: quantitative demands and double presence.
- Eight factors favorable to health: emotional demands, demands to hide emotions, meaningfulness of work, social support from colleagues, social support from superiors, recognition, vertical trust, and justice.

The results obtained should be used to design and implement an intervention plan that, over the long term, will minimize and control the existing psychosocial risk factors.

REFERENCES

[1] Arredondo, M., Viñas, S., & Oramas, A. (2019). Experiencia cubana con el ISTAS 21 en la evaluación de los factores de riesgo psicosociales en un centro de telecomunicaciones. *Revista Cubana de Salud y Trabajo, 20*(1), 58-64.

[2] Carbajal, P., Valiño, M., & Cuartero, M. (2005). Evaluación de salud en los trabajadores ferroviarios a turnos y nocturnos. *Revista de la Sociedad Española de Medicina y Seguridad del Trabajo, 1*(3), 205-208.

[3] Castaño, A., Rueda, B., Alcedo, A., & García-Izquierdo, A. (2017). La Evaluación de los Riesgos Psicosociales en las Organizaciones. In A. García-Izquierdo, *Ergonomía y Psicosociología aplicada a la Prevención de Riesgos Laborales* (pp. 353-393). Oviedo, Spain: Ediciones Universidad Oviedo.

[4] Ministerio de Trabajo y Promoción del Empleo. (2011). Ley N° 29783 - Ley de Seguridad y Salud en el Trabajo, su reglamento y modificatorias. https://cdn.www.gob.pe/uploads/document/file/349382/LEY_DE_SEGURIDAD_Y_SALUD_EN_EL_TRABAJO.pdf

[5] Cox, T., & Griffiths, A. J. (1996). The assessment of psychosocial hazards at work. En M. J. Schabracq, J. A. M. Winnubst, y C. L. Cooper (Eds.), *Handbook of Work and Health Psychology* (pp. 127-146). Chichester, England: Wiley and Sons.

[6] Cuadrado García, S. (2016). *Trabajo a turnos, estrés y rendimiento laboral en personal de enfermería.* (Master's thesis). Universitas Miguel Hernández, Alicante.

[7] García Albuerne, Y., Pérez Nieto, M. A., & Luceño Moreno, L. (2015). Turnos y estrés psicosocial en los policías locales de Madrid. *Ansiedad y Estrés, 21*(1), 57-70.

[8] George, D.,& Mallery, D. (2010). *SPSS for Windows step by step: A simple Guide and Reference 18.0 Update* (11th ed.). Boston, U.S.: Allyn & Bacon.

[9] Gil-Monte, P. (2012). Riesgos psicosociales en el trabajo y salud ocupacional. *Revista Peruana de Medicina Experimental y Salud Publica, 29*(2), 237-241.

[10] Guevara, C. A., Henao, D. P., & Herrera, J. A. (2004). Síndrome de desgaste profesional en médicos internos y residentes. Hospital Universitario del Valle, Cali, 2002. *Colombia Médica, 35*(4), 173-178.

[11] Güilgüiruca Retamal, M., Meza Godoy, K., Góngora Cabrera, R., & Moya Cañas, C. (2015). Factores de riesgo psicosocial y estrés percibido en trabajadores de una empresa eléctrica en Chile. *Medicina y Seguridad del Trabajo, 61*(238), 57-67. https://dx.doi.org/10.4321/S0465-546X2015000100006

[12] Gutiérrez Falcón, P. C. (2017). Uso de Grupos Focales como Complemento del Método CoPsoQ PSQCAT de Evaluación de Factores de Riesgos Psicosociales. *Ciencia & Trabajo, 19*(60), 166-170. http://dx.doi.org/10.4067/S0718-24492017000300166

[13] Juárez Acosta, F., & Cárdenas Riaño, S. (2006). Percepción de Salud en Guardas de Seguridad que Trabajan en Turnos Irregulares. *Terapia Psicológica, 24*(2), 131-138.

[14] Ministerio de Salud. (2005). *Manual de Salud Ocupacional.* http://www.digesa.minsa.gob.pe/publicaciones/descargas/manual_deso.PDF

[15] Moncada, S., Llorens, C., Andrés, R., Moreno, N., & Molinero, E. (2014). *Manual del método CoPsoQ-istas21 (versión 2) para la evaluación y la prevención de los riesgos psicosociales en empresas con 25 o más trabajadores y trabajadoras.* Instituto Sindical de Trabajo, Ambiente y Salud (ISTAS)-CCOO. https://copsoq.istas21.net/ficheros/documentos/v2/manual%20Copsoq%202(24-07-2014).pdf

[16] Moreno Jiménez, B. (2011). Factores y riesgos laborales psicosociales: conceptualización, historia y cambios actuales. *Medicina y Seguridad del Trabajo, 57*(1), 4-19. https://dx.doi.org/10.4321/S0465-546X2011000500002

[17] Moya Rubio, E. F. (2016). *Plan de prevención de riesgos psicosociales en el área administrativa de una empresa de servicios de desechos sólidos en Ambato.* (Research project). Pontificia Universidad Católica del Ecuador, Ambato.

[18] Navarrete Espinoza, E., Feliu Saavedra, N., & Bahamondes Valenzuela, G. (2017). Influencia de la Carga Organizacional y Trastornos del Sueño en la Accidentabilidad de Conductores de Camiones. *Ciencia & Trabajo, 19*(59), 67-75. http://dx.doi.org/10.4067/S0718-24492017000200067

[19] Instituto Nacional para la Seguridad y Salud Ocupacional. (1997). *El trabajo por turnos en lenguaje sencillo.* https://www.cdc.gov/spanish/niosh/docs/97-145_sp/default.html#:~:text=El%20trabajo%20por%20turnos%20supone,-de%207%20u%208%20horas

[20] Ortiz, K. (2019). Aplicación de la siesta en turnos nocturno de trabajo, su impacto cognitivo y en los signos vitales. *Revista Red de Investigación en Salud en el Trabajo, 2*(Memorias del 6to. Foro de Investigación de la Red de Posgrados en Salud en el Trabajo), 82-85.

[21] Unión General de Trabajadores. (2012). *Factores psicosociales - Organización del trabajo: Tiempo de trabajo.* http://portal.ugt.org/saludlaboral/observatorio/fichas/Fichas06%20Tiempo%20de%20trabajo.pdf

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