

# Frequency of Musculoskeletal Pain among Surgeons in Karachi

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## Abstract

To determine the dynamic physical strain exerted on an individual during work, an evaluation of all physical performances is necessary. For surgeons, sustaining healthy ergonomics is essential, particularly for cases requiring long standing hours. Indeed, the absence of proper ergonomics may lead to multiple musculoskeletal issues. Failure to check these problems may lead to future degenerative changes and eventually career-ending damages. Pain among surgeons is expected since they spend many hours caring for patients that they ignore their health, standing for prolonged hours. Lack of attention to work ergonomics often leads to work-related muscle pain and increased risk of problems.

## Keywords

Musculoskeletal Pain, Ergonomics, Orthopedic Surgeons, Karachi

## 1. Introduction

Musculoskeletal disorders affecting surgeons are complaints, signs, and pain that reveal several conditions such as back, neck, shoulder pain, atypical facial pain, pain in limbs, among others [1]. Musculoskeletal disorders are caused by ergonomic, physical, and psychosocial factors [2]. Medical professionals face much strain in their work, leading to physical strain, which causes musculoskeletal pain. Research has shown that musculoskeletal problems are the second most common problems surgeons have to deal with during work, after mental strain. Much research on medical care ergonomics exists, but these studies often focus on physicians and nurses. However, there has been a growing focus on surgeons in recent years. These studies reveal that the prevalence of pain among surgeons is between 20% - 80%. These professionals reported neck, lower back, shoulder,

and hand pain. Survey shows that good ergonomic practices reduce MSD cases.

Studies show that the doctor's posture during operations is a determinant factor in pain reduction. Experts agree that surgeons should be in a neutral posture when performing their duties, with their muscles in a relaxed position [1]. This position ensures less pressure is exerted on the muscles during operations, thus less pain and complications after the surgery. Despite the advance in medical technology, most operating rooms are not ergonomic; thus the operating and monitor tables heights can limit the movement and flexibility for the surgeons [3]. At the same time, some procedures require a surgeon to stand for hours. To determine the dynamic physical strain exerted on an individual during work, an evaluation of all physical performances is necessary. For surgeons, sustaining healthy ergonomics is essential, particularly in cases that require prolonged standing hours. Indeed, the absence of proper ergonomics may lead to multiple musculoskeletal issues. Failure to check these problems may lead to future degenerative changes and eventually career-ending damages. Pain among surgeons is expected since they spend many hours caring for patients that they ignore their health, standing for prolonged hours. Lack of attention to work ergonomics often leads to work-related muscle pain and increased risk of problems.

Among surgeons, the most prevalent pain reported in the UK was neck and back pain at about 90%. Many surgeons reported having pain during operations. Similarly, in the USA to Shuaha Kim that 436 out of 503 gynecology surgeons reported back pain. Research on cases of musculoskeletal issues takes both a broad and narrow approach, most focusing on a cross-sectional survey in their studies.

## 2. Methods

### Population of Study

The study surveyed resident surgeons that matched the research criteria. A cross-sectional survey of surgeons in five fields was conducted in different hospitals across Karachi. We made a list of all surgeons across five hospitals through random sampling. The questionnaire was distributed to the orthopedic, ENT, and gynecological surgeons, and after filling it, they returned it. Surgeons were to fill out the questionnaire and return it the same day of their shift. Those who could not return it were asked to leave it by the reception so we could pick them up the next day. The questionnaire contained three parts: demographic information, working hours and pathology, area of pain, positions that aggravate it, and knowledge of ergonomics.

The survey included 246 participants between 24 and 50 years of age. The participants were male and female and included surgeons specializing in orthopedics, ENT, general surgery, gynecology, and ophthalmology. We then used a non-probability purposive sampling with our analysis. Thereafter we calculated through the OpenEpi v. 3.0 with a hypothesized frequency of 80% (regular pain during surgery). The sample had limits of confidence of 5%, data effects of 1%,

as well as a level of confidence at 95%.

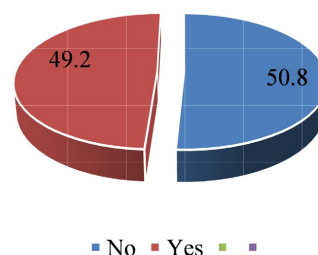
### 3. Statistical Analysis

We stored the data then evaluated using SPSS 23.0, a package for statistical analysis. count and percentage were reported for qualitative variables at baseline, frequency of musculoskeletal pain and its pain factors, bar chart used to locate the location of clinical symptoms, mean duration of working hours per day, operation hours per week and body mass index were compared using a chart in musculoskeletal pain and without pain (**Figure 1**).

### 4. Results

Among the 246 samples studied, 61.8% belonged to less than or equal to 30. 43.9% were male, 93.5% were MBBS/FCPS qualification, 49.6% were married, and 20.3% samples were taken from each specialty like orthopedics, general surgery, and gynecology, ENT, respectively. Meanwhile, 18.9 percent of samples were taken from ophthalmology. 12.2% of the samples reported hypertension as one of the co-morbidities. Among the samples, 22.4 percent smoked, and 11.8% had a history of trauma or surgery within the past year. The samples also revealed that 84.6% of them had standing operations. Only 14.6% of the sample used protective eyewear, and 80.1% used the right hand as the dominant hand (**Table 1**). The sample also showed that most commonly, orthopedics had occupation-related musculoskeletal pain at 30.6%. Meanwhile, ENT was 21.5%, while gynecology was 18.2% of pain prevalence. General surgery was at 15.7%, while ophthalmology pain was 14%.

Currently, the incidences of musculoskeletal pain were 50.8%. Incidentally, results also indicated that 85.1% of the surgeons with musculoskeletal pain had had a standing position during surgery, which aggravates this pain (**Table 2**). 12.4% cited having time off work due to musculoskeletal pain, and 7.4% had had to stop operating due to the pain. 42.1% claimed it took 2 - 3 hours before the onset of pain, while 30.6% said they had to take breaks during working hours. 12.4 percent reported experiencing a frequent combination of shoulder, lower back, and neck pain; 14% reported neck, shoulder, lower back, and upper back; more combinations were reported in upper back (**Table 2**). Among the sample, 71.9% reported using oral medication. Only 18.2% reported performing



**Figure 1.** Prevalence of Musculoskeletal Pain.

**Table 1.** Baseline Characteristics of Studied Sample.

Characteristics (n = 264)		N	%
AGE GROUP	30 YEARS	152	61.8
	30 YEARS	94	38.2
GENDER	MALE	108	43.3
	FEMALE	138	56.1
QUALIFICATION	MBBS/FCPS	230	93.5
	MBBS/FCPS/SUB-SPECIALITY	12	4.9
	MBBS/FCPS/PHD	4	1.6
MARITAL STATUS	MARRIED	122	49.6
	SINGLE	124	50.4
SPECIALITY	ORTHOPEDICS	50	20.3
	GENERAL SURGERY	50	20.3
	GYNAECOLOGY	50	20.3
	ENT	50	20.3
	OPHTHALMOLOGY	46	18.7
CORMOBIDITY	DIABETES	2	0.8
	HTN	30	12.2
	OTHERS	13	5.3
	NIL	201	81.7
DO YOU SMOKE	YES	55	22.4
	NO	191	77.6

**Table 2.** Baseline Characteristics of Studied Sample (Continued).

Characteristics		n	%
DID YOU HAVE ANY TRAUMA OR SURGERY IN THE PAST ONE YEAR?	YES	29	11.5
	NO	217	88.2
WHAT IS YOUR MOST COMMON OPERATING POSITION?	STANDING	208	84.6
	SITTING	31	12.6
	BOTH	7	2.8
DO YOU USE ANY SPECIALIZED EYEWEAR?	YES	36	14.6
	NO	210	85.4
WHICH IS YOUR DOMINANT HAND?	RIGHT	197	80.1
	LEFT	49	19.9
DO YOU HAVE ANY SYSTEMATIC PATHOLOGY FOR WHICH YOU TAKE MEDICINE FOR LAST 12 MONTHS?	YES	28	11.4
	NO	218	88.6

physical exercises, and 38.8 were aware of workplace ergonomics (**Table 3**). Average body mass index, daily working hours, and weekly working hours were found to be the same among both the sample with and without pain.

This study reveals that surgeons face pain around their neck, shoulder, and the lower back. Similarly, residents experience pain in their neck, shoulder, and upper back [3]. Due to their fewer prolonged operation hours, gynecologists were less affected by musculoskeletal pain. Comparatively, shorter working

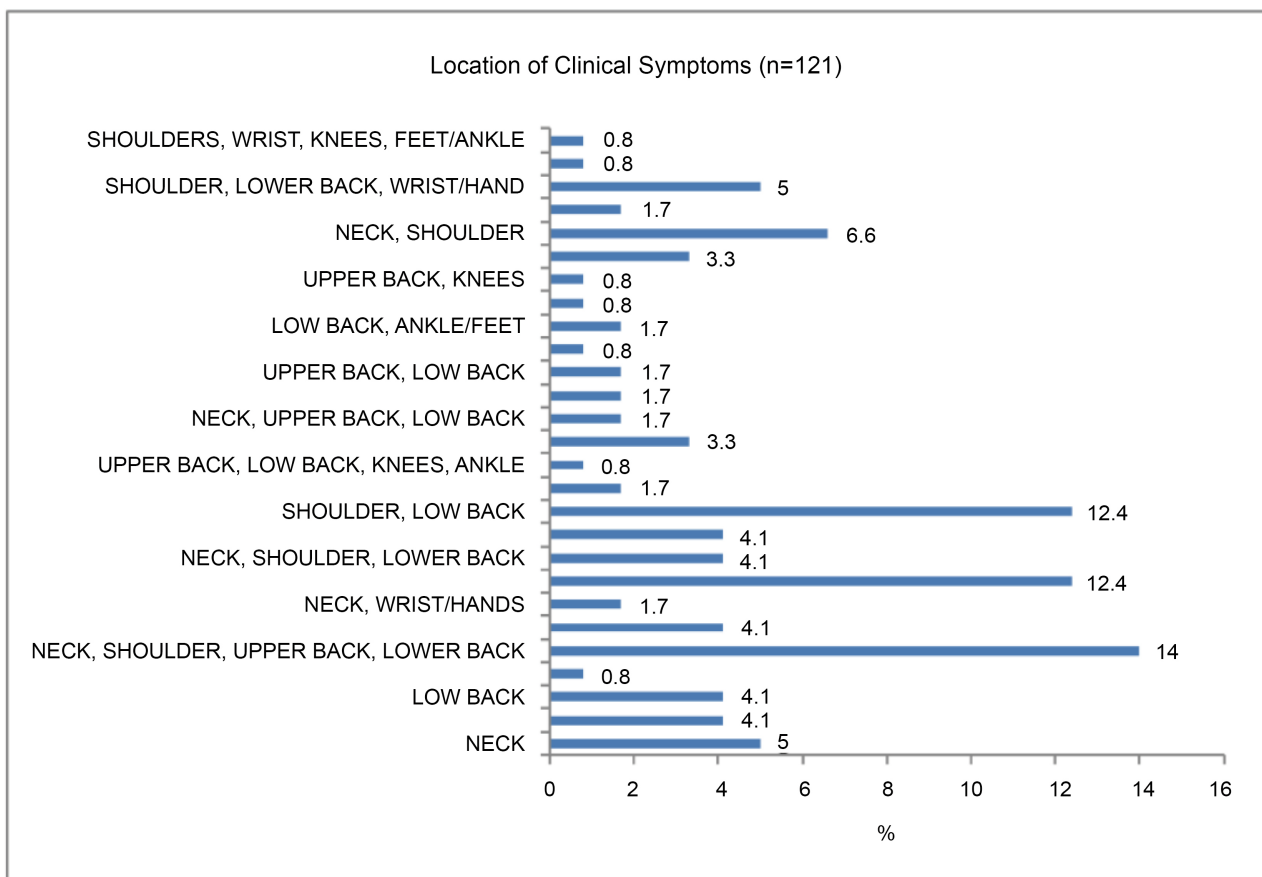
**Table 3.** Reported factors of musculoskeletal pain.

Have musculoskeletal Pain (n = 121)		n	%
THE POSITION THAT AGGRAVATES YOUR MUSCULOSKELETAL PAIN	STANDING	103	85.1
	SITTING	8	6.6
	OTHERS	5	4.1
	STANDING AND SITTING	5	4.1
HAVE YOU EVER LOST TIME FROM WORK DUE TO WORK RELATED PAIN?	YES	15	12.4
	NO	106	87.6
HAVE YOU EVER HAD TO STOP OPERATING DUE TO YOUR WORK-RELATED PAIN?	YES	9	7.4
	NO	112	92.6
SPECIFY THE PAIN ONCE DURING WORKING HOURS	IMMEDIATELY	4	3.3
	30 MIN - 1HR	12	9.9
	1 - 2 HOURS	42	37.4
	2 - 3 HOURS	51	42.1
	ANY OTHER	12	9.9
DO YOU TAKE BREAKS DURING WORKING HOURS?	YES	37	30.6
	NO	84	69.4
DID YOU RECEIVE ANY TREATMENT RELATED TO YOUR SYMPTOMS?	ORAL MEDICINE	87	71.9
	INJECTION	1	8
	PHYSIOTHERAPY	1	8
	SURGERY	0	0
	COMBINATION	6	5
	NONE	23	19.0
	ORAL MEDICINE, PHYSIOTHERAPY	2	1.7
ORAL MEDICINE, INJECTION	1	0.8	
DO YOU PERFORM EXERCISES?	YES	22	18.2
	NO	99	81.8
ARE YOU AWARE OF WORK ERGONOMICS?	NO	74	61.2
	YES	47	38.8

hours lead to fewer pain cases, as evidenced by ophthalmologists' and general surgeons' reports. Meanwhile, the result indicated that a staggering 81% of the surgeons do not engage in any form of exercise (Figure 2). In addition, this study shows that 64% of surgeons are unaware of workplace ergonomics which could be among the causative factor for musculoskeletal disorders; also, indicative that the mental demand of the job might be greater than the body can handle.

## 5. Discussion

This research aimed to evaluate the frequency of labor-related musculoskeletal pain with residents and surgeons in Karachi. The survey results showed that at 30%, orthopedic surgeons represented the highest frequency, followed by ENT surgeons at 21%, while general and ophthalmic surgeons had the minor frequency at 15% and 14%, respectively. These findings confirm that most orthopedic surgeons are more at risk of musculoskeletal pain than general surgeons [4]. Other studies indicated that at-risk surgeons are more susceptible to musculoskeletal disorders than surgeons in other specialties [5]. There is also a correlation between the surgeon's age and the prevalence of MSK pain [6]. The prevalence of such disorders among younger orthopedic surgeons is because



**Figure 2.** For reported location of clinical symptoms.

residents often work more hours. This also indicates that younger surgeons might not be keen in maintaining ergonomic environments hence the high pain rates. Since these doctors are young and vibrant, they often exert themselves more than the older surgeons.

Orthopedics and ENT surgeons have attributed their pain to loner working hours since Pakistan, a developing country, experiences more RTA (road traffic accidents) than developed countries. High emergency cases make the surgeons spend long hours on their feet at operating tables, which translates to neck and lower back pain. In addition, the surgeons' use of tools and constant movement causes severe upper back and neck pain and exerts mechanical strain on the body. Orthopedic surgeons constantly face lower back, upper limb, and neck pain [3] [7]. Conducting this research in Saudi Arabia, they concluded that the awkward postures and movements surgeons assume during orthopedic operations contribute to MSK pain. The researchers examined previously overlooked areas of MSK research that other factors such as height, weight, age, and working hours are all related to the pain surgeons feel [8]. Indeed, other surveys done elsewhere argue that MSK among surgeons is comparable to that of high-risk laborers [9]. From all these studies, work-related disorders and musculoskeletal pain in surgeons can be avoided if correct guidelines are implemented. One aspect that was common among all the practices was poor workplace ergonomics [8].

Compared to normal populations, orthopedic spine surgeons are more prone to musculoskeletal pain. Frequently self-reported complaints among spinal surgeons are cervical spasms and discomfort among 31%; disc herniation was 28%, while limb edema [10] was 20% reported. Of the reports, rotator muscle pain accounted for 24% of the surveys, while elbow or forearm pain was 18%. These findings clearly show that pain is caused by work-related movement among surgeons. Despite this evidence, most surgeons who report pain and strain rarely seek medical attention [11]. This further highlights that MSK affects more surgeons than is reported.

## 6. Strength of the Current Study

This study has several points to do a cross-sectional survey across several institutions, increasing the beneficial sample survey. The survey also received a 100% response rate.

## 7. Limitations

One of the limitations of our study was that our sample size was small (246), and it was taken from selected hospitals. Thus, the sample might not be representative of the entirety of Karachi. In addition, there is a disparity in the environment, instrumental tools, working hours, and resources between government and private hospital setups. Thirdly, the survey relied on self-reporting by participants, and subject documentation cannot be the only diagnostic criteria for

musculoskeletal pathology. Fourth, one cannot diagnose pain frequency based on the subjective assessment as many may have or may not have exaggerated their symptoms. Fifth, due to the hectic schedule of surgeons, some may not have had sufficient time to fill out the survey effectively. As no other study has been conducted in Karachi, comparing and accurately knowing the results is challenging.

Our study was a primary survey of musculoskeletal pain among the five categories of specialty surgeons, as the disorders harm the medical field. For instance, musculoskeletal pain can lead to early retirement, so there is a need for more awareness of the impediment to prevent the severity of the condition, which improves the quality of life and work of surgeons. Such an improvement in surgical ergonomics, in turn, benefits both doctors and patients.

## 8. Conclusion

There are numerous studies conducted on musculoskeletal disorders and pain in the field of medicine. Most of these surveys, however, focus on nursing staff and general doctors. Few in-depth studies focused on surgical musculoskeletal pain, especially around Karachi. Based on studies around the world, especially in the UK and US, this survey has surveyed surgical staff in government and private hospitals in Karachi. The study aimed to investigate risk factors of musculoskeletal pain and awareness of these risks to doctors' health. The findings indicate a high prevalence of pain among orthopedic surgeons and a lack of ergonomic information. This study suggests that the presence of information to the surgeons on ergonomics, exercise, and risk factors can be a step in alleviating musculoskeletal disorders. For instance, equipment in hospitals should make it easier for surgeons to work without straining, to avoid MSK disorders. Finally, working environments should be flexible and in the best interest of surgical staff.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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