Musculoskeletal disorders in administrative personnel

Trastornos musculo esqueléticos en personal administrativo

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ABSTRACT

The main objective of this research is to determine the level of musculoskeletal disorders in the administrative personnel of District 01D03 Salud Santa Isabel. Methodologically it is a non-experimental, descriptive design, the population studied comprised 55 workers. The area of the body most affected was the neck/shoulders and/or dorsal back, which presents discomfort in people between 20 and 30 years of age (34.54%) and 31 to 40 years of age (23.64%), which indicates that the worker presents more discomfort than pain as such in that age range. Through the application of the ROSA Method, it can be said that the evaluation of the workstation yielded accurate results to indicate the necessary actions, that is to say, for an ergonomic design favorable to the worker. It is also determined that, due to a high risk level, the worker would be prone to suffer musculoskeletal disorders.

Descriptors: occupational medicine; occupational diseases; work environment. (Source: UNESCO Thesaurus).

RESUMEN

El objetivo principal de esta investigación es determinar el nivel de Trastornos musculo esqueléticos en el personal administrativo del Distrito 01D03 Salud Santa Isabel. Metodológicamente es de diseño no experimental, descriptivo, la población que se estudió abarca 55 trabajadores. La zona del cuerpo más afectada fue la del cuello/ hombros y/o espalda dorsal la cual presenta molestias en las personas de 20 a 30 años (34.54%) y 31 a 40 años (23.64%), lo que nos indican que el trabajador presenta más molestias que dolor como tal en ese rango de edades. Mediante la aplicación del Método ROSA, por lo cual se puede decir, que la evaluación del puesto de trabajo arrojó resultados veraces para poder indicar las acciones necesarias, es decir para un diseño ergonómico favorable para el trabajador. Así también, se determina que, debido a un nivel de riesgo alto, el trabajador estaría propenso a padecer trastornos musculoesqueléticos.

Descriptores: medicina del trabajo; enfermedad profesional; ambiente de trabajo. (Fuente: Tesauro UNESCO).

INTRODUCTION

Musculoskeletal disorders, nowadays represent 30% of occupational morbidity, this affects the quality of life of workers in both cargo and administrative positions, as well as representing an economic cost in terms of lost work days, disabilities, absenteeism, early retirements, expenses for diagnostic tests and treatments (Balderas-López, *et al.* 2019).

The ROSA Method (Rapid Office Strain Assessment) is a posture evaluation tool that aims to identify priority intervention areas in office work in order to reduce exposure to risk factors in employees; it is applicable in workplaces where the worker remains seated in a chair, in front of a table or desk and handling computer equipment with a data display screen (computer) (RIMAC, 2019) (Diego-Mas, 2015). It should be emphasized that this method was created from the Canadian CSA Guide Z412 based on the ISO 9241 Standard (Ergonomic requirement for office work with visual display terminals).

The current study is based on the application of the ergonomic risk factors and damage questionnaire to assess the type of musculoskeletal injury, as well as the "ROSA" method, which allowed the evaluation of the level of risk of suffering musculoskeletal injuries and the effort of the worker in his position, in the administrative personnel of District 01D03 of Health in the Santa Isabel Canton, where 55 office workers are employed.

The main objective of this research is to determine the level of musculoskeletal disorders in the administrative personnel of District 01D03 Health Santa Isabel.

METHOD

Methodologically, the research is a non-experimental, descriptive, cross-sectional and bibliographic design, with a field study; to determine, through the application of a questionnaire and the ergonomic evaluation method, the musculoskeletal disorders present according to the work position.

The population studied included 55 workers in the administrative area of District 01D03 Santa Isabel Health. As it is a finite population of less than 100 people, the sample was not calculated, so we will work with the total universe of the place planned for the study.

Inclusion and exclusion criteria were applied. As criteria of inclusion we had the workers in active state of the administrative area or office workers of the place of study; and as criteria of exclusion the workers in inactive state telework and the workers of the operative area of the District 01D03 Health - Santa Isabel.

The instruments applied were the Questionnaire of Ergonomic Risk Factors and Harm of the ERGO Group, Field Sheet of the ROSA Method validated by ISO 9142 and Informed Consent. The data collection was carried out in the District Office 01D03 Health and in the Administrative Offices of the Hospital belonging to that District, in Santa Isabel - Azuay, Ecuador; this, during the working day of the participants, in August 2021.

The information was collected online through Office Forms, which gave us a digital database in Microsoft Excel, and the data were analyzed with the SPSS v24 program. The databases were analyzed to verify the quality of the data and the numerical variables were recoded for descriptive analysis. The results are presented in tables of frequencies and percentages; in some cases, the data are presented with single and double bar graphs.

The Ergonomic Risk Factors and Injuries Questionnaire was applied to the entire study population already stipulated, which helps to evaluate the worker as such; and the initial observation of the problem, in which the workstation was evaluated by means of the ROSA Method; all this to the administrative personnel of the study site.

RESULTS

Fifty-five workers were studied, of whom 38.18% were aged between 20-30 years, according to sex, 60.09% were women, 65.45% had third level education, 43.64% were single and the most

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frequent occupation among the workers studied was that of doctor, which represented 40%.

In terms of job position, 69.09% work split shifts (morning and afternoon), 67.27% have a temporary or temporary contract, 25.45% belong to the health promotion department, 41.82% have worked between 1 and 5 years, and in terms of working hours, 96.36% work more than 4 hours.

According to the variables of health at work, it was found that 52.73% present discomfort in the neck/shoulders and/or dorsal back and 30.91% present pain in the same area, and 47.27% present discomfort in the lumbar back and 12.73% present pain in the same area.

According to the ergonomic variables, it was found that the most frequently adopted position is that of sitting for a period of more than 4 hours with 70.91%; with regard to the postures adopted in the workplace, it was found that the intensive use of the fingers for more than 4 hours was reported by 61.82% of the workers studied.

According to the variables of well-being at work, it was found that most of the physical demands are Moderate with 41.82%, and with respect to the posture that affects health and well-being at work, 74.54% of the workers were in the Seated position.

In consideration of the Ergonomic Method applied, it was determined that 43.64% of the workers studied have a High Risk of suffering musculoskeletal injuries due to their work position.

Table 1. Description according to the relationship between the area of the body currently affected with the participant's age and marital status.

Variable	Zona del cuerpo afectada actualmente (Cuello/Hombros y/o espalda dorsal)		Total	Chi² / Valor p
	Molestia	**Dolor**		
Edad				
20 a 30 años	19(34.54)	2(3.64)	21(38.18)	8.97
31 a 40 años	13(23.64)	8(14.54)	21(38.18)	0.03
41 a 50 años	4(7.27)	6(10.91)	10(18.18)	
Mayores de 50 años	2(3.64)	1(1.82)	3(5.45)	

Source: Own elaboration.

En la tabla 1, se presenta que la zona del cuerpo más afectada fue la del cuello/ hombros y/o espalda dorsal la cual presenta molestias en las personas de 20 a 30 años (34.54%) y 31 a 40 años (23.64%), lo que nos indican que el trabajador presenta más molestias que dolor como tal en ese rango de edades. Por lo que se determinó que la edad está relacionada con la zona del cuerpo afectada, en este caso se relaciona con molestiao dolor en cuello/ hombros y/o espalda dorsal.

Table 2. Description according to the relationship between job and risk level obtained by the ROSA method.

Variable	Método ROSA				Total	Chi / Valor P
	Mejorable	**Alto**	**Muy Alto**	**Extremo**		
Ventanilla Única	0(0)	2(3.64)	0(0)	0(0)	2(3.64)	37.83 0.03
Talento Humano	0(0)	0(0)	3(5.45)	0(0)	3(5.45)	
Administrativo Financiero	4(7.27)	2(3.64)	3(5.45)	0(0)	9(16.36)	
Promoción de los Servicios deSalud	2(3.64)	5(9.09)	6(10.91)	1(1.82)	14(25.45)	
Vigilancia de la Salud	3(5.45)	5(9.09)	1(1.82)	0(0)	9(16.36)	
Comunicación, Imagen yPrensa	0(0)	0(0)	1(1.82)	0(0)	1(1.82)	
Provisión y Calidad de losServicios de Salud	0(0)	9(16.36)	1(1.82)	3(5.45)	13(23.64)	
Planificación y Estadística	0(0)	0(0)	2(3.64)	1(1.82)	3(5.45)	
Dirección	0(0)	1(1.82)	0(0)	0(0)	1(1.82)	

Source: Own elaboration.

Table 2 shows that the workstation is related to the level of risk obtained through the application of the ROSA Method, so it can be said that the evaluation of the workstation yielded accurate results in order to indicate the necessary actions, i.e. for a favorable ergonomic design for the worker. It is also determined that, due to a high risk level, the worker would be prone to suffer musculoskeletal disorders.

DISCUSSION

It agrees with the current results, in that most of the workers when working more than 4 hours on a display screen which leads them to suffer musculoskeletal disorders, also applied the ROSA method for the assessment of the workplace and its environment, determining that due to their job the risk is higher (Real & Cedeño, 2020); Therefore, when working more than 4 hours a day in a seated position presenting discomfort or pain in the neck, shoulders or dorsal back; this would indicate that this is similar to the study mentioned above, since most of them would be presenting musculoskeletal disorders due to the evaluated job.

In contrast with the work of (Vallejo-Morán, *et al.* 2021), the application of the ROSA method, shows that for fifty percent of the population the level of risk obtained is very high, and that, working under these measures adopted, therefore, an immediate redesign of the workstation is necessary, since the current ones could show damage to the health of teachers. On the other hand; musculoskeletal discomfort occurred in approximately 66% of the women investigated and 62% of the men investigated during the previous year. The results of the ROSA and RULA methods were not convergent. The final result of the ROSA method (scale 1-10 pts) was 2-6 pts (M = 3.51±1.09), whereas the final result of the RULA method (scale 1-7 pts) ranged from 2-4 pts (3.00± 0.17). The values of partial and final scores in the ROSA method correlated with the number of concurrent complaints and the intensity of discomfort in various regions of the musculoskeletal system. The assessment of the position of certain body parts during work, performed using the RULA method, in people with and without MSC was almost identical (Jóźwiak, *et al.* 2019).

In this order, the high prevalence of musculoskeletal symptoms found and the associated factors indicate the need to propose specific actions and care for this population, such as immediate treatment of symptoms and changes in the organization and work climate, to achieve balance and harmony in the demands of prolonged Sitting Work and avoid the impact of this condition on public health (Lopes, *et al.* 2021). In complement, job rotation is an administrative solution to prevent work-related musculoskeletal disorders that has become widespread. However, the development of work rotation schedules is a complex problem. This is due to the multifactorial nature of the disorders and the productive and organizational constraints of actual work environments. To avoid these problems, this paper presents an evolutionary algorithm for generating rotation schedules in which a set of workers cyclically rotates through a small number of jobs while reducing the potential for injury (Diego-Mas, *et al.* 2020).

On the other hand; Job rotation is an organizational strategy based on the systematic exchange of workers between jobs in a planned manner according to specific criteria. This study presents the GS-Rot method, a method based on Game Theory, in order to design job rotation schemes considering not only the job preferences of the workers, but also the competencies required for the different jobs. With this approach we promote the active participation of workers in the design of the rotation plan. It also allows us to address restrictions in the assignment of workers to jobs according to their disability (temporary or permanent). The GS-Rot method was implemented online and applied to a case in a work environment characterized by the presence of high repetition of movements, which is an important risk factor associated with work-related musculoskeletal disorders (WMSD) (Asensio-Cuesta, *et al.* 2019).

Being considerable, managing educational actions in employees with the aim of making them aware of the musculoskeletal risks of wrong postures during work, consequently; ergonomic educational intervention based on the "stages of change" model has a positive impact on the reduction of WMSDs. Therefore, these disorders can be decreased by reducing working hours, changing working conditions according to ergonomic principles, dedicating some time to staff exercise and conducting educational courses for staff (Khalili, *et al.* 2018). This prevention should take into account that low back pain (low back pain) is the most common musculoskeletal disease in adults (Nottidge, *et al.* 2019).

It is important to note, that musculoskeletal disorders are not adequately treated in office workers due to their busy work life. In-house physical therapy is a good way to manage musculoskeletal disorders in office workers. Despite the many advantages of internal physiotherapy, the implementation and research of internal physiotherapy were insufficient, consequently, of these office workers, the most common causes of injury were non-traumatic (36.8%) and the most common injury sites were neck (30.3%) and low back (25.6%). In the empirical characteristics of the in-house physical therapy clinics, basic thermoelectric treatments were the most common (46.8%). Satisfaction with the in-house physical therapy clinic was generally high. In addition, the cause of injury and treatment content affected treatment-related satisfaction and return-related functional satisfaction (Shin, 2019).

It is necessary to take into account the position of (Lee, *et al.* 2018), who suggest that office design for public office workers should take into account gender differences when preventing musculoskeletal disorders and also sick building syndrome, which is consistent with the current

results where a high prevalence of risk due to the job position is indicated (Malińska, *et al*. 2019).

CONCLUSION

The area of the body most affected was the neck/shoulders and/or dorsal back, which presents discomfort in people between 20 and 30 years old (34.54%) and 31 to 40 years old (23.64%), which indicates that the worker presents more discomfort than pain as such in that age range. Through the application of the ROSA Method, it can be said that the evaluation of the workstation yielded accurate results to indicate the necessary actions, that is to say, for an ergonomic design favorable to the worker. It is also determined that, due to a high risk level, the worker would be prone to suffer musculoskeletal disorders.

FINANCING

CONFLICT OF INTEREST

There is no conflict of interest with persons or institutions related to the research.

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