

## **Prevalence of Work-Related Musculoskeletal Disorders among Male Manual Material Handling (Mmh) in Markets across Port Harcourt Metropolis**

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### **Abstract**

Work-related musculoskeletal disorders (WRMSDs) are a leading cause of occupational injuries in both industrialized and developing countries, with medical, occupational, economic, and psychosocial consequences not just for the workers but for the society at large. This study assessed the prevalence of work-related musculoskeletal disorders among manual material handlers across markets in Port Harcourt metropolis, Nigeria. A Descriptive cross-sectional study design was used for the study. 284 manual material handlers in Port Harcourt metropolis were sampled using the multi-stage sampling technique. An adapted Standardized Nordic Musculoskeletal Survey questionnaire was used to obtain primary data and analyzed using descriptive statistics. The participants were all male from the major markets, (oil-mil market 90, mile (ca. 145 km) three market 110 and Ruomuokoro market 84 male). An exploratory descriptive data analysis using frequencies and percentages was done to measure the prevalence of WRMSDs using the SPSS version 27. The results from the descriptive analysis showed that the socio-demographic WRMSDs mostly were aged 35-45 years (31.69%), followed by 46 years and above (24.64%), had secondary level of education (39.43%) followed by the primary level of education (32.39%), marital status, single (70.42%) and Christians (49.29%), why Islam had 31.69%. The findings showed that most of the Manual Material handling males have been working for over 8 years (49.29%), and 194 (68.31%) have had a history of muscle or joint pain in their previous occupation with lower back pains (28.17%) and upper back pains (20.77%). The prevalence of WRMSDs on Manual Material Handler's male was 56.34% (respondents) yes to having signs and symptoms of muscle/joint pain discomfort or numbness in their present occupation. Muscle pain (37.33%), being the most commonly affected body region, followed by low back pain (27.46%), upper back pains. (23.14%). The least were shoulder pains and bone pains, having 7.75 and 3.52 % respectively. The majority expressed having feelings of musculoskeletal pain for about one to three months (45.4%), and those off work due to muscle/joint pain previously were (68.31%). It was noted that (69.71%) have no ergonomic hazard awareness. Conclusively, this study determined that there was a high prevalence of commonly occurring WRMSDs among Manual Material Handling Males across the major markets in Port Harcourt Metropolis. WRMSDs pose significant occupational stress and have been linked to age, and long hours of lifting or carrying heavy loads.

**Keywords: prevalence, WRMSDs, disorder, WHO, manual.**

## **Introduction**

The musculoskeletal system is made up of muscles, tendons, ligaments, cartilage, nerves, and bone. They shape, support, stabilize, and move the human body. According to (Canadian Center for Occupational Health and Safety 2023), When occupational practices and work environments substantially contribute to the development of musculoskeletal disorders such as pain and functional disability, the World Health Organization (WHO) acknowledges them as work-related musculoskeletal disorders. Korhan, et al (2019) defined it as the impaired functioning of various joints, muscles, tendons, nerves, and bones as a result of the work environment. Rugbeer, (2016) stated that to date, WRMSDs are the most frequent health complaints of workers in both developed and developing nations, accounting for 44% of all work-related injuries and illnesses in Great Britain. Manual Material Handling (MMH) males are individuals who manually move, lift, carry, or place objects, materials, or goods. Desos et al, (2015) The International Labour Organization (ILO) and the Occupational Safety and Health Administration (OSHA) also recognize manual material handling as a distinct occupation that involves manual handling of objects, material, or goods. Ergonomic work-related hazards are the leading cause of occupational risks in both industrialized and developing countries, with medical, occupational, economic, and psychosocial consequences not just for the workers but for society at large. According to Desos et al, (2010a) Human contribution as a manual work resource is still dominant in current manufacturing activities. The term used to describe the activities is Manual Material Handling (MMH) activities. MMH usage was preferred over machinery due to its high flexibility and being relatively low in cost. MMH holds the advantage in its flexibility to maneuver during simple and light material transfer, if compared to performing the same activity using mechanical aids. However, repetitive MMH activities, wrong transfer position, and method as well as heavy loads could risk the workers of a serious case of Lower Back Pain (LBP). This will intensify should it occur continuously and for a long period. Incorrect MMH activities are possible risks for LBP as well as other Musculoskeletal disorders (MSD) (John et al, 2024). As a direct consequence, there is an increased work demand on manual material handling males, especially those who lift loads long-distance. While wondering if long-distance manual material handlers in Rivers State would develop WRMSD, the researcher was moved to conduct the study on the prevalence of WRMSDs among manual material handling males across markets in the Port Harcourt metropolis. This was so as Port Harcourt metropolis is the largest city in the State, with lots of major markets where people come in and buy things in bulk and out of the city. Consequently,

this places a burden on the manual material handler especially those who go long distances. The nature of the Nigerian markets, no space, as well as the high level of insecurity in Nigeria exposes these occupational groups to hazards, affecting their personal and social life and a group of interest

### **Statement of the problem**

Manual material handling is a common occupational task among male market porters, load carriers, wheelbarrows pushers, and head loaders which involves repetitive lifting carrying, and moving of heavy loads. However, this physically demanding work is associated with a high risk of work-related musculoskeletal disorders (WMSDs) which can lead to pain, disability, and reduced productivity. Despite the importance of this issue, there is a lack of reliable data on the prevalence of WMSDs among male manual material handlers in markets across Port Harcourt Metropolis. This knowledge gap hinders the development of effective preventive measures and interventions to mitigate the risk of WMSDs in this vulnerable population. therefore, this study aims to investigate the prevalence of work-related musculoskeletal disorders among male manual material handlers in markets across Port Harcourt Metropolis, to provide valuable insights for policymakers, occupational and other stakeholders to design and implement evidence-based interventions to prevent WMSDs in this population

### **Aim and Objectives**

Prevalence of work-related musculoskeletal disorders among male manual material handling (MMH) in markets across Port Harcourt Metropolis

### **Specific Objectives**

- 1) To determine the sociodemographic variable of manual material handling males across market in Port Harcourt Metropolis
- 2) To determine the prevalence of the musculoskeletal disorder among male manual material handling across markets in the Port Harcourt metropolis
- 3) To Identify the common types of musculoskeletal disorders experienced by manual material handling males across the market in Port Harcourt Metropolis
- 4) To determine the occupational/ past history manual material handling males across the market in Port Harcourt Metropolis

### **Research Questions**

- 1) What are the sociodemographic variables of manual material handling males across the market in Port Harcourt Metropolis?

- 2) What is the prevalence of musculoskeletal disorders among male manual material handling across markets in the Port Harcourt metropolis?
- 3) What are the common types of musculoskeletal disorders experienced by manual material handling males across the market in Port Harcourt Metropolis?
- 4) What are the occupational/ past history manual material handling males across the market in Port Harcourt Metropolis?

### **Methodology**

A Descriptive cross-sectional study design was used for the study. 284 Manual Material handling males across markets in the Port Harcourt metropolis were sampled using the multi-stage sampling technique. An adapted Standardized Nordic Musculoskeletal Survey questionnaire was used to obtain primary data and analyzed using descriptive statistics. The participants were all male. An exploratory descriptive data analysis using frequencies and percentages was done to measure the prevalence of WRMSDs on MMH using the SPSS VERSION 27.

### **Research Design**

A Descriptive cross-sectional study design was used for the study.

### **Study Area**

The study was conducted in the Port Harcourt metropolis, one of the major centers of economic activities in Nigeria, located between latitude 4° 45' N and latitude 4° 55' N and longitude 6° 55' E and longitude 7° 05' E in Rivers State. The city extends across Port Harcourt and Obio/Akpor Local Government Areas with an estimated population of 1.85 million inhabitants as of 2016. The Port Harcourt metropolis is a major study industrial center with a large number of multinational firms, particularly, the petroleum industry, therefore known as the chief oil-refining city in Nigeria with two main refineries located at Eleme. Most major markets at Port Harcourt city. The precise locations for the study covered the Oil Mill market, Rumuokoro market, and the mile three market restricted to manual material handlers such as load carriers, porters, head loaders, and wheelbarrow pushers.

### **Study Population**

The study population comprises male manual material handlers who manually move, lift, carry, or place objects, materials, or goods for short and long distances, for at least 2 years down the journey at least 3 times per week. While those who were sick or on leave from work at the time of the study were excluded, manual material handlers who consented to participate were recruited.

### **Sample Size**

The sample size (n) was determined using the Cochran's formula.  $n = z^2pq/d^2$

The derived sample size was 267 while the non-response of 10% was added which resulted in a total sample size of 284.

### **Sampling Technique**

A multi-stage sampling technique was used to select the MMHM for the study using cluster sampling and simple random sampling technique as follows; First, A list of all the major markets was obtained from the Local Government Chairman in Obio-Akpor council, the market where then divided into clusters concerning their locations. Random sampling by ballot was done to select three clusters the wheelbarrow pusher, porter, head carrier, and load carriers obtained from the market gate past coordinator. A preliminary survey was then conducted to determine the total number of markets and the number of manual materials handlers in each cluster. From each selected cluster, manual material handlers present when questionnaires were given were used for this research purpose.

### **Data Collection**

Data was collected on socio-demographic characteristics of the participants, occupational and past medical history, and history of the musculoskeletal disorder in the present occupation. A structured interviewer-administered questionnaire was adapted from the Nordic Musculoskeletal Questionnaire used to evaluate musculoskeletal disorders. Data collection was mainly done in the morning hours before the departure for duty of the day.

### **Methods of Data Analysis**

The data collected was entered using Microsoft Excel and was then transferred to be analyzed with the Statistical Package for Social Sciences (SPSS) version 27 software. Exploratory Descriptive statistics (frequency and percentages) were used to analyze the data and present them in tables.

**Findings**

**Table 1: Demographic characteristics of Manual Material handling males in market in Port Harcourt metropolis respondents**

Factor	Variable	F (N=284)	%(100)
Age	15-25 years	60	21.1
	26-34 years	64	22.5
	35-45 years	90	31.69
	46 years & above	70	24.64
Designation	Load carriers	128	45.07
	Porters	30	10
	Head Loaders	8	2.81
	Wheelbarrow pusher	118	41.54
Level of Education	Primary	92	32.39
	Secondary	112	39.43
	Tertiary	80	28.17
Marital Status	Single	200	70.42
	Married	84	29.58
Religion	Christian	140	49.29
	Islam	90	31.69
	others	54	19.01
Experience	5-10 years	45	34.90
	11-15 years	29	22.50
	16-20 years	25	19.40
	21-25 years	16	12.40
	26 years and above	14	10.90

**Table 1** shows the socio-demographic characteristics of the Manual material handling males Across Major markets. All respondents were male, with most of whom were 35-45 years (n=284,31.69%), followed by 46years and above (n=284,24.64%), had secondary level of education (n=284,39.43%) followed by primary level of education(n=284,32.39%), marital status, single (n=284,70.42%) and Christians (n=284, 49.29%) why Islam had 31.69%.

**Table 2: Occupational/past medical history of the Manual Material Handling Male across Port Harcourt metropolis**

S/N	Questions	Variable	F (N=284)	%(100)
1)	How long have you been working as Manual material Handlers	2-4 years	40	14.08
		4-6 years	48	16.90
		6-8 years	56	19.71
		8 years & above	140	49.29
2)	Have you ever been diagnosed/ treated for any muscle or joint pain in your previous occupation?	Yes	194	68.31
		No	90	31.69
3)	What part of your body did you feel the muscle or joint pain in your previous occupation?	Shoulder	36	12.67
		Low back pain	80	28.17
		One or both high/thigh/buttocks	20	7.04
		30	10.56	
		One or both knees	20	7.04
		elbow	15	5.28
		Neck	59	20.77
		Wrist/hand	24	8.45
Upper Back				
One or both ankle/feet				

**Table 2** shows the occupational/past medical history of the Manual Material handlers across the Major markets in Port Harcourt Metropolis. The findings showed that most of the Manual Material handling males have been working for over 8 years (n=284, 49.29%), and 194

(68.31%) have had a history of muscle or joint pain in their previous occupation with lower back pains(n=284,28.17%) and upper back pains n=284,20.77%)

**Table 3: Prevalence of work-related musculoskeletal disorders among male manual material handling across Port Harcourt metropolis**

S/N	Questions	Variable	F (N=284)	% (100)
1)	Have you at any time felt any form of muscle/joint pain, discomfort, or numbness in any part of your body in your present occupation?	Yes	160	56.34
		NO	124	43.66
2)	What part of your body did you feel pain in your present occupation	Lower back	78	27.46
		Upper back	68	23.94
		Wrist/hand		
		Elbow		
		Neck		
		Muscle pains	106	37.33
		One or both		
		ankle/feet	10	3.52
		Bone pain	22	7.75
		Shoulder		
3)	How long have you been feeling the Musculoskeletal pain	6-12 months	71	25.00
		3-6months	84	29.58
		1-3 months	129	45.42
4)	Have you been off work due to muscle/joint pain gotten from work	Yes	194	68.31
		No	90	31.69
5)	Do you know Ergonomic hazard	Yes	86	23.94
		No	198	69.71

**Table 3** The prevalence of WRMSDs in Manual Material handlers was 56.34% (284 respondents) yes to having signs and symptoms of muscle/joint pain discomfort or numbness in their present occupation, with muscle pain(n=284,37.33%), being the most commonly affected body region followed by low back pain (n=284, 27.46%), upper back

pains(n=284,23.14%) and the least were shoulder pains and bone pains having 7.75 and 3.52 % respectively where n=284. The majority expressed having feelings of musculoskeletal pain for about one to three months(n=284,45.4%), and those off work due to muscle/joint pain previously were (n=284,68.31%). It was noted that (n=284, 69.71%) have no ergonomic hazards awareness.

### **Discussions of Findings**

The study findings have shown a high prevalence of commonly occurring WRMSDs in more than half (56.34%) of the study population. The finding is similar to the result of a study conducted among Rivers State transport drivers in Port Harcourt which reported a 58.6% prevalence of work-related musculoskeletal disorders among the drivers. (John et al, 2024) and also similar to the finding of a study conducted among Tri-city bus drivers in India which reported a 53% prevalence of work-related musculoskeletal disorders among the drivers Soni & Garg (2015) and Manual material handling (MMH) as the most common cause of musculoskeletal disorders (MSDs) and low back pain (LBP). It involves manual lifting, lowering, carrying, pushing, and pulling loads Desos et al (2015) who study on ergonomics awareness among Workers Performing Manual Material Handling Activities World Conference on Technology, Innovation, and Entrepreneurship. This similarity may be due to the slight difference in the number of study participants for both studies and variables. The current study finding differs from the result of a study in Ibadan, Nigeria reported a higher prevalence (89.3%) of WRMSDs among occupational drivers. Akinpelu et al (2011) the difference in the prevalence rate may be attributed to the different dependent variables and the sampled size or due to a misunderstanding of WRMSDs by the respondents. According to Ghaffari et al. (2006), repeated MMH activities, even if performed while in a sitting position could potentially cause LBP and MSD. This shows that the MMH performed is hazardous and high risk to LBP. Another study showed that the workers were lack of knowledge in regards to ergonomics and MMH. There was no particular safety and health program conducted at their workplace. Besides that, most programs organized were less effective and did not have an impact on the workers. It is a company's responsibility to provide safety and health requirements to the workers in the form of information, seminars, and exhibitions amongst others (Noriah, 2010). Another study in Mubi, Northern Nigeria, among occupational drivers reported a lower prevalence (21.2%) of WRMSDs which may be due to the nonprobability convenient sampling technique employed for the study or it could be different occupational job descriptions Maduagwu et al (2021).

The frequency of WRMSD among Manual Material handling Males across markets in Port Harcourt metropolis can be linked to the city's high population density and steady rise in the expense of living. Exposing them to risk factors with little time for relaxation and recuperation. If not addressed, this could lead to absenteeism from work, early retirement, or even disability, which would hurt their immediate family, community, and society at large. An important finding from the current study is the pattern of distribution of the prevalence varies with the body parts of the study participants. The lower back had the most prevalence and agrees with the findings of Nigeria and Indian studies Akinpelu et al (2011), Soni & Garg (2015). This can be explained by the bending position of this body region while lifting and carrying loads at the various markets, keeping the muscles of this region contracted for as long as when the loads carried by the manual material handlers are dropped down, overworking the muscles. If this continues for years, without adequate recovery, WRMSD occurs.

**Implications of the findings:** Awareness and Preventing WRMSDs among MMH males across markets in Port Harcourt Metropolis necessitates a multimodal strategy that includes proactive steps to improve musculoskeletal health in this particular occupational group of Labourers as well as education and awareness campaigns. Strengths and Limitations of the study: Most Manual Material Handling behaves similarly.

### **Conclusion**

This study determined that there was a high prevalence of commonly occurring WRMSDs among Manual Material Handling Males across the major markets in Port Harcourt Metropolis. WRMSDs pose significant occupational stress and have been linked to age, long hours of lifting or carrying heavy loads or goods, long duration of lifting and straining the muscles manually and awkward postures assumed by creating a balance while in motion with the goods been carried. There is a need for intervention in this occupational group. Though more than half of the participants were not aware of WRMSDs, the majority of the Manual Material handlers stated that WRMSDs are a normal experience that cannot be prevented indicating a negative attitude towards the prevention. However, encouraging stops every 2-4 hours of loading and offloading goods is a crucial practice preventing WRMSDs among Manual material handlers. There is a need for occupational health programs directed at motivating Manual Material Handlers to develop positive attitudes toward the prevention of WRMSDs.

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