



International Journal of Multidisciplinary Research and Growth Evaluation.

Knowledge of proper body mechanics and ergonomics among hospital workers in Rivers State

Madume AK ^{1*}, Aaron FE ², Otokwala IC ³, Dago GT ⁴, Paul JN ⁵, Ezekiel R ⁶

¹ Department of Physiotherapy, Faculty of Basic Medical Science, College of Medical Sciences, Rivers State University, Port Harcourt, Rivers State, Nigeria

² Department of Surgery, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, Nigeria

^{3,4} Department of Physiotherapy, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, Nigeria

⁵ Department of Anatomy, Faculty of Basic Medical Science, College of Medical Sciences, Rivers State University, Port Harcourt, Rivers State, Nigeria

⁶ Department of Nursing Science, PAMO University of Medical Sciences, Port Harcourt, Rivers State, Nigeria

* Corresponding Author: **Madume AK**

Article Info

ISSN (online): 2582-7138

Volume: 04

Issue: 03

May-June 2023

Received: 01-04-2023

Accepted: 18-04-2023

Page No: 218-230

Abstract

Over 59 million healthcare workers are prone to occupational hazards including biological, physical, ergonomic, environmental and psychosocial and having knowledge about it will go a long way in determining how well, safe and far every worker will go in the course of his or her job. The aim of this study was to assess knowledge of proper body mechanics and ergonomics among hospital workers in Rivers State. A descriptive design with sample size of 390 was used and the data was collected using researcher-modified questionnaires. Frequency of each demographic variable across the questions were determined on the average of 84% knowledge of ergonomics and body mechanics by the health workers. Inferential statistics of Chi-square was considered at 0.05 level of significance to determine the relationship between the demographic variables and the questions on knowledge and analyzed using Statistical Product and Service Solution, version 21. Age (what ergonomics/body mechanics is about, Chi-square, $p = 0.017$), Marital status (knowledge/awareness that standing for a long time can be hazardous to one's health, Chi-square, $p = 0.037$), Occupation [(what ergonomics/body mechanics is about, Chi-square, $p = 0.000$), (Back pain is one of the consequences of bad posture while doing procedures, Chi-square, $p = 0.004$), (Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health, Chi-square, $p = 0.019$), (Do you know that foot wears contribute to your musculoskeletal wellbeing, Chi-square, $p = 0.000$)], Years of Working [(what ergonomics/body mechanics is about, Chi-square, $p = 0.002$), (knowledge/awareness that standing for a long time can be hazardous to your health, Chi-square, $p = 0.023$)] and Highest Educational Qualification [(what ergonomics/body mechanics is about, Chi-square = 0.000), (knowledge/awareness that standing for a long time can be hazardous to your health, Chi-square, $p = 0.002$)]. It was concluded that the health workers in Rivers State are knowledgeable about ergonomics and body mechanics.

DOI: <https://doi.org/10.54660/IJMRGE.2023.4.3.218-230>

Keywords: Knowledge, Body Mechanics, Ergonomics, Hospital Workers, Rivers State

Introduction

Body mechanics describes how we use our body in daily routine. It includes the ways we maintain the body when we sit, stand, bend, and lift something ^[1]. By body mechanics, we can use our body in a safe manner and thus prevent many musculoskeletal injuries including low back pain. When we move our body safely and not follow the body mechanic techniques, our spine is at risk of getting injury, for this reason it is important to have good knowledge about body mechanics technique in order to apply

its principle in daily life to prevent it from various musculoskeletal injuries [2].

Ergonomics is a process which helps to assess the abilities of human and help the design makers to build certain systems and processes to help balance with human characteristics [3]. The goal of ergonomics is to reduce the risk of work-related injury at work places [4]. When properly applied to workplace environment and tasks, it has been reported to promote efficiency of the employee, improve productivity, and ultimately contribute to achievement of organizational goals [4]. Due to the various advancements in health care, there is an increase in the workload of the health care professionals. The role of the hospital staff is becoming more and more dynamic. The increasing complexity of patient care in the newer hospital environment increases the chances of work-related musculoskeletal disorders [3].

Ergonomics is defined as the study of interface between individuals and their working environment. Additionally, body mechanics refers to the method of efficiently using the body when making movement, such as bending the body, lifting a heavy object or person, starching an arm, sitting, standing or lying while performing work, increasing job satisfaction, increasing national income and economic benefits [4].

Therefore, there is a need for awareness and knowledge of proper body mechanic technique among the hospital personnel. Good body mechanics in moving, handling patients and lifting heavy object in a safe manner, many healthcare practitioners are suffering from the problem of musculoskeletal disorder due to the nature of their work such as performing various tasks most of the time in upright position, including lifting and moving equipment, handling patients [6]. Proper and effective body mechanic is possible only when health practitioners have good knowledge about it. Most common work related musculoskeletal disorder was lower back pain which is affecting 79.4% of health practitioners. Studies on healthcare activities and body mechanics in clinical area are mostly related to low back pain. Studies show that most healthcare practitioners who had back pain rarely used the body mechanics principle [7]. In most clinical settings in Nigeria, safety which is practiced is often focused on eliminating contact of personnel with infectious agents through the routine use of personal protective devices such as hand gloves, laboratory coats, and face masks, while paying little or no attention to other elements that may not necessarily cause an infection, but have the capacity to compromise the health of the worker. Healthcare practitioners working in a hospital with poor application of principles of ergonomics have increased risk for the development of work-musculoskeletal disorders (MSDs) [8], which could adversely affect his performance on the job, quality of test result, and ultimately patient's management and care.

Awareness basically is the knowledge or perception of a situation or fact [9]. Awareness of proper body mechanics and ergonomics helps prevent many work related musculoskeletal disorders among health practitioners and also the general population. Ergonomics awareness helps in ergonomic application and contributes significantly to human wellbeing and safety at workplaces [10]. While ergonomics has gained significant momentum in the developed countries, in developing regions of the world, its awareness still remains critically low [11]. The growing relevance of ergonomics to medical practice has been extensively described in a previous

study [12]. Although speedily becoming an integral part of the operation of most organizations, little is known about the awareness of the science of ergonomics among health practitioners working in Nigeria.

Statement of the problem

Over 59 million healthcare workers are prone to occupational hazards including biological, physical, ergonomic, environmental and psychosocial [3]. Musculoskeletal disorders (MSDs) are defined by National Institute for Occupational Safety and Health (NIOSH) as "injuries or disorder of the muscles, nerves, tendons, joints, cartilage and disc and supporting structures of the upper and lower limbs and lower back that are caused, precipitated or exacerbated by sudden exertion or prolonged exposure to physical factors such as repetition, force, vibration or awkward posture [13].

It is in the light of the above that the researchers seeks to know the extent of knowledge, awareness of proper body mechanics and ergonomics among hospital workers in Rivers State, for if the workers' goal is to remain at work healthy, fit and without much load of work on him/her, he/she must know how to work safe in such a manner as to reduce the negative effects of body mechanics and ergonomics, especially as he/she ages at work.

Methodology

The design for this study is the descriptive design. This study was carried out at the Rivers State University Teaching Hospital, Old GRA, Port Harcourt. The study population was made up of all staff of the university community

Permanent staff – 512

Casuals/Locums – 360

Interns/HO – 150

Sample size determination

There are two schools of thought about sample size – one is that as long as a survey representative, a relatively small sample size is adequate. Perhaps 300 – 500 respondents can work. The other point of view is that while maintaining a representative sample is essential, the more respondents you have the better. Using a standard deviation of 0.5 is a safe choice. Using Andrew Fisher's Formula:

Converting the confidence level into a Z-score => 1.96

Put these figures into the sample size formula to get

$$\begin{aligned} \text{Sample Size} &= \frac{(\text{Z-Score})^2 \times \text{Std Deviation} \times (1 - \text{Std Deviation})}{(\text{Confidence Interval})^2} \\ &= \frac{\{(1.96)^2 \times 0.5(0.5)\}}{(0.05)^2} \\ &= \frac{3.8416 \times 0.25}{0.0025} \\ &= \frac{0.9604}{0.0025} = 384.16 \end{aligned}$$

Here, sample size of 390 was used. (easycalculation.com)

The hospital community was sensitized and volunteers asked to buy into the study.

Data collection procedure

Researcher-modified (adopted) questionnaires were distributed to the members of staff. The questionnaires was retrieved after about 3 days. The various variables in the questionnaire were sieved and noted

Data analysis method

Frequency and percentage of the various variables was analysed. Inferential statistics of chi-square was used to ascertain the relationship between the variables at 0.05 level of significance. This was done using Statistical Product and Service Solutions (SPSS) version 21. The first of the analysis

was the demographic analysis, followed by the extent of knowledge of proper body mechanics and ergonomics among hospital workers in Rivers State and finally extent of practice of proper body mechanics and ergonomics among hospital workers in Rivers State.

Results

Table 1: Demographic Analysis

| Socio-demographics | Frequency | Percent |
|--|------------|--------------|
| Sex of the participants | | |
| Male | 155 | 39.7 |
| Female | 235 | 60.3 |
| Total | 390 | 100.0 |
| Marital Status | | |
| Single | 183 | 46.9 |
| Married | 201 | 51.6 |
| Divorced/Widow/Widower | 6 | 1.5 |
| Total | 390 | 100.0 |
| Occupation | | |
| Nurse | 58 | 14.9 |
| Physiotherapist | 11 | 2.8 |
| Doctor | 104 | 26.7 |
| Medical Laboratory Scientist | 78 | 20.0 |
| Pharmacist | 39 | 10.0 |
| Medical Records | 16 | 4.1 |
| Admin | 24 | 6.1 |
| Others | 60 | 15.4 |
| Total | 390 | 100.0 |
| Participants years of working (categorized) | | |
| 0-10years | 199 | 51.0 |
| 11-20years | 100 | 25.7 |
| 21-30years | 50 | 12.8 |
| Over 30years | 41 | 10.5 |
| Total | 390 | 100.0 |
| Highest educational qualification | | |
| High School (WASC) | 20 | 5.2 |
| RN/RM | 25 | 6.4 |
| First Degree | 231 | 59.2 |
| Postgraduate | 114 | 29.2 |
| Total | 390 | 100.0 |

The study revealed participation of (235) 60.3% of females compared to (155) 39.7% of males

On the marital status of the participants, we had more married people with (201) 51.6% followed by the singles with (183) 46.9% and then divorced/widow/widower with (6) 1.5%

On participant's occupation, doctors have the highest participation with (104) 26.7% followed by medical laboratory scientist with (78) 20.0%. This was followed by Others majorly radiographers, catering department, etc with (60) 15.4% and then nurses (58) 14.9% followed by pharmacists (39) 10.0% then admin with (24) 6.1% followed

by medical records with (16) 4.2% and lastly physiotherapists (11) 2.8%.

On participants years of working, less than 10years were more with (199) 51.0% followed by 11-20years with (100) 25.7% then 21-30years with (50) 12.8% and lastly over 30 years with (41) 10.5%.

On their highest educational qualification, first degree was the highest with (231) 59.2% followed by postgraduate with (114) 29.2% followed by Registered Nurse (RN)/ Registered Midwife (RM) with (25) 6.4% and lastly high school/West African School Certificate(WASC) with (20) 5.1%.

Question 1: Do you know what ergonomics/body mechanics is about?

Table 2: Knowledge of ergonomics and body mechanics among healthcare workers

| | | Yes | No | Total |
|---|------------------------|--------------------|--------------------|-------------------|
| Sex of the participants | Male | 118 (30.2%) | 37 (9.5%) | 155 (39.7%) |
| | Female | 152 (39.0%) | 83 (21.3%) | 235 (60.3%) |
| | Total | 270 (69.2%) | 120 (30.8%) | 390 (100%) |
| Marital Status of the participants | Single | 124 (31.8%) | 59 (15.1%) | 183 (46.9%) |
| | Married | 141 (36.2%) | 60 (15.4%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 5 (1.2%) | 1 (0.3%) | 6 (1.5%) |

| | | | | |
|---|------------------------|--------------------|--------------------|-------------------|
| | Total | 270 (69.2%) | 120 (30.8%) | 390 (100%) |
| Occupation of the participants | Nurse | 48 (12.3%) | 10 (2.6%) | 58 (14.9%) |
| | Physiotherapist | 10 (2.5%) | 1 (0.3%) | 11 (2.8%) |
| | Doctor | 91 (23.3%) | 13 (3.4%) | 104 (26.7%) |
| | Medical Lab. Scientist | 56 (14.4%) | 22 (5.6%) | 78 (20.0%) |
| | Pharmacist | 24 (6.2%) | 15 (3.8%) | 39 (10.0%) |
| | Medical Records | 9 (2.3%) | 7 (1.8%) | 16 (4.1%) |
| | Admin | 9 (2.3%) | 15 (3.8%) | 24 (6.1%) |
| | Others | 23 (5.9%) | 37 (9.5%) | 60 (15.4%) |
| | Total | 270 (69.2%) | 120 (30.8%) | 390 (100%) |
| Participants years of working | 0-10years | 129 (33.1%) | 70 (17.9%) | 199 (51.0%) |
| | 11-20years | 64 (16.4%) | 36 (9.3%) | 100 (25.7%) |
| | 21-30years | 45 (11.5%) | 5 (1.3%) | 50 (12.8%) |
| | Over 30years | 32 (8.2%) | 9 (2.3%) | 41 (10.5%) |
| | Total | 270 (69.2%) | 120 (30.8%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 10 (2.6%) | 10 (2.6%) | 20 (5.2%) |
| | RN/RM | 21 (5.4%) | 4 (1.0%) | 25 (6.4%) |
| | First Degree | 144 (36.9%) | 87 (22.3%) | 231 (59.2%) |
| | Postgraduate | 95 (24.3%) | 19 (4.9%) | 114 (29.2%) |
| | Total | 270 (69.2%) | 120 (30.8%) | 390 (100%) |

Question 2: Is it better to use bed sheet/other aids to lift patients or heavier objects?

| | | | | |
|---|------------------------|--------------------|--------------------|-------------------|
| | | Yes | No | Total |
| Sex of participants | Male | 121 (31.0%) | 34 (8.7%) | 155 (39.7%) |
| | Female | 169 (43.3%) | 66 (16.9%) | 235 (60.3%) |
| | Total | 290 (74.4%) | 100 (25.6%) | 390 (100%) |
| Marital Status of the participants | Single | 145 (37.2%) | 38 (9.7%) | 183 (46.9%) |
| | Married | 142 (36.4%) | 59 (15.2%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 3 (0.8%) | 3 (0.8%) | 6 (1.5%) |
| | Total | 290 (74.4%) | 100 (25.6%) | 390 (100%) |
| Occupation of the participants | Nurse | 47 (12.1%) | 11 (2.8%) | 58 (14.9%) |
| | Physiotherapist | 9 (2.3%) | 2 (0.5%) | 11 (2.8%) |
| | Doctor | 78 (20.0%) | 26 (6.7%) | 104 (26.7%) |
| | Medical Lab. Scientist | 60 (15.4%) | 18 (4.6%) | 78 (20.0%) |
| | Pharmacist | 31 (7.9%) | 8 (2.1%) | 39 (10.0%) |
| | Medical Records | 14 (3.6%) | 2 (0.5%) | 16 (4.1%) |
| | Admin | 15 (3.8%) | 9 (2.3%) | 24 (6.1%) |
| | Others | 36 (9.2%) | 24 (6.2%) | 60 (15.4%) |
| | Total | 290 (74.4%) | 100 (25.6%) | 390 (100%) |
| Participants years of working | 0-10years | 145 (37.2%) | 54 (13.8%) | 199 (51.0%) |
| | 11-20years | 75 (19.2%) | 25 (6.5%) | 100 (25.7%) |
| | 21-30years | 40 (10.3%) | 10 (2.5%) | 50 (12.8%) |
| | Over 30years | 30 (7.7%) | 11 (2.8%) | 41 (10.5%) |
| | Total | 290 (74.4%) | 100 (25.6%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 13 (3.4%) | 7 (1.8%) | 20 (5.2%) |
| | RN/RM | 23 (5.9%) | 2 (0.5%) | 25 (6.4%) |
| | First Degree | 172 (44.1%) | 59 (15.1%) | 231 (59.2%) |
| | Postgraduate | 82 (21.0%) | 32 (8.2%) | 114 (29.2%) |
| | Total | 290 (74.4%) | 100 (25.6%) | 390 (100%) |

Question 3: Back pain is one of the consequences of bad posture while doing procedures?

| | | | | |
|---|------------------------|--------------------|------------------|-------------------|
| | | Yes | No | Total |
| Sex of the participants | Male | 150 (38.5%) | 5 (1.3%) | 155 (39.7%) |
| | Female | 227 (58.2%) | 8 (2.1%) | 235 (60.3%) |
| | Total | 377 (96.7%) | 13 (3.3%) | 390 (100%) |
| Marital Status of the participants | Single | 178 (45.6%) | 5 (1.3%) | 183 (46.9%) |
| | Married | 193 (49.6%) | 8 (2.0%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 377 (96.7%) | 13 (3.3%) | 390 (100%) |
| Occupation of the participants | Nurse | 56 (14.4%) | 2 (0.5%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0 (0.0%) | 11 (2.8%) |
| | Doctor | 103 (26.4%) | 1 (0.3%) | 104 (26.7%) |
| | Medical Lab. Scientist | 76 (19.5%) | 2 (0.5%) | 78 (20.0%) |
| | Pharmacist | 39 (10.0%) | 0 (0.0%) | 39 (10.0%) |
| | Medical Records | 14 (3.6%) | 2 (0.5%) | 16 (4.1%) |

| | | | | |
|---|------------------|--------------------|------------------|-------------------|
| | Admin | 20 (5.1%) | 4 (1.0%) | 24 (6.1%) |
| | Others | 58 (14.9%) | 2 (0.5%) | 60 (15.4%) |
| | Total | 377 (96.7%) | 13 (3.3%) | 390 (100%) |
| Participants years of working | 0-10years | 191 (49.0%) | 8 (2.0%) | 199 (51.0%) |
| | 11-20years | 98 (25.2%) | 2 (0.5%) | 100 (25.7%) |
| | 21-30years | 50 (12.8%) | 0 (0.0%) | 50 (12.8%) |
| | Over 30years | 38 (9.7%) | 3 (0.8%) | 41 (10.5%) |
| | Total | 377 (96.7%) | 13 (3.3%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 19 (4.9%) | 1 (0.3%) | 20 (5.2%) |
| | RN/RM | 25 (6.4%) | 0 (0.0%) | 25 (6.4%) |
| | First Degree | 221 (56.7%) | 10 (2.5%) | 231 (59.2%) |
| | Postgraduate | 112 (28.7%) | 2 (0.5%) | 114 (29.2%) |
| | Total | 377 (96.7%) | 13 (3.3%) | 390 (100%) |

Question 4: Do heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 150 (38.5%) | 5 (1.3%) | 155 (39.7%) |
| | Female | 216 (55.4%) | 19 (4.9%) | 235 (60.3%) |
| | Total | 366 (93.8%) | 24 (6.2%) | 390 (100%) |
| Marital Status of the participants | Single | 173 (44.3%) | 10 (2.6%) | 183 (46.9%) |
| | Married | 187 (48.0%) | 14 (3.6%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 366 (93.8%) | 24 (6.2%) | 390 (100%) |
| Occupation of the participants | Nurse | 54 (13.8%) | 4 (1.0%) | 58 (14.9%) |
| | Physiotherapist | 10 (2.5%) | 1 (0.3%) | 11 (2.8%) |
| | Doctor | 100 (25.7%) | 4 (1.0%) | 104 (26.7%) |
| | Medical Lab. Scientist | 76 (19.5%) | 2 (0.5%) | 78 (20.0%) |
| | Pharmacist | 37 (9.5%) | 2 (0.5%) | 39 (10.0%) |
| | Medical Records | 16 (4.1%) | 0 (0.0%) | 16 (4.1%) |
| | Admin | 20 (5.1%) | 4 (1.0%) | 24 (6.1%) |
| | Others | 53 (13.6%) | 7 (1.8%) | 60 (15.4%) |
| Total | 366 (93.8%) | 24 (6.2%) | 390 (100%) | |
| Participants years of working | 0-10years | 185 (47.4%) | 14 (3.6%) | 199 (51.0%) |
| | 11-20years | 95 (24.4%) | 5 (1.3%) | 100 (25.7%) |
| | 21-30years | 48 (12.3%) | 2 (0.5%) | 50 (12.8%) |
| | Over 30years | 38 (9.7%) | 3 (0.8%) | 41 (10.5%) |
| | Total | 366 (93.8%) | 24 (6.2%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 16 (4.2%) | 4 (1.0%) | 20 (5.2%) |
| | RN/RM | 24 (6.1%) | 1 (0.3%) | 25 (6.4%) |
| | First Degree | 219 (56.1%) | 12 (3.1%) | 231 (59.2%) |
| | Postgraduate | 107 (27.4%) | 7 (1.8%) | 114 (29.2%) |
| | Total | 366 (93.8%) | 24 (6.2%) | 390 (100%) |

Question 5: Improper usage of body mechanics techniques can cause spinal injury?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 147 (37.7%) | 8 (2.0%) | 155 (39.7%) |
| | Female | 212 (54.4%) | 23 (5.9%) | 235 (60.3%) |
| | Total | 359 (92.1%) | 31 (7.9%) | 390 (100%) |
| Marital Status of the participants | Single | 171 (43.8%) | 12 (3.1%) | 183 (46.9%) |
| | Married | 182 (46.8%) | 19 (4.8%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 359 (92.1%) | 31 (7.9%) | 390 (100%) |
| Occupation of the participants | Nurse | 53 (13.6%) | 5 (1.3%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0 (0.0%) | 11 (2.8%) |
| | Doctor | 93 (23.9%) | 11 (2.8%) | 104 (26.7%) |
| | Medical Lab. Scientist | 73 (18.7%) | 5 (1.3%) | 78 (20.0%) |
| | Pharmacist | 37 (9.5%) | 2 (0.5%) | 39 (10.0%) |
| | Medical Records | 15 (3.8%) | 1 (0.3%) | 16 (4.1%) |
| | Admin | 22 (5.6%) | 2 (0.5%) | 24 (6.1%) |
| | Others | 55 (14.1%) | 5 (1.3%) | 60 (15.4%) |
| Total | 359 (92.1%) | 31 (7.9%) | 390 (100%) | |
| Participants years of working | 0-10years | 184 (47.2%) | 15 (3.8%) | 199 (51.0%) |
| | 11-20years | 90 (23.1%) | 10 (2.6%) | 100 (25.7%) |
| | 21-30years | 48 (12.3%) | 2 (0.5%) | 50 (12.8%) |
| | Over 30years | 37 (9.5%) | 4 (1.0%) | 41 (10.5%) |
| | Total | 359 (92.1%) | 31 (7.9%) | 390 (100%) |

| | | | | |
|---|------------------|--------------------|------------------|-------------------|
| Participants highest educational qualification | High School/WASC | 17 (4.4%) | 3 (0.8%) | 20 (5.2%) |
| | RN/RM | 24 (6.1%) | 1 (0.3%) | 25 (6.4%) |
| | First Degree | 216 (55.4%) | 15 (3.8%) | 231 (59.2%) |
| | Postgraduate | 102 (26.2%) | 12 (3.0%) | 114 (29.2%) |
| | Total | 359 (92.1%) | 31 (7.9%) | 390 (100%) |

Question 6: Do you know that sitting for long hours at a stretch can be injurious to your musculoskeletal system & health?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 132 (33.8%) | 23 (5.9%) | 155 (39.7%) |
| | Female | 203 (52.1%) | 32 (8.2%) | 235 (60.3%) |
| | Total | 335 (85.9%) | 55 (14.1%) | 390 (100%) |
| Marital Status of the participants | Single | 153 (39.2%) | 30 (7.7%) | 183 (46.9%) |
| | Married | 176 (45.2%) | 25 (6.4%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 335 (85.9%) | 55 (14.1%) | 390 (100%) |
| Occupation of the participants | Nurse | 51 (13.1%) | 7 (1.8%) | 58 (14.9%) |
| | Physiotherapist | 10 (2.5%) | 1 (0.3%) | 11 (2.8%) |
| | Doctor | 98 (25.1%) | 6 (1.6%) | 104 (26.7%) |
| | Medical Lab. Scientist | 65 (16.7%) | 13 (3.3%) | 78 (20.0%) |
| | Pharmacist | 30 (7.7%) | 9 (2.3%) | 39 (10.0%) |
| | Medical Records | 10 (2.6%) | 6 (1.5%) | 16 (4.1%) |
| | Admin | 20 (5.1%) | 4 (1.0%) | 24 (6.1%) |
| | Others | 51 (13.1%) | 9 (2.3%) | 60 (15.4%) |
| | Total | 335 (85.9%) | 55 (14.1%) | 390 (100%) |
| Participants years of working | 0-10years | 174 (44.6%) | 25 (6.4%) | 199 (51.0%) |
| | 11-20years | 84 (21.6%) | 16 (4.1%) | 100 (25.7%) |
| | 21-30years | 39 (10.0%) | 11 (2.8%) | 50 (12.8%) |
| | Over 30years | 38 (9.7%) | 3 (0.8%) | 41 (10.5%) |
| | Total | 335 (85.9%) | 55 (14.1%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 16 (4.2%) | 4 (1.0%) | 20 (5.2%) |
| | RN/RM | 24 (6.1%) | 1 (0.3%) | 25 (6.4%) |
| | First Degree | 195 (50.0%) | 36 (9.2%) | 231 (59.2%) |
| | Postgraduate | 100 (25.6%) | 14 (3.6%) | 114 (29.2%) |
| | Total | 335 (85.9%) | 55 (14.1%) | 390 (100%) |

Question 7: Do you know/aware that standing for a long time can be hazardous to your health?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 131 (33.6%) | 24 (6.1%) | 155 (39.7%) |
| | Female | 185 (47.4%) | 50 (12.9%) | 235 (60.3%) |
| | Total | 316 (81.0%) | 74 (19.0%) | 390 (100%) |
| Marital Status of the participants | Single | 139 (35.6%) | 44 (11.3%) | 183 (46.9%) |
| | Married | 171 (43.9%) | 30 (7.7%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 316 (81.0%) | 74 (19.0%) | 390 (100%) |
| Occupation of the participants | Nurse | 51 (13.1%) | 7 (1.8%) | 58 (14.9%) |
| | Physiotherapist | 7 (1.8%) | 4 (1.0%) | 11 (2.8%) |
| | Doctor | 92 (23.6%) | 12 (3.1%) | 104 (26.7%) |
| | Medical Lab. Scientist | 61 (15.6%) | 17 (4.4%) | 78 (20.0%) |
| | Pharmacist | 33 (8.5%) | 6 (1.5%) | 39 (10.0%) |
| | Medical Records | 11 (2.8%) | 5 (1.3%) | 16 (4.1%) |
| | Admin | 17 (4.3%) | 7 (1.8%) | 24 (6.1%) |
| | Others | 44 (11.3%) | 16 (4.1%) | 60 (15.4%) |
| | Total | 316 (81.0%) | 74 (19.0%) | 390 (100%) |
| Participants years of working | 0-10years | 152 (39.0%) | 47 (12.0%) | 199 (51.0%) |
| | 11-20years | 81 (20.8%) | 19 (4.9%) | 100 (25.7%) |
| | 21-30years | 47 (12.0%) | 3 (0.8%) | 50 (12.8%) |
| | Over 30years | 36 (9.2%) | 5 (1.3%) | 41 (10.5%) |
| | Total | 316 (81.0%) | 74 (19.0%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 13 (3.4%) | 7 (1.8%) | 20 (5.2%) |
| | RN/RM | 25 (6.4%) | 0 (0.0%) | 25 (6.4%) |
| | First Degree | 178 (45.6%) | 53 (13.6%) | 231 (59.2%) |
| | Postgraduate | 100 (25.6%) | 14 (3.6%) | 114 (29.2%) |
| | Total | 316 (81.0%) | 74 (19.0%) | 390 (100%) |

Question 8: Are you aware that interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chair are options for standing relief?

| | | Yes | No | Total |
|--|------------------------|--------------------|--------------------|-------------------|
| Sex of participants | Male | 101 (25.9%) | 54 (13.8%) | 155 (39.7%) |
| | Female | 148 (37.9%) | 87 (22.4%) | 235 (60.3%) |
| | Total | 249 (63.8%) | 141 (36.2%) | 390 (100%) |
| Marital Status of the participants | Single | 123 (31.5%) | 60 (15.4%) | 183 (46.9%) |
| | Married | 122 (31.3%) | 79 (20.3%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 4 (1.0%) | 2 (0.5%) | 6 (1.5%) |
| | Total | 249 (63.8%) | 141 (36.2%) | 390 (100%) |
| Occupation of the participants | Nurse | 38 (9.7%) | 20 (5.2%) | 58 (14.9%) |
| | Physiotherapist | 8 (2.0%) | 3 (0.8%) | 11 (2.8%) |
| | Doctor | 70 (18.0%) | 34 (8.7%) | 104 (26.7%) |
| | Medical Lab. Scientist | 50 (12.8%) | 28 (7.2%) | 78 (20.0%) |
| | Pharmacist | 19 (4.9%) | 20 (5.1%) | 39 (10.0%) |
| | Medical Records | 10 (2.6%) | 6 (1.5%) | 16 (4.1%) |
| | Admin | 14 (3.5%) | 10 (2.6%) | 24 (6.1%) |
| | Others | 40 (10.3%) | 20 (5.1%) | 60 (15.4%) |
| | Total | 249 (63.8%) | 141 (36.2%) | 390 (100%) |
| Participants years of working | 0-10years | 127 (32.6%) | 72 (18.4%) | 199 (51.0%) |
| | 11-20years | 62 (15.8%) | 38 (9.9%) | 100 (25.7%) |
| | 21-30years | 34 (8.7%) | 16 (4.1%) | 50 (12.8%) |
| | Over 30years | 26 (6.7%) | 15 (3.8%) | 41 (10.5%) |
| | Total | 249 (63.8%) | 141 (36.2%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 14 (3.6%) | 6 (1.6%) | 20 (5.2%) |
| | RN/RM | 14 (3.6%) | 11 (2.8%) | 25 (6.4%) |
| | First Degree | 149 (38.2%) | 82 (21.0%) | 231 (59.2%) |
| | Postgraduate | 72 (18.4%) | 42 (10.8%) | 114 (29.2%) |
| | Total | 249 (63.8%) | 141 (36.2%) | 390 (100%) |

Question 9: Do you know that foot wears contribute to your musculoskeletal wellbeing?

| | | Yes | No | Total |
|--|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 115 (29.5%) | 40 (10.2%) | 155 (39.7%) |
| | Female | 179 (45.9%) | 56 (14.4%) | 235 (60.3%) |
| | Total | 294 (75.4%) | 96 (24.6%) | 390 (100%) |
| Marital Status of the participants | Single | 136 (34.8%) | 47 (12.1%) | 183 (46.9%) |
| | Married | 152 (39.1%) | 49 (12.5%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 294 (75.4%) | 96 (24.6%) | 390 (100%) |
| Occupation of the participants | Nurse | 49 (12.6%) | 9 (2.3%) | 58 (14.9%) |
| | Physiotherapist | 7 (1.8%) | 4 (1.0%) | 11 (2.8%) |
| | Doctor | 94 (24.1%) | 10 (2.6%) | 104 (26.7%) |
| | Medical Lab. Scientist | 57 (14.6%) | 21 (5.4%) | 78 (20.0%) |
| | Pharmacist | 27 (6.9%) | 12 (3.1%) | 39 (10.0%) |
| | Medical Records | 8 (2.0%) | 8 (2.1%) | 16 (4.1%) |
| | Admin | 14 (3.6%) | 10 (2.5%) | 24 (6.1%) |
| | Others | 38 (9.8%) | 22 (5.6%) | 60 (15.4%) |
| | Total | 294 (75.4%) | 96 (24.6%) | 390 (100%) |
| Participants years of working | 0-10years | 140 (35.9%) | 59 (15.1%) | 199 (51.0%) |
| | 11-20years | 80 (20.5%) | 20 (5.2%) | 100 (25.7%) |
| | 21-30years | 40 (10.3%) | 10 (2.5%) | 50 (12.8%) |
| | Over 30years | 34 (8.7%) | 7 (1.8%) | 41 (10.5%) |
| | Total | 294 (75.4%) | 96 (24.6%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 12 (3.1%) | 8 (2.1%) | 20 (5.2%) |
| | RN/RM | 19 (4.9%) | 6 (1.5%) | 25 (6.4%) |
| | First Degree | 170 (43.6%) | 61 (15.6%) | 231 (59.2%) |
| | Postgraduate | 93 (23.8%) | 21 (5.4%) | 114 (29.2%) |
| | Total | 294 (75.4%) | 96 (24.6%) | 390 (100%) |

Question 10: Ergonomically, soft sole shoes are better with in-soles. Do you agree?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 120 (30.7%) | 35 (9.0%) | 155 (39.7%) |
| | Female | 198 (50.8%) | 37 (9.5%) | 235 (60.3%) |
| | Total | 318 (81.5%) | 72 (18.5%) | 390 (100%) |
| Marital Status of the participants | Single | 149 (38.2%) | 34 (8.7%) | 183 (46.9%) |
| | Married | 164 (42.1%) | 37 (9.5%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 5 (1.2%) | 1 (0.3%) | 6 (1.5%) |
| | Total | 318 (81.5%) | 72 (18.5%) | 390 (100%) |
| Occupation of the participants | Nurse | 50 (12.8%) | 8 (2.1%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0(0.0%) | 11 (2.8%) |
| | Doctor | 86 (22.0%) | 18 (4.7%) | 104 (26.7%) |
| | Medical Lab. Scientist | 62 (15.9%) | 16 (4.1%) | 78 (20.0%) |
| | Pharmacist | 28 (7.2%) | 11 (2.8%) | 39 (10.0%) |
| | Medical Records | 12 (3.1%) | 4 (1.0%) | 16 (4.1%) |
| | Admin | 20 (5.1%) | 4 (1.0%) | 24 (6.1%) |
| | Others | 49 (12.6%) | 11 (2.8%) | 60 (15.4%) |
| Total | 318 (81.5%) | 72 (18.5%) | 390 (100%) | |
| Participants years of working | 0-10years | 162 (41.5%) | 37 (9.5%) | 199 (51.0%) |
| | 11-20years | 80 (20.5%) | 20 (5.2%) | 100 (25.7%) |
| | 21-30years | 42 (10.8%) | 8 (2.0%) | 50 (12.8%) |
| | Over 30years | 34 (8.7%) | 7 (1.8%) | 41 (10.5%) |
| | Total | 318 (81.5%) | 72 (18.5%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 16 (4.1%) | 4 (1.1%) | 20 (5.2%) |
| | RN/RM | 23 (5.9%) | 2 (0.5%) | 25 (6.4%) |
| | First Degree | 187 (47.9%) | 44 (11.3%) | 231 (59.2%) |
| | Postgraduate | 92 (23.6%) | 22 (5.6%) | 114 (29.2%) |
| | Total | 318 (81.5%) | 72 (18.5%) | 390 (100%) |

Question 11: High heels shoes are not good for your limbs, do you agree?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 139 (35.6%) | 16 (4.1%) | 155 (39.7%) |
| | Female | 208 (53.4%) | 27 (6.9%) | 235 (60.3%) |
| | Total | 347 (89.0%) | 43 (11.0%) | 390 (100%) |
| Marital Status of the participants | Single | 162 (41.5%) | 21 (5.4%) | 183 (46.9%) |
| | Married | 179 (46.0%) | 22 (5.6%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 347 (89.0%) | 43 (11.0%) | 390 (100%) |
| Occupation of the participants | Nurse | 54 (13.9%) | 4 (1.0%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0 (0.0%) | 11 (2.8%) |
| | Doctor | 87 (22.3%) | 17 (4.4%) | 104 (26.7%) |
| | Medical Lab. Scientist | 70 (17.9%) | 8 (2.1%) | 78 (20.0%) |
| | Pharmacist | 34 (8.7%) | 5 (1.3%) | 39 (10.0%) |
| | Medical Records | 15 (3.8%) | 1 (0.3%) | 16 (4.1%) |
| | Admin | 22 (5.7%) | 2 (0.4%) | 24 (6.1%) |
| | Others | 54 (13.9%) | 6 (1.5%) | 60 (15.4%) |
| Total | 347 (89.0%) | 43 (11.0%) | 390 (100%) | |
| Participants years of working | 0-10years | 174 (44.6%) | 25 (6.4%) | 199 (51.0%) |
| | 11-20years | 90 (23.1%) | 10 (2.6%) | 100 (25.7%) |
| | 21-30years | 43 (11.0%) | 7 (1.8%) | 50 (12.8%) |
| | Over 30years | 40 (10.3%) | 1 (0.2%) | 41 (10.5%) |
| | Total | 347 (89.0%) | 43 (11.0%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 17(4.4%) | 3 (0.8%) | 20 (5.2%) |
| | RN/RM | 24(6.1%) | 1 (0.3%) | 25 (6.4%) |
| | First Degree | 209 (53.7%) | 22 (5.5%) | 231 (59.2%) |
| | Postgraduate | 97 (24.8%) | 17 (4.4%) | 114 (29.2%) |
| | Total | 347 (89.0%) | 43 (11.0%) | 390 (100%) |

Question 12: High heel shoes are only cosmetic but injurious functionally. Agreed?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 140 (35.9%) | 15 (3.8%) | 155 (39.7%) |
| | Female | 214 (54.9%) | 21 (5.4%) | 235 (60.3%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Marital Status of the participants | Single | 162 (41.5%) | 21 (5.4%) | 183 (46.9%) |
| | Married | 186 (47.8%) | 15 (3.8%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Occupation of the participants | Nurse | 56 (14.4%) | 2 (0.5%) | 58 (14.9%) |
| | Physiotherapist | 10 (2.6%) | 1 (0.2%) | 11 (2.8%) |
| | Doctor | 94 (24.1%) | 10 (2.6%) | 104 (26.7%) |
| | Medical Lab. Scientist | 73 (18.7%) | 5 (1.3%) | 78 (20.0%) |
| | Pharmacist | 33 (8.5%) | 6 (1.5%) | 39 (10.0%) |
| | Medical Records | 14 (3.6%) | 2 (0.5%) | 16 (4.1%) |
| | Admin | 23 (5.8%) | 1 (0.3%) | 24 (6.1%) |
| | Others | 51 (13.1%) | 9 (2.3%) | 60 (15.4%) |
| Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) | |
| Participants years of working | 0-10years | 177 (45.4%) | 22 (5.6%) | 199 (51.0%) |
| | 11-20years | 90 (23.1%) | 10 (2.6%) | 100 (25.7%) |
| | 21-30years | 46 (11.8%) | 4 (1.0%) | 50 (12.8%) |
| | Over 30years | 41 (10.5%) | 0 (0.0%) | 41 (10.5%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 16 (4.2%) | 4 (1.0%) | 20 (5.2%) |
| | RN/RM | 25 (6.4%) | 0 (0.0%) | 25 (6.4%) |
| | First Degree | 213 (54.6%) | 18 (4.6%) | 231 (59.2%) |
| | Postgraduate | 100 (25.6%) | 14 (3.6%) | 114 (29.2%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |

Question 13: Soft and flat rubber shoes with friction are the best for the work place Do you agree?

| | | Yes | No | Total |
|---|------------------------|--------------------|-------------------|-------------------|
| Sex of participants | Male | 145 (37.2%) | 10 (2.5%) | 155 (39.7%) |
| | Female | 210 (53.8%) | 25 (6.5%) | 235 (60.3%) |
| | Total | 355 (91.0%) | 35 (9.0%) | 390 (100%) |
| Marital Status of the participants | Single | 167 (42.8%) | 16 (4.1%) | 183 (46.9%) |
| | Married | 182 (46.7%) | 19 (4.9%) | 201 (51.6%) |
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 355 (91.0%) | 35 (9.0%) | 390 (100%) |
| Occupation of the participants | Nurse | 53 (13.6%) | 5 (1.3%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0 (0.0%) | 11 (2.8%) |
| | Doctor | 96 (24.6%) | 8 (2.1%) | 104 (26.7%) |
| | Medical Lab. Scientist | 72 (18.5%) | 6 (1.5%) | 78 (20.0%) |
| | Pharmacist | 35 (9.0%) | 4 (1.0%) | 39 (10.0%) |
| | Medical Records | 11 (2.8%) | 5 (1.3%) | 16 (4.1%) |
| | Admin | 21 (5.3%) | 3 (0.8%) | 24 (6.1%) |
| | Others | 56 (14.4%) | 4 (1.0%) | 60 (15.4%) |
| Total | 355 (91.0%) | 35 (9.0%) | 390 (100%) | |
| Participants years of working | 0-10years | 181 (46.4%) | 18 (4.6%) | 199 (51.0%) |
| | 11-20years | 94 (24.1%) | 6 (1.6%) | 100 (25.7%) |
| | 21-30years | 45 (11.5%) | 5 (1.3%) | 50 (12.8%) |
| | Over 30years | 35 (9.0%) | 6 (1.5%) | 41 (10.5%) |
| | Total | 355 (91.0%) | 35 (9.0%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 18 (4.6%) | 2 (0.5%) | 20 (5.2%) |
| | RN/RM | 23 (5.9%) | 2 (0.5%) | 25 (6.4%) |
| | First Degree | 212 (54.4%) | 19 (4.9%) | 231 (59.2%) |
| | Postgraduate | 102 (26.1%) | 12 (3.1%) | 114 (29.2%) |
| | Total | 355 (91.0%) | 35 (9.0%) | 390 (100%) |

Question 14: Putting on soft sole shoes will help cushion your weight on your knees during walking. Do you agree?

| | | Yes | No | Total |
|---|--------------|--------------------|------------------|-------------------|
| Sex of participants | Male | 139 (35.6%) | 16 (4.1%) | 155 (39.7%) |
| | Female | 215 (55.2%) | 20 (5.1%) | 235 (60.3%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Marital Status of the participants | Single | 167 (42.8%) | 16 (4.1%) | 183 (46.9%) |
| | Married | 181 (46.5%) | 20 (5.1%) | 201 (51.6%) |

| | | | | |
|---|------------------------|--------------------|------------------|-------------------|
| | Divorced/Widow/Widower | 6 (1.5%) | 0 (0.0%) | 6 (1.5%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Occupation of the participants | Nurse | 54 (13.9%) | 4 (1.0%) | 58 (14.9%) |
| | Physiotherapist | 11 (2.8%) | 0 (0.0%) | 11 (2.8%) |
| | Doctor | 97 (24.9%) | 7 (1.8%) | 104 (26.7%) |
| | Medical Lab. Scientist | 73 (18.7%) | 5 (1.3%) | 78 (20.0%) |
| | Pharmacist | 35 (9.0%) | 4 (1.0%) | 39 (10.0%) |
| | Medical Records | 13 (3.3%) | 3 (0.8%) | 16 (4.1%) |
| | Admin | 19 (4.9%) | 5 (1.2%) | 24 (6.1%) |
| | Others | 52 (13.3%) | 8 (2.1%) | 60 (15.4%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Participants years of working | 0-10years | 178 (45.6%) | 21 (5.4%) | 199 (51.0%) |
| | 11-20years | 89 (22.9%) | 11 (2.8%) | 100 (25.7%) |
| | 21-30years | 48 (12.3%) | 2 (0.5%) | 50 (12.8%) |
| | Over 30years | 39 (10.0%) | 2 (0.5%) | 41 (10.5%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |
| Participants highest educational qualification | High School/WASC | 16 (4.2%) | 4 (1.0%) | 20 (5.2%) |
| | RN/RM | 23 (5.9%) | 2 (0.5%) | 25 (6.4%) |
| | First Degree | 213 (54.6%) | 18 (4.6%) | 231 (59.2%) |
| | Postgraduate | 102 (26.1%) | 12 (3.1%) | 114 (29.2%) |
| | Total | 354 (90.8%) | 36 (9.2%) | 390 (100%) |

Table 2 contained some interesting questions looking at the knowledge of ergonomics and body mechanics among healthcare workers. We had 69.2% (270) that have knowledge on what ergonomics and body mechanics is all about against 30.8% (120) that do not. 74.4% (290) agreed that it is better to use bed sheet/other aids to lift patients or heavier objects against 25.6% (100) that do not agree. 96.7% (377) of the participants agreed that back pain is one of the consequences of bad posture while doing procedures against 3.3% (13) who disagreed. 93.8% (366) agreed that heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain while 6.2% (24) disagreed. Also 92.1% (359) agreed that improper usage of body mechanics techniques can cause spinal injury while 7.9% (31) disagreed. Out of the 390 participants, 85.9% (335) know that sitting for long hours at a stretch can be injurious to their musculoskeletal system and health while 14.1% (55)

do not know. 81% (316) are aware that standing for a long time can be hazardous to their health while 19% (74) are not. On if they -were aware that interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chair are options for standing relief, 63.8% (249) are aware while 36.2% (141) are not. 75.4% (294) knows that foot wears contribute to their musculoskeletal wellbeing while 24.6% (96) do not. Ergonomically, 81.5% (318) agreed that soft sole shoes are better with in-sole while 18.5% (72) disagreed. Also, 89% (347) agreed that high heel shoes are not good for one’s limbs while 11% (43) do not agree. On if high heel shoes are only cosmetics but injurious functionally, 90.8% (354) agreed while 9.2 (36) do not agree. 91% (355) agreed that soft and flat rubber shoes with friction are the best for the work place while 9% (35) do not. 90.8% (354) agreed that putting on soft sole shoes will help cushion their weight on the knees during walking while 9.2 (36) do not.

Table 2: Chi-square result

| Sex of the participants | | | | |
|--------------------------------|--|-------------------|--------------------------|---------------------|
| | Questions | Chi-Square | Degree of freedom | Significance |
| 1 | Do you what ergonomics/body mechanics is about? | 5.746 | 1 | 0.017 |
| 2 | It is better to use bed sheet/other aids to lift patients or heavier objects? | 1.853 | 1 | 0.173 |
| 3 | Back pain is one of the consequences of bad posture while doing procedures? | 0.009 | 1 | 0.923 |
| 4 | Heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain? | 3.819 | 1 | 0.051 |
| 5 | Improper use of body mechanics technique can cause spinal injury. Do you agree? | 2.732 | 1 | 0.098 |
| 6 | Do you know that sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? | 0.115 | 1 | 0.734 |
| 7 | Do you know/aware that standing for a long time can be hazardous to your health? | 2.039 | 1 | 0.153 |
| 8 | Interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chain are options for standing relief? | 0.193 | 1 | 0.661 |
| 9 | Do you know that foot wears contribute to your musculoskeletal wellbeing? | 0.197 | 1 | 0.657 |
| 10 | Ergonomically, soft sole shoes are better with in-soles. Do you agree? | 2.899 | 1 | 0.089 |
| 11 | High heel shoes are not good for your limbs. Agreed? | 0.130 | 1 | 0.719 |
| 12 | High heel shoes are only cosmetic but injurious functionally, Agreed? | 0.061 | 1 | 0.805 |
| 13 | Soft and flat rubber shoes with friction are the best for the work place. Do you agree? | 2.004 | 1 | 0.157 |
| 14 | Putting on soft sole shoes will help cushion your weight on your knees during walking. Agreed? | 0.300 | 1 | 0.545 |

Table 3

| Marital Status of the participants | | | | |
|------------------------------------|--|------------|-------------------|--------------|
| | Questions | Chi-Square | Degree of freedom | Significance |
| 1 | Do you what ergonomics/body mechanics is about? | 0.826 | 2 | 0.662 |
| 2 | It is better to use bed sheet/other aids to lift patients or heavier objects? | 5.602 | 2 | 0.061 |
| 3 | Back pain is one of the consequences of bad posture while doing procedures? | 0.673 | 2 | 0.714 |
| 4 | Heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain? | 0.773 | 2 | 0.679 |
| 5 | Improper use of body mechanics technique can cause spinal injury. Do you agree? | 1.624 | 2 | 0.444 |
| 6 | Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? | 2.238 | 2 | 0.327 |
| 7 | Do you know/aware that standing for a long time can be hazardous to your health? | 6.607 | 2 | 0.037 |
| 8 | Interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chain are options for standing relief? | 1.783 | 2 | 0.410 |
| 9 | Do you know that foot wears contribute to your musculoskeletal wellbeing? | 2.078 | 2 | 0.354 |
| 10 | Ergonomically, soft sole shoes are better with in-soles. Do you agree? | 0.015 | 2 | 0.993 |
| 11 | High heel shoes are not good for your limbs. Agreed? | 0.783 | 2 | 0.676 |
| 12 | High heel shoes are only cosmetic but injurious functionally, Agreed? | 2.461 | 2 | 0.292 |
| 13 | Soft and flat rubber shoes with friction are the best for the work place. Do you agree? | 0.660 | 2 | 0.719 |
| 14 | Putting on soft sole shoes will help cushion your weight on your knees during walking. Agreed? | 0.786 | 2 | 0.675 |

Table 4

| Occupation of the participants | | | | |
|--------------------------------|--|------------|-------------------|--------------|
| | Questions | Chi-Square | Degree of freedom | Significance |
| 1 | Do you what ergonomics/body mechanics is about? | 64.527 | 7 | 0.000 |
| 2 | It is better to use bed sheet/other aids to lift patients or heavier objects? | 12.214 | 7 | 0.094 |
| 3 | Back pain is one of the consequences of bad posture while doing procedures? | 21.099 | 7 | 0.004 |
| 4 | Heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain? | 11.790 | 7 | 0.108 |
| 5 | Improper use of body mechanics technique can cause spinal injury. Do you agree? | 2.724 | 7 | 0.909 |
| 6 | Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? | 16.805 | 7 | 0.019 |
| 7 | Do you know/aware that standing for a long time can be hazardous to your health? | 13.933 | 7 | 0.052 |
| 8 | Interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chain are options for standing relief? | 5.390 | 7 | 0.612 |
| 9 | Do you know that foot wears contribute to your musculoskeletal wellbeing? | 31.048 | 7 | 0.000 |
| 10 | Ergonomically, soft sole shoes are better with in-soles. Do you agree? | 6.606 | 7 | 0.471 |
| 11 | High heel shoes are not good for your limbs. Agreed? | 6.161 | 7 | 0.521 |
| 12 | High heel shoes are only cosmetic but injurious functionally, Agreed? | 8.159 | 7 | 0.319 |
| 13 | Soft and flat rubber shoes with friction are the best for the work place. Do you agree? | 12.013 | 7 | 0.100 |
| 14 | Putting on soft sole shoes will help cushion your weight on your knees during walking. Agreed? | 9.853 | 7 | 0.197 |

Table 5

| Participants years of working | | | | |
|-------------------------------|--|------------|-------------------|--------------|
| | Questions | Chi-Square | Degree of freedom | Significance |
| 1 | Do you what ergonomics/body mechanics is about? | 14.720 | 3 | 0.002 |
| 2 | It is better to use bed sheet/other aids to lift patients or heavier objects? | 1.120 | 3 | 0.772 |
| 3 | Back pain is one of the consequences of bad posture while doing procedures? | 4.586 | 3 | 0.205 |
| 4 | Heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain? | 0.996 | 3 | 0.802 |
| 5 | Improper use of body mechanics technique can cause spinal injury. Do you agree? | 1.870 | 3 | 0.600 |
| 6 | Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? | 4.819 | 3 | 0.186 |
| 7 | Do you know/aware that standing for a long time can be hazardous to your health? | 9.492 | 3 | 0.023 |
| 8 | Interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chain are options for standing relief? | 0.525 | 3 | 0.913 |
| 9 | Do you know that foot wears contribute to your musculoskeletal wellbeing? | 5.695 | 3 | 0.127 |
| 10 | Ergonomically, soft sole shoes are better with in-soles. Do you agree? | 0.413 | 3 | 0.937 |
| 11 | High heel shoes are not good for your limbs. Agreed? | 4.119 | 3 | 0.249 |
| 12 | High heel shoes are only cosmetic but injurious functionally, Agreed? | 5.121 | 3 | 0.163 |
| 13 | Soft and flat rubber shoes with friction are the best for the work place. Do you agree? | 2.756 | 3 | 0.431 |
| 14 | Putting on soft sole shoes will help cushion your weight on your knees during walking. Agreed? | 3.349 | 3 | 0.341 |

Table 6

| Participants highest Educational Qualification | | | | |
|--|--|------------|-------------------|--------------|
| | Questions | Chi-Square | Degree of freedom | Significance |
| 1 | Do you what ergonomics/body mechanics is about? | 21.828 | 3 | 0.000 |
| 2 | It is better to use bed sheet/other aids to lift patients or heavier objects? | 5.353 | 3 | 0.148 |
| 3 | Back pain is one of the consequences of bad posture while doing procedures? | 2.627 | 3 | 0.453 |
| 4 | Heavy work activities like bending, twisting and frequent heavy lifting contribute to low back pain? | 7.208 | 3 | 0.066 |
| 5 | Improper use of body mechanics technique can cause spinal injury. Do you agree? | 3.596 | 3 | 0.309 |
| 6 | Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? | 3.412 | 3 | 0.332 |
| 7 | Do you know/aware that standing for a long time can be hazardous to your health? | 14.885 | 3 | 0.002 |
| 8 | Interchanging the legs on a low stool, sitting on high stools and having short rest periods on a normal chair are options for standing relief? | 1.061 | 3 | 0.786 |
| 9 | Do you know that foot wears contribute to your musculoskeletal wellbeing? | 6.313 | 3 | 0.150 |
| 10 | Ergonomically, soft sole shoes are better with in-soles. Do you agree? | 1.955 | 3 | 0.582 |
| 11 | High heel shoes are not good for your limbs. Agreed? | 3.866 | 3 | 0.276 |
| 12 | High heel shoes are only cosmetic but injurious functionally, Agreed? | 7.147 | 3 | 0.067 |
| 13 | Soft and flat rubber shoes with friction are the best for the work place. Do you agree? | 0.550 | 3 | 0.908 |
| 14 | Putting on soft sole shoes will help cushion your weight on your knees during walking. Agreed? | 3.612 | 3 | 0.306 |

In table 4, it is evident that sex was significant in one question about knowledge as well as Marital status, occupation in four questions about knowledge, years of working in two questions about knowledge, same as highest educational qualification which is significant in two questions about knowledge.

Discussions

This study was conducted to know the extent of knowledge of ergonomics and body mechanics among healthcare workers in River State, Nigeria. Demographic data of the respondents showed that majority are females 60.3%, marital status had more married 51.6%, closely followed by singles. Profession had doctors 26.7% followed by medical laboratory scientists 20% with 0 to 10 years of working experience 51% having first degree educational qualification 59.2%. In this study, the second part of the questionnaires were about how knowledgeable the health workers are as regard ergonomics and body mechanics. From the chi-square results, sex which had more females is significant with one question (Do you know what ergonomics/body mechanics is about). Marital status which consists of more married people is significant with one question as well (Do you know/aware that standing for a long time can be hazardous to your health?) out of fourteen questions. Occupation consisting of more doctors was significant with four knowledge questions (Do you know what ergonomics/body mechanics is about?, Back pain is one of the consequences of bad posture while doing procedures?, Sitting for long hours at a stretch can be injurious to your musculoskeletal system and health? and Do you know that foot wears contribute to your musculoskeletal wellbeing?) out of fourteen questions. Working years which had more of 0-10 years was significant with two questions (Do you know what ergonomics/body mechanics is about?, and Do you know/aware that standing for a long time can be hazardous to your health?) out of fourteen, that is the same position with highest educational qualification which had more of first degree (Do you know what ergonomics/body mechanics is about?, and Do you know/aware that standing for a long time can be hazardous to your health?). From the result showed, there is poor relationship between the demographic variables and the questions on the knowledge of ergonomics and body mechanics among health workers in

Rivers State as only proved significant. This argument does not stop the fact that average of 84% of the health workers have knowledge or are aware of ergonomics and body mechanics which is a very good one expected as health workers. This result agrees with Shamim^[5] who proved that 65% or nurses had fair knowledge of ergonomics and body mechanics when they asses knowledge and practices of body mechanic technique among nurses at Punjab institute of cardiology Lahore. It is also affirming the 68.1% (adequate knowledge) as shown in the study by Sabita^[14]. Also, on the study on the knowledge and practice of body mechanics among staff nurses with the result of 50% of good knowledge, 40% very good knowledge and 10% of average knowledge Vidya^[15]. This research didn't agree with the study by D'Souza^[16] on Knowledge and usage of body mechanics among class IV workers whose result showed nurses with 64% poor knowledge of body mechanics.

Conclusion

Based on the findings of the study, it was concluded that healthcare workers in Rivers State have an excellent knowledge of ergonomics and body mechanics.

Conflicts of interest

The authors declare that there is no conflict of interest regarding the publication of this article

Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

References

1. Arsalani N, Fallahi-Khoshknab M, Josephson M, Lagerström M. Musculoskeletal disorders and working conditions among Iranian nursing personnel. *International journal of occupational safety and ergonomics*. 2014; 20(4):671-680. <https://doi.org/10.1080/10803548.2014.11077073>.
2. Jaromi M, Nemeth A, Kranicz J, Laczko T, Betlehem J. Treatment and ergonomics training of work-related lower back pain and body posture problems for nurses. *Journal of clinical nursing*. 2012; 21(11-12):1776-1784. <https://doi.org/10.1111/j.1365->

- 2702.2012.04089.x
3. Habibi E, Pourabdian S, Atabaki AK, Hoseini M. Evaluation of Work-related Psychosocial and Ergonomics Factors in Relation to Low Back Discomfort in Emergency Unit Nurses. *International journal of preventive medicine*. 2012; 3(8):564-568.
 4. Ismaila SO. A Study on Ergonomics Awareness in Nigeria. *Australia Journal of Asic Applied Science*. 2010; 4:731-734.
 5. Shamim A, Muhammed A, Roubina K, Ali W, Syed AG. Asses knowledge and practices of body mechanic technique among nurses at Punjab institute of cardiology Lahore. *Saudi J. Med. Pharm. Sci*. 2017; 3(6A):545-555.
 6. American Nurse Association (ANA). *Safe patient handling and mobility*, 2013.
 7. Jung KB, Suh S. Relationships among Nursing Activities, the Use of Body Mechanics, and Job Stress in Nurses with Low Back Pain. *Journal of muscle and joint health*. 2013; 20(2):141-150.
 8. Haile EL, Taye B, Hussen F. Ergonomic Workstations and Work-Related Musculoskeletal Disorders in the Clinical Laboratory. *Laboratory Medicine*. 2012; 43(suppl 2), e11–e19. <https://doi.org/10.1309/lm7bq15ttqfbxis>.
 9. Simpson JA, Weiner ESC. Oxford Univeristy Press. *The Oxford English Dictionary*. Oxford: Clarendon Press, 1989.
 10. Kroemer KH, Grandjean E. *Fitting the Task to the Human: A Textbook of Occupational Ergonomics*. 5th edition. London: Taylor and Francis, 1997.
 11. Shikdar AA, Sawaqed NM. Ergonomics, and occupational health and safety in the oil industry: a managers' response, *Computers & Industrial Engineering*. 2004; 47(2-3):223-232.
 12. Stone R, McCloy R. Ergonomics in medicine and surgery. *British Medical Journal*. 2004; 328:1115-1118.
 13. Health and Safety Laboratory (HSL). *Musculoskeletal problems in bricklayers, carpenters and plasters: literature review and results of site visit (HSL/2001/13)*. Sheffield. UK: HSL, 2001. Retrieved June 25, 2014, from http://www.hse.gov.uk/research/hsl_pdf/2001/hs101-13.pdf. <https://www.iasp-pain.org/publications/iasp-news/iasp-announces-revised-definition>.
 14. Sabita K, Mandira S, Bharati S, Sulata K. Knowledge and Preventive Practice of Occupational Health Hazards among Nurses in different Teaching Hospitals. *Innovative Journal of Medical and Health Science*. 2018; 8:225-234.
 15. Vidya VP, D'Souza VF, Vinyamol TO, Machado V, Francis J, Gireesh GR, *et al*. The knowledge and practice of body mechanics among staff nurses: descriptive correlational study. *American International Journal of Research in Humanities, Arts & Social Sciences*. 2014; 8(2):124-126.
 16. D'Souza P, Frank RW, Mathias AA. Knowledge and usage of body mechanics among class IV workers. *International Journal of Physiotherapy*. 2020; 7(6):264-268.