ORIGINAL RESEARCH ARTICLE

Association between Work-Related Musculoskeletal Disorders' risk factors and different body parts affected among Housekeepers in selected hotels in Mombasa County

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ABSTRACT

Work-related musculoskeletal disorder (WRMSDs) affects primarily muscles, tendons, joints, intervertebral discs, peripheral nerves, and the vascular system. WRMSDs are a worldwide issue and are experienced in both developed countries and industrially developing countries (IDCs). The prevalence of WRMSDs and their risk factors are not well known among hotel housekeepers in Kenya. Therefore, this study aimed to establish the annual prevalence of work-related musculoskeletal disorders among housekeepers in selected hotels in Mombasa County. The study also sought to assess the common body parts affected by pain as well as the WRMD risk factors associated with these body parts among housekeepers at selected hotels in Mombasa County. The study employed a cross-sectional approach. The sample size of 276 study participants' housekeepers was obtained by considering housekeepers' availability at the time of study at 18 purposefully selected hotels. Data collection was done through standardized questionnaires. Qualitative and quantitative methods were used for data analysis. Quantitative data was coded and entered into the Statistical Package for Social Sciences (SPSS 23) for analysis. Descriptive and inferential statistical analyses were utilized to analyze the quantitative data collected from the structured questionnaires. To establish the link between variables, descriptive statistical analysis, including frequencies and percentages, and inferential statistical analysis, including the Chi-square test and linear regression, were utilized, with findings displayed in frequency tables, bar graphs, and pie charts. On the other hand, the qualitative analysis utilized thematic analysis, with findings presented in narrations. WRMDs were found to be prevalent in 91.7% of hotel housekeepers in Mombasa County. The most widely reported WRMD by housekeepers was lower back pain. The study cohort also reported leg, neck, and shoulder joint and muscle pains as a result of carrying, lifting, pulling, or pushing heavy objects weighing more than 20 kilograms. Hotels ought to identify the common WRMDs among housekeepers and determine specific risk factors associated with these pains. The study's key recommendations are for hotels to evaluate their labor practices to mitigate understaffing, invest in the mechanization of equipment to ensure that staff have reasonable working hours per day with adequate breaks in between chores, and take reasonable leave. Implementing health and safety standards is crucial, with an emphasis on good posture and techniques while performing tasks. The study recommends strengthening labor regulations by raising awareness and sensitizing labor unions and health committees on musculoskeletal disorders and

preventing undue work-related injuries among hotel housekeepers.

Key Words: Common, risk factors, work-related musculoskeletal disorder, housekeepers

1.0 Introduction

According to the World Health Organization, musculoskeletal disorders (MSDs) are a term that identifies a large group of conditions that result from trauma to the body over a period of time. It is this cumulative buildup of trauma that causes the disorder. Hence, MSDs are also referred to as cumulative traumatic disorders (CTDs), occupational overuse syndrome (OOS), or repetitive strain injuries (RSIs). Multiple definitions of MSDs exist. While some MSD definitions report the frequency, duration, or intensity of pain, others define MSDS as pain that causes changes in functioning (NIOSH, 2020). Both governmental organizations and the business sector continue to be faced with serious occupational health issues as a result of MSDs (Trinkoff, 2014).

Work-related musculoskeletal disorders (WRMSDs) typically affect muscles, tendons, joints, intervertebral discs, peripheral nerves, and the vascular system. The main work-related activities that cause these disorders on the lower back, neck, and shoulders result from the frequency and repetitiveness of tasks or from performing tasks that require awkward postures. Most employees, including office personnel, nurses, housekeeping personnel, and caterers, reported back pain followed by neck and shoulder pains as a result of their daily work-related activities (WHO, 2015).

WRMSDs are a worldwide health concern that affects populations in both developed countries and industrially developing countries (IDCs). The prevalence of work-related injuries is particularly significant in IDCs due to the absence of comprehensive and effective work injury prevention programs as well as unfavorable working conditions that have resulted in a high rate of WRMSD in IDCs. Work-related activities such as heavy weight lifting, repetitive tasks, and awkward working postures have been reported as risk factors for WRMSDs, whereas demographics and psychosocial factors are also known to be important predictive variables for developing WRMDs (Aptel *et al.*, 2016).

1.1 Purpose of the study /Problem statement

Studies targeting WRMSDs among housekeepers and other professionals or industries with similar working-related activities as housekeepers, such as health nurses, reported a high prevalence of muscular pain on different body parts attributable to the nature of their work. For example, Wami *et al*. (2019) conducted a related study on the impact of work-related risk factors on developing neck and upper limb pain among low-wage hotel housekeepers in Gondar town, Northwest Ethiopia. The institution-based cross-sectional study established that the overall magnitude of the self-reported neck and upper limb musculoskeletal disorders among hotel housekeepers in the last 12 months was 62.8% (95%). The main body areas of concern were neck pain (50.7%), shoulder pain (54%), elbow/forearm (47.2%), and hand/wrist (45.5%). Age, number of rest breaks taken, repetitive movement, reaching or overstretching,

organization concern for health and safety, and job satisfaction were the risk factors significantly associated with neck and upper limb musculoskeletal disorders.

In a study done on nurses working at Kenyatta National Hospital, the reported incidence of MSDs among the nurses was 74.2%. The most vulnerable parts of the body were found to be the back, feet, and shoulders, revealing a rate of 32.5, 21.5, and 20.4%, respectively. Further, the study found that age in the etiology of MSDs but independent among their male counterparts (Mailutha, 2020).

In Kenya, a study by Kisilu, Gatebe and Msanzu (2017) that assessed the prevalence of work-related musculoskeletal disorders among housing construction workers in Mombasa County, Kenya, established a 31% prevalence of musculoskeletal disorders and that the majority (98.1%) of the workers reported having had body pain as a result of their daily work activities within the past 12 months of his study. According to the study, the most common musculoskeletal disorder symptom was low back pain (68%). Only 2.7% of the respondents had sought medical advice for musculoskeletal disorders experienced within 12 months. The study noted that factors contributing to musculoskeletal disorders were physical, organizational, and individual factors. A further regression analysis at a 95% level of confidence established that physical factors, organizational factors, and individual factors significantly influenced the prevalence of musculoskeletal disorders.

However, research on WRMSDs among housekeepers has not been carried out within the hospitality sector in Kenya, an industry that contributes significantly to the country's foreign exchange. Given this context, the study sought to evaluate work-related musculoskeletal disorders among housekeepers in selected hotels within Mombasa County. The study evaluated the following: assessed the prevalence of MSDs among housekeepers, determined risk factors, and applied preventive measures in relation to MSDs among housekeepers in selected hotels in Mombasa County. Having concluded that MSDs are prevalent among housekeepers, this article focuses on body parts that were found to correlate with particular risk factors that were established by this study.

Housekeeping encompasses, in a broader sense, tasks that the majority of individuals undertake on a regular basis, whether at home or in a work setting such as a hotel. Therefore, findings from the study could be adopted to sensitize individuals to lifestyle changes while performing strenuous tasks, as well as establish a culture and foundation for students at the elementary level on the importance of good posture. Furthermore, findings can be used to inform the development of work-related preventative strategies and policies for WRMSDs that safeguard employees' health and safety at the workplace, particularly within hotel settings.

1.2 Theory of the study
The study was anchored on Herzberg's two-factor theory. According to Hertzberg, employee satisfaction and dissatisfaction are critical, and hence motivation or lack thereof is the opposite, implying that individuals are either satisfied with their jobs or unsatisfied. Motivators, similar to

Maslow's higher-level needs, are what improve an employee's satisfaction and are associated with the nature of the work itself: recognition at work, achievement, responsibility, and growth. Hence, the worker would rather desire working conditions that result in greater physical comfort and convenience. The absence of such working conditions, among other things, can have a negative impact on the worker's mental and physical well-being (Herzberg, 1968). This theory is relevant to the study in assessing the work-related conditions (activities and strategies in place for prevention) that might lead to MSD among hoteliers in Kenya.

2.0 Methodology
2.1 Study design
A descriptive research design was used to collect qualitative and quantitative data for the study as well as to describe the risk factors associated with work-related musculoskeletal disorders among housekeepers in selected hotels within Mombasa County.

2.2 Study population size and area
The study area was Mombasa County, Kenya. Mombasa County is one of the 47 counties in Kenya, reconstituted from a district in 2013. The county is within the coastal region of Kenya, therefore a tourist destination. The target population was housekeepers working in hotels within Mombasa County.

2.3 Sample size determination
The sample size of 276 housekeepers was obtained by considering all the housekeepers available at the time of the study from the purposefully selected 18 hotels.

2.4 Sampling procedure
Purposeful sampling was applied to hotel selection and suitability criteria as per the researchers' requirement of fifteen permanent housekeepers due to the COVID-19 effects on hotels in Mombasa at the time of data collection.

2.5 Data collection method
The main data collection tool was a semi-structured, closed-end questionnaire with provisions for open-ended questions for the in-depth interviews. In addition, an observation checklist was applied for data comparison from the questionnaires. The questions guided the objectives of the study. Reliability was determined by the results that correlated with previous studies.

2.6 Data analysis and presentation
The study used both qualitative and quantitative data analysis. Quantitative data was coded and entered into the Statistical Package for Social Sciences (SPSS 23) for analysis. This study used descriptive and inferential statistical analysis to analyze the quantitative data collected from the structured questions. Descriptive statistical analysis, including frequencies and percentages, and inferential statistical analysis, including the Chi-square test (at 95% confidence level) and linear regression, were used to establish the association between variables. On the other hand,

the qualitative analysis included thematic analysis. The study's findings from the quantitative analysis were presented in a frequency table, bar graphs, and pie charts, while the analysis from the thematic analysis was presented in narrations.

3.0 Study Results

The findings of the study established that out of the total 276 questionnaires sent to the respondents (housekeepers), 205 were duly filled in and returned by the respondents, yielding a response rate of 74.3%. These were considered very reliable response rates for generalizations of study findings since, according to Zikmund et al. (2010), a response rate of 70 percent and above is said to be a reliable response rate.

3.1 Demographic Informatiom

Table 3.1: Demographic Information

Variable	Category	N	Percentage (%)
Gender	Male	87	42.4
	Female	118	57.6
Age Group	26-35	47	22.9
	36-45	111	54.1
	46-55	23	11.2
	>55	24	11.8
BMI	26.3-26.9	103	50.3
	27.01-27.34	87	42.4
	27.36-27.47	15	7.3
Education Level	Primary	23	11.2
	Secondary	120	58.5
	Certificate	54	26.4
	Diploma	8	3.9
Marital Status	Single	79	38.5
	Married	126	61.5
Department	Common areas/Public Attendants	44	21.4
	Room Stewards	114	55.6
	Linen Store	23	11.2
Duration of Service	0-5	55	26.8
	6-10	110	53.7
	11-15	40	19.5

The study established that 57.6% of the respondents were female, while 42.4% were male. This study's findings represented both genders well at the respective hotels. The distribution of the age group of the respondents showed that 54.1% of them were between 36 and 45 years old,

22.9% of them were between 26 and 35 years old, 11.8% of them were above 55 years old, and only 11.2% of them were between 46 and 55 years old. Findings on weight and height indicated that half of the respondents, 50.3%, had a BMI of between 26.3-26.9, 42.4% of them had a BMI of between 27.01-27.34, and only 7.3% of them had a BMI of between 27.36-27.47. The findings revealed that most respondents had a BMI that was not ideal and were termed overweight.

Results also indicated that more than half of the respondents, 58.5%, had attained secondary education, 26.4% had attained a college certificate, 11.2% had attained primary education, and only 3.9% had attained a college diploma. None of the respondents had a university degree or postgraduate degree. The study also showed that 61.5% of the respondents were married, while only 38.5% were single. The study's findings show that most respondents, 55.6%, work as room stewards, while the rest of the housekeepers work as public attendants and at linen stores, at 21.4% and 11.2%, respectively. The results of the study also showed that the majority of the respondents, 53.7%, had worked in their respective hotels between 6 and 10 years; 26.8% of them had worked in their respective hotels between 0 and 5 years; and 19.5% of them had worked in their respective hotels between 11 and 15 years.

3.2 Prevalence of body parts pain associated with WRMD among housekeeping staff in selected hotels in Mombasa County

The study sought to assess the annual prevalence of body part pain associated with WRMD among housekeeping staff in selected hotels in Mombasa County. The response was as follows:
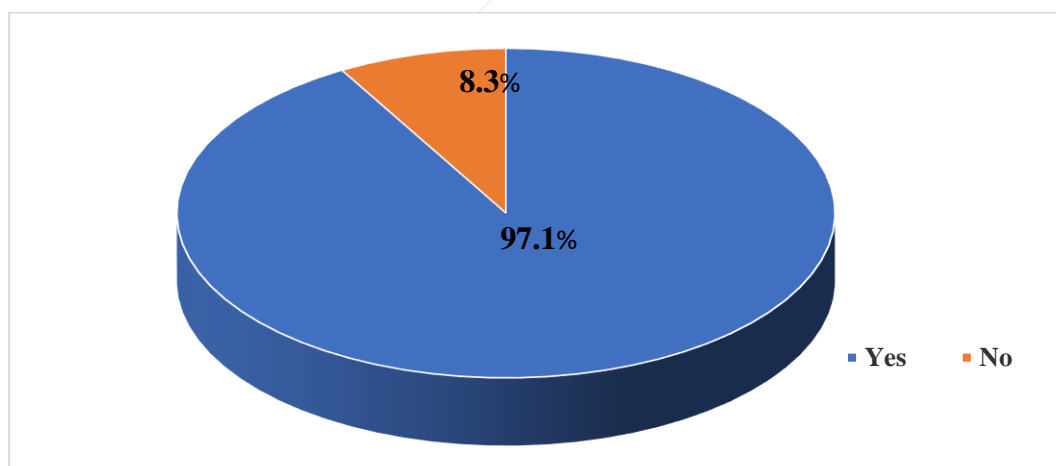

Fig 3.1 Prevalence of body pain among housekeeping staff in selected hotels in Mombasa County

Table 3.2: Prevalence of body parts pain associated with WRMD among housekeeping staff in selected hotels in Mombasa County

Annual Prevalence 91.7%	Body parts pain associated with WRMD		
	Lower back pain	Neck and shoulder pains	Legs pains
Frequency	181	152	50
Percentage	96.1%	81.0%	26.8%

The results indicated that 96.1% of the housekeepers who experienced regular muscle and joint pain experienced it at the lower back, 81.0% had neck and shoulder pains, and 26.8% of them experienced leg pains. This indicated that lower back pain was the most prevalent pain among the housekeepers.

Table 3.3 Association between different parts of body pains

Pain	Had leg pain	Did not Have Leg pain	Total	Chi-Square
Had lower back pain	53(26.7%)	145(73.3%)	198(96.6%)	.598
Had Upper back (Neck and Shoulder) pain	45(26.6%)	124(73.4%)	169(82.4%)	.603

The findings of the study indicated that 48% of the staff would be experiencing leg, upper back, and lower back pains. Results also indicated that out of the 96.6% of the total staff who had lower back pain, 26.7% of them would also have leg pains. Furthermore, 26.6% of the 82.4% of staff who had lower back pain also experienced leg pain. According to the study, housekeeping staff with musculoskeletal disorders who experience back pain do not always report pain in their legs ($p > .598$; $p > .603$).

3.4 Association between risk factors and parts of body with WRMD among housekeeping staff in selected hotels in Mombasa County

The study also assessed the association between risk factors and parts of body pains and WRMD among housekeeping staff in selected hotels in Mombasa County. The response was as follows:

Table 3.4: Association between Risk Factors and parts of body pains

Risk Factors	Low Back Pain		Neck And Shoulder Pains		Legs	
	Chi square	P value	Chi square	P value	Chi square	P value
Carrying/lifting Pulling/pushing heavy things >20 kilograms	0.705	0.506	10.809	0.003	6.363	0.015
Not taking breaks	0.338	0.723	1.956	0.179	3.052	0.078
Standing	0.294	0.754	1.703	0.351	2.657	0.108
Bending	3.527	0.056	1.746	0.242	0.222	0.387

The results indicated that all the risk factors (carrying or lifting heavy things > 20 kg, not taking breaks, standing, and bending) had no significant association with low back pain among the housekeeping staff in selected hotels in Mombasa. Findings from the study indicated there was a strong correlation between carrying, lifting, pulling, and pushing heavy things >20 kilograms and the development of leg (P = 0.015), neck, and shoulder pains (P=-0.003). While not taking breaks, standing or bending did not have any association with leg, neck, or shoulder pains. This implied that one would easily get leg, neck, and shoulder pains from carrying, lifting, pulling, or pushing heavy things >20 kilograms.

4 .0 Discussion

The findings of the study established that 96.1% of the housekeepers who experienced regular muscle and joint pain experienced it at the lower back, 81.0% had neck and shoulder pains, and 26.8% of them experienced leg pains. The study is consistent with the findings of Özcan *et al.* (2019), who found that the annual prevalence of complaints was 64.8% low back, 52.9% upper back, and neck 48.0% among metal workers.

The study established that carrying or lifting heavy things > 20 kg, not taking breaks, standing, and bending had no significant association with low back pain. However, there was a closer association of low back pain with bending as opposed to low back pain that had no specific correlation to any of the risk factors, implying that housekeepers were at risk of low back pain, irrespective of the activity done. This also implies that the risk of low back pain is likely due to the posture adopted while performing the tasks.

The study findings are consistent with research by Eriksen *et al.* (2014), which established that workplace lighting, design, awkward body postures, heavy physical work, night shifts, lifting, bending, twisting, pulling, and pushing have often been associated with low back pain. The results also indicated that taking breaks, standing, and bending had no correlation to neck and shoulder pain. These findings align with Linaker and Bone's (2015) study that shoulder disorders are associated with exposure to overhead work, heavy load lifting, forceful work, and repetition.

Lastly, while carrying, lifting, pulling, or pushing heavy things >20 kilograms and taking breaks had a significant association with leg pain, there was no significant association between standing and bending and leg pain. These results align with a study by Kadota *et al.* ([2020](#)) that showed an association between increasing load-carrying exposures, long trip durations, and knee pain.

5.0 Conclusion

The study indicated that lower back pain was the most common WRMD-related pain experienced by housekeepers. The results indicated that all the risk factors (carrying or lifting heavy things >20 kilograms without taking a break, standing, and bending) had no significant association with low back pain at a 95% confidence level; however, there was a significant association between carrying, lifting, pushing, and pulling things with neck, shoulder, and leg injuries at a 95% confidence level. Therefore, the study concluded that all activities done by housekeepers are a risk factor for low back pain, and specifically lifting, carrying, pushing, and pulling things were strongly associated with leg, neck, and shoulder pains. Therefore, preventive measures should be taken seriously for all the activities to curb MSDs among housekeepers in selected hotels in Mombasa County.

6.0 Recommendation

Hotels ought to identify the common WRMDs among housekeepers and the specific risk factors associated with these pains. The management of the hotels should evaluate labor practices and consider making work efficient for their housekeepers. This can be made possible by investing in the mechanization of equipment, having light-weight furniture, serviced trolleys, lifting aids, and laundry rooms or stores within easy reach for big hotels. In return, the above measures will mitigate understaffing and, in turn, control work-related musculoskeletal disorder among housekeepers, since carrying, lifting, pushing, pulling, long standing, bending, not taking breaks in between tasks, and walking long distances in a day have come out as major factors associated with WRMDs among housekeepers in this study.

Reinforcing workers' laws through workers' unions and health committees in hotels can also go a long way towards mitigating musculoskeletal disorders among housekeepers in hotels. Ergonomic training (adoption of ideal postures while performing daily tasks, lifting, or carrying any items) as a basic learning in schools from primary to high school and all the way to higher learning institutions would ensure individuals adopt the good posture and lifting techniques required in all disciplines to prevent WRMSDs. WRMSD should not be a low-ranked burden, as pain affects productivity and quality of life.

7.0 Acknowledgements

7.1 General acknowledgement

pivotal role in generating the study's insightful results

7.2 Declaration of interest

The Ethical Review Committee (ERC-REFERENCE NO: ERC/MSc/021/2019R) and National Commission for Science, Technology, and Innovation (NACOSTI- Applicant Identification Number-509299) reviewed and approved the research project before collecting data.

7.3 Conflict of interest

None

7.4 Study Limitations

Lack of proper knowledge of MSDs by the housekeepers, hence had to generalize the disorders as pain. An experimental study can be done to establish the disorders.

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