



ORIGINAL

## Musculoskeletal disorders in workers of Aldean Supermarkets, Santo Domingo

### Trastornos músculo esqueléticos en trabajadores de Aldean Supermercados, Santo Domingo

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#### ABSTRACT

**Introduction:** according to the World Health Organization (WHO) report, it is estimated that approximately 1,710 million people in the world have musculoskeletal disorders, mainly low back pain with a prevalence rate of at least 568 million individuals.

**Objective:** to describe musculoskeletal disorders in workers at Aldean Supermarkets, Santo Domingo 2023.

**Method:** the type of study carried out in this research had a quantitative emphasis. The variables were handled: ergonomic risk factors, physical demands of the job, discomfort in the locomotor system, musculoskeletal disorders and prevention measures. Among the research techniques that were used is the questionnaire.

**Results:** regarding the female gender, it was possible to identify that 26 % corresponded to the ages between 18 and 25 years; Regarding the male gender, it was found that 18 % corresponds to the age group between 25 and 32 years. It was possible to show that 40 % commonly perform repetitive movements. It was observed that 80 % of the participants presented forced postures in the trunk; likewise, 76 % presented forced postures in the elbows and 74 in the arms. 100 % of the workers surveyed, the assigned areas do not use the necessary equipment to be able to carry out their work effectively.

**Conclusions:** in the study carried out there was a predominance of the female sex with respect to the male. A significant percentage of the workers surveyed reported performing repetitive movements, as well as presenting work stress. The highest percentage of the jobs presented forced postures in the trunk, as well as all the workers in the assigned areas do not use the necessary equipment to be able to carry out their work effectively.

**Keywords:** Working Conditions; Injury; Safety at Work; Workers.

#### RESUMEN

**Introducción:** de acuerdo con el informe de la Organización Mundial de la Salud (OMS), se estima que un aproximado de 1710 millones de personas en el mundo presentan trastornos músculo esqueléticos, principalmente el dolor lumbar con un índice de prevalencia de al menos 568 millones de individuos.

**Objetivo:** describir los trastornos músculo esqueléticos en trabajadores del Aldean Supermercados, Santo Domingo 2023.

**Método:** el tipo de estudio que se realizó en esta investigación tuvo énfasis cuantitativo. Se manejaron las variables: factores de riesgo ergonómico, demandas físicas del trabajo, molestias en el aparato locomotor, trastornos musculoesqueléticos y medidas de prevención. Entre las técnicas de investigación que fueron utilizadas se encuentra el cuestionario.

**Resultados:** con respecto al género femenino se pudo identificar que el 26 % correspondía a las edades entre 18 a 25 años; en cuanto al género masculino se pudo constatar que el 18 % corresponde al grupo de edad comprendido entre los 25 a 32 años. Se logró evidenciar que el 40 % comúnmente realizan movimientos

repetitivos. Se pudo observar que el 80 % de los participantes presentó posturas forzadas en el tronco; así mismo el 76 % presentó posturas forzadas en codos y el 74 en brazos. El 100 % de los trabajadores encuestados, las áreas asignadas no utilizan los equipos necesarios para poder realizar su trabajo con eficacia.

**Conclusiones:** en el estudio realizado existió un predominio del sexo femenino con respecto al masculino. Un porcentaje importante de los trabajadores encuestados refirió realizar movimientos repetitivos, así como presentaron estrés laboral. El mayor porcentaje de los trabajos presentó posturas forzadas en el tronco, así como la totalidad de los trabajadores de las áreas asignadas no utiliza los equipos necesarios para poder realizar su trabajo con eficacia.

**Palabras clave:** Condiciones de Trabajo; Lesión; Seguridad en el Trabajo; Trabajadores.

## INTRODUCTION

According to the World Health Organization (WHO) report,<sup>(1)</sup> it is estimated that approximately 1,71 billion people in the world have musculoskeletal disorders, mainly low back pain, with a prevalence rate of at least 568 million individuals. These figures are alarming regarding occupational health and safety because they affect workers' vitality and entail high economic costs. In industrialized countries, the prevalence in adults is between 60 and 70 %, such is the case of China, where the prevalence rates of low back pain among its population range from 26,4 to 84,6. In Costa Rica, the prevalence rate ranges from 60 to 85 % during the population's lifetime.<sup>(2)</sup>

This problem does not go unnoticed in Latin America, according to the study by Ramírez-Pozo and Montalvo Luna.<sup>(3)</sup> In Peru, a constancy of musculoskeletal disturbances in the production area of 52,9 % is considered. "In Mexico, the prevalence of low back pain is between 18 and 45 % of the population. On the other hand, in Ecuador, according to the Ecuadorian Institute of Social Security (IESS) records, 2014 about 14 000 cases of diseases linked to occupational safety were reported.<sup>(4)</sup> However, 3 % of this number of users gave notice of their condition, which becomes a factor that increases the rate of occupational accidents and puts the ergonomic health of workers at risk. In this context, the main complaints reported were pain at the base of the heel and thumb, back pain, cervical pain, and carpal tunnel syndrome.

Studies have yet to be carried out on these variables in the province of Santo Domingo. However, the exploration of Medina<sup>(5)</sup> showed that the prevalence of this type of affection in the province of Santo Domingo, together with its surrounding regions, is 2 %; however, in the observation of this problem around the company Aldean Supermarkets, it was possible to establish that no more extensive research has been carried out regarding the mentioned problem so that there is not enough theoretical evidence to serve as an indicator of prevalence since it was considered that this situation becomes a risk box for the development of musculoskeletal alterations.

In the case of Aldean Supermarkets, workers are exposed to this problem because poor posture increases the likelihood of musculoskeletal discomfort and leads to a deviated spine. That said, such posture also involves certain muscle groups and joints, which can lead to diseases of the system above. Given this, reinforcement of continuing education activities and appropriate intervention studies are needed to reduce the complications of these hazards. Being a company that supports Ecuadorian families, they need to know what actions the human talent area carries out to prevent MSDs; Cabrera & Hinojosa<sup>(6)</sup> mention that "it is essential to investigate possible risk factors that threaten the health and integrity of workers."

According to the Department of Occupational Health of Comisiones obreras de Asturias<sup>(7)</sup> it is known that "musculoskeletal disorders refer to those injuries produced at the level of muscles, nerves, joints, cartilage, and tendons". Thus, several specific work-related disorders have been identified in the literature, including low back pain, epicondylitis, carpal tunnel syndrome, thoracic outlet syndrome, meniscal tears, knee osteoarthritis, and plantar fasciitis.<sup>(8)</sup> That said, these disorders represent a health problem for today's society, not only because of their prevalence but also because of the costs associated with absenteeism from work.

For this reason, the authors of this research set the following objective: to describe the musculoskeletal disorders in workers of Aldean Supermarkets, Santo Domingo, 2023.

## METHOD

The type of study carried out in this research had a quantitative emphasis, so it focused on the analysis of information obtained through the bibliographic review together with a projection of quantifiable data, each one of them serving both as a contribution and support to the theoretical foundation, in order to know the correlation between musculoskeletal disorders with the impact on the health and well-being of the population. The present study had a basic purpose since it framed the theoretical foundations without considering the practical purposes. According to the research source, the study was a cross-sectional study, so the surveys were personally applied to the company Aldean Supermercados de Santo Domingo workers in a determined period.

In this study, we selected a population of 50 workers who work in the production area of the company Aldean Supermarkets, located in the canton of Santo Domingo; however, due to the limited participation of the personnel, we proceeded to carry out a non-probabilistic sampling by convenience.

The following variables were used: ergonomic risk factors, physical demands of the work, discomfort in the locomotor system, musculoskeletal disorders, and preventive measures.

Among the research techniques used was the questionnaire, which was used to obtain the results of this study and its respective conclusions attached to the situational analysis of musculoskeletal disorders in the company studied. In addition to this, the observation sheet was used to collect data on musculoskeletal disorders and their prevention within the company.

The instrument used was taken from Benavides Ibarra & Córdor Oña <sup>(9)</sup> in this questionnaire consisting of 15 questions, which was oriented to the workers of the Aldean Supermarkets company in Santo Domingo. It should be noted that the survey questions were closed in order to avoid biases at the time of obtaining the information.

Once the data were obtained, we analyzed the information for each question. All the information obtained was carried out in the Microsoft Excel program; the procedure was to group the equal data and add them together to identify how many answers were obtained for each question, and thus have the rubric of the percentages obtained for each answer to conclude the total number of respondents with musculoskeletal disorders in Aldean Supermarkets.

## RESULTS

Figure 1 refers to the socio-demographic data; concerning the female gender, it was identified that 26 % corresponded to ages between 18 and 25 years; concerning the male gender, it was found that 18 % corresponded to the age group between 25 and 32 years.

Edad		Femenino		Masculino	
		n	%	n	%
Entre 18 a 25		13	26	8	16
Entre 25 a 32		7	14	9	18
Entre 32 a 40		5	10	7	16
más de 40		0	0	1	2

Figure 1. Sociodemographic factors of workers

Figure 2 shows the results regarding risk factors, taking the most significant percentages of the response options of always and almost always; it became evident that 40 % commonly perform repetitive movements; as for the dynamic work, 34 % recorded that they apply it because they must mobilize continuously; Among the other factors, 24 % use force; in addition to this, 24 % continuously perform manual lifting of loads greater than 23 kg; 20 % suffer from work stress; 14 % have a high work pace and 16 % adopt painful or forced postures.

	Nunca		A veces		Regularmente		Casi siempre		Siempre		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
Levantamiento manual de cargas mayores a 23kg	24	48	13	26	1	2	5	10	7	14	50	100
Movimientos repetidos	0	0	19	38	11	22	8	16	12	24	50	100
Aplicación de fuerza	5	10	25	50	8	16	5	10	7	14	50	100
Adopta posturas dolorosas o forzadas	18	36	18	36	6	12	6	12	2	4	50	100
Ausencia de pausas laborales	6	12	28	56	12	24	3	6	1	2	50	100
Ritmo de trabajo elevado	4	8	19	38	17	34	7	14	3	6	50	100
Estrés laboral	9	18	24	48	7	14	5	10	5	10	50	100
Trabajo dinámico	1	2	15	30	17	34	11	22	6	12	50	100
Trabajo estático	33	66	13	26	2	4	1	2	1	2	50	100

Figure 2. Ergonomic risk factors

About the observation sheet in table 1, it could be observed that 80 % of the participants presented forced postures in the trunk; likewise, 76 % presented forced postures in the elbows and 74 % in the arms; 44 % of the workers had forced postures in the knees; 34 % presented forced postures in the hands and 32 % in the neck and head.

**Table 1. Forced postures of workers.**

		Yes		No		Total	
		%	N	%	N	%	N
Forced head postures	Tilted forward, backward, sideways or rotated	16	32	34	68	50	100
	Tilted forward, backward without support, to one side or rotated with respect to hips	40	80	10	20	50	100
Forced trunk postures	Arm raised forward, backward or sideways	37	74	13	26	50	100
	Elbow flexed or extended, palm of hand up or down	38	76	12	24	50	100
Forced postures of the upper extremity	Hand deviated with respect to the forearm: upward, downward or sideward	17	34	33	66	50	100
	Knees bent	22	44	28	56	50	100

100 % of the workers surveyed, the assigned areas do not use the necessary equipment to be able to perform their work effectively.

	Si		No		Total	
	n	%	n	%	n	%
Cintas transportadoras	0	0	50	100	50	100
Transpaletas manuales	0	0	50	100	50	100
Flejadoras	0	0	50	100	50	100
Retractiladora	0	0	50	100	50	100
Rodillo etiquetador	0	0	50	100	50	100
Gavetas	0	0	50	100	50	100

Figure 3. Equipment used in the observed position

**DISCUSSION**

When comparing the research conducted by Luzuriaga,<sup>(10)</sup> whose theme was “Ergonomic evaluation of supermarket workers, case applied to the Galván Ramírez trading company”, it is evident that the most important results of the study indicate that there is a medium (47 %) and high (32 %) level of ergonomic risk, The jobs with the highest exposure to forced postures are the warehouse and production assistants, presenting MSD symptoms with a higher prevalence in the male sex (54 %) with ailments in the dorsal (12 %), cervical (11 %) and shoulders (10 %), According to statistical observations, it can be established that there is a positive association between musculoskeletal disorders and forced postures, since the personnel must maintain uncomfortable and repetitive postures when lifting heavy objects, being in a static position or in motion for long periods of time, pushing and pulling loads, poor posture and work stress, resulting in possible disorders such as low back pain, scoliosis, cervical tension syndrome, lumbar disc herniation, epicondylitis, carpal tunnel syndrome, among others.

On the other hand, Sarmiento,<sup>(11)</sup> in his thesis entitled “Forced Postures and Their Relationship with Musculoskeletal Disorders of the Trunk, neck, legs, arms, forearms and Wrists in Administrative Workers of the Technological University of the Andes” with a sample of 108, where the sampling applied corresponded to simple random sampling, the data collection technique was the measurement with a digital goniometer of the forced postures that they choose daily for the development of their activities, the field sheet of the REBA method was used as a data collection instrument, the correlation measure applied was that of Pearson and with a significance level of 95 %. Likewise, according to the Pearson correlation calculated with a result of 0,60 for a significance level of 95 %, it is concluded that there is a relationship between forced postures and the risk of

suffering musculoskeletal disorders of the trunk, neck, legs, arms, forearms, and wrists.

Finally, this correlation is high. Thanks to this and previous research related to this topic, it was possible to determine that even when employees use the appropriate equipment, there is a possibility of injuries and fractures; therefore, future research could determine better alternatives or better management of personal protective equipment in areas assigned to personnel.

## CONCLUSIONS

In the study, the female sex was predominant concerning the male sex. A significant percentage of the workers surveyed reported repetitive movements and occupational stress. The highest percentage of the jobs presented forced postures in the trunk, and the totality of the workers in the assigned areas did not use the necessary equipment to carry out their work effectively.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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