

Work Related Musculoskeletal Disorders among Healthcare Professional and their Preventive Measure : A Report

Naveen Ganer

Senior Manual Therapist, Physiotherapy, Jindal Institute of Medical Sciences, Hisar, Haryana, India

ABSTRACT

According to World Health Organization work-related musculoskeletal disorders (MSDs) are defined as disorders and diseases of the musculoskeletal system, which have been proven or assumed to have at least a partly work-related background characterized by the occurrence of several symptoms, concomitant or not, such as pain, paresthesia, sleep disturbances, anxiety, depression, fatigue, vertigo, headaches and irritable bowel syndrome which appear insidiously. However vulnerability to acquire MSDs is well reported among healthcare professionals, particularly those who are in direct contact with patients during the course of their work routine. Factors involved in MSDs among them are physical exposure, sustained static and/or awkward posture, prolonged sitting & standing, forward bending of trunk, excessive neck flexion & extension, wrong lifting, pulling or pushing at work, repetitive and/or forceful work, repetitive upper arm elevation above 90°, demanding work schedule etc. Majority of these issues can be prevented with simple measures like ergonomic design of the work environment, postural re-education and regular exercises.

Keywords : Musculoskeletal Disorders, Healthcare Professionals, Ergonomics, Posture, Exercise, Yoga

I. INTRODUCTION

Work-related musculoskeletal disorders (MSDs) are defined as disorders and diseases of the musculoskeletal system, which have been proven or assumed to have at least a partly work-related background (WHO, 1985) characterized by the occurrence of several symptoms, concomitant or not, such as pain, paresthesia, sleep disturbances, anxiety, depression, fatigue, vertigo, headaches and irritable bowel syndrome which appear insidiously. These syndromes have a gradual but multi-factorial etiology and, therefore, they are of great diagnostic complexity and often go untreated (Polanyi MFD, Cole DC et al: 1997; Gallinaro AL, Feldman D, Natour J: 2001).^{1,2} MSDs affect large numbers of people across most industries and occupations, have the potential to lead to long and serious disability, and impose heavy costs on employers and on society.³ In India, MSDs estimates have shown that it contributes to about 40% of all costs towards the treatment of work-related injuries (European Agency for Safety and Health: Dec

2012). However vulnerability to acquire MSDs is also reported among healthcare professionals, particularly those who are in direct contact with patients during the course of their work routine (Ylipaa & Szuster et al: 2002; Lorusso A, Bruno S & L'Abbate N: 2007). Nurses (41.70%) are at the highest level of exposure, followed by physiotherapists (35%) and dentists (22.6%). Physicians/surgeons and lab technicians are the least exposed, at 4% in their respective workstations.^{4,5,6} A study in Kasturba Medical College, Mangalor reported MSDs among physician (13.3%), surgeon & orthopedist (each 12.8%), gynecologists (11.7%), physiotherapist (7.4%), otolaryngologist and pediatrician (each 6.4%), anesthetist (5.9%), dermatologists (4.8%), psychiatrist and radiologist (each 4.3%), cardiologist and ophthalmologist (each 3.7%), and oncologist (2.7%).⁷ Outcome of studies show Lower back (25%), neck (20.21%), and knees (14.36%) were the common MSDs among doctors in different specialties.⁸

Prevalence Among Physiotherapists

Physiotherapists have to use high physically demanding manual and handling skills while treating their patients that put uneven stress on the body. A high percentage (61%) of physical therapists experienced work-related musculoskeletal symptoms in at least one anatomical area. The highest prevalence of work-related musculoskeletal disorders (WMD) among physical therapists were in the following anatomical areas: low back, wrist/hand, upper back, neck, knee, hip and thigh.⁹ The risk factors quoted by most of the Physiotherapists who were managing large number of patients in a day, adoption of constant uncomfortable postures, manual therapy techniques and transferring the patients during their services in prevention and treatment of musculoskeletal disorders.^{10,11,12}

Prevalence Among Dentists

A study over Indian graduated dental surgeons from Mangalore stated that 6.6% dental surgeons always experienced shoulder pain, 73.3% experienced stiffness in the back and 23.3% experienced severe pain in their neck, rest also suffer from knee, hip and thigh pain.^{13,14} Other study over female dentists reported higher percentage of upper extremity disorders (UED) that includes problems in the neck, shoulders, arms, elbows, wrists, hands and fingers.^{15,16}

Prevalence Among Sonographers & Radiologists

MSD prevalence rates in excess of 80% have been reported for sonographers in the literature (Smith et al. 1997; Magnavita et al, 1999 and Dodd-Hughes, 2008). Worryingly, Brown and Baker (2004) found that around 20% of sonographers reportedly left the profession due to persistent discomfort.¹⁷ A literature review identified risk factors, particularly arm abduction greater than 30°, repeated isometric maneuvers without compensatory rest, the level of force applied to the probe, abdominal scanning approaches, examination times longer than 25 minutes, and more than 100 sonographic examinations per month.¹⁸ The average time spent for each examination, discomfort for transducer design was related to MSDs whereas a comfortable chair and correct position of the body protected from the onset of MSDs.¹⁹

Prevalence Among Physicians & Surgeons

77% of physicians who regularly perform endoscopic surgeries suffered physical discomfort or symptoms attributable to endoscopy with endonasal procedures become more prevalent.²⁰

A survey study in 2010 on members of the American College of Mohs Surgery found 90% surgeon suffering from MSDs. The most common complaints were neck, lower back, shoulder, and upper back pain. Most of them were not using ergonomic modifications in their practice.²¹

43.7% North American members of the American Society of Pediatric Otolaryngology reported pain or discomfort that they attributed to their surgical practice. Women were significantly more likely to report experiencing pain or discomfort that they associated with their surgical practice.²²

II. METHODS AND MATERIAL

Causative Factors for MSDs

The most common ergonomic hazards reported were prolonged sitting, standing, forward bending of trunk and neck flexion, whereas lifting, pulling or pushing at work and repetitive and/or forceful work were the least common reported issues. A cross sectional study found four patterns of occupational biomechanical demands: “low demands”, “sitting demands”, “repetitive and asymmetric demands”, and “high and vibrational demands”. Professionals with sitting demands were more likely to report any or severe upper-/lower-back pain when compared to those with low demands. Patterns of high work-related physical demands were associated with the presence of neck/shoulder pain and severity of upper-/lower-back pain.²³ Among those “with MSDs,” 83% reported that forward bending of trunk is a major hazard in their workplace, followed by neck flexion (75%). Even those “without MSDs” reported forward bending of trunk (85%) as a major hazard, followed by prolonged standing (70%) and sitting (60%).^{3,23,24,25} Similarly upper arm elevation above 90°, a duration increment of 1% of the daily working hours was associated with supraspinatus tendinitis and shoulder pain with/without disability.²⁴ An exposure–response

relationship was found between lifetime upper arm elevation and supraspinatus tendinopathy.²⁵ Repetitiveness of work was also found to be significantly associated with prevalence of reported discomfort in the wrist, hand, or fingers, tendinitis in the distal upper extremity, and symptoms consistent

with carpal tunnel syndrome.²⁶ Demanding work schedule, physical exposure, sustained static and/or awkward posture and use of force and repetitive movements of hands were perceived as the factors for MSD in surgeons.^{27,28}

Table 1 : Reference value for physical load factors as risk factors for neck/shoulder, elbow/wrist/hand disorders.²⁹

	neck/shoulder	elbow/wrist/hand disorders
Posture	<ul style="list-style-type: none"> • Sitting at work >95% of working time (Ariens et al., 2001a) • Neck flexion >20° >70% of working time (Ariens et al., 2001a) • Neck flexion >45° >10 % of working time (Ariens et al., 2001a) • Neck flexion >20° ≥ 66% of work cycle time (Andersen et al., 2002) • Rotated neck >1 h·day-1, arm above shoulder level >1 h·day-1 (Miranda et al., 2001b) • Arm flexion/abduction >90° >10% of work cycle (Punnett et al., 2000) • Awkward and static postures (van der Windt et al., 2000) • Extreme neck postures (Bernard, 1997) • Duration of work with a hand above shoulder level (Viikari-Juntura et al., 2001) 	<ul style="list-style-type: none"> • Posture combinations, no clear limits (Bernard, 1997) • Use of pinch grip, extreme wrist posture >1/3 of working time (Stetson et al., 1993) • Extreme forearm, wrist and finger postures (Viikari-Juntura and Silverstein, 1999)

MSDs association with respect to age, gender, length of time in practice, academic vs community setting, work experiences or number of surgeries completed by the healthcare professionals were non-significant, except physical activity.^{20,30} In contrast high BMI were not at a higher risk for developing LBP than normal BMI.^{22,31}

Preventive Measures:

A. Ergonomics

Ergonomics can be defined as the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and

the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance (International Ergonomics Association, August 2000).³² Greater adherence to the ergonomics process in designing and assessment of work systems would seem to be the most likely strategy for long term primary prevention of these disorders and improve quality of life.

Ergonomic Intervention

- The adoption of regular breaks to recover most of the structures required is recommended.³³
- Place the most frequently used objects near and the least used farther away, avoiding trunk twists or spine to use them.
- Adjustment of the chair:

Moderate amount of literature suggests that chair interventions reduce musculoskeletal symptoms among workers who are required to sit for prolonged periods.³⁴ While sitting in a chair the head should be round or slanted without excessive bending of neck; elbows should not be flexed more than 90°; forearm support should be at comfortable height so that the shoulders will not shrug; the feet should be completely soiled or use support for the feet; and knees must not be completely flexed or extended. The adjustment of the height of the chair should be such that the healthcare professionals can reach the table contents without excessive bending or lifting of the shoulders & spine (Cory HGC: 1995; OSHA: 1997; NIOSH: 1999; OSHA: 2008). The lumbar spine should be well supported and should be tilting front or back so that the professionals feel well accommodated.³⁵

In the prevention of neck disorders in work with a high frequency of visual display unit (VDU) tasks like in radiography or sonography, attention should be given to the work environment in general and to the more specific aspects of VDU workstation layout.^{18,36} Overall ergonomic modifications in behavior and workplace are recommended to reduce pain and injury to healthcare professionals.³⁷

B. Posture

How an individual should sit, stand or move can be described under the term of posture. Posture can be described as the attitude assumed by the human body

and its segments.³⁸ A good working posture include neutral head, straight and low shoulders; their elevation above 90 is not indicated; arms are pretty close to body; forearm are supported, but if this is not possible, the elbow should not exceed the 90-120° of flexion; ulnar or radial deviations and wrist flexion should be minimal, maintaining neutral posture; spine is always aligned and unnecessary torsion and bending should be avoided. In such alignment least amount of stress/strain will encountered by the musculoskeletal system. Any alterations to this alignment (faulty posture) will create MSDs. To prevent MSDs professional should be either aware by themselves or some skilled fellows should make them aware about this. Pillastrini et al (2007) found that, after changes in the workplace by a physiotherapist, as chair adjustment, screen height and inclination of the backrest, there was significant reduction of musculoskeletal disorders of the lumbar spine, neck and shoulders.³⁵

C. Exercises

Regular exercises are also an important aspect for preventing and treating MSDs. Short and long exercise sessions of workplace exercises and yoga for minimum of 10 weeks seems essential to reduce MSDs, improve flexibility, endurance and conditioning.^{36,39,40}

III. CONCLUSION

The health of the professional who are taking care of community health is also on the edge. Work related MSDs are rising silently among them. Majority of these issues can be prevented with three affordable things i.e. ergonomic work environment designing, postural re-education and regular exercises.

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