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Prevalence of Work-Related Musculoskeletal Disorders and Its Association with Fatigue and Individual Factors Among Supermarket Grocery Workers: Cross-Sectional Study

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ABSTRACT

BACKGROUND: Supermarket grocery workers are at high risk of work-related musculoskeletal disorders (WRMSDs) due to demanding postures and repetitive tasks. This study investigated the prevalence of WRMSDs, their association with fatigue, and individual factors affecting these workers in Surat, India.
METHODOLOGY: A cross-sectional study involving 190 grocery workers employed a convenience sampling method. The Nordic Musculoskeletal Questionnaire (NMQ) assessed WRMSDs and the Fatigue Severity Scale (FSS) evaluated fatigue.
RESULTS: Results revealed a high prevalence of WRMSDs, with 72.7% of workers reporting experiencing them at least once. The lower back and ankle were the most commonly affected body parts (36.4% each), followed by the upper back (35.5%), neck (31.8%), and knee (28.2%). Gender distribution among those with WRMSDs was nearly equal (51.8% female, 48.2% male).
DISCUSSION: It was found that difficulty with work and fatigue were associated with WRMSDs. However, factors like gender, body mass index (BMI), work experience, work duration, rest periods, rest duration, and worker type (full-time/part-time) did not show a statistically significant association.
CONCLUSION: This study highlights the concerning prevalence of WRMSDs among supermarket grocery workers in India. The significant association between WRMSDs and work difficulty/fatigue suggests a need for interventions. Future research should explore ergonomic improvements, work organization strategies, and fatigue management programs to reduce WRMSDs and improve worker well-being in this industry.

KEYWORDS: Work-related Musculoskeletal Disorders (WRMSDs), Supermarket Grocery Workers, Fatigue

INTRODUCTION

Work is defined as the accomplishment of duties for compensation. Benefits to both physical and mental health have been linked to work. [1] Muscles, bones, nerves, tendons, ligaments, joints, cartilage, and the spinal disc are all included in musculoskeletal disorders, which are injuries or dysfunctions.[2] The most common work-related musculoskeletal illnesses, however, resulted from a combination of a hard workload, ergonomic dangers that stressed,

and tense muscles, which made people, feel discomfort.[3]

Among cashiers and supermarket workers, managers and employees made up one of the top ten occupations for musculoskeletal disorders. These tasks require exacting postures as well as continuous, repetitive motions that are often performed forcefully, which can aggravate the symptoms of musculoskeletal problems. [4][5] The supermarket industry was one of the top 25 occupations for conditions such as wrist tendinitis, back pain syndrome, rotator cuff syndrome, and neck discomfort.[3] Supermarket cashiers are often at risk for upper limb musculoskeletal disorders, including carpal tunnel syndrome (CTS).[6]

The worldwide prevalence of WRMSDs among Cashiers and grocery workers is as follows with the maximum prevalence in Saudi Arabia (90%),[1] Estonia (86.6%) [13], Canada (83%),[11] The USA (78%),[10] and The Philippines (76%) [7]. From the same studies, the major affected parts were the upper extremity, and lower back followed by the Lower extremity. Whereas a study done in India suggested that 60% of workers had at least one body part in discomfort within the previous 12 months, and 56% had it within the previous 7 days [6] The worldwide affliction of joints is the Lower back (78%) [6], Shoulder and neck pain (70%)[5], and wrist and hand(47%)[5]. Other frequent sites include the knee, ankle/foot followed by the Hip and Upper back [6]. Back sprains and strains made for 30% of all injuries in food warehouses, according to the National Organization of Food Warehouses, a US trade organization [9,12].

Particularly for the working population that suffers exhaustion, work-related fatigue is a serious occupational safety and health (OSH) issue [8]. Some researchers think that when Manual Material Handling is involved in the activity, as it is for our focal group and grocery workers, there is a higher chance of getting musculoskeletal injury [9]. The social norms around work and sleep, individual behaviors, individual health issues, and elements relating to the workplace are only a few of the risk factors and causes of exhaustion at work [8]. Additionally, at least one recordable injury will occur to one-third of all warehouse workers each year due to fatigue. According to WIOSH, in one health hazard assessment at a grocery warehouse, of 38 full-time grocery order selectors, 50% reported at least one injury in the previous 12 months, and 18% of full-time selectors had at least one back injury in the prior years. These percentages were 63 and 47%, respectively, in a second assessment of health risks 70% of full-time employees at the first warehouse and 47% of those at the second reported having considerable back discomfort the year before.[9]

Various studies have been reported regarding the prevalence in supermarket grocery workers and its association with fatigue, WRMSDs, and factors affecting but there is no retrieval studies have been found in India. Therefore, the main aim of this study is to find the prevalence of WRMSDs and their association with fatigue and individual factors that impair work among supermarket grocery workers in India.

METHODOLOGY:

Study population: Supermarket Grocery workers from Surat.

Study Design: Cross-sectional analytical study.

Study Setting: Supermarket of Surat.

Study Duration: September 2023 to February 2024.

Sampling Method: Convenient sampling

Inclusion criteria:

- should have work experience of a minimum of 6 months.
- Supermarket Grocery workers will be included.
- Workers are working for 6 days/week and a minimum of 6 hours/day duration.
- Both gender male and female will be included.
- The age group should be between 19 to 50 years.

Exclusion Criteria:

- There is no occupational origin musculoskeletal injury.
- Pregnant females will be excluded.
- Any who will have co-morbid conditions.
- Workers who had surgery in the last one year.

Materials:

Scales: Nordic Musculoskeletal Questionnaire (NMQ)[14,15] & Fatigue Severity Scale (FSS)[16].

DATA COLLECTION PROCEDURE:

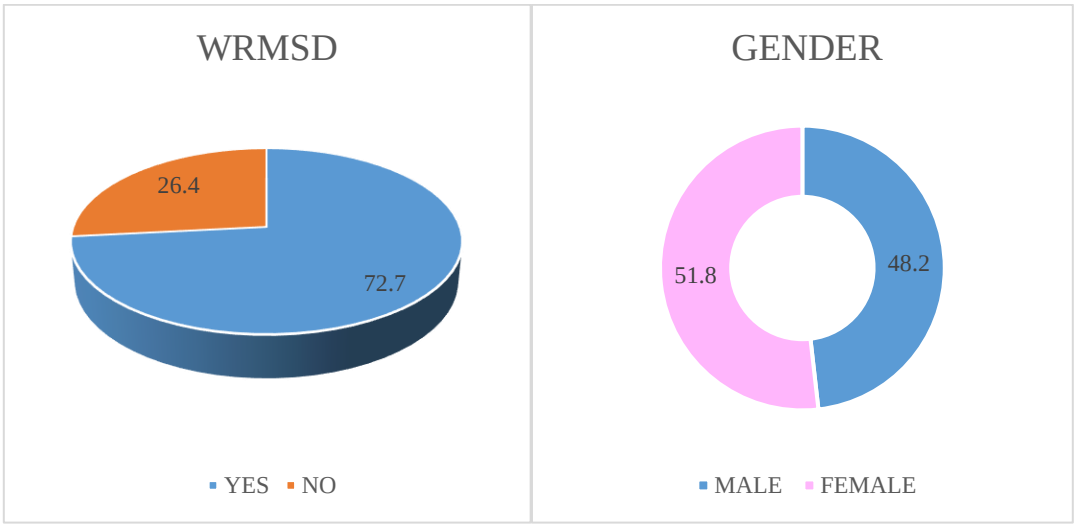
The study protocol was submitted to the School of Physiotherapy, P.P. Savani University. Upon approval, Permission was sought from various supermarkets and grocery stores in Surat City. Those who were willing to participate in the study were recruited for the same. After signing a written consent form all the subjects were collected based on inclusion and exclusion criteria and those who were qualified for participation, were evaluated using outcome measures for pain and fatigue, which were the Nordic Musculoskeletal Questionnaire (NMQ) and Fatigue Severity Scale (FSS). NMQ was taken by interview method whereas FSS was self-reported. After taking NMQ by interview method, we handed it over to the second outcome, which was FSS. Any of the queries were clear while filling up the scale. We provided 10 minutes to complete the stated scale and then collected it back.

DATA ANALYSIS:

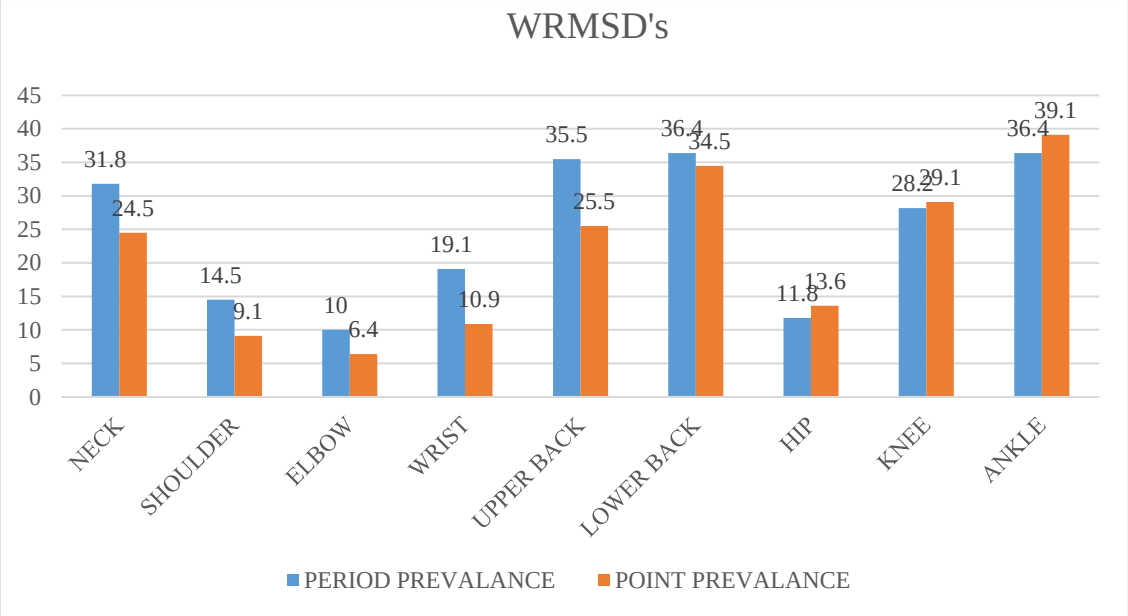
- Data Analysis was done using the latest version of SPSS software.
- Prevalence and joint-wise distribution were done using descriptive analysis.
- Association between WRMSD, Fatigue, and individual factors was done using the Chi-square method.
- P<0.05 was considered as statistically significance.

RESULT

72.7% of supermarket grocery workers suffered Work-Related Musculoskeletal Disorders one time or more in their professional lives. out of 72.7% of supermarket grocery workers who had suffered from WRMSD, 51.8% were female and 48.2% were male.



The 12 months and point prevalence rate of Work-Related Musculoskeletal Disorders involving any of the regions of the body is shown in Graph 2 below. Work Related Musculoskeletal Disorders occurred mostly in lower back and ankle (36.4%), upper back (35.5%), neck (31.8%), knee (28.2%), wrist (19.1%), shoulder (14.5%), hip (11.8%) and elbow (10%).



INDIVIDUAL FACTORS	DATA	FREQUENCY N=110	WRMSD's	NO WRMSD's	p-VALUE
Gender	MALE FEMALE	53 57	38 42	14 15	0.580
BMI	UNDERWEIGHT NORMAL OVERWEIGHT OBESE	15 73 21 1	9 55 15 1	6 17 6 0	0.853
WORK EXPERIENCE	6-MONTHS 1-4 YRS 5-10 YRS >10 YRS	20 59 29 2	14 42 22 2	6 17 6 0	0.651
DURATION OF WORK	9 HOURS 12 HOURS	56 54	43 37	13 16	0.422
REST	YES NO	107 3	78 2	28 1	0.951
REST DURATION	.00 30.00 40.00 45.00 60.00	3 10 4 47 46	2 9 2 37 30	1 1 2 10 15	0.675
TYPE OF WORKER	CASHIER GROCERY BOTH	25 73 12	19 50 11	6 22 1	0.518
DIFFICULTY IN WORK	YES NO	78 32	71 9	7 22	0.000
FATIGUE	NO FATIGUE	110	80	29	0

Above table shows association of individual factors with WRMSDs, where factors like difficulty of work and fatigue were shown to be significantly related to WRMSDs in supermarket grocery workers. Other factors like gender, BMI, work experience, duration of work, rest, rest duration, and type of worker were not found to be associated significantly.

DISCUSSION

The study was aimed at identifying the prevalence of WRMSDs and fatigue among supermarket grocery workers in Surat. A total of 110 workers distributed and engaged

in the study and necessary data was collected by distributing the questionnaires. A study found that 72.7% (n=110) of recruited grocery workers reported musculoskeletal symptoms in at least one region of the body.

From a total of 110 grocery workers who participated in the study, 72.7% of workers reported musculoskeletal symptoms. The most common area of reported symptoms was the lower back (36.4%) and ankle (36.4%), followed by the upper back (35.5%), neck (31.8%), knee (28.2%), wrist (19.1%), shoulder (14.5%), hip (11.8%) and elbow (10%). A similar study was done in the USA where 78% of recruited workers were prone to WRMSDs in at least one body region, with the majority of workers complaining of low back pain and foot discomfort [19]. LBP is also considered to be one of the main causes of disability and sick leave according to the European Agency of Safety and Health at Work [21]. Other studies claimed that most back disorders are due to axial twisting, lateral bending, and awkward postures [24][25]. Studies have shown that the leading reason for foot discomfort is prolonged standing by grocery workers [20][23]. Other studies claimed that the most troubled body part among workers in the last work week was the shoulder with the percentage of 61.29% out of total workers experiencing discomfort compared to other studies by Rahman and Xuhaidi (2017) and Forcier et.al.(2008), showed that lower back pain to be the most prevalent among workers while current findings reported that lower back was the 3rd most troubled body region [3]. Another study found that the highest prevalence of MSD symptoms in 12 months involved the neck, with 67% of respondents having neck pain [5]. The possible justification for the high prevalence of neck pain in that study may be the cashier's desire to work in a standing position, which requires more range of motion (ROM) of the neck [26]. However, the combined prevalence of shoulder and neck pain among supermarket cashiers reached 70% in other studies [27]. However, while most existing literature investigated female cashiers. The majority of participants in this study were female 51.8%. Additionally, the study revealed significant differences in the musculoskeletal system between men and women [17].

As per our data, collected 0% fatigue was analysed among supermarket grocery workers. The most probable reason for not having an association with fatigue can be the age factor. As majority of the participants in our study were young population. Therefore, age might be a possible factor for not having fatigue. While other studies demonstrated that approximately 90% of cashiers, felt fatigued after the workday [18]. Fatigue after the workday occurs due to reduced blood flow to muscles, therefore employees working in sitting positions and not doing physical hard work; feel highly fatigued at the end of the workday [18].

The association between WRMSD and various factors like individual factors and fatigue-related musculoskeletal symptoms were analyzed. None of the individual factors like BMI, Gender, Sick leaves, or working hours showed any statistical significance with WRMSD. Various studies have shown that the association between factors like working environment, psychosocial factors, and postural stress could be the major risk factors that are associated. When supermarket cashiers perform their regular job, handling items from a conveyor belt, wiping them over the laser scanner, and placing the items in the bagging area, involves trunk forward flexion, lateral leaning, and rotational movements [28]. The combination of flexion, lateral leaning, and rotation of the trunk are considered the main factors associated with the development of back problems [22]. The spine particularly the lower part is loaded and stressed by upper body weight [1].

CONCLUSION

From the current study, it could be concluded that the total prevalence of WRMSD, among workers working in supermarket grocery stores was 72.7%, and with lower back and foot were most affected followed by the upper back, neck, knee, wrist, shoulder, hip,

and elbow regions. In addition, there was no significant fatigue level found as none of the individual factors taken was associated with WRMSDs.

Declaration by Authors

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