International Journal of Preventive, Curative & Community Medicine
Volume 7, Issue 4 - 2021, Pg. No. 1-7
Peer Reviewed & Open Access Journal

Research Article

Musculoskeletal Disorders among Group-D Staff in Government-Aided Hospitals in Aurangabad City, Maharashtra

Shivsen C Raut[1], Ruchika Kuba[2], Sushmitha Baskar[3]

[1]Artificial Limb Fitting Centre, Government Medical College and Hospital, Aurangabad, Maharashtra, India.
[2]Professor, School of Health Sciences, Indira Gandhi National Open University, New Delhi, India.
[3]School of Interdisciplinary and Trans-disciplinary Studies, Indira Gandhi National Open University, New Delhi, India.
DOI: https://doi.org/10.24321/2454.325X.202115

I N F O

Corresponding Author:
Ruchika Kuba, School of Health Sciences, Indira Gandhi National Open University, New Delhi, India.
E-mail Id:
rkuba@ignou.ac.in
Orcid Id:
https://orcid.org/0000-0002-7757-3304
How to cite this article:
Raut SC, Kuba R, Baskar S. Musculoskeletal Disorders among Group-D Staff in Government-Aided Hospitals in Aurangabad City, Maharashtra. Int J Preven Curat Comm Med. 2021;7(4):1-7.

Date of Submission: 2021-12-02
Date of Acceptance: 2021-12-29

A B S T R A C T

Background: Group-D (attendants) employees are subjected to significant workload due to the constant demand for their services in hospitals.

Objectives: To discern distribution of work-related musculoskeletal diseases (WMSDs) among the Group-D staff according to their work responsibilities and its effects on their Activities of Daily Living (ADL).

Methods: A study was conducted among Group-D staff from five government-aided general hospitals, using customized questionnaires including pre-validated Nordic Musculoskeletal Questionnaire (NMQ) to measure the MSDs and associated inefficiencies in ADL.

Results: Our results showed the MSDs as Low Back pain (LBP) affecting 76.67% of total studied population followed by pain in the wrist/ hands (45%), shoulders (43.33%) and knees (35%). There was a significant difference in the MSDs according to the work; where, among Dhobis (Wrist/ Hands), Office Attendants (Knees and Wrist/ Hands), OPD attendants (Knees, Hip, Upperback and Wrist/ Hands), Ward Attendants (Upperback) and Sweepers (Shoulders and Wrist/ Hands) respectively were affected alongside prevalent MSD. LBP restricted 31.67% of the studied population from performing their ADL.

Conclusion: A high proportion of Group-D staff reported MSDs which were directly related to type of work. However, the number of people who were unable to conduct ADL due to MSD was small. The study highlights the need of ergonomic training among Group D hospital employees.

Keywords: Musculoskeletal Disorders, NMQ, Group-D Staff, Healthcare Workers, Hospital Attendants

Introduction

Healthy population irrefutably can contribute to economic growth and development of a country. Hospitals along with other healthcare setups play a vital role in keeping general

public healthy, where the population of 4.3 million of health care workers (HCWs) works around the clock to serve the population of 1.3 billion people in India.[1-2] In healthcare setup, it requires a broad range of workers such as direct service providers like doctors, nurses, technicians, social workers, administration as well as indirect service providers or back of the house employees like helpers and aides (Group-D) staff to provide health services to the general people.[3] Group-D staff such as multitask workers, attendants, cleaners, etc. of healthcare facilities are exposed to arduous and challenging physical work along with other physically and mentally exhausting situations every day.[4] They act as a back of the house and form a firm support behind every aspect of the services provided to the general public by the hospital. For instance, relocation of patients or holding and supporting patients during their treatment, relocation of equipment and heavy machineries, sanitization, and cleanliness of the hospital premises, regulating the patient flow to the concerned OPDs and departments, and many more physically exhausting duties are performed by these Group-D staff as their work responsibilities on a daily basis. Thus, these activities and responsibilities may render them vulnerable to work related physical stress and leads to deterioration of their health, ultimately affecting the performance of this supporting staff members.[5]

The Musculoskeletal Disorders (MSDs) are a frequent source of morbidity among health care professionals[6] and there have been several studies providing evidences of a causal relationship between physical exertion at work and Work Related Musculoskeletal Disorders (WMSD).[7]

Work related a musculoskeletal disorder (WMSD) is a term used for symptoms caused or aggravated due to occupation or work. They are characterized by distress, incessant pain, functional impairment, or disability, resulting to substantial financial cost and decreased productivity among employers and employees.[8] The work responsibilities of Group-D staff are physically challenging and they are vulnerable to develop WMSDs. As MSDs can originate through various sources and can affect part of the musculoskeletal system and thus a brief, valid and reliable tool becomes an indispensable part of assessment of MSDs, and Nordic Musculoskeletal Questionnaire (NMQ) is considered as valid and reliable tool by several epidemiological studies for MSDs.[9-12]

There are much more prevalence studies available on WMSDs among HCWs such as physiotherapists, doctors, nurses, lab technicians working in the health care setups[8,13-19] however, the dearth of literature available for these Group-D staff members of the healthcare facilities provided impulse for this study. Therefore, a study was conducted among these employees of the government run hospitals in the city of Aurangabad, with the help of NMQ along with the concern of frequently reported MSDs by these helping staff of hospitals.

Materials and Method

A cross-sectional study was carried out among permanent Group-D staff members from 5 government-aided hospitals within the city of Aurangabad, Maharashtra, India. Firstly, the subjects were categorized as per their area of work and responsibilities according to their hospital Group-D employee register; who were identified as Dhobi (Washerman), OPD Attendants, Ward Attendants, Office Attendants and Sweepers from the various departments of hospitals such as Linen Department, OPDs, Wards, Administration and Establishments, Sanitary and Cleaning Department and other miscellaneous departments in the Hospitals. Secondly, the employees from these facilities were approached after a verbal permission from the Head of the Department or Officer Incharge for an informal personal interview with the help of customized questionnaires designed for the study. Employees in Group-D were approached and given a brief overview of the study, including its aims and objectives; they were considered for a follow-up interview only after giving their consent to participate in the study.

Demographic Characteristics of Participants

The demographic characteristics of the participants of the study are given in Table 1.

Table 1.Demographic Characteristic of the Participants of the Survey

Demographic Characteristics		Male		Female		Total	
		No.	%	No.	%	No.	%
Age Range in Years	20- 30	17	35.42	4	33.33	21	35.00
	31- 40	21	43.75	5	41.67	26	43.33
	41- 50	10	20.83	3	25.00	13	21.67
	Total	48	100	12	100	60	100
Area of Work	Dhobi	11	91.67	1	8.33	12	20
	Office Attendant	10	83.33	2	16.67	12	20
	OPD Attendant	7	58.33	5	41.67	12	20
	Sweeper	12	100	0	0.00	12	20

ISSN: 2454-325X
DOI: https://doi.org/10.24321/2454.325X.202115

	Ward Attendant	8	66.67	4	33.33	12	20
	Total	48	100	12	100	60	100
Working Hours	8hrs/ Day	46	95.83	10	83.33	56	93.33
	≤ 12hrs/ Day	2	4.17	2	16.67	4	6.67
Medical Conditions	Systemic Diseases	0	0	0	0	0	0
	Trauma in Last 5 years	0	0	0	0	0	0
	Pregnant	NA	NA	0	0	0	0

Inclusion and Exclusion Criteria of Subjects

Employees among the Group-D staff, who had completed the tenure of minimum 1 year in the same area of work as well as those who were working minimum 8 hours per day, were considered for the study. Whereas subjects who had Systemic Diseases (25.7%) such as cardiovascular diseases, pulmonary diseases, renal diseases, neural diseases, diabetes mellitus and arthritis, history of physical trauma or accident in last five years and persons with physical disability (8.57%), out of the selected age range of 21-50 years of age (age barred) (20%), pregnant employees (2.86%) and those who denied their participation in the study (42.86%) were excluded. The percentage shows the number of subjects who were excluded due to specific reason.

Questionnaire Description

A self-developed customized questionnaire was utilized for the interview, which was divided into two parts. Part A to assess the demographic and occupational characteristics (age, gender, medical conditions, area of work, and duration of work per day). Part B was adopted from the pre-validated Nordic Musculoskeletal Questionnaire (NMQ)[9-12] which assesses the last 6 months self-reported MSDs in the body regions such as neck, shoulder, elbow, wrist/ hands, hip/ buttocks/ thigh, knee, ankles and feet. It also addresses the efficiency ADL performance during last 6 months.

A total of 60 subjects were included out of 95 approached employees for the study with a response rate of 63.16%. The sample of 60 subjects was kept purposively, to manage the data for analysis; where 12 subjects were considered in each area of work and responsibilities.

Results

Table 1, shows that most of the studied population fall under the age range of 31-40 years covering 43%, followed by the 20-30 years covering 35% and the least number of subjects were from 41-50 years covering 21.67% of the total studied population. The proportion of male to female was 80% and 20% respectively.

In the aspect of area of work and responsibilities, the number of subjects was deliberately kept same, to compare parameters of the data and study population recruited in the area of work, to rule out unintended parameters. However, the ratio of male to female was purely random and based on the availability of the employees. As shown in Table 1, according to area of work, the distribution of Male (M) and Female (F) staff among the different categories was - Dhobi's (91.67% M, 8.33% F), Office Attendants (83.33% M, 16.67% F), OPD attendants (58.33% M, 41.67% F), Sweepers (100% M, 0% F), and Ward Attendants (66.67% M, 33.33% F) respectively.

As per the data from Table 1, 93.33% of the studied population (95.83% M; 83.33% F) worked 8 hours per day whereas; 6,67% of the total studied population (4.17% M; 16.67% F) worked less than or equals to 12 hours per day in the hospital while performing their shift duties in the hospitals. Furthermore; as per the exclusion criteria, none of the members from the studied population had any kind of chronic medical condition.

Distribution of MSD among Group-D Staff

As shown in Figure 1 the regional occurrence of MSD for majority of the studied subjects was Lower back affecting 76.67% studied population during last 6 months, followed by the Wrist/ Hands (45%), Shoulders (43.33%); whereas, least number of subjects were affected in the Elbow region (18.33%).

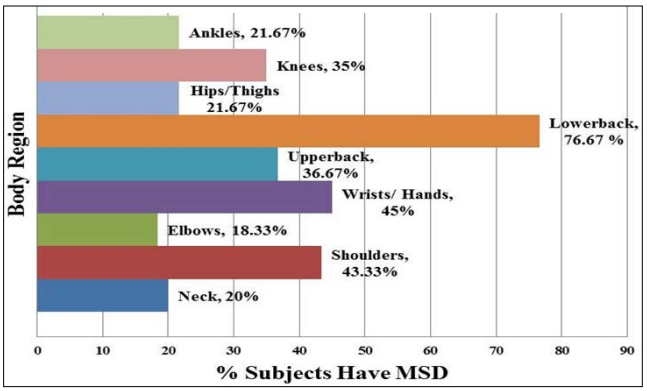

Figure 1.Distribution of MSD among Group-D Staff

Distribution of MSD according to the Area of Work

The analysis was also done for distribution of MSD according to the area of work as shown in Figure 2 and regional MSDs

ISSN: 2454-325X
DOI: https://doi.org/10.24321/2454.325X.202115

affecting subjects other than Lower Back Pain was, among Dhobi's Wrist/Hands (91.67%); Office Attendants Wrist/ Hands and Knees (33.33% each); OPD Attendants Wrist/ Hands, Upperback, Hip/ Thigh/Buttocks, and Knees (25% each); Ward Attendants Upperback (41.67%) and Knees (33.33%); and among Sweepers Shoulder and Lowerback was equally affected in 75% of studied subjects respectively.

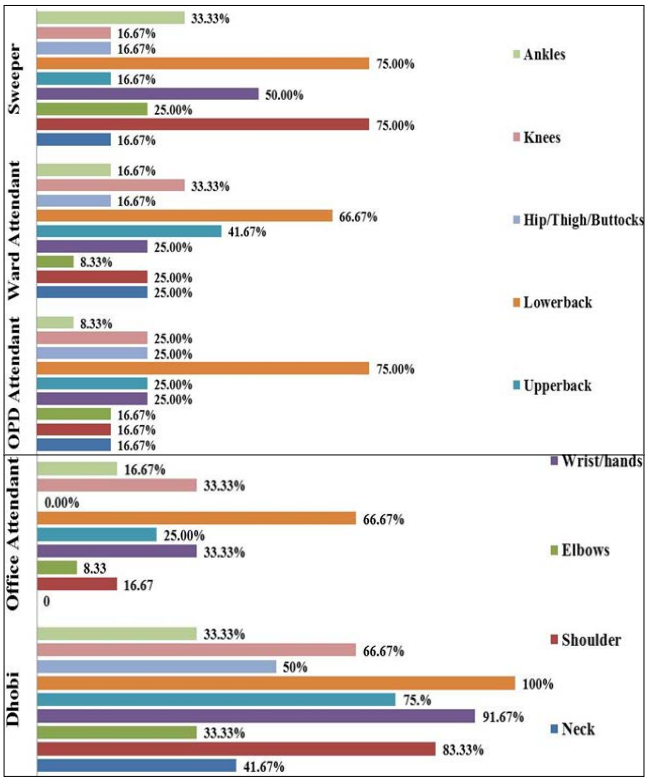

Figure 2.Distribution of MSD according to the Area of Work

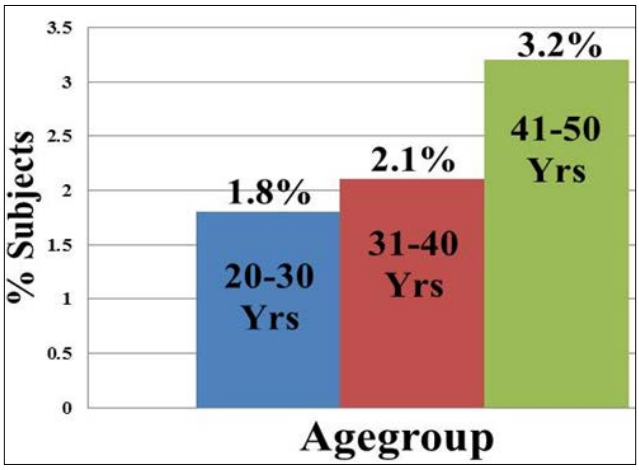

Figure 3.Distribution of Affected Age Group

Affected Age Group

According to Figure 3 the majority number of affected subjects was from the age range of 41-50 years affecting 3.2% subjects with the prevalent MSD, followed by the age range 31-40 years affecting 2.1% subjects from the category. In the age range of 20-31, 1.8% subjects were affected with the prevalent MSD of Lower Back Pain.

Distribution of MSDs Restricting Activities of Daily Living (ADL)

In the study, as shown in Figure 4 among the studied population 31.67% had difficulty in performing ADL due to MSD in Lower back during period of last 6 months. 16.67% subjects felt restriction due to Upperback, Wrist/ Hands and Shoulders equally, while carrying out their activities of daily living; whereas, least of them complained about restriction to perform ADL due to MSDs in neck region (3.33%).

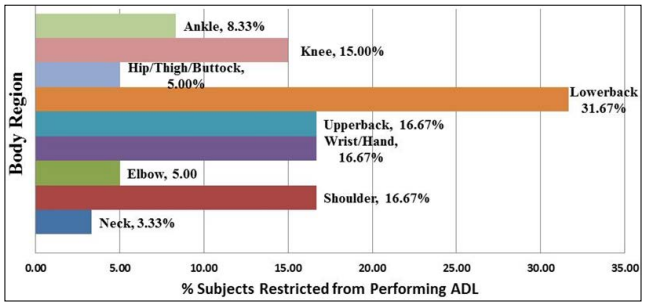

Figure 4.Distribution of MSDs Restricting Activities of Daily Living (ADL)

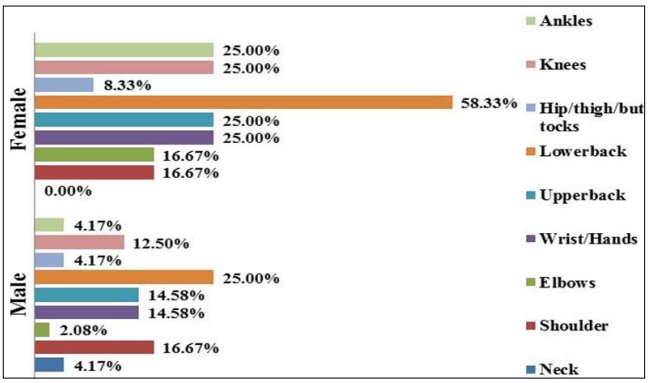

Figure 5.Gender wise ADL Performance

Gender wise ADL Performance

As shown in Figure 5, the gender wise distribution of data suggested that in the last 6 months, (58.33%) females were prevented from performing ADL due to pain in Lower back as compared to their Male counterparts (25%). MSDs in Ankles, Knees, Upperback and Wrist/ Hands were the second most affecting areas for the females preventing (25%) females from performing their ADLs. On the other hand, among Males (4.17%) were prevented from performing ADL due to pain in Ankles, 12.50% males were affected due to pain in Knees. Upperback and Wrist/Hands equally prevented 14.58% males from performing ADL. Shoulder pain equally affected both Males and Females (16.67% each); whereas, pain in Elbows prevented least of the males (2.08%) from performing ADL as compare to their

ISSN: 2454-325X
DOI: https://doi.org/10.24321/2454.325X.202115

Female (16.67%) counterparts. Among female employees, pain in Hip/ Thighs/ Buttocks affected 8.33% Females and Neck pain affected no females; however, pain in Neck and Hips/ Thighs/Buttocks, affected males equally, restricting 4.17% Males from performing ADL during last six months.

Discussion

The study represented an attempt to access the distribution of MSDs among the Group-D staff in the government run or aided hospitals in the city of Aurangabad for the period of six months. There are very few studies and published articles on the Group-D or helping staff of the hospitals which limits its comparison with similar nature of work. Therefore, although the few available studies have been referred to for comparisons, studies on different occupational group such as professors, doctors, nurses, physiotherapists and lab technicians were also referred during the study. Thus, most of the results have been compared in consideration with occupations in health care setups for the nature of work and associated MSDs. In addition, the physical work done by Group-D staff, has also been compared with other categories of workers engaged in laborious work such as farm workers, traditional weavers, waste loaders, and street sweepers to justify the work responsibilities of studied subjects.

The results achieved from the study for the prevalent MSD, which was Lowerback Pain (76.67%) and it was consistent with the other studies in MSD and were relatively in similar range[4,14,15,20] however, the results of few studies on health care staff shows that the MSDs associated with lower back is much lower as compared to this study among health care professionals.[5,19] The prevalence for regional MSDs had uppermost values for Lowerback Pain and it has been frequently testified through previous studies on MSDs. The lowest regional MSD was Elbow (18.33%) and the Neck (20%) became the second lowest region to be affected among the studied population, which is in contradiction to several studies; where, neck and head were most frequently reported MSDs.[7,14,15,17,21]

According to Area of Work, the results were found consistent and significant with the nature of specific duties and responsibilities. Among Dhobis (Washer men), apart from prevalent MSD, Wrist/ Hands (91.67%) and Shoulders (83.33%) were commonly reported MSDs; which were consistent with the MSDs reported for hospital employees.[22] Office Attendants reported MSD in the Wrist/ Hands (33.33%) and Knees (33.33%) and OPD Attendants had their Wrist / Hands, Upperback, Hip / Thigh / Buttocks and Knees equally affected by (25%). Among Sweepers, apart from prevalent MSD, the shoulders (75%), Wrist/ Hands (50%) and Ankles (33.33%) were most commonly affected; where, among Ward Attendants, Upperback (41.67%) and Knees (33.33%) had shown the most frequently affected body regions apart from the lowerback. The results of this study were consistent with the analyses presented and collectively suggests that different work responsibilities affects different body regions with MSD as well as it is significantly associated with the individual and professional factors.[23,4,24,18,19,15,17,25,21,26]

Demographically, prevalent MSD was found frequently affecting the Age Range of 41-50 years of age; whereas, the least number of 20-30 years range, and the results were consistent with the study; where the similar age range reported MSDs frequently.[27]

The highest prevalence of MSD preventing ADL performance found as MSD in Lowerback restricting (31.67%) of the total studied subjects, leaving Upperback, Wrist/Hands and Shoulders at secondary position affecting (16.67%) the entire population, followed by Knee affecting (15%) of the studied subjects. The gender factor was significant; where, female Group-D staff was most often felt restriction in ADL performances due to MSDs as compared to their male counterparts. The results found to be in agreement with the other studies stating the prevalent MSD was most frequent among females than males.[28,17,14]

To recapitulate, the outcomes for prevalent MSD of Lowerback were congruent with outcomes of most of the studies with the similar or relatable population. There is significant difference in the regional MSDs affecting different body regions across the different area of work. Upper aged subjects were most vulnerable to the MSDs; which may be owing to their deteriorating health caused by underlying age related conditions; however, the younger population can sustain to the physical exertion demanded by the work.

There are certain limitations to this study. One of them is the non-generalization of outcomes due to the small sample size as well as male to female ratio being considerably low. Because the survey was conducted informally, it may have resulted in erroneous or casual responses to the interview. Also, ergonomical factors were not evaluated.

Conclusion and Recommendations

In conclusion, this study revealed the six months MSDs symptoms among studied Group-D (Aides group) staff of the government-run hospitals in the city of Aurangabad over six months. A high proportion of Group-D staff reported MSDs, at least in one body region with the Lowerback being injured most often. Individual work responsibilities and their associated MSDs are in accordance with the literature found on the health care workers and other similar and relatable population.

The employees falling in the range of age group of 41-50 years were most frequently affected. Their lowerback,

ISSN: 2454-325X
DOI: https://doi.org/10.24321/2454.325X.202115

shoulders and wrist/ hands were the most frequently affected body regions among all the different area of work (posts) of the group-d staff of the hospitals.

The findings show that, MSDs in Lowerback have prevented fewer employees from completing activities of daily living (ADL), but female employees have been impacted in greater numbers and have been restricted from conducting other personal activities.

Further studies can be undertaken with bigger sample sizes to reduce bias and increase generalization of findings. Impartial evaluation of participants would reduce feedback bias and aid in the collection of reliable data. To identify and determine the exact ergonomic risk factors responsible for the development of MSDs, additional investigations should include nature of work analysis and work site analysis.

Acknowledgement

The authors convey their heartfelt gratitude to all the participants for their exuberant cooperation throughout the data collection for this study. Authors would also like to extend their appreciations to the people whose direct or indirect involvement facilitated finalizing the study.

Source of Funding: None

Conflicts of Interest: None

References

1. National Health Profile 2011 India: Central Bureau of Health Intelligence, Director General of Health Services, Ministry of Health & Family Welfare, Government of India; 2011 [cited 2013 February 16]. Available from: http://www.cbhidghs.nic.in/index2.asp?slid51208&sublinkid5944
2. National Health Profile 2018 India: Central Bureau of Health Intelligence, Director General of Health Services, Ministry of Health & Family Welfare, Government of India; NHP 2018, 13th Issue.
3. Chhabra SA. Health hazards among health care personnel. J Mahatma Gandhi Inst Med Sci. 2016 Jan;21(1):19. [Google Scholar]
4. Nodooshan S, Rastipisheh P, Yadegarfar G, Daneshmandi H, Alighanbari N, Taheri S. The effect of work-related psychosocial stressors on musculoskeletal disorder symptoms in hospital attendants. Work. 2020 Oct;1-0. [PubMed] [Google Scholar]
5. Hafner ND, Milek DM, Fikfak MD. Hospital staff's risk of developing musculoskeletal disorders, especially low back pain. Slovenian J Pub Health. 2018 Jun;57(3):133. [PubMed] [Google Scholar]
6. Fritzsche FR, Ramach C, Soldini D, Caduff R, Tinguely M, Cassoly E, Moch H, Stewart A. Occupational health risks of pathologists-results from a nationwide online questionnaire in Switzerland. BMC pub health. 2012 Dec;12(1):1-2. [Google Scholar]
7. Bernard BP. Musculoskeletal disorders and workplace factors: a criticial review of epidemiologic evidence for work-related musculoskeletal disorders of the neck, upper extremity, and low back . Publication No. 97-141. National Institute for Occupational Safety and Health. Cincinnati, OH: U.S. Department of Health and Human Services. 1997.
8. Ellapen TJ, Narsigan S. Work related musculoskeletal disorders among nurses: systematic review. J Ergon. 2014;4:S4-003. [Google Scholar]
9. López-Aragón L, López-Liria R, Callejón-Ferre ÁJ, Gómez-Galán M. Applications of the standardized Nordic questionnaire: a review. Sustainability. 2017 Sep;9(9):1514. [Google Scholar]
10. Gupta G, Bhavana R, Rishikesh R. Reliability and validity of Hindi version of Nordic musculoskeletal questionnaire. EC Orthop. 2018;9(8):533-8.
11. Pinheiro FA, Tróccoli BT, Carvalho CV. Validity of the Nordic Musculoskeletal Questionnaire as morbidity measurement tool. Revista de Saude Publica. 2002 Jun;36(3):307-12. [Google Scholar]
12. Descatha A, Roquelaure Y, Chastang JF, Evanoff B, Melchior M, Mariot C, Ha C, Imbernon E, Goldberg M, Leclerc A. Validity of Nordic-style questionnaires in the surveillance of upper-limb work-related musculoskeletal disorders. Scand J Work Environ Health. 2007 Feb;33(1):58. [PubMed] [Google Scholar]
13. Abaraogu UO, Ezema CI, Nwosu CK. Job stress dimension and work-related musculoskeletal disorders among southeast Nigerian physiotherapists. Int J Occup Saf Ergon. 2017 Jul;23(3):404-9. [PubMed] [Google Scholar]
14. Choobineh A, Movahed M, Tabatabaie SH, Kumashiro M. Perceived demands and musculoskeletal disorders in operating room nurses of Shiraz city hospitals. Indust health. 2010;48(1):74-84. [PubMed] [Google Scholar]
15. Jellad A, Lajili H, Boudokhane S, Migaou H, Maatallah S, Frih ZB. Musculoskeletal disorders among Tunisian hospital staff: Prevalence and risk factors. Egyptian Rheumatol. 2013 Apr 1;35(2):59-63. [Google Scholar]
16. Sadeghian F, Kasaeian A, Noroozi P, Vatani J, Taiebi SH. Psychosocial and individual characteristics and musculoskeletal complaints among clinical laboratory workers. Int J Occup Saf Ergon. 2014;20(2):355-61. doi: 10.1080/10803548.2014.11077049. PMID: 24934430. [PubMed] [Google Scholar]
17. Shafiezadeh K. Prevalence of musculoskeletal disorders among paramedics working in a large hospital in Ahwaz, southwestern Iran in 2010. IJOEM. 2011;2:3. [PubMed] [Google Scholar]
18. Szeto GP, Ho P, Ting AC, Poon JT, Cheng SW, Tsang

RC. Work-related musculoskeletal symptoms in surgeons. J Occup Rehab. 2009 Jun;19(2):175-84. [PubMed] [Google Scholar]

19. Yasobant S, Rajkumar P. Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital, India. Indian J Occup Environ Med. 2014 May;18(2):75. [PubMed] [Google Scholar]
20. Chanchai W, Songkham W, Ketsomporn P, Sappakitchanchai P, Siriwong W. Prevalence and factors associated with musculoskeletal disorders among Thai hospital orderlies. Int J envron Res Publ Health. 2016;13:464. [PubMed] [CrossRef] [Google Scholar]
21. Salve PS, Chokhandre P. Assessing the exposure of street sweeping and potential risk factors for developing musculoskeletal disorders and related disabilities: a cross-sectional study. BMJ open. 2016 Dec 1;6(12):e012354. [PubMed] [Google Scholar]
22. Farhaduzzaman SM, Hossain QZ. Prevalence of musculoskeletal disorders among selective hospital employees in Bangladesh. Asia Pacific Environmental and Occupational Health Journal. 2018;4(3).
23. Farhaduzzaman SM, Hossain QZ. The association between musculoskeletal disorders and work-related risk factors in hospital employees of Bangladesh. Asia Pacific Environmental and Occupational Health Journal. 2018;4(3).
24. Liang CA, Levine VJ, Dusza SW, Hale EK, Nehal KS. Musculoskeletal Disorders and Ergonomics in Dermatologic Surgery: A Survey of M ohs Surgeons in 2010. Dermatol Surg. 2012 Feb;38(2):240-8. [PubMed] [Google Scholar]
25. Rahman MN, JAFFAR MS. Musculoskeletal symptoms and ergonomic hazards among room attendants in hotel industries. J Human Factors Ergonomics. 2017;1(2):25-34. [Google Scholar]
26. Ramdan IM, Duma K, Setyowati DL. Reliability and Validity Test of the Indonesian Version of the Nordic Musculoskeletal Questionnaire (NMQ) to Measure Musculoskeletal Disorders (MSD) in Traditional Women Weavers. [Google Scholar]
27. Salve P, Chokhandre P, Bansod D. Assessing musculoskeletal disorders among municipal waste loaders of Mumbai, India. Int J Occup Med Environ Health. 2017 Oct 6;30(6):875-86. [PubMed] [Google Scholar]
28. Estryn-Behar M, Kaminski M, Peigne E, Maillard MF, Pelletier A, Berthier C, Delaporte MF, Paoli MC, Leroux JM. Strenuous working conditions and musculo-skeletal disorders among female hospital workers. Int Arch Occup Env health. 1990 Jan;62(1):47-57. [PubMed] [Google Scholar]

ISSN: 2454-325X
DOI: https://doi.org/10.24321/2454.325X.202115