

Prevalence of Work Related Musculoskeletal Problems in Ophthalmologists practicing in Navi Mumbai and Mumbai.

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ABSTRACT

Introduction: The term musculoskeletal disorder denotes health problems of the locomotor apparatus i.e. of muscles, tendons, the skeleton, cartilage, nerves and ligaments. Musculoskeletal disorders that are caused or intensified due to work are termed as Work related musculoskeletal disorders (WRMSDs). There have been many reports of work related musculoskeletal disorders in other minimal access surgical branches, but very few in Ophthalmology.

Purpose of the study: The aim of this study was to find the prevalence of work related musculoskeletal disorders in Ophthalmologists practicing in Mumbai and Navi Mumbai.

Methodology: A pre-validated questionnaire was used for the survey which contained information on demographics, workload, and report of work related musculoskeletal disorder and the ergonomic contributory and preventive factors as perceived by the ophthalmologists. Seventy five ophthalmologists responded to the questionnaire. Response rate was 62.5%.

Results: According to the results, 49% of the participating ophthalmologists reported that they suffered from musculoskeletal problems during the surgical hours and 40% reported that they suffered from musculoskeletal problems during OPD hours which they attributed to the ergonomic issues. During surgical practice, 19% ophthalmologists experienced pain in more than one site. The prevalence of pain was highest in the neck (51%) during surgical hours followed by the other regions. The most commonly reported factors to which they attributed the pain and discomfort during surgery were poor posture, long surgery hours, workplace ergonomics, use of microscope and stress. The factors that they attributed pain and discomfort to during OPD hours were poor posture, long working hour, stress & lack of exercise. Only 38% ophthalmologists informed that they were aware of ergonomic recommendations.

Conclusion: There is a high prevalence of work related musculoskeletal disorders in Ophthalmologists which warrants attention to ergonomic assessment of their work practices.

KEYWORDS: Ophthalmology practice, Work related musculoskeletal disorders, Ergonomics.

INTRODUCTION

The human musculoskeletal system is an organ system that gives humans the ability to move using their muscular and skeletal systems.

The musculoskeletal system provides form, support, stability and movement to the entire body. Musculoskeletal disorders or MSDs are degenerative diseases and inflammatory conditions that cause pain and impair normal activities of daily living. Work related musculoskeletal disorders (WRMSDs) are thus the musculoskeletal disorders that are usually caused in the workplace and are diverse disorders that may affect the

different structures of the musculoskeletal system. They can affect many different parts of the body including upper and lower back, neck, shoulders and extremities (arms, legs, feet, and hands). MSDs can arise from a sudden exertion or they can arise from making the same motions repeatedly (repetitive strain), or from repeated exposure to force, vibration, or awkward posture. MSDs are an increasing healthcare issue globally, being the second leading cause of disability and most individuals complain of multiple MSDs occurring in their workplace.

A growing body of epidemiological research has provided a strong cause-effect relationship between high levels of exposure or simultaneous exposure to the various ergonomic workplace hazards and the development of (MSD's) musculoskeletal disorders in the workplace¹.

According to the Ocular Surgery News, Asia Pacific Edition 2010, "As the global population age changes, the demand for ophthalmologists is more than ever."

Due to this even a basic refraction test which an optometrist can perform has to be done by an ophthalmologist leading to increase in their workload further leading to increase in their work stress causing musculoskeletal disorders amongst them. The prevalence of musculoskeletal symptoms in this group has not been adequately studied.

In a study done by Sivak-Callcott Jennifer A. et al conducted a study titled, "A Survey Study of Occupational Pain and Injury in Ophthalmic Plastic Surgeons" One hundred thirty participants responded to the survey². 72.5% reported pain associated with operating, 80.9% reported use of loupe magnification, 68.7% reported use of a headlight, 42.5% reported modification of their operating room practice, and 9.2% reported stopping surgery due to pain or spine injury. Most respondents exercised regularly, with 55.7% characterizing the amount of exercise as less than necessary. 60.8% and 57.3% agreed that loupe use and headlamp use, respectively, can lead to spine problems. The study concluded that many oculoplastic surgeons experience discomfort due to surgical practice, and an alarming minority have stopped operating due to pain or neck injury. Participants identified loupe and headlamp use as a special concern. In the study, "Symptoms of musculoskeletal disorders in ophthalmologists" by Kenneth C. Dhimitri found that, self-reported prevalence of neck, upper body, or lower back symptoms in the prior month was 51.8%³. Low back pain was present in 39% of respondents, followed by upper extremity symptoms (32.9%) and neck pain (32.6%). Approximately 15% of ophthalmologists said they had to limit their work to some extent, as a result of these symptoms. The study concluded that, MSD symptoms appear to be common among ophthalmologists. With a relatively low response rate, however, it is plausible that asymptomatic subjects represented a large percentage of the non-respondents. Additional investigation is thus warranted to evaluate ergonomic risk exposure and establish injury prevention guidelines in this population. There is limited research for both prevalence and ergonomic assessment in the Indian scenario. Indian cities like Mumbai and Navi Mumbai have a high density of population which puts a severe strain on the limited health care resources. Due to lack of awareness, many ergonomic guidelines are not being followed in the

operation theatres and in the OPD. Hence the objective of this study was to determine the WRMSDs in ophthalmologists practicing in Mumbai and Navi Mumbai.

METHODOLOGY

For the survey, a questionnaire was formulated and validated with two experts in field. Revisions were made based on comments regarding the language, format and context issues of the questions. The questionnaire was largely structured but it included some open ended questions.

The survey questionnaire contained information on 3 categories:

A. Demographic (age, gender, height, weight and hand glove size) and workload data segregated into Surgical and OPD hours (average number of operations and operating hours per week and type of operations, etc. and number of OPD days, number of patients per week, etc.)

B. History of musculoskeletal symptoms (modified version of the Standardized Nordic Questionnaire). The area of pain was marked and the ophthalmologists were asked to report severity of symptoms on a scale 1 to 10, 1 indicating mild pain and 10 indicating severe pain or symptoms noted separately during surgical hours and OPD hours.

C. Ergonomic risk factors: The probable causative factors as well as relieving factors related to work related symptoms were included.

This study followed a participatory ergonomics approach which states that involvement of the participant in addressing the solutions to the problems leads to greater carryover of the benefits. The survey was conducted on ophthalmologists practicing in general hospitals, hospitals attached with teaching institutes in private set up. The survey questionnaire was distributed by both delivery & email. The questionnaires were collected either on the same day or participants were contacted after a week for the same as per the convenience of the participants. 120 questionnaires were distributed. The response rate was $75/120 = 62.5\%$.

RESULTS

75 questionnaires were returned after completion. Before discarding any questionnaire one attempt was made for personal communication for the unfilled answers. 65% of the study participants were males & 35% were female Ophthalmologists. 92% were right handed by dominance, 7% were left handed and 1% were ambidextrous by dominance. 2% participants were underweight having a Body Mass Index (BMI) <18.5, 56% participants belonged to in the normal range of 18.5-25, 39% were overweight falling the range of 25-30 and 2% belonged to in the obese type 1 and 1% belonged to obese type 2 category. 56% participants were working in a hospital based/private clinic, 8% participants were working in hospital based with

attached teaching institute and 36% participants were working in both, hospital based/private clinic and hospital based with attached teaching institute. (Table 1) The regional prevalence of WRMSDs in this population during surgical hours was as follows:

Out of the 38 Ophthalmologists complaining of pain and discomfort during surgical hours, 17(46%) complained of lower back, 19(51%) complained of neck pain and stiffness, 7(18%) complained of shoulder pain and 4(11%) complained of leg numbness and fatigue.(Fig 1)

Table 1. Demography and prevalence of WRMSDs in ophthalmologists

	Ophthalmologists suffering from WRMSD		Ophthalmologists not suffering from WRMSD	
	During surgery	During OPD	During surgery	During OPD
Percentage prevalence	49%	40%	51%	60%
Single site pain	14.6% one area pain	30.6% one area pain	-	-
More than one site pain	30.6% more than one area pain	40% more than one area pain	-	-
Male surgeons	25(55.5%)	20(44.4%)	24(46.1%)	28(53.8%)
Female surgeons	12(52.1%)	11(47.8%)	13(46.4%)	15(53.5%)
Average age	37.1	37.5	37.1	37.3
Mean height	170.8	169.6	169.9	171.3
Mean weight	72.2	73.4	70.3	70.1
Glove size	7.1	7.1	7.2	7.2
Workings years	13.04		12.3	
Working hours/week	57.04		54	
Surgeries/week	19.6		14.9	
Surgery hours/week	19.8		16.3	
OPD hours/week	38.04		37.5	

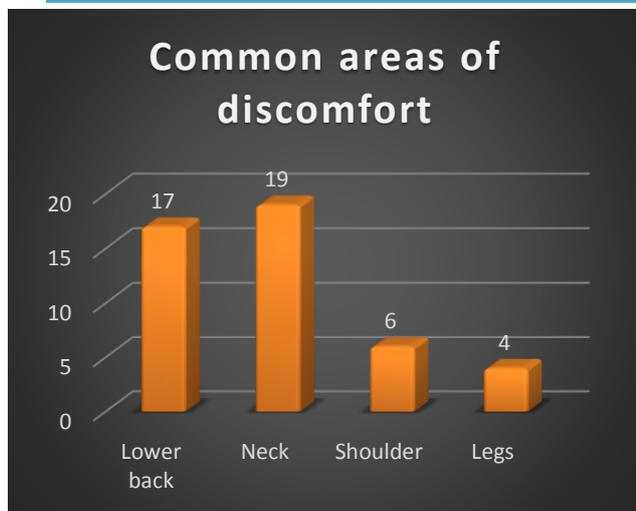


Figure 1: Regional Prevalence of WRMSD in Ophthalmologists during surgical hours



Figure 2: Regional Prevalence of WRMSD in Ophthalmologists during OPD hours.

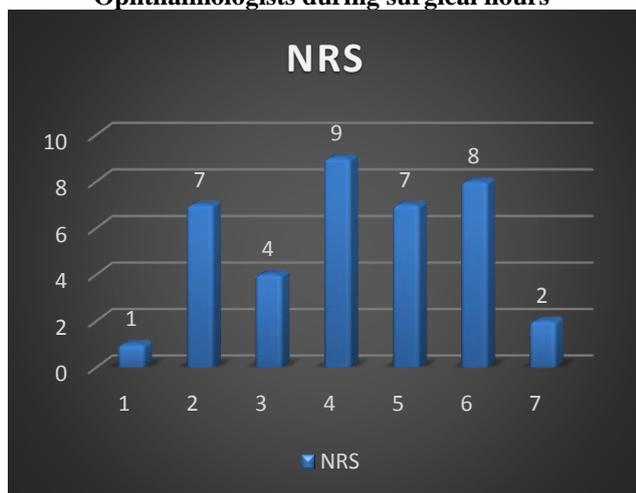


Figure 3: The above graph displays the number of surgeons with the severity of pain (NRS -Numeric Rating Scale) during surgical practice

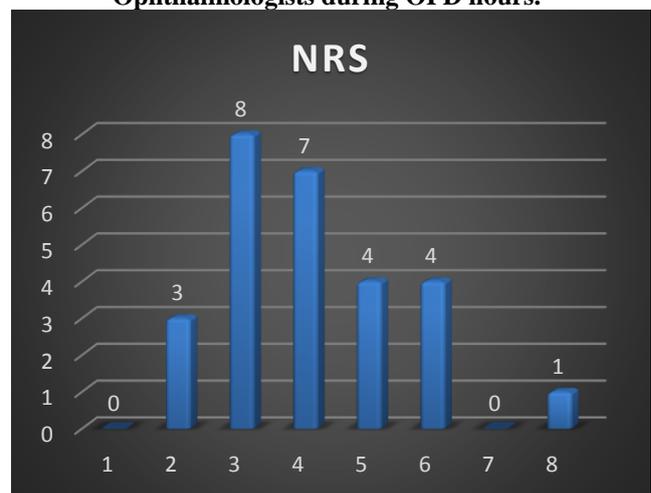


Figure 4: The above graph displays the number of surgeon with the Severity of pain (NRS - Numeric Rating Scale) during OPD practice

Out of the 30 ophthalmologists complaining of pain and discomfort during OPD hours, 15(41%) complained of low back pain, 9(25%) complained of neck pain, 6(17%) complained of headache and 2(5%); while only 1(3%) complained of numbness of legs, eye strain, shoulder pain, upper thoracic pain and generalized pain each. (Figure 2).

The figures above depict the intensity of pain on NRS experienced by the participating ophthalmologists during surgical and OPD hours. 38 participants complained of pain/symptom during surgical hours while 30 complained of pain/symptom during OPD hours. The severity of pain on Numeric Rating Scale (NRS) is calculated on a scale of 1-10. The mean of the NRS of total 38 participants during surgical hours is 5.42 (3.1) and total 30 participants during OPD hours is 3.6(2.4). 29% Ophthalmologists suffering from WRMSD during surgical hours reported that they undertook treatment for the pain and/or discomfort. 28% Ophthalmologists suffering from WRMSD during OPD hours reported that they undertook treatment for the pain and/or discomfort. To incorporate the elements of participatory ergonomics in our study as well, ophthalmologists were asked their interpretation of the origin of symptoms during surgical and well as OPD hours. Out of the 38 participants suffering from WRMSD during surgical hours, the various reasons that they attributed their pain/symptoms to were: poor posture (79%), long surgery hours (11%), uncomfortable seating (10%), use of microscope (10%) and stress (10%). Out of the 30 participants suffering from WRMSD during OPD hours, the various factors that they attributed their pain/symptoms were bad posture (50%), long working hours (40%), stress (3%) and lack of exercise (7%). Among the participants that reported pain or symptoms, the various factors which they believed would help in relieving their symptoms of WRMSD during surgical hours were rest and sleep (48%), postural correction (3%), exercise (29%), better work surface i.e. appropriate chair & table height(7%), physiotherapy(7%) & medications (6%). The various factors the participants believed would help in relieving their symptoms of WRMSD during OPD hours were rest(50%), posture (3%), exercise (30%) , better ergonomics(7%) and physiotherapy (10%).

DISCUSSION

This study analysed the prevalence and distribution of work-related musculoskeletal disorders in Ophthalmologists during their surgical and OPD hours, practising in Mumbai and Navi Mumbai by using a self-reported method of outcome measurement with the help of a validated questionnaire. Various methods of assessment have been described to estimate the prevalence rates such as self-report, interview and clinical examination with some differences.

The questionnaire method is a cost-effective and well accepted with results apparently similar when compared to the other two methods of assessment. Hence, we selected the questionnaire method. The prevalence rate in this study for reported musculoskeletal symptoms were 49% during surgical hours and 40% during OPD hours which is higher than the 15% to 18% prevalence rate reported in the Indian population^{4, 5}. This prevalence rate is comparable with that reported in dentists^{6, 7}, nurses^{8, 9} & sonologists^{10, 11} who are considered as risk group in health care workers. Of the 30(40%) and 38(50.6%) ophthalmologists complaining of pain during the OPD and surgical practice, neck and back pain are the most commonly reported symptoms. The other problems associated with work related practices were shoulder pain, headache, and lower limb discomfort. The percentiles mentioned in the discussion are calculated out of the affected population of ophthalmologists.

NECK PAIN:

51% of the ophthalmologists complain of neck pain and stiffness during surgery hours and 27% of them complain during OPD hours. The faulty positions adopted by the ophthalmologists during a slit lamp test (adoption of stoop sitting or stoop standing) could be the main cause for neck pain and stiffness. Almost 64% of them also make use of the headlight due to which the load on the cervical spine increases. Studies have found evidence for a positive relationship between neck pain and the following work-related risk factors: neck flexion, arm force, arm posture, duration of sitting, twisting or bending of the trunk, hand-arm vibration, and workplace design. Routine ophthalmic practice involves excessive musculoskeletal workload in the cervico-brachial region. Performance of tasks which have a high level of "visual", "manipulative" and "reach" demands on head neck and arms, results in increased muscular tension in the cervico-brachial muscle complexes¹²⁻¹⁴. The long consulting hours and the large number of patients seen by them every day, while bending forward in a sitting position is also high and could cause neck stiffness.

BACK-PAIN:

46% of the participants complained of low back pain during surgical hours and 51% complained of low back pain during OPD hours. The non-neutral postures adopted by them during surgical and consulting practice could be a cause to the low back pain.

LOWER LIMB DISCOMFORT:

11% of Ophthalmologists complained of leg numbness during surgical hours and 8% during hours. Faulty ergonomics including inappropriate stool or chair height (work surface), type of chair, support provided by the same, prolonged sitting may be responsible for these symptoms.

SHOULDER-PAIN:

16% of the total subject size complained of shoulder pain during surgical hours. The main cause for the same could also be due to the faulty posture (shoulder abduction) adopted by them during the surgery or the use of faulty ergonomic work surfaces (OT table and writing desk height) causing spasm and fatigue leading to pain and strain on the shoulder muscles.

HEADACHE:

14% of the subjects suffered from severe headache and fatigue during and after the OPD hours. Headaches are caused when there is a nerve compression occurring during upper cervical extension. There are basically two types of headaches that occur; primary and secondary.

Ophthalmologists usually suffer from primary headaches caused to stress, fatigue and anxiety due to increase in the workload and deprivation of sleep. Moreover not taking frequent breaks can also cause severe headache and fatigue. This is mainly due to large patient size seen by them during OPD hours, a sedentary lifestyle and absence of relaxation techniques and exercises. Setting in of early fatigue would mainly be experienced by the overweight and obese subjects and by those who do not indulge in performing regularly exercise. With increasing age and higher exposure to job stress, older surgeons would be expected to have a higher risk of developing musculoskeletal problems. In our study too, the mean age was higher in the group with WRMSDs. However there are studies which have reported younger workers to be at increased risk of musculoskeletal problems due to their lack of experience resulting in poor job skills and insufficient practice. The "healthy worker effect" also suggests that those who are healthy are more likely to remain at work. In our study, 38% of Ophthalmologists reported that they were aware of ergonomic recommendations whereas 62% reported that they were unaware of the same.

CONCLUSION

The prevalence of WRMSDs in Ophthalmologists during their surgical hours and OPD hours were 49% and 40% respectively. The areas reported during surgical hours were neck, low back, shoulder and legs and those reported during consulting hours were low back, neck, legs and headache. In view to this high prevalence we recommend urgent ergonomic attention to the work set up and better ergonomic practices in ophthalmologists.

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