ORIGINAL ARTICLE

Prevalence and Associated Risk Factors of Musculoskeletal Disorders among Block Molders in Umuahia Municipal Area of Abia State, Nigeria

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ABSTRACT

Introduction: This study assessed the prevalence and associated risk factors of musculoskeletal disorders (MSDs) among block molders in Umuahia municipal area of Abia State, Nigeria. Four specific objectives with corresponding research questions and one hypothesis guided the study. **Materials and Methods:** Descriptive cross-sectional study design was used for this study. A multi-stage cluster sampling technique was used to draw samples of 400 block molders in 10 wards out of the 20 wards in Umuahia municipal area of Abia State, Nigeria. A modified Nordic Musculoskeletal questionnaire, standard weight scale (in kg) and a standard stadiometer (in meters) were utilized for data collection. The data collected were analyzed using frequencies, percentage, and bar chart; the hypotheses were tested using the adjusted odds ratio and Chi-square statistics at ≤0.05 level of significance. **Results:** The result revealed that among block molders who do block molding manually, an increased prevalence of 79.4% musculoskeletal disorder (pains in one/both hip or thigh) was recorded in the past 1 year. The study also revealed that among block molders who do block molding using machines, an increased prevalence of 77.0% and 62.2% musculoskeletal disorder (pains in one or both hip/thigh and lower back pain, respectively) was recorded. The majority of the block molders identified one or both hips/thighs as the main localized pain point experienced during the course of their work. Many of the block molders were overweight as their BMI was within the range of (25–29.9 kg/m^2). The majority of the block molders were aware of the risk factors of MSDs and they also have good knowledge of it. Repetitive work showed a significant association with MSDs (knee trouble) and also a likelihood that repetitive work could lead to knee trouble (AOR = 1.339, $P = 0.065$). Findings from the study showed an association between repetitive work and ankle/feet trouble and also 3 times likelihood that repetitive work could lead to ankle/feet trouble. **Conclusion:** Based on the findings, the researcher concluded that there is a significant association between some risk factors of MSDs and the presence of MSDs among block molders in Umuahia municipal area of Abia State, Nigeria. Furthermore, some occupational and individual risk factors have the likelihood of causing MSDs. The researcher then recommended that further studies should be carried out (longitudinal studies) among block molders to determine predictive factors related to leaving or staying in the block molding industry as well as to gain a better understanding of the risk associated with it. Since there is an increase in the prevalence of MSDs, especially with respect to ankles pain, awareness on the effect of increased BMI and repetitive movement should be created and the importance of job shifting be made known in other to reduce these occupational risk factors that can lead to MSDs.

Key words: Abia state, block molders, prevalence, BMI, musculoskeletal disorder, Nigeria, Umuahia municipal

INTRODUCTION

Work-related musculoskeletal disorders (WMSDs), as defined by the National Institute for Occupational Safety and Health,[1] are disorders and diseases of the musculoskeletal system that has a causal determinant that is work-related. The term "work-related" has been used by the World Health Organization to specify a scientific cause of a disease, where the performance of the work and the work environment are

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two significant factors that may contribute to the onset of the disease.[2]

There is a wide variety of WMSDs, from back injuries caused by the manual handling of heavy loads to wrist injuries caused by repetitive work. Musculoskeletal disorders (MSDs) are relatively common conditions known as cumulative trauma disorders and repetitive strain injuries (RSIs).[3] MSDs are prevalent among workers in the construction industry which warrants heavy physical work, often necessitating inappropriate working postures for prolonged periods, which significantly increases morbidity and considerably decreases the workability.[4-6]

The block molding industry in Nigeria falls under the above-mentioned category, where the majority of the workforce is part of the unorganized sector, comprising mostly of skilled and unskilled workers, including men, women, and in some cases, even children.[7] In contrast to other occupational disorders, which could be attributed to occupational exposures to toxic substances, MSD among block molders owes its pathophysiology to unorthodox postures opted by these workers, where the joints and muscles are held in unconducive physiological positions for protracted periods of time, in suboptimal working conditions.[8-11] The molding of blocks begins with the mixing of cement and sand, preparation and molding of blocks, followed by drying and stacking of molded blocks, after which they are arranged in a prescribed fashion for transport.[12] Prior research in this area has identified that poor working conditions, suboptimal physiological postures that compel frequent bending and twisting, and inadequate rest-breaks are among the risk factors for MSD among these workers.[13,14] These studies found that block molders carrying out manual molding had more strains and sprains (40% of injuries) and fewer lacerations (24% of injuries) than block moulders using electrical techniques (16.6% and 52%).[15,16] These MSDs take a toll on their lives by affecting their activities of daily living, leading to slow economic growth of their families, resulting in poor overall quality of life.[17-21] Consequently, block molders who comprise a part of the unorganized work sector in Nigeria are in a disadvantageous position and literature regarding their health problems and needs is largely unavailable.[22] Hence, this study was done with a threefold aim of determining the prevalence of MSD among block molders, assessing the associated risk factors of MSD among block molders, and to identify common postures adopted by block molders during and outside the course of their work.

MATERIALS AND METHODS

A descriptive cross-sectional study design was used for this study. A total of 400 block molders in 10 wards out of the 20 wards in Umuahia municipal area of Abia State, Nigeria, were recruited for the study. A modified Nordic Musculoskeletal questionnaire,[23] standard weight scale (in kg) and a standard stadiometer (in meters) were utilized for data collection. The data collected were analyzed using frequencies, percentage, and bar chart; the hypotheses were tested using the adjusted odds ratio and Chi-square statistics at ≤0.05 level of significance.

RESULTS

Demographic profile of molders in Umuahia, Abia State

Based on the data analyzed on the demographic profile of block molders, 400 of the block molders are all-male participant; this portrays the fact that in the South East, hard work like block molding is seen as a male occupation due to the nature of activities involved. This is in line with the study schematics of 1which was conducted in the South East wherein responders were predominantly males. Also, majority of these male block molders are within the ages of 14–55 years. Furthermore, data analyzed showed that the majority of the block molders were overweight as their BMI was within (25–29.9 kg/m^2). From the data also, it shows that the majority of the block molders were aware of the risk factors of MSDs and also majority of them have good knowledge of musculoskeletal disorder risk factors.

Prevalence of MSDs among manual block molders in Umuahia, Abia State

The prevalence of MSDs among manual block molders in Umuahia, Abia State was high 79.4% as many of the block

Table 1: Demographic profile of molders in Umuahia, Abia State (*n*=400)

S/N	General characteristics	Frequency (*n*=400)	Percentage
1	Gender		
	Male	400	100.0
2	Age in years		
	18–25	48	12.0
	26–40	115	28.8
	41–55	121	30.3
	>55	112	28.0
3	BMI		
	Underweight; (18.5)	11	2.8
	Normal weight; (18.5–24.9)	166	41.5
	Overweight (25–29.9)	185	46.3
	Obese (>30)	38	9.5
4	Duration (years)		
	≥10	208	52.0
	>10	192	48.0

molders reported that they have experienced localized pains on one or both hip/thighs within the past 1 year; this result is in line with the assertion of[1,19,20,22] which stated that workers who use poor work practices, body mechanics and lifting techniques are introducing unnecessary risk factors that can contribute to MSDs. These poor practices create unnecessary stress on their bodies that increase fatigue and decrease their body's ability to properly recover.

Prevalence of MSDs among machine block molders in Umuahia, Abia State

The result of this study showed that 77.0% of the machine block molders reported that they have experienced lower back pain in the past 1 year; this may be as a result of their age bracket 41–55 years because according to[7,9,10,22,24,21] age is a contributory risk factor to MSDs.

Localized pain points experienced by block molders in Umuahia, Abia State in the course of their work (*n*=400)

Shown in Table 2 is the localized pain point experienced by block molders in Umuahia, Abia State in the course of their work. Two hundred and sixty-three (65.8%) of the participants identified the neck region as the localized pain point experienced during the course of their work, 231 (57.8%) of the participants identified the shoulder region as the localized pain point experienced during the course of their work, 210 (52.5%) of the participants identified the elbow region as the localized pain point experienced during the course of their work, and 222 (55.5%) of the participants identified the upper back region as the localized pain point experienced during the course of their work.

Two hundred and forty-three (60.8%) of the participants identified the lower back region as the localized pain point

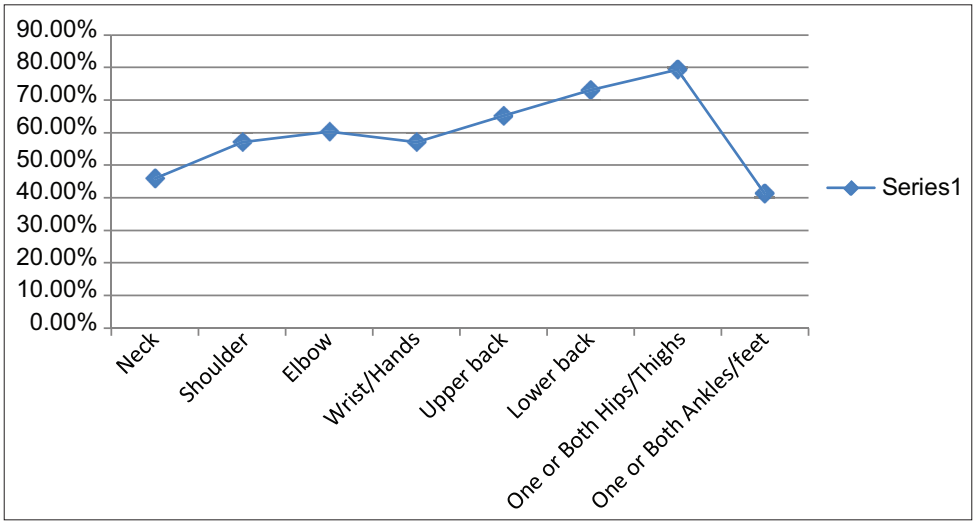

Figure 1: Prevalence of musculoskeletal disorders among manual block molders in Umuahia, Abia State

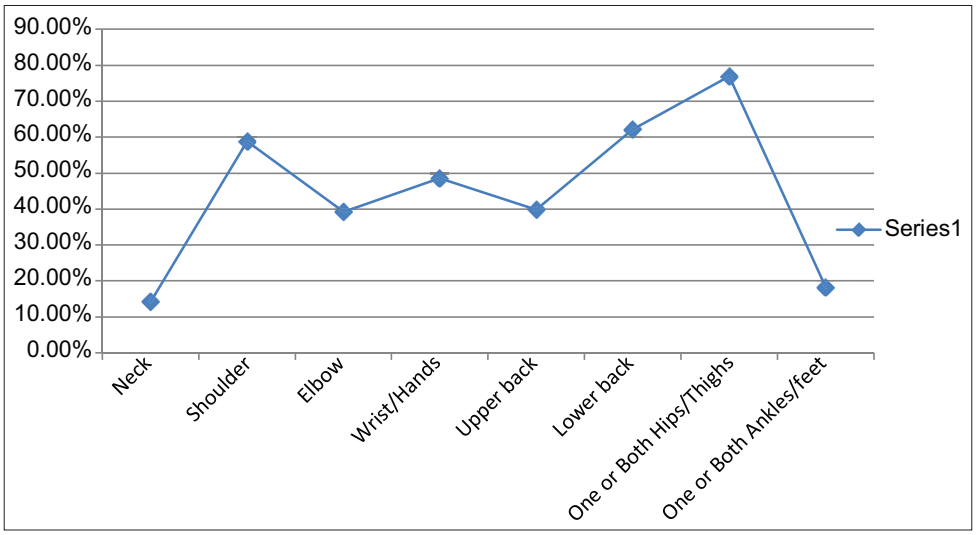

Figure 2: Prevalence of musculoskeletal disorders among manual block molders in Umuahia, Abia State

Table 2: Localized pain points experienced by block molders in Umuahia, Abia State in the course of their work (*n*=400)

S/N	Localized pain points	Frequency (*n*=400)	Percentage
1	Neck		
	Yes	263	65.8
	No	137	34.3
2	Shoulder		
	Yes	231	57.8
	No	169	42.3
3	Elbow		
	Yes	210	52.5
	No	190	47.5
4	Upper back		
	Yes	222	55.5
	No	178	44.5
5	Lower back		
	Yes	243	60.8
	No	153	38.3
6	One or both hips/thighs		
	Yes	292	73.0
	No	108	27.0
7	One or both knees		
	Yes	190	47.5
	No	206	51.5
8	One or both ankles/feet		
	Yes	131	32.8
	No	250	62.5

experienced during the course of their work, 292 (73.0%) of the participants identified one or both hips/thighs as the localized pain point experienced during the course of their work, 190 (47.5%) of the participants identified one or both knees as the localized pain point experienced during the course of their work, while 131 (32.8%) of the participants identified one or both ankles/feet as the localized pain point experienced during the course of their work.

Discussion of major findings

Demographic profile of molders in Umuahia, Abia State

Based on the data analyzed on the demographic profile of block molders, 400 of the block molders are all-male participant; this portrays the fact that in the east, hard work like block molding is seen as a male occupation due to the nature of activities involved. Majority of male block molders are within the ages of 14–55 years. Furthermore, data analyzed showed that the majority of the block molders were overweight as their BMI was within (25–29.9 kg/m^2). From the data also, it shows that the majority of the block molders were aware of the risk factors of MSDs and also majority of them have good knowledge of musculoskeletal disorder risk factors.

Prevalence of MSDs among manual block molders in Umuahia, Abia State

The prevalence of MSDs among manual block molders in Umuahia, Abia State was high 79.4% as many of the block molders reported that they have experienced localized pains on one or both hip/thighs within the past 1 year; this result is in line with the assertion of the (Sanya and Ogwumike, 2005; National Institute for Occupational Safety and Health, 2012; Riihimaki *et al*., 2014; Riihimaki *et al.,* 1994) which stated that workers who use poor work practices, body mechanics and lifting techniques are introducing unnecessary risk factors that can contribute to MSDs. These poor practices create unnecessary stress on their bodies that increase fatigue and decrease their body's ability to properly recover.

Prevalence of MSDs among machine block molders in Umuahia, Abia State

The result of this study showed that 77.0% of the machine block molders reported that they have experienced lower back pain in the past 1 year; this may be as a result of their age bracket 41–55 years because according to (Abanobi *et al*., 2015; Sanya and Ogwumike, 2005; Hoozeman *et al*., 2014; Lemaster *et al*., 2008; Inbaraj *et al*., 2013; Lei *et al*., 2005) age is a contributory risk factor to MSDs.

CONCLUSION

The findings of this study showed a strong relationship between some associated risk factors of MSDs among block molders in Umuahia municipal area of Abia State, Nigeria. The findings above showed that the collection of data for prevalence and associated risk factors of MSDs among block molders in Umuahia municipal area of Abia State, Nigeria, at the community level is feasible. It also showed the necessity for preventive measures focusing on of MSDs among block molders, risk reduction, prevention, and control. The result showed that the burden of MSDs can be reduced if constant preventive training, modification of work environment as well as adherence to the precautionary measures is kept.

Recommendations

1. Further studies should be carried out (longitudinal studies) among block molders to determine predictive factors related to leaving or staying in the block molding industry as well as to gain a better understanding of the risk associated with it.

2. A collaborative effort is need both from the individual, the block molding association and the government in other to establish a regular screen site for block molders in other to determine their health status at every point in time.
3. Since there is an increase in the prevalence of MSDs, especially with respect to ankles pain, awareness on the effect of repetitive movement should be created and the importance of job shifting should be created to reduce these occupational risk factors that can lead to MSDs.
4. It is also important to note that from the BMI data collected, the majority of the block molders are overweight hence the need for appropriate preventive health education on dietary pattern and nutrition among the block molders in Umuahia municipal area of Abia State, Nigeria.

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