

# Prevalence and Risk Factors of Work-Related Musculoskeletal Health Problems among Staff Nurses

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## Abstract

**Background:** Nursing workers continue to work in different places including hospitals, institutions, and continuously demanding repetitive movements and weight lifting which predisposes them to the risk of work-related disease.

**Aim:** A study aims to assess the prevalence and risk factors of work-related musculoskeletal disorders among staff nurses in Sri Ramakrishna Hospital, Coimbatore.

**Methodology:** A descriptive cross-sectional research design was used. A convenient sample size of 100 staff nurses was selected for the study. A structured questionnaire was prepared to assess the prevalence and 4-point Likert scale was used to assess the risk factors; in addition, three yes/no questions were used to find out the risk factors.

**Results:** In the present study, majority of staff nurses were in the age group of 23–25 years, were females with 1–3 years of experience, and most of them are working in the general wards. The result shows that 44% of staff nurses had pain in the lower back and 42% had pain in the knee. Predisposing risk factors were among 79% of staff nurses experienced prolonged standing, 99% of staff nurses work on night duty, and 40% of staff nurses experienced mental stress.

**Conclusion:** The prevalence of musculoskeletal health problems among staff nurses was found to be high. Nurses are the largest number of professionals in any hospital setting. Hence, the nurses should have knowledge of working ergonomics by that we can able to reduce the work-related health problems.

**Keywords:** Musculoskeletal health problem, staff nurses, work related

## INTRODUCTION

Nursing is a health-care profession focused on the care of individual, families, and communities in attaining, maintaining, and recovering optimal health and functioning. Nurses are part of the multidisciplinary medical team at hospitals and other medical centers that are susceptible to work-related musculoskeletal disorders (WMSDs).<sup>[1,2]</sup> A nurse assesses, plans, implements, and evaluates care independently of medical staff and typically provides anything from basic triage care to assistance in serious trauma care and surgery. WMSDs

are an important occupational health issue among all healthcare workers. WMSD is a collective and descriptive term for the symptoms caused or aggravated by work and characterized by discomfort, impairment, disability, or persistent pain.<sup>[3]</sup>

Consequences of work-related musculoskeletal health disorders among professional nurses are increased the number of sick days per year, premature retirement, and poor health.<sup>[1,2]</sup> The nursing population constitutes about 33% of the hospital workforce, and nurses are at a high risk, accounting for 60% of reported occupational injuries.<sup>[4]</sup> It is estimated that 12% of nurses leave the profession annually and 52% complain of chronic low back pain (LBP).<sup>[5]</sup> The job requirements of nurses are to maintain patients' hygiene, look after their needs, and provide them with medication. These requirements predispose them to developing MSDs.<sup>[6]</sup> A major role of the nurses is to provide hands-on physical care; however, other skills are equally important.<sup>[7]</sup>

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WMSDs are isolated or combined problems in muscles, tendons, synovial membrane (joint tissues), nerves, fascia (connective tissue), and ligaments with or without tissue degeneration, caused by work. They are characterized by the occurrence of symptoms such as pain, numbness, and fatigue. These injuries generally affect the superior limbs, scapular region around the shoulder, and the cervical region but can also affect inferior limbs and can cause temporary or permanent occupational disabilities.<sup>[8]</sup>

Manual handling and awkward postures may cause disorders of the musculoskeletal system of nurses in hospital. A manual handling operation in hospital means moving or supporting a load by a person's hands arms or by some other forms of body effort. Patient handling includes the use of force by a person to lift, lower, push, pull, carry, move, and support another person. Potential risk to safety and health in patient handling operation includes the patient weight (especially an adult, who has limited strength) and horizontal distance of the hands to low back of the person doing the lifting. There are many reasons why the injuries occur, for example, overexertion, lack of skill, frequency, working condition, and the physical condition of the person being handled.<sup>[9]</sup> Work-related musculoskeletal health disorders are accounted for 34% of workplace illnesses with an incidence rate of 38 cases per 10,000 full-time workers.<sup>[5]</sup> While Schlossmacher and Amaral systematically reviewed the methods of evaluating low back injury caused by unfavorable working conditions among nurses.<sup>[10]</sup>

Nursing and personal care services are cited as having one of the highest non-fatal occupational injuries incidences rate at 18.5/100 full-time equivalent workers. One category of such injury is musculoskeletal injury; up to 38% of nurses are affected by these injuries. In addition, 67% of recent disabling injuries in nursing as per the Bureau of Labor statistics were due to sprains and strains, most of them due to overexertion in lifting patients.<sup>[11]</sup>

According to statistical records, the Occupational Safety and Health Administration has calculated that nearly half of all healthcare workers suffer at least one work-related musculoskeletal injury during their career. More than half of all nurses (52%) complaints of chronic pain and 38% of registered nurses (RNs) have suffered occupational-related back injuries severe enough to require time away from work. About 12% of RNs consider leaving the profession due to lower back pain and in the American Nurses Association survey, almost 60% of nurses list disabling back injuries as one of the top three health safety issues. During the stressful situations, even the most experienced staff members can forget the importance of ergonomics. Hence, nurses are at an increased risk for work-related musculoskeletal injuries as a result of the cumulative effect of manual patient handling tasks.<sup>[12]</sup>

The investigator has seen nursing students suffering from leg pain in student period, both during undergraduate and postgraduate education programs. During the investigators experience as staff nurses, we have seen nurses suffering from

severe backache and back pain. Nurses are the largest number of professionals in any hospital setting; the work they perform, unpredictable internal shift rotations including night duty, which are traditional and typical in nursing care are harmful in maintaining nurses health. Hence, we decided to take up a study to assess the prevalence and risk factors among hospital staff nurses and concerning of musculoskeletal problems such as low back pain (LBP), neck pain, leg pain, and shoulder pain. Thus, there is a need to assess the prevalence and risk factors of work-related musculoskeletal health problems among staff nurses.

## Objectives

The objectives of the study were as follows:

- To assess the prevalence of work-related musculoskeletal health problems among staff nurses
- To evaluate the risk factors of work-related musculoskeletal health problems among staff nurses.

## METHODOLOGY

In view of the nature of problem and to accomplish the objective, qualitative research approach was adopted. A non-experimental descriptive design is used to assess the prevalence and risk factors of work-related musculoskeletal health problems among staff nurses. The study was carried out in Sri Ramakrishna Hospital which is a 950-bedded hospital. The hospital has about 185 doctors and 862 nurses. The hospital has different special departments and ward which includes surgical, cardiology, oncology, gynecology, neuro-step down, intensive care unit, cardiac intensive care unit, and cardiovascular intensive care unit. The sample consists of staff nurses working in Sri Ramakrishna Hospital, Coimbatore. Convenient sampling was adopted. A sample size of 100 staff nurses who fulfilled the inclusive criteria was selected for the study. The samples were selected based on the inclusion criteria of willingness to participate in the study. The staff nurses with <1 year of experience have undergone any musculoskeletal surgery, and workings at managerial levels were excluded from the study.

The tool consists of demographic variables such as age, sex, total years of experience, area of working, and duty hours. A structured questionnaire was prepared by the researcher after reviewing various literatures and obtaining experts opinion. The questionnaire consists of 45 questions which covers musculoskeletal health problems in various parts of the body such as neck, shoulder, elbow, wrist/forearm, hand, upper back, lower back, knee, and foot. A 4-point Likert scale is used to assess the perceived risk factors of musculoskeletal problems. It had four options which includes never, sometimes, often, and always. It had eight statements and in addition, three yes/no questions were including to find out the risk factors.

The investigator explained the aims and objectives of the study to the staff nurses. A structured questionnaire was given to the samples and they were asked to complete the questionnaire.

The collected data were analyzed using descriptive and statistical analysis.

Table 1 shows the frequency and percentage distribution of demographic variables. Regarding the age group, majority of population 53% was in the age group of 23–25 years and the least 1% is in the age group of 32–34 years. According to the sex of the staff nurses, majority 92% were female and 8% were male. With regard to experience of staff nurses, majority 83% were with 1–3 years of experience and least 3% were with 7–9 years of experience. Regarding the area of work, majority

43% of staff nurses were working in the general wards and least 5% were working in the emergency.

Table 2 shows the prevalence of work-related musculoskeletal health problems in different areas. The staff nurses commonly had problem in the lower back, knee, foot, and neck. The majority of the samples 44% experienced pain (or) discomfort in the lower back, 42% of the sample experienced pain over the knee, 30% of the sampled experienced pain over the foot, and the least 1% of staff nurses had pain in the hand and none of the staff nurses had pain (or) discomfort in the elbow.

Table 3 data show that among 22 staff nurses who had pain in neck, 40% had same pain while working, 40% had worse pain after the shift, 54% of staff nurses had pain interfering with work, and 40% of staff nurses had pain interfering with sleep. The data reveal that among the 44 staff nurses who had pain in the lower back, 38% had experienced worst pain while working, 40% had worst pain after the shift after the shift, 70% of staff nurse had pain interfering with work, and 43% of staff nurses had the pain interfering with the sleep. The data show that among the 42 staff nurses who had pain in the knee, 38% had experienced worst pain while working, 69% of staff nurse had pain interfering with work, and 50% of staff nurses had the pain interfering with the sleep.

Table 4 data reveal that among 100 staff nurses, 35% of staff nurses are often doing extra hours of duty, 79% of staff nurses always experienced prolonged standing, 66% of staff nurses always experienced repetitive movements, 83% of staff nurses often experienced uncomfortable postures, 65% of staff nurses always experienced shifting of patients, 55% of staff nurses have experienced lifting and changing position, and 61% of staff nurses never experienced climbing stairs.

Table 5 shows that 99% of staff nurses work on night shifts, 40% of staff nurses experienced mental stress, and 9% of staff nurses involved in other activities. Among 9% of staff nurses, 3% were doing higher studies, 3% staff nurses were involved in sports, and 3% of staff nurses were involved in household works and part-time job.

## DISCUSSION

The study finding shows that majority of staff nurses were in the age group of 23–25 years, were females, were with 1–3 years

**Table 1:** Frequency and percentage distributions of demographic variables

Demographic variables	Staff nurses	
	Frequency	Percentage
Age (years)		
20–22	25	25
23–25	53	53
26–28	19	19
29–31	2	2
32–34	1	1
Sex		
Male	8	8
Female	92	92
Years of experience (years)		
1–3	83	83
4–6	14	14
7–9	3	3
Area of work		
General ward	43	43
Special ward	30	30
Intensive care unit	15	15
Emergency	5	5
Operation theater	7	7

**Table 2:** Prevalence of work-related musculoskeletal health problems

Area of pain (or) discomfort	Number of respondents	%
Neck	22	22
Shoulder	6	6
Elbow	0	0
Wrist/forearm	2	2
Hand	1	1
Upper back	17	17
Lower back	44	44
Knee	42	42
Foot	30	30

**Table 3:** Experience of pain and discomfort according to the area

Questions	Neck n=22			Upper back n=17			Lower back n=44			Knee n=42			Foot n=30		
	L	S	W	L	S	W	L	S	W	L	S	W	L	S	W
While working	27	40	31	11	17	70	23	38	38	30	30	38	33	33	33
After the shift	31	27	40	52	23	24	25	34	40	42	23	33	44	18	37
After a week	54	31	13	82	5	11	45	34	20	54	30	14	51	33	14
	NI	SI	TL	NI	SI	TL	NI	SI	TL	NI	SI	TL	NI	SI	TL
Interfere with work	36	54	9	29	70	0	18	70	11	26	69	4	25	62	11
	NI	SI	EN	NI	SI	EN	NI	SI	EN	NI	SI	EN	NI	SI	EN
Interfere with sleep	36	40	13	17	58	23	38	43	18	57	50	16	37	25	37

L: Less, S: Same, W: Worst, NI: No interference, SI: Some interference, TL: Taken leave, EN: Every night

**Table 4:** Risk factors for work-related musculoskeletal health problems

Risk factors	Never (%)	Sometimes (%)	Often (%)	Always (%)
Extra hours of duty	3	4	58	35
Prolonged standing	4	6	11	79
Prolonged sitting	88	7	5	0
Repetitive movements	1	5	28	66
Uncomfortable postures	4	2	11	83
Lifting and changing position	5	8	32	55
Shifting patients	3	2	30	65
Climbing stairs	61	32	2	5

**Table 5:** Other risk factors for work-related musculoskeletal health problems

Risk factors	Yes (%)	No (%)
Work on night shifts	99	1
Experience of any mental stress	40	60
Involvement in other activities such as sports, part-time job, household works, and higher studies	9	91

of experience, and were with most of them working in the general wards. A similar study done on MSDs among staff in South Korea's largest nursing home reported almost similar results in that majority participants were female 80.2%.<sup>[13]</sup> In a study to determine the prevalence and risk factors for LBP among nurses in a typical Nigerian and Ethiopian Specialized Hospitals in 2009 that LBP was more prevalent among female nurses (67.5%) than the male nurses (32.5%).<sup>[14]</sup>

The study findings show that the majority of the samples 44% experienced pain (or) discomfort in the lower back, 42% of the sample experienced pain over the knee, and 30% of the samples experienced pain over the foot. In a study, 86% of the nurses were found to be suffering from MSDs with lower back pain and leg pain being the most common among them. Similar results were found in a study done by Israni *et al.*, in Ahmedabad; with the percentage of nurses suffering with MSDs was 76% and leg pain being the most common musculoskeletal complaint.<sup>[15]</sup> In a study by Ellapen and Narsigan, in Duban, South Africa, the percentage of nurses with MSDs was 71.85% and the most common complaint was pain in lower back, neck, and shoulders.<sup>[16]</sup> It has been shown that 60–80% of the general population suffers from LBP at some time during their lives. Among nurses, the lifetime prevalence was found to be slightly higher, varying between 56% and 90%.<sup>[17]</sup> Research from Hong Kong and China has also shown that LBP may affect between 40.6%<sup>[18]</sup> and 57%,<sup>[19]</sup> respectively.

LBP is the most common MSD in adult and about 60–80% of all individuals will experience the condition at some stage in their lifetime. However, it is noticed in this study that majority of the sample (53%) were with 1–3 years' of experience and with age <25 years. The prevalence of MSD in the elbow region was the least. Similar finding was also obtained in the study conducted by Choobineh *et al.*<sup>[20]</sup>

In this study, 79% of staff nurses always experienced prolonged standing, 66% of staff nurses always experienced repetitive

movements, 83% of staff nurses often experienced uncomfortable postures, 65% of staff nurses always experienced shifting of patients, and 55% of staff nurses have experienced lifting and changing position. In a study, pushing and pulling of heavy load in our study mostly affected the neck, elbows, and the lower back. This differed with Smedley *et al.*<sup>[21]</sup> who observed that pushing/pulling seemed to be harder on subjects' shoulders than on their backs. Musculoskeletal pain among hospital nurses has also been associated with some actual tasks and items related to work postures, work control, and work organization.<sup>[22]</sup> Several studies have implicated manual handling of patients' physical loads as predictors of MSDs and low back pain among nurses;<sup>[23]</sup> however, in this study, there was no significant association between MSDs and manual handling of patients. People with MSD symptoms may have been selected out of the most physically demanding jobs.

In this study, 99% of staff nurses work on night shifts, 40% of staff nurses experienced mental stress, and 9% of staff nurses involved in other activities. Among 9% of staff nurses, 3% were doing higher studies, 3% staff nurses were involved in sports, and 3% of staff nurses were involved in household works and part-time job. Psychosocial factors have been identified as strong risks of MSD.<sup>[24]</sup> Mental exhaustion was found to be associated with an almost 2-fold increase in reported MSD in this study. This is also consistent with studies done among Asian nurses who reported high mental pressure as a significant risk factor for MSD.<sup>[25]</sup>

On performing same task repeatedly, 3.1% of the nurses had no problem when performing the same task over and over, 23.1% had minimal or moderate problem while 73.8% had major problem. This clearly indicates that performing a given task over and over again is a major cause of WMSD among nurses. Preventative measure needs to be put in place to reduce the risk of this disorder such as job rotation and taking breaks between shifts. Nurses usually perform their daily task for instance, carrying out injection procedures, and taking weights and body measurements doing it over and over as observed in this study. These are related to WMSD, especially if it done in an awkward/poor posture. Lifting patients in bed, transferring patients out of bed, and lifting patients from the floor were the job activities most commonly reported as sources of back pain among nurses.<sup>[21]</sup>



## CONCLUSION

To help alleviate the considerable MSD burden, there should be greater advocacy, increased recruitment of more human resources, better working conditions, reduction of the work overload and increase job satisfaction and job performance, and adoption of strategies to reduce manual patient handling activities.

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