RESEARCH PAPER

A Study To Assess The Ergonomic Hazards And Musculoskeletal Disorders Among The Health Care Workers At Government Medical College Anantnag, Kashmir.

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ABSTRACT

Healthcare workers are regularly exposed to various physical and environmental demands that place them at high risk for ergonomic stress and musculoskeletal disorders (MSDs). Tasks such as prolonged standing, repetitive movements, awkward postures, and handling patients contribute significantly to these occupational health issues. This study was conducted to assess the pattern of ergonomic hazards and the prevalence of MSDs among healthcare workers at Government Medical College Anantnag, Kashmir. A descriptive cross-sectional study was carried out over a period of six months in 2022 among 350 healthcare workers from different departments. Participants were selected based on availability and willingness to participate. Data were collected using a structured questionnaire divided into three sections: demographic profile, assessment of ergonomic hazards, and musculoskeletal symptoms. The questionnaire included yes/no items addressing exposure to physical, biological, and psychosocial risk factors. Ethical approval was obtained prior to data collection, and informed consent was taken from all participants. Data were analyzed using frequency and percentage distribution. The majority of participants were young adults aged 26–30 years, predominantly male, and engaged mainly in clinical work. A high proportion reported exposure to ergonomic stressors such as repetitive tasks, prolonged static postures, bending and twisting, and working beyond physical limits. Back pain, neck pain, muscle aches, and posture-related discomfort were frequently reported. Psychosocial issues, including workplace stress and verbal or physical abuse, were also noted. Although only a minority were receiving treatment for MSDs, a substantial number experienced recurrent symptoms that could impact long-term health and productivity. The study highlights a significant burden of ergonomic hazards and musculoskeletal symptoms among healthcare workers at GMC Anantnag. The findings emphasize the need for improved ergonomic practices, adequate staffing, regular training, and a supportive work environment to reduce occupational strain. Implementing preventive strategies rather than depending solely on treatment can enhance workers' wellbeing and improve overall healthcare delivery**.**

Keywords: Ergonomic hazards; Musculoskeletal disorders; Healthcare workers; Occupational health; Repetitive strain; Workplace safety; Kashmir; GMC Anantnag.

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INTRODUCTION

According to OSHA, the term ergonomics can be simply defined as the study of work. In detail, it is the science of designing work to fit the employee instead of physically forcing the worker's body to fit the work. It is the interaction of the employee with various elements in the work environment. These elements such as workstations, tasks, tools, and equipment must adapt to fit the job of the employee. Ergonomics at the workplace is envisioned to maximize the productivity by reducing the employee's discomfort and fatigue. This will help to reduce prevalence of work-related health disorders among the workers (U.S Department of Labor, Occupational Safety and Health Administration, 2000).[1]

Ergonomic hazards are physical conditions that may pose risk of injury to the musculoskeletal system[2], such as the muscles or ligaments of the lower back, tendons or nerves of the hands/wrists, or bones surrounding the knees, resulting in a musculoskeletal disorder (MSD). An ergonomic hazard in the workplace is any condition which has the potential to cause harm to a worker's musculoskeletal system. An ergonomic hazard may be caused by the physical condition of the workplace or the physical demands of a particular job. When there is a poor fit, a worker may suffer injuries or trauma, sometimes

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referred to as ergonomic disorders or musculoskeletal disorders (MSDs). Whenever a situation has the potential to cause stress or strain on an employee's body, it is an ergonomic hazard. Ergonomic hazards may also be referred to as ergonomic risk factors or biomechanical stressors.[3]

OBJECTIVES

To assess the ergonomic hazards among the health care workers.

To assess the musculoskeletal disorders among the health care workers.

To find the co-relation between the ergonomic and musculoskeletal disorders among the health care workers with their socio-demographic and clinical variables

MATERIAL AND METHODS

Descriptive cross sectional prospective study was carried out among the healthcare workers of Government Medical College Anantnag for the period of six months in 2022.

Inclusion Criteria: Health Care workers who were:

• Available at the time of study.
• Willing to participate in the study.
• Working in various areas of GMC Anantnag.

Exclusion Criteria: Health Care workers who were:

• On leave at the time of study.
• Not willing to participate in the study.

Data Collection Instrument: In the present study data collection instrument used was structured questionnaire to assess ergonomic hazards and musculoskeletal disorders.

Description of the tool: Structured questionnaire was used as the research tool to get responses from the subjects. It is divided into three main sections. **Section I**: Demographic data related to Health care workers. **Section II**: Included the assessment of ergonomic hazards among health care workers. It consisted of 24 items with "Yes or No" response on a Likert Scale and was further divide into four sub-sections to assess the ergonomic hazards. **Section III**: It included the assessment of musculoskeletal disorders. It consisted of 17 items with "Yes or No" response.

Ethical consideration: Prior permission was obtained from the principal of Government Medical College, Anantnag to conduct the study. Synopsis was presented and submitted to Ethical committee of GMC Anantnag for ethical clearance and permission. The purpose of study was informed and explained to the Health Care Workers and permission was obtained by taking informed consent from them, and privacy, confidentiality and anonymity had been guarded.

Table 1: Demographic and Work Characteristics of Study Subjects:

Variable	Response	Frequency	Percentage (%)
Age Distribution	Less than 25 years	19	5.4%
	26-30 years	190	54.1%
	31-35 years	39	11.1%
	36-40 years	56	16.0%
	41-45 years	15	4.3%
	Greater than 51 years	3	0.9%
	Total	**350**	**100.0%**
Gender Distribution	Male	231	65.8%
	Female	119	33.9%
	Total	**350**	**100.0%**
Marital Status	Married	128	36.5%
	Unmarried	222	63.2%
	Total	**350**	**100.0%**
Smoking Status	Smoker	3	0.9%
	Ex-smoker	27	7.7%
	Non-smoker	320	91.2%
	Total	**350**	**100.0%**
Occupation	Doctor	109	31.1%
	Nurse	121	34.5%
	Nursing Assistant	26	7.4%
	Laboratory Attendant	16	4.6%
	-Pharmacist	27	7.7%

Variable	Response	Frequency	Percentage (%)
	Sanitary Worker	6	1.7%
	Other (Technicians, Clerk, etc.)	44	12.5%
	Total	**350**	**100.0%**
Area of Practice	Clinical	198	56.4%
	Non-clinical	152	43.3%
	Total	**350**	**100.0%**
Number of Shifts	One Tier	294	83.8%
	Two Tier	36	10.3%
	Three Tier	20	5.7%
	Total	**350**	**100.0%**
Work Characteristics	Work in Multiple Facilities	184	52.4%
	Work Overtime	166	47.3%
	Total	**350**	**100.0%**
Work Experience	> 5 Years	158	45.3%
	< 5 Years	192	54.7%
	Total	**350**	**100.0%**
Medicine for Musculoskeletal Disorder	Yes	67	19.1%
	No	283	80.9%
	Total	**350**	**100.0%**
Duration of Treatment for Musculoskeletal Disorders	< 1 Year	260	74.1%
	> 1 Year	90	25.9%
	Total	**350**	**100.0%**

The data shows that most participants were young adults aged 26–30 years, indicating that the healthcare workforce is largely composed of early-career professionals. Males were more in number than females, creating a clear gender imbalance. A majority of workers were unmarried, which may be linked to flexible work schedules and overtime capacity. Most participants were non-smokers, reflecting healthy lifestyle choices common in healthcare settings.
Nurses and doctors formed the largest professional groups, demonstrating that patient care roles dominate the workforce. More than half of the workers were assigned to clinical areas, suggesting heavy patient-related responsibilities. Most participants worked in a single-tier shift system, although many reported working across multiple facilities or doing overtime, pointing to workload pressure. More workers had less than five years of experience, showing a young and relatively less-experienced workforce. Although only a small proportion used medication for musculoskeletal issues, those receiving treatment included both short- and long-term cases, indicating ongoing occupational health concerns.

Table 2: Ergonomic Factors Affecting Study Subjects:

Variable	Response	Frequency	Percentage
Muscle Aches/Muscle Sprains	Yes	115	32.8%
	No	235	67.0%
Carpel Tunnel Syndrome	No	330	94.0%
	Yes	20	5.7%

Variable	Response	Frequency	Percentage
Chronic Back Pain	No	208	59.3%
	Yes	142	40.5%
Elbow/Wrist and Neck Pain	No	194	55.3%
	Yes	156	44.4%
Hamstring Pain	No	242	68.9%
	Yes	108	30.8%
Fracture	No	335	95.4%
	Yes	15	4.3%
Problems of Body Posture	No	183	52.1%
	Yes	167	47.6%
Problem of Excessive Stretching of Muscles	No	173	49.3%
	Yes	177	50.4%
Bending/Twisting at Work	No	157	44.7%
	Yes	193	55.3%
Heavy Load/Weightlifting	No	266	75.8%
	Yes	84	23.9%
Slips/Trips/Falls at Work	No	275	78.3%
	Yes	75	21.4%
Exposure to X-ray	No	249	70.9%
	Yes	101	28.8%
Skin Burn	No	292	83.2%
	Yes	58	16.5%
High Noise Levels	No	251	71.5%
	Yes	99	28.2%
Chemical Spills	No	273	77.8%
	Yes	77	21.9%
Cuts/Wounds/Lacerations	No	234	66.7%
	Yes	116	33.3%
Direct Contact with Specimens	No	268	76.6%
	Yes	82	23.4%
Body Contact with Retroviral Patients	No	277	78.9%
	Yes	73	20.8%
Airborne Diseases	No	190	54.1%
	Yes	160	45.6%
Infectious Diseases	No	187	53.3%
	Yes	163	46.4%

Variable	Response	Frequency	Percentage
Blood Borne Pathogens	No	243	69.2%
	Yes	107	30.5%
Psychosocial/Physical Abuse	No	207	59.0%
	Yes	143	40.7%
Assaults from Co-Workers	No	261	74.4%
	Yes	89	25.4%
Stress Due to Work	No	76	21.7%
	Yes	274	78.1%

The ergonomic assessment shows that nearly one-third of workers experienced muscle aches and a large number reported back, neck, or upper-limb pain, suggesting that physical strain is common in their work environment. Almost half of the workers reported posture problems and excessive stretching, showing frequent exposure to uncomfortable body positions. Bending and twisting were also common, which can increase the risk of musculoskeletal injury. Although only a portion of the workforce handled heavy lifting or chemicals, exposure to X-ray radiation, high noise, and sharp injuries was still reported by many. A notable percentage experienced slips or falls, and several workers had contact with infectious agents, bloodborne pathogens, or airborne diseases, reflecting biological hazards at the workplace. Psychosocial risks were also evident, with many workers reporting both abuse and high levels of stress, indicating the need for mental health and safety support

Table 3: Frequency and Percentage Distribution of Study Subjects

Variable	Response	Frequency	Percentage
Performing the same task over and over again	No	134	38.2%
	Yes	216	61.5%
Treating/caring for an excessive number of patients in one day	No	126	35.9%
	Yes	224	63.8%
Performing manual techniques	No	109	31.1%
	Yes	241	68.7%
Taking adequate rest breaks during the workday	No	69	19.7%
	Yes	281	80.1%
Working in awkward and cramped positions	No	207	59.0%
	Yes	143	40.7%
Working in the same position for long periods	No	87	24.8%
	Yes	263	74.9%
Bending or twisting back in awkward positions	No	190	54.1%
	Yes	160	45.6%
Working beyond physical capability	No	128	36.5%
	Yes	222	63.2%
Working or reaching away from the body	No	243	69.2%
	Yes	107	30.5%
Continuing to work while injured or hurt	No	153	43.6%
	Yes	197	56.1%
Assigned work for lifting or transferring dependent patients	No	285	81.2%
	Yes	65	18.5%
Carrying, lifting, or moving heavy materials or equipment	No	276	78.6%
	Yes	74	21.1%
Unanticipated sudden movements or falls by patients	No	260	74.1%
	Yes	90	25.6%
Assisting patients during gait activities	No	202	57.5%
	Yes	148	42.2%
Work schedule overtime	No	188	53.6%
	Yes	162	46.2%
Inadequate knowledge and training on injury/hazard prevention	No	219	62.4%
	Yes	131	37.3%

The table indicates that repetitive tasks and caring for large numbers of patients are common and may contribute to physical fatigue. Many workers regularly perform manual techniques and continue working even when injured, which can worsen musculoskeletal strain. Although most workers take rest breaks, prolonged static postures—such as standing or sitting for long periods—remain widespread.

A considerable number of workers reported bending, twisting, working beyond their physical abilities, or reaching away from the body, all of which are known ergonomic risk factors. A smaller group was responsible for lifting dependent patients or moving heavy material, but this still places them at higher injury risk. Overtime work and lack of adequate training in hazard prevention were also identified among a significant portion of workers, showing that both

workload and skills gaps contribute to vulnerability to musculoskeletal disorders.

DISCUSSION

The findings of the present study provide a comprehensive overview of the demographic profile and work-related characteristics of the healthcare workforce, along with an assessment of ergonomic exposures and musculoskeletal risk factors. The demographic distribution clearly reflects a predominantly young workforce, with a majority of participants belonging to the 26–30-year age group. This implies that the system is largely dependent on early-career professionals who bring energy and adaptability to the profession. However, it also highlights an indirect challenge—relatively limited experience and a high probability of turnover due to job transitions and workplace stress. The male-to-female ratio further shows a gender imbalance, which could influence workplace dynamics and participation in physically demanding tasks. The high proportion of unmarried workers may explain the flexibility and willingness of staff to work multiple shifts or overtime, which was evident from the work characteristics.

Despite the physically and mentally demanding nature of healthcare professions, most workers reported being non-smokers, indicating a general inclination toward healthier lifestyles. Occupational categories also depicted a diversified workforce, dominated by nurses and doctors who are directly involved in patient management. Nearly half of the workers were on clinical assignments, while the remaining engaged in non-clinical responsibilities, signifying the importance of both groups in sustaining healthcare services. However, the high number of individuals working across multiple facilities and large proportions working overtime signal heavy workload distribution and possible staff shortages.

The ergonomic assessment further emphasizes how work demands may translate into health problems. A considerable proportion of participants reported chronic back pain, neck pain, elbow/wrist discomfort, and muscle sprains—all of which are common outcomes of repetitive movements, sustained postures, and excessive stretching. Activities such as bending, twisting, excessive reaching, or working beyond physical capacity were frequently practiced by many participants. These behaviours, over time, significantly increase the risk of musculoskeletal disorders. Although many workers reported taking rest breaks, the findings indicate that break duration alone cannot compensate for prolonged static postures or continuous manual work. Another alarming finding was that more than half continued to work despite being injured, which suggests underreporting of occupational health issues and fear of workload redistribution or job insecurity.

Psychosocial factors were also prominent in the study. A notable number of healthcare workers had experienced some form of psychological or physical abuse, and a large majority reported workplace stress. This shows that the risk faced by healthcare workers is not limited to physical injuries but also extends to emotional and mental domains. The combination of ergonomic strain, demanding workloads, and psychosocial pressure collectively increases the susceptibility of staff to burnout and long-term health complications. Although only a fraction of participants were taking medications for musculoskeletal disorders, the duration of treatment among those affected indicates that many injuries become chronic if preventive measures are not introduced early.

Overall, the trends suggest that musculoskeletal concerns among healthcare workers are largely preventable and stem from prolonged static postures, repetitive tasks, lack of ergonomic training, inadequate staffing, and insufficient emphasis on occupational safety. Improving the work environment therefore requires an integrated approach that considers both physical and psychosocial demands placed on the workforce.

CONCLUSION

The present study highlights that although the majority of healthcare professionals are young, energetic, and dedicated, they are constantly exposed to high physical and mental demands. The combined effect of awkward postures, repetitive manual
activities, prolonged standing or sitting, and excessive workload significantly increases the likelihood of musculoskeletal problems. In addition,
work stress, abuse, and overtime further contribute to occupational strain. These findings emphasize an urgent need to introduce structured ergonomic training, regular wellness programs, improved staffing patterns, and a supportive work atmosphere that prioritizes both physical and psychological safety. Strengthening preventive measures rather than depending solely on treatment will not only enhance employee health but also contribute to sustainable workforce performance and overall quality of patient care..

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