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# Work-related musculoskeletal disorder among surgeons in Gujarat

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## Abstract:

**INTRODUCTION:** Work-related musculoskeletal symptoms are a major health issue in many occupations all over the world. Past researches on hospital workers have mainly been focused on nurses, and not many studies have examined musculoskeletal symptoms among doctors in various specialties. The work of surgeons can involve high levels of mental concentration and very precise movements that can be categorized as mild-to-moderate physical demands.

**OBJECTIVE:** To identify the prevalence of musculoskeletal problems and their related physical and psychosocial factors of surgeons who are involved in such work.

**METHODOLOGY:** Forty-three surgeons were enrolled in this study. To evaluate the musculoskeletal disorders, the participants were assessed through Standardized Nordic Questionnaire, Quick Exposure Check for the work pattern, and Work style Short Form for screening purpose.

**RESULTS:** Out of 43 participants, 30 were male and 13 were female. Their mean age was  $42.07 \pm 12.35$  years, and the mean working years  $\pm$  standard deviation of the group was  $15.14 \text{ years} \pm 9.017$ . On an average, they worked a total of about  $8.58 \text{ h} \pm 1.96$  per day. The prevalence of work-related musculoskeletal symptoms was found in 36 participants (83.70%), while only seven surgeons (16.30%) were symptom free.

**CONCLUSION:** The present study indicates a high prevalence of musculoskeletal symptoms in surgeons. The results also indicated that surgeons had a high sense of commitment and self-imposed pressure.

## Keywords:

Disability, musculoskeletal disorders, physical health, repetitive stress injury, surgeons

## Introduction

Symptoms with disorders are a major health issue in many occupations all over the world.<sup>[1]</sup> Extensive research has been conducted on these musculoskeletal problems in different occupational groups such as office workers, bus drivers, cleaners, and sewing machine operators.<sup>[2-5]</sup> Among the health-care professions, extensive research has been done on nurses, nurse assistants, and patient care workers, with a focus on lifting and back pain.<sup>[6,7]</sup>

Past researches on hospital workers have been mainly focused on nurses,<sup>[8]</sup> and there

were studies examining musculoskeletal symptoms among doctors in various specialties. The work of surgeons has involved high levels of mental concentration and very precise movements that can be categorized as mild-to-moderate physical demands.<sup>[9]</sup>

They have to be extremely skillful with their hands as well as make important decisions quickly at critical moments during surgery. Other elements of their jobs include ward rounds, surgical meetings, patient consultations, and report-writing. It would be expected that surgeons are constantly exposed to both physical and psychosocial workplace demands, as they have to manage not only the physical work of performing

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surgery but also to communicate with both the patients and their families.

There is a general consensus among researchers that work-related musculoskeletal symptoms and disorders usually involve a multifactorial etiology, and psychosocial factors have a very major role in affecting these symptoms.<sup>[2,10,11]</sup> In an effort to integrate some of the psychosocial factors and concomitant physical factors, Feuerstein *et al.* proposed that the response of the worker in terms of “behavioral, cognitive, and physiological elements is triggered by the perceived or actual elevation in job demands to respond to the increases in work demands.”<sup>[12,13]</sup> They proposed that not all workers react similarly to increases in perceived or real work demands and therefore the extent of the reaction has the potential to exacerbate and maintain symptoms, particularly in those who have a heightened reaction. This reaction which is dependent of a given work situation is referred to as the individual’s “work style.”<sup>[14,15]</sup> It was created to provide a measure that incorporates both physical and psychosocial dimensions of exposure in workers who perform intensive upper-limb work, such as office workers.<sup>[16-18]</sup> The questions the measure asks can be particularly relevant for professionals such as surgeons who may impose stress on themselves due to a high sense of responsibility and not providing small breaks to allow muscles to recover.

The present study aims to examine the prevalence of work-related musculoskeletal symptoms among surgeons in Anand, Gujarat, India, and identify the prevalence of their musculoskeletal problems in relation to physical and psychosocial factors that may be involved in such work. The results can provide information about the magnitude of the problem, and the findings can be used to develop interventional strategies for surgeons.

## Methodology

This was a cross-sectional pilot study including 43 surgeons from in and around Anand city, Gujarat. Surgeons who were having prior spine or any other joint surgeries; inflammatory diseases; arthropathy except degenerative arthritis; malignancy; and a history of HIV, trauma, or fall in the past 6 months were excluded. Surgeons who were having gynecological conditions such as postpregnancy and who have undergone spinal anesthesia and any other medical or surgical conditions contributing to pain were also excluded from the study.

The study examined the self-report of musculoskeletal symptoms among surgeons from various specialties in Anand city. The surgeons were explained in detail about the project. Informed consent was taken from each surgeon, and the surgeons were requested to

assist in the process of carrying out the project. Prior to commencing the study, ethical approval was sought for the study from the concerned committee. Each surgeon, participating in the project, was assessed maintaining full confidentiality. To collect the data, each surgeon was interviewed using the standardized Nordic Questionnaire which is a reliable tool to assess the musculoskeletal disorders; along with this, the researcher also collected information on psychological impact on musculoskeletal symptoms with Work Style short-form questionnaire. Ergonomic risk factors were also evaluated using Quick Exposure Checklist which asks the participants to consider whether the factors of posture, repetition, force, and environmental factors would contribute to their musculoskeletal problems.

Surgeon’s behavior was also evaluated with the help of Work style Short Form;<sup>[13]</sup> ten questions were adopted in the present questionnaire and these questions are considered most relevant to reflect the influence of the behavioral factors involved in the reaction of the surgeons. For each question, the answers are in five categories, namely almost never (0); rarely (1); sometimes (2); frequently (3); and almost always (4).

## Results

A total of 43 surgeons comprising 30 males and 13 females completed the survey successfully. Their mean age was 42.07 years, and the mean working years of the group was 15.14 years. [Table 1a] On an average, they have a duty of work of about 8 h per day, and the main duties included operating and attending ward rounds and outpatient clinics. In terms of their own estimated working hours and types of duties performed, there appeared to be no difference between the genders. The present study reveals that among all the participants, 83.70% of surgeons were having musculoskeletal symptoms, whereas 16.30% of surgeons had no symptoms at all [Table 1b].

Over 83.7% of the respondents reported experiencing at least one area of musculoskeletal symptoms in the past 12 months. The back region had the highest prevalence rate of 52.5% ( $n = 43$ ), followed by the neck with 30.2%, shoulder 23.3%, knees and ankle 6.98%, elbow 2.32%, wrist 2.32%, and hip 2.32% [Table 2].

As a part of the derived objectives’ psychosocial factors, questions were adopted from the Work Style short form. These included questions that asked whether the respondent would work through pain, their social reactivity, and sense of responsibility and/or pressure and whether they would take breaks even when they are in pain. The results showed that 41.86% of surgeons responded that their schedule at work is very

uncontrollable, 34.87% reported that “they don’t have time to take a break because of everything that must get done,” 34.88% responded that they were physically exhausted by the end of the day, and 25% reported that “I put a lot of pressure on myself” [Tables 3-6].

### Discussion

The present study has examined work-related musculoskeletal problems in surgeons working in Anand. With increasing age and cumulative exposure to job stress, it would be expected that older surgeons may have a higher risk of developing musculoskeletal problems. Moreover, it has been reported in other studies that younger workers had higher prevalence rates of musculoskeletal problems due to their lack of experience, resulting in poorer job skills and insufficient practice.<sup>[19-21]</sup>

The frequency and duration of different surgical procedures performed may vary greatly from time to time and between different hospitals, and therefore it may not be easy to establish a direct relationship of these workload factors to the musculoskeletal problems. The prevalence of work-related musculoskeletal symptoms in our study is significantly high along with the exposure levels of ergonomic risk factors. Studies done by Hagberg<sup>[22]</sup> and Hildebrandt<sup>[23]</sup> had shown the relationship between musculoskeletal symptoms and physical workload. It can be noted here that musculoskeletal symptoms in head, neck, shoulder, and back are associated with occupations that are not necessarily heavy manual ones. The most likely reason for these symptoms in workers with physically light work can be attributed to the posture adopted during work. Static tension of neck and shoulder muscles has been addressed as causing tension neck syndrome which is a constant feeling of stiffness in the neck along with headache or neck pain.<sup>[24,25]</sup> An established relationship has already been shown between nonneutral postures and back pain in several studies. Surgical procedures involve greater biomechanical stresses on the lumbar spine, contributing to higher symptom prevalence for this region. The surgeons may adopt more sustained lumbar flexion during these procedures while working on various anatomical regions, deeper internal organs, etc., for long hours. The risk of developing work-related musculoskeletal symptoms in surgeons will be further increased due to the long hours of work and maintaining a static posture while performing movements of very fine eye–hand coordination.

The Work Style short form scores suggest that the cognitive, social, and biomechanical response of surgeons to increased work demands would place them at risk for developing musculoskeletal symptoms.

**Table 1a: Prevalence of WMS among surgeons**

<i>n</i> =43 (M=30, F=13)	Mean	Std. Dev.
Age	42.07	12.35
Working experience	15.14	9.01

M=male, F=Female

**Table 1b: Prevalence of WMS among surgeons**

Category	Percent
Affected	83.70%
Not affected	16.30%

**Table 2: Shows the jointwise prevalence of WMS among surgeons**

	Not affected	Affected
SNQ_Back	46.50%	52.50%
SNQ_Neck	69.80%	30.20%
SNQ_Shoulder	76.70%	23.30%
SNQ_Knees	93.02%	6.98%
SNQ_Ankle	93.02%	6.98%
SNQ_Elbow	97.68%	2.32%
SNQ_Wrist/Hand	97.68%	2.32%
SNQ_Hip	97.68%	2.32%

**Table 3: Categorical distribution of surgeons based on joint wise QEC scoring**

	LOW	MODERATE	HIGH	VERY HIGH
QEC_Back	27.90%	65.11%	6.97%	0
QEC_Neck	6.97%	25.56%	60.46%	6.97%
QEC_Shoulder	65.11%	34.88%	0	0

**Table 4: Categorical distribution based on scoring of QEC for vibration, workplace, stress**

	LOW	MODERATE	HIGH	VERY HIGH
QEC_Vibration	79.06%	18.60%	2.32%	0
QEC_Workpace	62.79%	32.56%	0	0
QEC_Stress	43.88%	37.20%	16.07%	11.26%

**Table 5: Comparison of prevalence based on Workstyle Shortform scoring**

	WSF
High risk	67.44
Low risk	32.56

**Table 6: Frequency distribution of surgeons based on total QEC score obtained**

Score	Frequency	Percent	Action
<40%	12	27.90%	Acceptable
40-49%	13	30.23%	Investigate further
50-69%	17	39.53%	Investigate further & change soon
≥70%	1	2.32%	Investigate further & change immediately

Hence, understanding the exposure levels of ergonomic risk factors and psychosocial factors is an important step toward finding effective solutions to these problems. Furthermore, it is proposed in previous studies on

work style that it may be a factor for exacerbating musculoskeletal symptoms rather than causing the problems.<sup>[11,15]</sup>

### Limitations

This is a cross-sectional pilot study; hence, it is not known whether musculoskeletal symptoms are the cause or effect of the physical and psychological risk factors. A Self-reported problems by participants means subjectively mention the symptoms which could be limitation of study.

### Future recommendations

Further studies can examine factors contributing to these problems more extensively and develop appropriate interventional strategies for the surgeons. The study can be carried out on surgeons in specific specialty branches. Further study can investigate the more precise physical demands of the different types of surgery and examine their relationships with musculoskeletal symptoms.

### Conclusion

The present survey has shown high prevalence rates of musculoskeletal symptoms of neck, back, and shoulders in surgeons. The results showed that physical risk factors involving constrained posture, repetitive movements, etc., were significant predictors of work-related musculoskeletal symptoms in surgeons. The results also indicated that the surgeons had a high sense of commitment and self-imposed pressure.

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### Conflicts of interest

There are no conflicts of interest.

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