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PREVALENCE OF MUSCULOSKELETAL DISORDERS AND ITS IMPACT ON HEALTH IN DOCTORS OF THE PICHINCHA SURGERY SOCIETY

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Abstract
The study developed focused on the problem of musculoskeletal disorders, which impact the health of surgeons who are members of the Pichincha Surgery Society. Musculoskeletal disorders constitute a series of alterations that affect each of the structures that make up the musculoskeletal system and specifically the musculoskeletal system. Therefore, the objective corresponds to; determine the prevalence of musculoskeletal disorders and their impact on health in surgeons of the Pichincha Surgery Society. The research was carried out using a quantitative, transversal approach, with a deductive and experimental methodology, taking into consideration a population of 250 and a sample of 50 surgeons from the Pichincha Surgery Society, to whom the Standardized Nordic Questionnaire was applied as an instrument. Among the main results obtained, they say that, during the last seven days, 24% have had pain, discomfort or discomfort at the neck level, while 28% had shoulder problems. On the other hand, 32% had elbow problems and 12% had wrist problems. In another context, 38% presented these problems in the lumbar area, 22% in the lumbar area, 20% in one or both hips and finally, 26% in one or both ankles. It is concluded that the prevalence of musculoskeletal disorders in the members of the Pichincha Surgery Society corresponds to 22%.

Keywords: Prevalence, musculoskeletal disorders, impact on health.

INTRODUCTION

The development of the article focuses on the establishment of musculoskeletal disorders in healthcare personnel. In this regard, it is taken as a starting point that these disorders, also called musculoskeletal, for the World Health Organization (WHO) constitute a wide variety of alterations or disorders that mainly affect the structures of the musculoskeletal system, that is; associated with movement, which can cause functional limitations and permanent disability in the individual (OMS, 2021)(Balderas et al., 2019).

According to WHO statistics, worldwide, a total of 1710 individuals have been diagnosed with some type of musculoskeletal disorders, among which, the most frequent is low back pain, with a frequency

of 568 million individuals. In addition, it is stated that this problem is the main cause of disability in more than 160 countries and leads to early retirement. (OMS, 2021)(Fundación ONCE, 2023)
Similarly, the statistic mentions that eight out of ten inhabitants in Latin America suffer a musculoskeletal injury at some point in their lives. However, these estimates tend to increase in the population due to improper posture, as well as other risk factors, such as sedentary lifestyle and obesity, directly affect the musculoskeletal system. (OMS, 2021)(Medline Plus, 2022)
In the Ecuadorian context, according to the Ministry of Public Health (MSP) through the National Health Policy in the area of Labor, Musculoskeletal disorders represent the highest percentage of occupational morbidity with 87%, leaving hearing and respiratory conditions in the background with only 1%, so ergonomic risks according to the perception of workers represent the greatest risk to trigger work-related diseases and occupational accidents.(MSP, 2019)

Cieza et al. He mentions that musculoskeletal injuries occur when the balance and relationships between different parts of the body are altered. Muscular and positional effort, non-compliance with ergonomic rules at work, rapid movements and poor postures, often performed in adverse environmental conditions, cause this imbalance, which leads to joint overload and reduction of joint space, causes other pain, loss of mobility, arthritis, osteoarthritis (2019)(Caiza et al., 2022).
On the other hand, for Puig et al. In order to develop measures for the prevention, monitoring and control of these risk factors, it is necessary to know the possible consequences. One way to intervene early is an integrated ergonomics program, ergonomics has the task of scientifically determining the design of the workplace and adapting the environment to people avoiding work anxiety, the sum of these external conditions and requirements, work system that interferes with homeostasis in humans. In this regard, excessive tension as an internal reaction to personal characteristics and temperaments has physical and psychological consequences, fatigue is a local or general non-pathological manifestation of work stress that is completely reversed with rest. (2020)(Villa, 2022)(MSD, 2022)
In professional practice, it has been observed that surgeons experience a great deal of upper body and back pain. Many of these doctors do not have time for physical therapy treatments, so prevention should be done by avoiding prolonged forced postures. Work in the operating room is very precise, static and requires prolonged postural effort, there is no longer the possibility of changing posture. Therefore, the musculoskeletal system and blood circulation are affected; The result is muscle fatigue, stress, and tension at work.
Previous studies denote the importance of the topic to be dealt with on ergonomic risks and musculoskeletal injuries of personnel working in the operating room, some of these investigations below:

In the context of the study, research conducted by Loor et al. The aim of this study was to determine the prevalence of different sustained postures and musculoskeletal symptoms in health workers at the State University of Ecuador, which was the first to be carried out from a descriptive and cross-sectional position in a sample of thirty people. From the results, it is evident that, in the entire population, work is done in a seated position, in addition to the musculoskeletal symptoms (SME) based on the anatomical position, the highest was in the neck (26.6%), followed by the upper back (23.33%), and in the wrist (23.3%), for the shoulder (13.3%) and elbow (13.3%). Musculoskeletal signs (SME) According to the age of the group, the greatest presence of symptoms is generated in workers aged 20 to 30 years (57.00%), with an age range of 31 to 40 years (27.00%).(2020)
For the study by Montoya et al. In order to determine musculoskeletal problems in the clinic staff, through a descriptive and observational study, where the Nordic questionnaire was applied, which resulted in a predominance of neck discomfort in 20 of the individuals, in addition to problems in the dorsal or lumbar area, Finally, 20 of the individuals presented difficulties in the wrist or hand, but not in the elbow or forearm.(2022)
In another context, the study of Cañarte with the general objective of determining the magnitude of musculoskeletal disorders in health personnel in a descriptive, observational and cross-sectional research in thirty people who work in the health area. Among the most important aspects, it was

evidenced that 46.67 percent are men and 53.33 percent are women; 43.75 percent of overweight people are female, while 60.00 percent of individuals with a BMI higher than normal are male. On the other hand, the most frequent discomforts in the administration workers participating in the study are pain in the neck (78.57% of men, 81.25% of women), dorsal region (71.43% male, 75% female) and elbow or forearm pain (57.14% of men, 62.60% of women). (57.14% male, 62.60% female).(2019)

Under Rodríguez's study, the main musculoskeletal problems in health personnel were identified, which was created through a bibliographic research, which determined that the main musculoskeletal alterations correspond to the area of the upper limbs and the neck, it was also established that the majority of those affected had not been educated regarding good ergonomic practices.(2020)
The research directly benefits specialists in the area of surgery, since the results will make it possible to publicize the reality or current situation of the profession, based on the study specifically of the professionals of the Pichincha Surgery Society, since they will serve as a basis for suggestions for modifications or reconstruction of the operating room area. Surgeons who work in the correct posture can also bring additional benefits to the patient, such as optimizing surgical outcomes.

Therefore, the main purpose of the research is related to determining the prevalence of musculoskeletal disorders and their impact on health in surgeons of the Pichincha Surgery Society, in addition to determining the presence of MSDs related to working time, establishing the frequency of MSDs with existing work activity, and finally, establishing MSDs are the most frequent in all variables. Taking as a study question what is the prevalence of musculoskeletal disorders and their impact on health in surgeons of the Pichincha Surgery Society?

METHODOLOGY

The analysis carried out in this study is quantitative, this is for Hernández and Mendoza (2018) a way to understand recurrence, patterns, averages, relationships between cause and effect, and thus be able to test the hypothesis through a statistical study. The analysis was carried out to determine the magnitude of musculoskeletal disorders and their impact on health in surgeons of the Pichincha Surgery Society.

This study is cross-sectional, since the data collected will be carried out in a single time cut-off. In addition, it is deductive, since a deduction was made from the general to the particular for the conduct of the different scenarios on which the problem is presented or developed.
The design of the analysis is non-experimental, because the study variable and its different characteristics will not be manipulated or changed, only the particularities and characteristics in relation to the contribution of the research will be studied. In the case of research, it will be considered as an independent variable of musculoskeletal alterations.

The population for the study is made up of 250 surgeons from whom a sample was selected through a convenience sampling, taking into consideration 50 surgeons of the Pichincha Surgery Society (25 male and 25 female), to whom the Standardized Nordic Questionnaire was applied as an instrument, which serves to analyze the presence of musculoskeletal symptoms. which has a report of Cronbach's Alpha between 0.855 and 0.860.(González, 2021)

Within the procedures for data collection, the established instrument will be applied, which consists of five questions associated with the characteristics of the society, the individual or the situation, for example; age, sex, weight, and height, in order to calculate BMI, activity, and seniority. In addition, the instrument has a second section that makes it possible to analyze the alterations in specific areas of the body, making it possible to find the musculoskeletal symptoms manifested in the last twelve months, manifesting symptoms such as pain, discomfort, numbness, among others.

RESULTS OF INSTRUMENT APPLICATION

Table 1. Classification of Sampling Data by Sociodemographic Characteristics

Sex	**Frequency**	**Percentage**
Male	25	50
Female	25	50
TOTAL	50	100
BMI	**Frequency**	**Percentage**
Normal weight	23	46
Overweight	17	34
Obesity I	6	12
Obesity II	4	8
TOTAL	50	100

Note. The table shows the frequency of surgeons according to sex and body mass index. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Society of Surgeons of Pichincha.

Table 1 shows that there is equality among the participants in the study in relation to sex, since 50% are males and the rest are females. On the other hand, in relation to body mass index, it can be identified that 46% have a BMI corresponding to normal weight, followed by 34% who are overweight. To a lesser extent, 20% of employees have type I and II obesity.

Table 2. Job Characteristics: Working Time

Seniority in the job	**Frequency**	**Percentage**
0-5 years	31	62
6-10 years	1	2
11-15 years	12	24
> 16 years old	6	12
TOTAL	50	100
Hours per week	**Frequency**	**Percentage**
< 40 hours	0	0
40 hours	36	72
> 40 hours	14	28
TOTAL	50	100

Note. The table shows the frequency of surgeons according to seniority in the job and according to the hours they work in the week. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Society of Surgeons of Pichincha.

Table 2 shows that 62% of employees have been in the position for 0-5 years, while 24% have been in the position for 11-15 years, 12% for more than 16 years and, to a lesser extent, 2% have been in the position for 6-10 years. Likewise, 72% say they work 40 hours a week, while the remaining 28% indicate that they work more than 40 hours a week.

Table 3. Pain, discomfort, discomfort present in the study group in the last 12 months

	Yes		**No**	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Neck	22	44	28	56
Shoulder	21	42	29	58
Elbow	17	34	33	66
Wrist	10	20	40	80
Upper Back (Dorsal Region)	22	44	28	56
Lower Back (Lumbar Region)	14	28	36	72
One or both hips/legs	12	24	38	76
One or both ankles/feet	19	38	31	62

Note. The table shows the discomfort presented during the last 12 months. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Society of Surgeons of Pichincha. Own elaboration

Table 3 shows that, during the last twelve months, 44% have had pain, discomfort or discomfort in the neck, while 42% had shoulder problems. On the other hand, 34% had elbow problems and 20% had wrist problems. In another context, 44% presented these problems at the level of the upper back, 28% in the lower back, 24% in one or both hips and finally, 38% in one or both ankles.

Table 4. Pain, discomfort, discomfort present in the study group in the last 7 days

	Yes		No	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Neck	12	24	38	76
Shoulder	14	28	36	72
Elbow	9	32	41	82
Wrist	6	12	44	88
Upper Back (Dorsal Region)	16	38	34	68
Lower Back (Lumbar Region)	11	22	39	78
One or both hips/legs	10	20	40	80
One or both ankles/feet	13	26	37	74

Note. The table shows the discomfort presented during the last week. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Pichincha Society of Surgeons. Own elaboration

Table 4 shows that, during the last seven days, 24% have had pain, discomfort or discomfort in the neck, while 28% have had shoulder problems. On the other hand, 32% had elbow problems and 12% had wrist problems. In another context, 38% had problems in the upper back, 22% in the lower back, 20% in one or both hips and finally, 26% in one or both ankles.

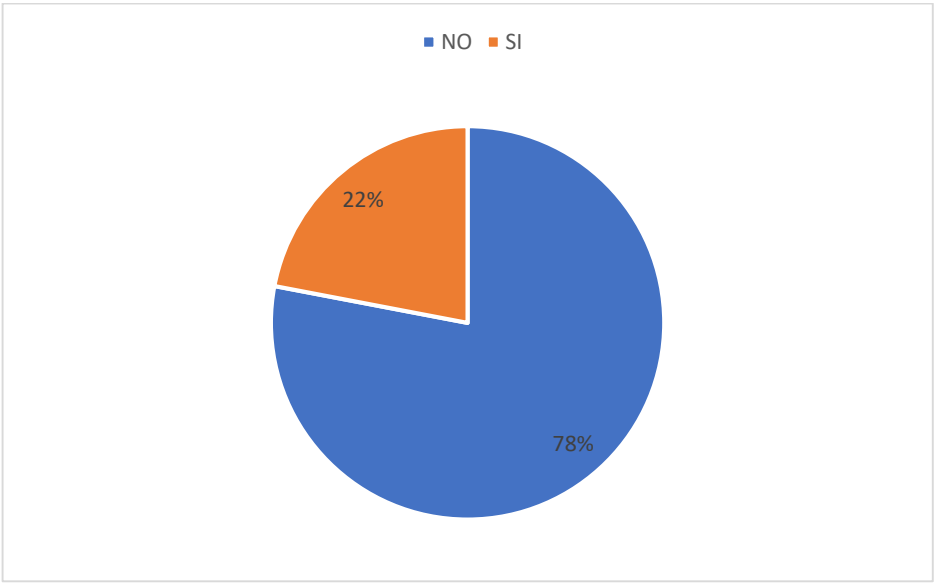

Figure 1. Prevalence of MSDs

Source: Authors.

To establish the prevalence of MSDs in the collaborators who make up the study, a total of 91 alterations in the different areas of the body were evidenced, out of a total of 400 possible MSDs, which showed a prevalence of 22%.

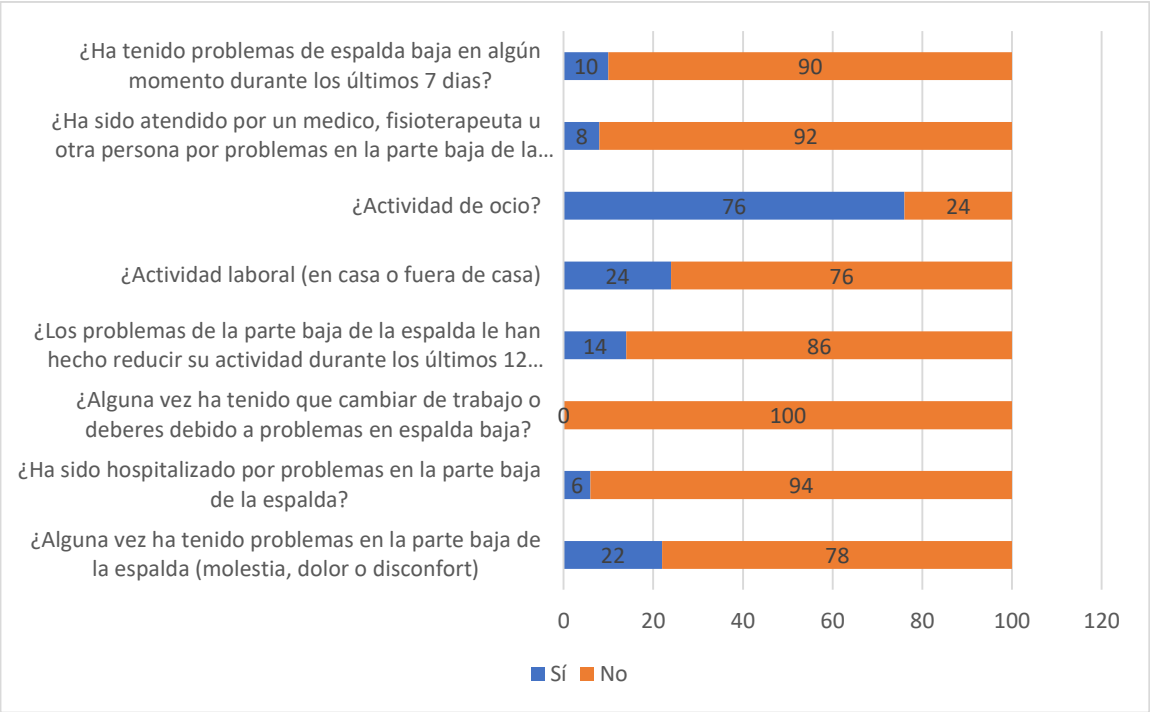

Figure 2. Spinal problems
Source: Authors' own creation

The figure shows that 22% have had lower back problems, while 6% have been hospitalized for this problem. However, 14% have had to reduce their activity due to this discomfort in the last year. In addition, 24% say they carry out work activities outside the home and 76% carry out leisure activities. Similarly, 8% have been seen by a physiotherapist due to this problem, while 10% had back problems during the last 10 days. However, it was observed that none of the collaborators had to change their work for MSDs at the level of the lower back.

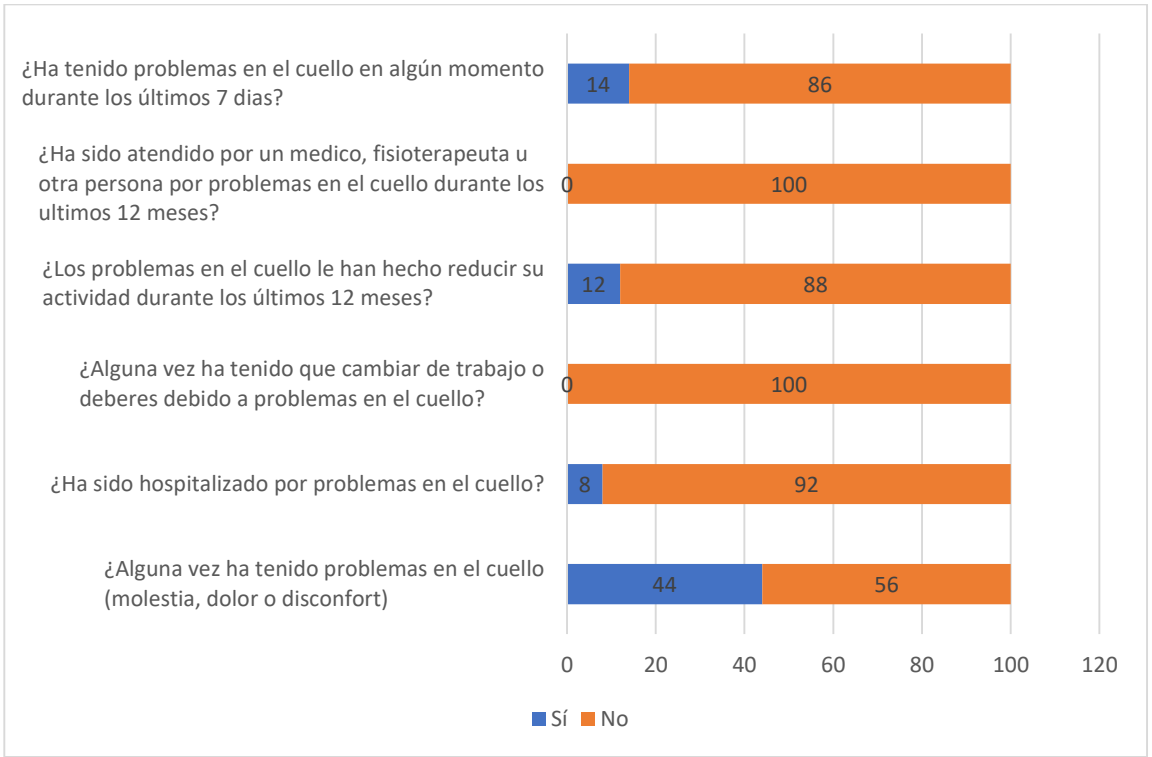

Figure 3. Neck problems
Source: Authors' own creation

The figure shows that 14% have had neck problems, while 8% have been hospitalized for this problem. However, 12% have had to reduce their activity due to this discomfort in the last year. While 14% had back problems during the last 7 days. However, it is observed that none of the collaborators had to change their work for MSDs at the neck level and none of them has been seen by a physiotherapist during the last 12 months.

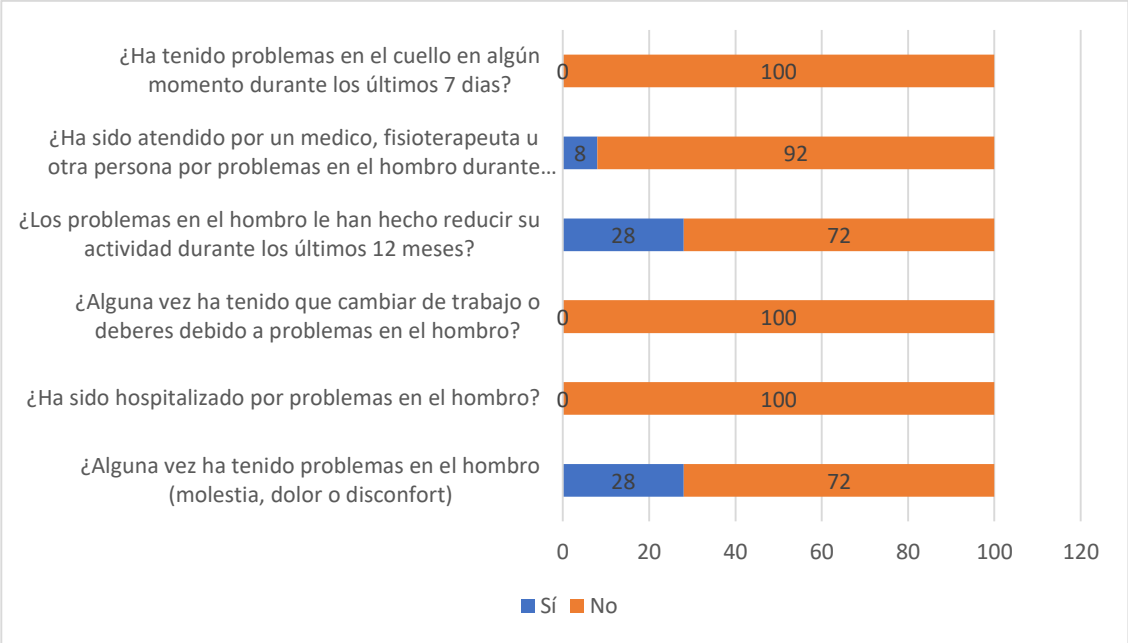

Figure 4. Shoulder problems
Source: Authors' own creation

The figure shows that 28% have had shoulder problems, while 12% have had to reduce their activity due to this discomfort in the last year and none have had problems in the last 7 days, and 8% have been treated by a physiotherapist during the last 12 months. On the other hand, 14% had back problems during the last 7 days. Finally, it is observed that none of the collaborators had to change their work for MSDs at the shoulder level.

Table 5. MSDs according to the seniority of the surgeons

	0-5 years		6-10 years		11-15 years		> 16 years old	
TME	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Neck	2	2,20	0	0,00	6	6,59	4	4,40
Shoulder	3	3,30	0	0,00	2	2,20	9	9,89
Elbow	1	1,10	0	0,00	3	3,30	5	5,49
Wrist	1	1,10	0	0,00	2	2,20	3	3,30
Upper Back (Dorsal Region)	4	4,40	2	2,20	4	4,40	6	6,59
Lower Back (Lumbar Region)	3	3,30	0	0,00	4	4,40	4	4,40
One or both hips/legs	2	2,20	0	0,00	3	3,30	5	5,49
One or both ankles/feet	2	2,20	0	0,00	5	5,49	6	6,59
TOTAL	18	19,78	2	2,20	29	31,87	42	46,15

Note. The table shows the MSDs associated with seniority in the job. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Pichincha Society of Surgeons. Own elaboration.

The table shows that there is a progressive and generalized development of MSDs according to the seniority of the collaborators, since a higher frequency of MSDs is observed in physicians between 11-15 years of age (31.87%) and older than 16 years in 46.15% of cases. However, a higher frequency

of neck-associated MSDs (6.59%) is observed in surgeons aged 11-15 years. In addition, a higher frequency of MSDs associated with the shoulder (9.89%), elbow (5.49%), wrist (3.30%), dorsal region (6.59%), lumbar region (4.40%), one or both hips or legs (5.49%) and at the level of the ankle or foot area (6.59%) in surgeons who have more than 16 years of seniority.

Table 6. MSDs according to the working day

	40 hours		> 40 hours	
TME	**f**	**%**	**f**	**%**
Neck	4	4,40	8	8,79
Shoulder	5	5,49	7	7,69
Elbow	4	4,40	5	5,49
Wrist	2	2,20	4	4,40
Upper Back (Dorsal Region)	6	6,59	8	8,79
Lower Back (Lumbar Region)	4	4,40	7	7,69
One or both hips/legs	5	5,49	5	5,49
One or both ankles/feet	5	5,49	8	8,79
TOTAL	35	38,46	52	57,14

Note. The table shows the MSDs according to the working day. Source: Data obtained from the application of the Nordic questionnaire to the convenience sample in the group of surgeons of the Pichincha Society of Surgeons. Own elaboration.

The table shows the presence of MSDs according to the working day, where it is evident that surgeons have two types of working hours, the first according to the labor law, that is; 40 hours per week, and the second associated with a higher number of hours per week. In addition, none of the employees reported working less than 40 hours per week. Similarly, it is observed that the percentage of MSDs is higher in those surgeons who work more than 40 hours (57.14%). In this regard, it can be observed that a higher frequency of MSDs at the level of the neck (8.79%), shoulder (7.69%), elbow (5.49%), wrist (4.40%), dorsal region (8.79%), lumbar region (7.69%), hip and leg region (5.49%) and ankle and foot region (8.79%).

DISCUSSION

In the study, it was evident that 50% correspond to the male sex and the rest is made up of female individuals, in addition, 46% have a BMI corresponding to normal weight, followed by 34% overweight. Similarly, Cañarte showed that 46.67 percent are men and 53.33 percent are women. Likewise, 43.75 percent of people who are overweight are women, while 60.00 percent of individuals who have a BMI higher than what is considered normal are men. (2019)

In relation to MSDs developed during the last 12 months, 44% have had pain, discomfort or discomfort at the neck level, while 42% had shoulder problems. On the other hand, 34% had elbow problems and 20% had wrist problems. In another context, 44% presented these problems at the level of the upper back, 28% in the lower back, 24% in one or both hips and finally, 38% in one or both ankles.

In relation to MSDs developed during the last seven days, 24% had pain, discomfort or discomfort in the neck, while 28% had shoulder problems. On the other hand, 32% had elbow problems and 12% had wrist problems. In another context, 38% presented these problems at the level of the upper back, 22% in the lower back, 20% in one or both hips and finally, 26% in one or both ankles. The same one that is related to the study by Loor et al. the most frequent MSD is the neck (26.6%), followed by the upper back (23.33%), and the wrist (23.3%), the shoulder (13.3%) and the elbow (13.3%). (2020)

Likewise, the study by Montoya et al. It established a predominance of neck discomfort in 20 of the individuals, in addition to problems in the dorsal or lumbar area, stating that, for the shoulder.

Similarly, Cañarte's study established that the most frequent discomforts are neck pain (78.57% of men, 81.25% of women). In addition, Rodríguez's study established that the main musculoskeletal alterations correspond to the area of the upper limbs and neck.(2022)(2019)(2020)

CONCLUSIONS

At the end of the study, it was evident that there is a prevalence of 22% of musculoskeletal alterations in surgeons of the Pichincha Surgery Society to whom the instrument for the identification of musculoskeletal disorders was applied.

Regarding the presence of MSDs in relation to the seniority of the surgeons, it is observed that there is a progressive and generalized development of MSDs, since there is a higher frequency of MSDs in surgeons between 11-15 years of age (31.87%) and older than 16 years in 46.15% of cases. However, a higher frequency of neck-associated MSDs is observed in surgeons aged 11-15 years. In addition, a higher frequency of MSDs associated with the shoulder, elbow, wrist, dorsal region, lumbar region, one or both hips or legs and at the level of the ankle or foot area in surgeons who have more than 16 years of seniority.

Regarding the presence of MSDs according to the working day, it was possible to show that surgeons have two types of working hours, the first according to the labor law, that is; 40 hours per week, and the second associated with a higher number of hours per week. In addition, none of the employees reported working less than 40 hours per week. Similarly, it is observed that the percentage of MSDs is higher in those surgeons who work more than 40 hours (57.14%) with the presence of alterations at the level of the neck, shoulder, elbow, wrist, dorsal region, lumbar region, hip and leg region and ankle and foot region.

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