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Original Research Article

Musculoskeletal disorders among group D healthcare workers in a tertiary care hospital in urban Bengaluru

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ABSTRACT

Background: Musculoskeletal disorders (MSDs) are a major cause of disability worldwide, with healthcare workers—especially Group D staff—being particularly vulnerable due to physically demanding tasks such as lifting, prolonged standing, and repetitive movements. This study aimed to determine the prevalence of MSDs and identify associated risk factors among Group D healthcare workers in a tertiary care hospital in Bengaluru.
Methods: A cross-sectional study was conducted among 100 Group D healthcare workers with at least six months of work experience. Data were collected using a structured questionnaire assessing sociodemographic details, work history, and MSD symptoms. Interviews were conducted face-to-face in the local language. Statistical analysis was performed using SPSS version 20.0, applying descriptive statistics and relevant associations.
Results: The study revealed a high prevalence of MSDs, with 54.3% reporting lower back pain, and nearly one in three workers reporting neck and knee pain. Females reported a higher proportion of musculoskeletal symptoms compared to males. Long working hours, repetitive tasks, awkward postures, and lack of ergonomic support were identified as major contributing factors. Sleep disturbances, mood changes, and reduced ability to perform daily activities were also commonly reported.
Conclusions: More than one in two workers experienced MSDs, largely due to long hours and poor ergonomics, leading to reduced quality of life. Strengthening workplace ergonomics and preventive health measures is essential to protect this workforce.

Keywords: Musculoskeletal disorders, Healthcare workers, Ergonomics, Occupational health, Group D staff, Bengaluru

INTRODUCTION

Musculoskeletal disorders (MSDs) are one of the leading causes of disability worldwide. According to the Global Burden of Disease (GBD) 2019, approximately 1.71 billion people globally are living with MSDs, while in the WHO Western Pacific Region and South-East Asia Region, 427 million and 369 million people are affected, respectively.[1] MSDs, affecting the muscles, tendons, joints, nerves, and supporting structures like intervertebral discs, are widespread across multiple professions. Healthcare workers, particularly those in physical, repetitive, or labour-intensive roles, are highly susceptible to MSDs. Group D healthcare workers, including hospital cleaners and support staff, often face elevated risks due to heavy lifting, prolonged standing, and repetitive tasks.[2] Healthcare tasks, including lifting patients, repetitive movements, prolonged standing, and awkward postures during patient care, expose workers to multiple ergonomic risk factors.[3] MSDs can lead to absenteeism, reduced productivity, and permanent disability, creating economic loss for institutions and

society.[4] Hence, this study aims to determine the prevalence of MSDs and associated risk factors among Group D healthcare workers at a tertiary care hospital in Bengaluru.

METHODS

Study design and setting

A cross-sectional study was conducted over a period of Six months from January to July 2025 among Group D healthcare workers at a tertiary care hospital in Bengaluru.

Sample size

The sample size was calculated using the following formula:

n=Z2×P×(1−P) d2 Where:

The sample size (n) is determined using a standard formula where Z represents the standard normal deviate of 1.96 corresponding to a 95% confidence level, p is the estimated proportion of MSD which is 77.3%, q is calculated as 1 minus p, and d is the absolute precision set at 10%.

Using this formula, the calculated sample size was 70 participants. Total participants included in the study are 100 participants.

Sampling method

A convenience sampling method was employed to select the study participants. This method was chosen to ensure easy accessibility and practicality in the selection of participants who met the inclusion criteria. The study participants were healthcare workers from various departments of the hospital who were willing to participate.

Study population

The study population consisted of Group D healthcare workers (cleaners, ward boys, and other support staff) employed at tertiary care hospital, with at least 6 months of work experience and who gave written informed consent. Participants with any severe chronic illnesses, pregnant women and Those who are not available even after attempting to contact for more than 2 times were excluded from the study.

Data collection

Data was collected using structured questionnaires, which were administered through face-to-face direct interviews. The interviews were conducted in the local language, and participants were given ample time to comprehend and respond to each question. The questionnaire included sections on demographic details, work history, physical activity, and the presence of musculoskeletal disorders.

Participants were also asked to rate the severity of their musculoskeletal pain using an Extended Nordic Musculoskeletal Questionnaire, and additional questions focused on identifying potential ergonomic risks in their work environment (e.g., prolonged standing, heavy lifting, and awkward postures).[6] Consent was obtained from each participant prior to data collection, ensuring that they were informed of the study's purpose and that their participation was voluntary.

The data were gathered in a confidential manner, and participants were assured that their responses would only be used for research purposes. The collected data were then analysed to determine the prevalence of MSDs among the workers and to assess the risk factors associated with these disorders.

Ethical considerations

The study was approved by the institution Ethics Committee. Informed consent was obtained from all study participants, ensuring that they were fully aware of the study's objectives, methods, and potential risks and benefits. Participants were informed that their participation was voluntary, and they could withdraw from the study at any time without any repercussions.

During the data collection process, confidentiality was maintained. All personal identifiers were removed, and the data were anonymized to protect the privacy of participants. The information collected was used solely for the purpose of the research and was stored securely. Ethical guidelines were followed to ensure the safety, rights, and dignity of all participants throughout the study.

Statistical analysis

The data analysis for this study was carried out using the Statistical Package for Social Sciences (SPSS) Version 20.0. Data were entered and processed using Microsoft Excel, after which they were numerically coded for ease of analysis. Descriptive statistics, including frequencies and percentages, were used to summarize categorical data, while continuous data were presented using mean and standard deviation.

RESULTS

Table 1 presents the sociodemographic characteristics of the study participants. The largest proportion of participants belonged to the 36–45-year age group (30%), followed by those aged 26–35 years (25%). Females constituted the majority of the study population (74%). With respect to educational status, most participants had completed high school (35%) or graduation (30%). A majority were married (70%), and more than half of the

participants possessed Above Poverty Line cards (55%). Table 2 shows the distribution of participants according to work-related and health parameters. Almost 70% of the individuals had been employed for more than one year, and 40% worked in day shifts.

Cleaning and sanitation work (30%) and general maintenance work (30%) were the most common job categories. Government health services were utilized by half of the participants. The mean height, weight, and BMI were 165 cm, 70 kg, and 24.5 respectively. Hypertension (20%) and diabetes (15%) were the most commonly reported existing illnesses. A majority of participants consumed a non-vegetarian diet (65%).

Table 1: Distribution of individuals according to the sociodemographic variables (n=100).

S. no.	Variables	Categories	Frequency (percentage) N (%)
1	Age (in years)	18-25	15 (15)
		26-35	25 (25)
		36-45	30 (30)
		46-55	20 (20)
		56-60	10 (10)
2	Gender	Male	26 (26)
		Female	74 (74)
3	Educational qualification	Illiterate	5 (5)
		Primary school	15 (15)
		High school	35 (35)
		Graduate	30 (30)
		Postgraduate	15 (15)
4	Marital status	Married	70 (70)
		Unmarried	30 (30)
5	APL/BPL card holder	APL	55 (55)
		BPL	45 (45)

Table 3 shows the distribution of musculoskeletal problems across gender. Aches or pains in the past 12 months were mainly reported by females (74.1%), while males accounted for 25.9%.

Trouble related to pain in the past seven days was reported by females (77.8%) and males (22.2%). Working posture worsening the condition was reported by females (78.2%) and males (21.8%).

Sleep disturbance due to musculoskeletal pain was reported by females (78.2%) and males (21.8%). Mood disturbance related to musculoskeletal problems was reported by females (80%) and males (20%).

Figure 1 describes the distribution of participants according to their personal habits. Smoking, smokeless tobacco and alcohol consumption seen more among males, about 77% ,31% and 70% respectively.

Table 2: Distribution of individuals according to the work and health parameters (n=100).

S. no.	Variables	Categories	Frequency (percentage) N (%)
1	Duration of employment	<6 months	10 (10)
		6 months to 1 year	20 (20)
		1-3 years	35 (35)
		>3 years	35 (35)
2	Shift timing	Day shift (8 am - 2 pm)	40 (40)
		Evening shift (2 pm - 10 pm)	20 (20)
		Night shift (10 pm - 8 am)	15 (15)
		Rotating shifts	25 (25)
3	Type of work	Cleaning and sanitation	30 (30)
		Waste management	25 (25)
		General maintenance	30 (30)
		Other	15 (15)
4	Group D health care utilization	Government	50 (50)
		Private	40 (40)
5	Health parameters	Height (mean)	165 cm
		Weight (mean)	70 kg
		BMI (mean)	24.5
6	Existing illnesses	Hypertension	20 (20)
		Diabetes	15 (15)
		Other illnesses	10 (10)
7	Type of diet	Vegetarian	30 (30)
		Non-vegetarian	65 (65)
		Other	5 (5)

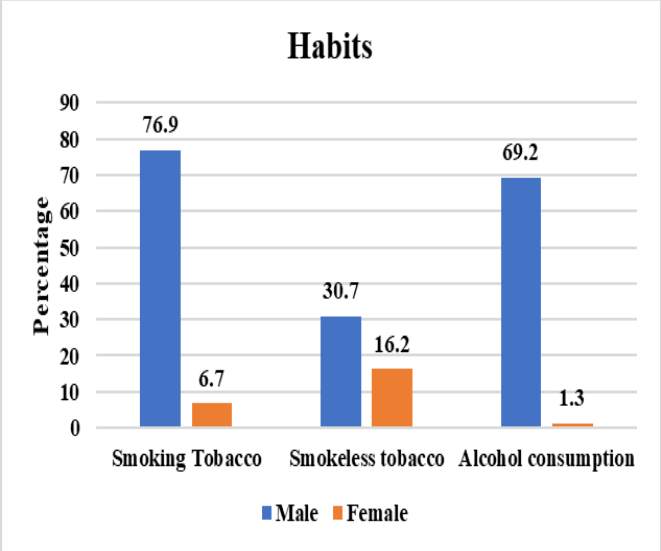

Figure 1: Distribution of individuals according to the personal habits (n=100).

Table 3: Distribution of musculoskeletal pain across gender variable (male=26; female=74).

S. no.	Variables	Categories	Gender	
			Male	Female
1	Aches/pains in past 12 months	Yes	22 (25.9)	63 (74.1)
		No	4 (26.7)	11 (73.3)
2	Prevented from doing normal work	Yes	15 (30)	35 (70)
		No	11 (22)	39 (78)
3	Trouble in past 7 days	Yes	10 (22.2)	35 (77.8)
		No	16 (29.1)	39 (70.9)
4	Taken medication in past 7 days	Yes	8 (26.7)	22 (73.3)
		No	18 (25.7)	52 (74.3)
5	Working posture worsens condition	Yes	12 (21.8)	43 (78.2)
		No	14 (31.1)	31 (68.9)
6	Seen a doctor for this condition	Yes	10 (25)	30 (75)
		No	16 (26.7)	44 (73.3)
7	Changed profession due to this condition	Yes	2 (20)	8 (80)
		No	24 (26.7)	66 (73.3)
8	Changed profession due to this condition	Yes	4 (26.7)	11 (73.3)
		No	22 (25.9)	63 (74.1)
9	Trouble sleeping due to condition	Yes	12 (21.8)	43 (78.2)
		No	14 (31.1)	31 (68.9)
10	Trouble walking due to muscle/joint pain	Yes	8 (22.9)	27 (77.1)
		No	18 (27.7)	47 (72.3)
11	Condition affected mood	Yes	10 (20)	40 (80)
		No	16 (32)	34 (68)
12	Made lifestyle changes due to condition	Yes	10 (25)	30 (75)
		No	16 (26.7)	44 (73.3)
13	Faced workplace incidents	Yes	7 (23.3)	23 (76.7)
		No	19 (27.1)	51 (72.9)
14	Experienced economic crisis due to condition	Yes	6 (24)	19 (76)
		No	18 (24)	55 (76)
15	Received ergonomics training	Yes	8 (22.9)	27 (77.1)
		No	18 (77.1)	47 (72.3)

DISCUSSION

Prevalence of musculoskeletal pain

The study demonstrated a high prevalence of musculoskeletal pain among Group-D workers, with over 80% of both males and females reporting aches or pains in the previous 12 months. This finding is consistent with studies among healthcare professionals, where prevalence rates frequently exceed 80–90% annually.

A Nigerian study among healthcare workers reported a 12-month prevalence of 94.2%, with the lower back being the most commonly affected region.[7]

Similarly, a hospital-based study in Morocco found an overall MSD prevalence of 89.2% among healthcare professionals.[8] A recent meta-analysis involving 42 studies and over 36,000 nurses also reported a global pooled prevalence of 77.2%.[9]

Gender differences

The study revealed minimal gender differences in the prevalence of MSDs, with females only slightly more affected than males. similarly, the Moroccan study found MSD prevalence of 95% among females versus 77.5% among males.[8] Other several international reviews have highlighted female gender as a major predictor of musculoskeletal symptoms.[9]

The deviation in the present study may be attributed to the nature of Group-D roles, where both male and female workers are exposed to similar physical tasks, including cleaning, waste handling, and sanitation duties.

Work experience, shift patterns, and occupational demands

The study showed that a majority of workers had between one and three years or more than three years of employment, and MSD symptoms were distributed across all experience groups. Similar findings have been

reported in previous research, which identified workers with fewer than ten years of experience as having significantly higher risk of MSDs, possibly due to limited ergonomic adaptation or survival bias, wherein workers with severe pain may exit the profession early.[8] Rotating shifts and long hours of physically demanding work have been previously identified as risk factors for MSDs. The Moroccan study reported a prevalence of 92% among shift workers, supporting the present finding that rotating-shift workers exhibited high levels of discomfort.[8] The cleaning, maintenance, and waste management responsibilities of Group-D workers involve repetitive motion, awkward postures, and prolonged standing, all of which are recognized ergonomic hazards contributing to MSDs.[7-9]

Distribution of affected body regions and functional impact

The study shows lower back and lower extremities pain among participants. This aligns with multiple studies in which the lower back consistently emerges as the most affected region. The Nigerian study found lower-back prevalence of 79.7%, while the Moroccan hospital study recorded a 63.3% prevalence of lower-back pain.[7,8] Meta-analytic evidence supports these findings, reporting the lower back, neck, and shoulders as the most commonly affected anatomical sites among healthcare personnel worldwide.[9] The high impact of pain on normal work activities in the present study also reflects findings from previous research that associates MSDs with work disability, reduced productivity, and increased workplace errors.[9] Notably, a significant proportion of workers in the present study reported workplace incidents associated with pain, highlighting the occupational risk posed by untreated or persistent musculoskeletal conditions.

Limitations

The study has several limitations that should be considered. Its cross-sectional design prevents understanding long-term trends in MSDs and reliance on self-reported questionnaires introduces potential recall or reporting bias. Important factors such as genetic predisposition, previous injuries, and lifestyle habits were not fully controlled. Variations in job roles and workloads may also affect the generalizability of the findings. Since the research was conducted within a specific industry setting, the results may not be applicable to other workplaces.

CONCLUSION

This study highlights a significant burden of MSDs that one in two workers experienced lower back pain and nearly one in three reported neck and knee-related problems. It is strongly linked to prolonged working hours, repetitive tasks, and poor ergonomic conditions. It is not only caused physical discomfort but also affected workers' daily activities, sleep quality, and emotional well-being. The study underscores the urgent need for ergonomic interventions, workplace health programs, and targeted preventive measures to reduce musculoskeletal strain and improve the overall health and productivity of healthcare support staff.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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