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Work-related Musculoskeletal Disorders in Indian Nurses: A Cross-sectional Study

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Abstract

It is established that nurses suffer from varying degrees of musculoskeletal disorders (MSD) in different regions of the body which results in frequent loss of work days. There are about 1.5 million registered nurses employed in health sector in India. Out of these, a majority are taking care of the health of 1.2 million strong Indian military personnel. However the prevalence of MSD in these nurses has not yet been explored till date.

A detailed study of the MSD occurring in Indian nurses (n=627) working in Indian Army was carried out using standard Nordic Musculoskeletal Questionnaire and Borg's scale of Rating of Perceived Exertion. The participants completed the Questionnaires in presence of the authors without disclosing their identity. The data collected was tabulated and analyzed for aspects like frequencies of MSD, body parts affected, normal activities prevented, duration of pain in various regions of the body, doctor visited, duty changed, etc. One year prevalence of low back (LB) pain was found to be maximum (67.0%) followed by pain in neck (47.4%) and ankles/feet (36.0%). Musculoskeletal disorders were found to be more widespread among the nurses in middle age group (31-40 years) closely followed by youngest group (21-25 years). Among the subjects studied, married subjects were found to face more problems due to upper body MSD and single nurses suffered more from lower body MSD.

The study concluded that nurses in India were suffering from high level of MSD which could be comparable with international studies with younger age group being at higher risk. This study has highlighted the health status of care givers in Indian Armed Forces and indicates the need to develop preventive strategies to minimise the health risk of these personnel. This would enhance the performance of our nurses and improve the quality of health care services.

Keywords: Nurses; Musculoskeletal disorders; Nordic musculoskeletal questionnaire; Rating of perceived exertion

Introduction

Nursing, the biggest health care profession, is globally dominated by female population. Even though the basics of nursing profession remain the same, nursing practices have changed around the world along with technological advancements. Today nursing is not limited to just delivering expert physical care to the sick. It also involves helping the patient to adjust to unalterable situations such as personal, family and economic conditions, teaching him and others at home and community to take care of one another. Nursing care also includes guiding the patient to prevent illness through hygienic living and helping him to use the available community resources for the same. So modern day 'nursing' may be defined as a process of action, reaction, interaction and transaction in which nurses assist individuals of any age group to meet their basic human needs in coping with their health status at some particular point in their life cycle [1].

However, in course of providing health care, nursing personnel themselves become affected by complex interactive factors including social, cultural, economic and political situations. In Indian context, such situations over the years have resulted in changes in the status of women, population increase, geographic, economic and social mobility, increased educational opportunities, and advances in biomedical technology, introduction of automation, expansion and demand in the supply of better health care. Regarded throughout the world as one of the most strenuous physically and emotionally demanding work, nursing involves typical shift work that disrupts the circadian rhythm, causing several acute and chronic health problems in nursing personnel. A number of studies carried out in other countries have shown that nursing profession is associated with acute and chronic health disorders including many musculoskeletal problems, especially low back pain [2].

The First World War gave way to the establishing of Military Nursing Service in India, which now plays a key role in giving health care to service personnel. Nursing officers in Indian Armed Forces are subjected to long shifts of duty hours with high workload in terms of patient care, housekeeping, administrative work, etc. However reported details of scientific evaluation and official reporting of Musculoskeletal Disorder (MSD) occurrences by these nurses are not available. It was hypothesized that the degree and frequency of MSD occurring in military nursing population will vary with age, marital status, nature of job carried out and duration of work exposure. As the authors were from Defence Research and Development Organization under the Ministry of Defence (Government of India), it was easier for them to conduct such a cross-sectional study on Army personnel. The present study, carried out in 2007-2011, therefore aimed to investigate these factors in nursing personnel of Indian Armed Forces using subjective evaluation and questionnaire survey method.

Methodology

Standard Nordic musculoskeletal questionnaire [3] and Rating of Perceived Exertion [4] were administered to a total number of 627 Nursing Officers, ranking between Lieutenants to Brigadier, volunteered for the study. These nurses were posted in 12 different Military hospitals across the country. The authors visited each of these hospitals and conducted the study themselves. The volunteers were called in a room within their respective hospitals during the working hours, in groups of 20-30. They were told about the purpose of the study. The authors were aware that these Indian Army personnel may not give honest replies regarding their MSD occurrences if they would need to write their names and addresses on the Questionnaire, as they would apprehend that doing so may affect their military carrier adversely. Therefore, the authors requested these Nursing Officers to anonymously fill up the questionnaire giving honest and frank replies. The Nordic musculoskeletal questionnaire was distributed to them. They went through the questionnaire, clarified any doubts from the authors, and then in next 1 to 1½ h they completed the questionnaire. They were not allowed to take the questionnaire for submitting later. This ensured 100% responses from the volunteers.

Nordic musculoskeletal questionnaire

Standard Nordic Musculoskeletal Questionnaire developed by [3] was used. This questionnaire evaluates the musculoskeletal complaints in nine regions of the body namely neck, shoulders, upper back (UB), elbows, lower back (LB), wrists/hands (WH), hips/thigh/buttocks (HTB), knees and ankle/feet (AF) in the last 12 months, 6 months and within 7 days, respectively. The questionnaire also evaluates the normal activities prevented for an individual due to occurrences of MSDs in one or more of these regions of the body. The questionnaire has queries to find the existing status of MSDs in terms of pain in three specific regions of the body, i.e., neck, low back (LB) and shoulders. Some sections of this questionnaire identify the problems faced by the nurses that are directly or indirectly associated with incidences of MSDs in these specific body regions. These problems may be number of days pain persisted, leisure and work activity reduced, visits to doctor, swapping of duties, etc. Subjects' responses on different aspects of MSD were expressed as percentage of the total population studied.

Borg's scale of rating of perceived exertion (RPE) scale

The Borg Scale is a method to measure a person's perceived exertion rate. Developed by Gunnar Borg during the 1980s, the scale does not require any equipment, but asks participants who engage in physical activity to assess his or her perceived rate of exertion from light to strenuous. During exertion, a person puts the Borg Scale to use by deciding how strenuous his or her activity is. The scale measures exertion in a 15 point scale ranging between 6 and 20. During activity a person is asked to honestly evaluate his or her level of effort and assign it a number between 6 and 20. This number is called the rating of perceived exertion. Six represents a person who is not putting forth effort. If a person rates his or her perceived exertion between seven and eight, he or she is exerting modest effort. Nine and 10 is considered very light activity, such as walking comfortably.

In this study participants' perception about the workload endured during different shifts followed in Indian Army Hospitals was evaluated using Borg's Scale (1982). The subjects rated their perception about severity of the job correctly in the concerned shift between 6 to 20, starting with 'no exertion at all' through 'somewhat hard' to 'maximal exertion'. Each volunteer was asked to respond on RPE scale at the end of the particular shift to give her opinion on the perceived workload of the shift on RPE scale.

Results and Discussion

Table 1 gives the physical characteristics like average age, height and weight of the subjects who participated in the study (n=627). Out of this population, the percentage of married, single, widow and divorcee were computed as 62.6%, 35.6%, 0.8% and 1.0, respectively. There were only 11 out of total 627 volunteers who were either widow or divorcee. So their physical characteristics were not represented separately but included within the information on total number of volunteers.

	Age, yrs	Height, cm	Weight, kg
	(Mean ± SD)	(Mean ± SD)	(Mean ± SD)
Total* (n=627)	34.0 ± 8.35	156.4 ± 6.97	53.6 ± 7.25
Single (n=223)	28.4 ± 7.48	156.9 ± 5.84	50.2 ± 6.27
Married (n=393)	37.6 ± 6.74	156.4 ± 5.61	55.7 ± 7.04
*includes widows and divorcee (n=11)			

Table 1: Physical characteristics of the nurses who volunteered for the study along with separate information on single and married population among the participating nurses

Musculoskeletal disorders are inflammatory and degenerative conditions that affect muscles, tendons, ligaments, joints or peripheral nerves, usually leading to ache, pain or discomfort [2]. A number of studies around the world [5,6] have shown that nurses suffer from different degrees of MSDs in different regions of the body due to the nature of their profession.

Table 2 presents the population of nurses, out of the total volunteers participating in the study, who were affected with MSD of different body regions. The occurrences of MSD in nine body regions of single and married nurses are also given in this table. Married nurses, as seen in this study, characteristically suffered more from upper body and upper limb MSD whereas, single nurses were found to be more prone to LB, HTB and knee injuries. Though aetiology of these observations is unknown, the role of body weight and redistribution of fat may be taken into consideration.

	Body Regions				
	Neck	Shoulders	Elbows	Wrist/ Hands	Upper Back
Total nurses (n=627)	52.2	47.2	34.8	33	33.5
Single (n=223)	37.8	34.7	9.1	33.3	25
Married (n=393)	57.4	50.6	63.8	41.3	37.9

Table 2: The population of nurses affected with MSD of different regions with separate information on single and married population among the participating nurses

Table 3 gives the distribution of volunteers (n=627) in different age groups (as given in parenthesis), the percentages of nurses affected with MSD (A, %) and the population in which normal activities were prevented (B, %) in each age group. The age wise distributions of subjects indicate a gradual attrition of nurses beyond the age of 40 years. Distribution of MSD in nine regions of the body in different age groups of our nurses indicated that middle aged nurses, i.e., between 36-40 years suffer maximally from MSD in all the regions of body followed by 31-35 years and 21-25 years age group. Musculoskeletal symptoms beyond the age of 45 years were found to be quite less amongst the subjects studied. This may be due to the fact that higher age group of nurses mostly engages in administrative, housekeeping and logistic activities, rather than strenuous patient care activities. Nurses from age group 21-40 years are engaged in active patient care services and suffer maximally from MSD. These observations of the present study corroborate with the study by [7]. They compared the MSDs in nurses working in two different hospitals and showed that 48% of the nurses in an urban general hospital suffered from LB pain whereas only 33% of nurses suffered from LB pain in a small Oncology department in another hospital. They concluded that LB pain in the nurses varied depending upon the hospital and department where the nurses work [7]. The pain reported in some regions of the body are more (e.g., AF, WH, etc.) but the normal activities prevented are less reported. It is seen that though the pain in LB (18.8%) reported was less than AF (22.6%), but normal activities prevented due to pains in these areas were 8.6% and 6.2%, respectively. This may be due to the fact that work pressure and service rules prevented these nurses to avail.

Body	Age Groups (%, n-627)											
Region	21-25		26-30		31-35		36-40		41-45		46-50	
	-23.10%		-11.30%		-22.30%		-22.30%		-10.00%		-8.00%	
	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)
Neck	19.9	6.7	8.1	4.7	22.5	10.8	22.5	15.5	22.5	6.7	22.5	4.7
Shoulders	14.8	4.6	9.2	5.1	20.8	7.4	20.8	14.3	20.8	6.5	20.8	6.5
Elbows	9.1	1.5	9.1	3	16.7	6.1	16.7	10.6	16.7	6.1	16.7	4.5
WH	15.2	3.4	9.3	4.2	19.5	6.8	19.5	7.6	19.5	5.1	19.5	4.2
UB	21	3.4	10.2	4	23.3	9.6	23.3	7.4	23.3	4.5	23.3	1.7
LB	18.8	8.6	10.9	7.8	23.8	14.5	23.8	15.2	23.8	6.2	23.8	5.2
HTB	11.3	5.6	8.4	4.9	20.4	11.3	20.4	14.1	20.4	4.2	20.4	2.8
Knees	15.9	5.8	10.1	4.3	18.3	6.8	18.3	9.2	18.3	6.3	18.3	3.9
AF	22.6	6.2	11.5	4.4	20.3	9.3	20.3	10.2	20.3	4	20.3	2.9
WH : Wrists/Hands; UB : Upper Back; LB : Lower Back; HTB : Hip/Thigh/Buttock; AF : Ankle/Foot												

Table 3: Distribution of volunteers (n=627) in different age groups (given in parenthesis), the nurses affected with MSD (A,%) and the population in which normal activities were prevented (B, %) in each age group

Prevalence of MSD in different body regions among affected nurses (%) in different periods of the year is given in table 4. It includes one year period prevalence of MSD in nurses apart from MSD occurring in affected nurses between last 6 to 12 months, 7 days to 6 months and within last 7 days. It shows that LB pain was highest followed by neck and A/F. Highest musculoskeletal pain was reported in the LB (67.0%) region followed by neck (47.4%), AF (36.0 %), shoulders (34.4%), knees (33.0%), UB (28.1%), HTB (22.6%), WH (18.8%) and elbows (10.5%) for one year prevalence of MSD. The distribution of MSD of nurses as it occurred between last 6-12 months, 7 days - 6 months and

within last 7 days also reported that LB pain was highest followed by pain in neck and AF. The reported incidences of pain in all the regions of the body in the two groups, 6 – 12 months and 7 days to 6 months were quite closer but less than the prevalence rate of one year. Similar results were observed by researchers in other parts of the globe [1,2,5,8,9]. An epidemiological study in Taiwan showed that 77.9% of nurses suffered from LB pain [10]. Niedhammer et al. [6] observed that 57.9% of French nurses suffered from LB pain.

	Neck	Shoulders	Elbows	Wrist/ Hands	Upper Back	Lower Back	Hip/Thigh/Buttock	Knees	Ankle/Foot
1 Yr Prevalence	47.4	34.4	10.5	18.8	28.1	67	22.6	33	36
6-12 months	43.1	30.5	9.4	15.9	24.9	60.9	19.9	29.5	30.5
7 days-6 months	38.7	28.1	8.6	14.5	22.6	59	19	27.4	30.1
Within 7 days	24.6	20.6	6.2	10.4	17.5	45.6	15.1	19	23.4

Table 4: Prevalence of MSD in different body regions among affected nurses (%) in different periods of a year

A comparison of the occurrences of MSD of different body regions in single (A, n=223) and married (B, n=393) nurses, in different age groups are given in table 5. It shows that married nurses had higher incidences of MSD than those of the single nurses within the age range of 31-40 years. Single nurses' responses for MSD in all of the nine body regions in the age group 21-25 years are much higher than their married counterparts. The reason for this anomaly is difficult to explain as the age range and duration of occupational exposure is same in both the groups. It may be attributed to the fact that married nurses are psychologically more tolerant and their threshold of discomfort and pain tolerance may be higher than single nurses of the same age group. This is clearly evident in the responses of single nurses reporting pain in WH and elbows as high as 60% and 54.5%, respectively, as against 0% reported in both cases by married nurses. However, the responses get reversed in the respondents between the age ranges of 31-40 years. In the age group of 31-35 years, the married nurses report pain in LB, UB and neck as 31.7%, 30.6% and 29.2%, respectively as against the responses of their single counterparts as 4.8%, 5.8% and 4.9%, respectively, for pain in same body parts. This may be attributed to the increase in cumulative stresses in the married nurses due to simultaneous handling of professional issues as well as the increased family responsibilities.

The Table 6 gives frequency of pain occurrences, type of activity reduced, duration of normal activities prevented, doctor visited and duty changed in affected nurses population (%) due to neck, shoulders and LB pain. Pain reported were maximum during 1-7 days (40.7%, 37.5%, 33.3%) as compared to that during 8-30 days (11.8%, 17.1%, 16.4%) or >30 days (29.6%, 31.9%, 32.1%) in neck, shoulders and LB, respectively. The nurses reported that reduction in their work and leisure activities together due to pain in these regions were more than reduction in work and leisure activities taken separately. The nurses affected with MSD needed to change their duties to other wards due to LB, shoulder and neck pains were 11.9%, 9.2 % and 7.1%, respectively. As a result of pain in these body regions, about 28% of affected nurses regularly visited doctors. This observation is very important for maintaining their health status and should be applied while designing the work rotation of the nurses.

	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)	A (%)	B (%)
Neck	64.6	2.9	11	6.7	4.9	29.2	9.7	28.7	2.4	17.2	4.9	10.5	2.4	4.3	0	0.5
Shoulders	57.1	2.4	16.3	7.3	4.1	25.6	14.3	28	2	16.5	2	14	4.1	5.5	0	0.6
Elbows	54.5	0	27.3	5.4	0	20	0	34.5	9.1	23.6	9.1	10.9	0	5.4	0	0
WH	60	0	23.3	4.5	3.3	25	6.7	32.9	3.3	20.4	3.3	10.2	0	5.7	0	1.1
UB	63.5	3.3	15.4	8.3	5.8	30.6	9.6	28.9	1.9	17.3	0	6.6	3.8	4.9	0	0
LB	56.4	3.1	16.9	8.4	4.8	31.7	12.1	29.3	2.4	15	5.6	8.7	1.6	3.8	0	0
HTB	46.9	0.9	15.6	6.5	3.1	25	18.7	40.7	3.1	15.7	6.2	7.4	6.2	3.7	0	0
Knees	51.7	2.1	19	6.9	1.7	24.1	17.2	31	3.4	19.3	3.4	12.4	3.4	5.5	0	0
AF	63.5	2.6	16.2	9.3	4	28	9.4	32.7	2.7	15.3	1.3	10	2.7	2	0	0
WH : Wrists/Hands; UB : Upper Back; LB : Lower Back; HTB : Hip/Thigh/Buttock; AF : Ankle/Foot																

Table 5: Distribution in different age groups of nurses affected with MSDs of different body regions belonging to single (A, n=223) and married (B, n=393) nurses categories

		Neck (%)	Shoulder (%)	Lower Back (%)
Days of Pain	7-Jan	40.7	37.5	33.3
	30-Aug	11.8	17.1	16.4
	>30	29.6	31.9	32.1
	Every Day	17.8	13.4	18.1
Type of Activity Reduced	Work	13.5	12.5	15.5
	Leisure	15.5	18	14
	Both	25.9	27.3	35.2
Normal Activity	7-Jan	32.3	27.3	31.2
Prevented	30-Aug	10.1	10.2	15
	>30	9.8	9.7	13.8
Doctor Visited (%)		27.9	28.2	28.8
Duty Changed (%)		7.1	9.2	11.9

Table 6: Frequency of pain occurrence, type of activity reduced, duration of normal activity prevented, doctor visited and duty changed in affected nurses population (%) due to neck, shoulders and low back pain

Workload of different shifts as perceived and rated by the subjects' (n=627) using Borg Scale [4] is presented in table 7. Mean value of subjective responses in RPE scale for each shift was expressed.

From the data reported in the present study, it was found that neck; shoulders and LB pains in the nurses were more acute in nature and mostly subsided within 7 days. At the same time, about 17.8%, 13.4% and 18.1% of the affected population suffered everyday from neck, shoulder and LB pain respectively. These personnel could be identified as very chronic group suffering from MSD, whose activity (work, leisure or both) were mostly reduced. Though the number of nurses suffering from neck, shoulders and LB pain for more than 30 days was quite large, the normal activity was prevented for only 9.7 to 13.8% (Table 6) of above population. This indicated that the nurses may have learnt to work with the pain, cope with the pain, accommodate or accept the pain as part of the work component [11]. While the nurses suffered acutely from neck, shoulder and LB pain, as seen in this study, only 27.0-29.0% visited doctor due to MSD and only 7.0-12.0% suffering from LB Pain had changed their duties to other wards (Table 6). This observation is very critical as more visits to doctor indicated unhealthy and uncomfortable work environment. This may lead to withdrawal of the nurses from active participation in nursing care, resulting in poor health care services.

While analysing the occurrences of MSD in nursing population in our study as per their age groups, it was observed that about 33% of participating nurses were between 21-30years age (younger group) and 45% between 31-40 years (middle aged), that is, the age range of 21-40 years is represented by 79% of the studied population. The age range of 41-60 years is represented by about 21% only (Table 3). This may be due to attrition of aged nurses, their withdrawal from active nursing duties, change of duties, permanent administration work sitting in the office or premature retirement due to health reasons. In a review paper, Long et al. [12] state that incidences or prevalence of MSD is a possible source of attrition from the work force causing global shortage of health care workers. In the present study, the active young people (21-30 years) were about 33% who carried out the most physically and mentally strenuous jobs like night shift, transferring patient, administering injections, starting intravenous fluids, etc. However, it was the middle aged nurses between 31-40 years age who suffered maximum from MSDs and associated incidences (Tables 3 and 5), followed by the youngest group (21-25 years).

Shift	Mean (SD)
Short Shift (0730-1300h)	12.0 (3.10)
Long Shift (0730-1100 & 1300-1900h)	15.9 (2.63)
Night Shift (1900-0730h)	16.5 (2.79)

Table 7: Rating of different shifts by nurses (n=627) using Borg Scale (Borg 1982)

The prevalence of MSD and associated problems were also found to be quite less in the more aged population (41-60 yrs) in the present study. This finding agrees with the study by Larese and Fiorito [7] which says the intensity of MSD depends upon the type of activities undertaken. Ribeiro et al. [13] carried out a cross-sectional study that estimated the prevalence of work related musculoskeletal disorders (WRMSD) among 308 nursing assistants in Salvador, Bahia. They stated that the prevalence of WRMSD in at least one body segment was 83.4%, followed by low back (53.9%), legs (51.9%), neck (36.4%), upper back (35.7%) and shoulders (33.8%).

The reason for low prevalence of MSD and associated problems in the age group 26-30 years is not yet understood. It may be assumed that this group was already familiar with the hazards of the job and they had not yet spent sufficient time in the service to develop the WRMSD symptoms. Development of WRMSD normally takes about 10-15 years under any work situation of occupational environment. On the other hand, higher responses of the youngest nurses group, in terms of prevalence of MSD, may be considered as their overreaction to a semi-precarious situation and/or being less capable, both physically and mentally, of tolerating the stress of their profession. It is expected that with the progress of their job, they too become acclimatized to the situation and become more tolerant and flexible.

From the available data, the occurrences of MSD in different regions of the body in the single and married nurses (Table 2) were calculated. The study on prevalence of MSD in lower body by Chiou and Wong [10] indicated higher prevalence rate in married nurses. However, present study shows that single nurses suffered more in lower body MSD as compared to married nurses. Also, the pattern / sequence of occurrence of normal activity prevention in both groups did not conform to the incidences in the total population. Elbows pain caused more number of days' activity prevention in the married population (63.8%) which is only 9.1% in single nurses. Maximum days' normal activity was prevented due to LB pain (51.6%, Table 2) in single nurses. There was not much differences in the duration of pain due to neck, shoulders and LB pain in both the groups (Table 6), but activity was reduced more in both the groups due to LB pain as compared to pain in other areas. All these observations indicated that additional social and household responsibilities of raising a family in married nurses along with job stresses played synergistic role in developing the MSD symptoms.

When the distribution of MSD as per the age groups was compared in both married and single group (Table 5), it was observed that in single nurses group it was the youngest nurses (21-25 years) who suffered maximum from all the MSD in all the regions of the body with equal distribution in neck, shoulders, elbow, WH, UB, LB and AF regions. However, in the married nurses' population, middle aged nurses between 31-35 and 36-40 years suffered maximally due to MSD. The prevalence of MSD in nine regions of the body was almost equal in these age groups of married population. It follows that responses of the youngest group (21-25 years) in the total population was actually a representation of the responses of the single/ unmarried nurses. A comparison of the activities prevented due to MSD in single and married nurses' population indicate that maximum activity prevented due to LB pain was 32.9% in married whereas in single nurses it was 51.6% (Table 2). This indicated that younger group was more sensitive and lacked capabilities to cope with occupational stresses and constraints. On the contrary, the occurrences of MSD in the middle aged population were quite natural as it happened in all occupational work environments. Normal activities, as shown in Table 3, were prevented maximally for 31-35 years and 36-40 years age groups of nurses suffering from LB, HTB and neck pains.

Subjective perception of the nurses about workloads of short, long and night shifts, as they undertake regularly, were taken after the respective shifts (Table 7). According to individual perception of the participating nurses, the long shift (0730h-1900h) and night shift (1900h-0730h) were between 'hard' to 'very hard' category of work as per the Scale administered. This indicated that these shifts were perceived by participating nurses as physically and mentally highly demanding. A study by Herin et al. [14] indicated that the psychosocial factors play an important role in the development of upper limb MSD and that there is association between the organizational work environment and MSD in health care workers. This may indicate that the subjects' perception of a particular shift as 'very heavy' may be one of the causal factors in onset of WRMSD in our nurses.

Conclusions

Present study aimed to evaluate the degree and frequency of MSD occurring in military nurses as related to age, marital status, pain in different regions of the body, normal activities prevented, periods of prevalence of MSD and duration of work exposure using questionnaire survey and subjective evaluation method. The study indicated that large numbers of Indian nurses were suffering from WRMSD. The middle aged and the youngest groups were at higher risk zone. According to individual perception of the participating nurses, the long shift (0730h-1900h) and night shift (1900h-0730h) were between 'hard' to 'very hard' category of work as per the Scale administered. These shifts were perceived by participating nurses as physically and mentally highly demanding. Results also indicated that among the nurses who volunteered for the study, the married nurses suffered more acutely due to upper body MSD and the single nurses due to lower body MSD.

This cross sectional study has given an overview of the health status of the military nurses in Indian Armed Forces. It has emphasized the importance of having some preventive strategies tailor-made for nursing profession that may be implemented to improve the working condition and reduce the musculoskeletal complaints to a reasonable limit. Also increasing the numbers of nurses in different wards of the hospitals may reduce their stress level. Suggestions like reduction in total shift duration, reduction in administrative workload of nurses, extensive training on patient handling and maintaining adequate work postures, participating in regular physical exercise programme, etc., could help to keep them operationally fit. Cross-sectional studies, like the present study, may help to identify the problem areas, in terms of WRMSD, that could be responsible in reducing the quality of nursing care given. Taking care of these WRMSD issues may also reduce the attrition of nurses from the health care services.

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