

PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG NURSES IN A NATIONAL REFERRAL HOSPITAL IN KENYA

IRENE KOLEBECH, TITUS TARUS, ABIGAEEL GESUKA

ELDORET, KENYA

Abstract: Globally, musculoskeletal disorders (MSDs) are common among health care workers, with the nursing population that constitutes about 33% of the hospital workforce being most affected. MSDs are reported to significantly impact on quality of life, cause lost work time or absenteeism, increase work restriction, transfer to another job or disability. Compared to other group of diseases, musculoskeletal disorders (MSDs) also causes considerable economic toll on the individual, the organization and the society. As such, the overall objective of the study was to document the occurrence of musculoskeletal disorders among nurses in a national referral hospital. The specific objectives being: to determine demographic characteristics of nurses with musculoskeletal disorders; to identify risk factors leading to musculoskeletal disorders among nurses; and to determine the point prevalence of musculoskeletal disorders among nurses. The study was a cross-sectional descriptive study carried out within a national referral hospital. Simple random sampling was used to draw the 258 respondents of the study. The study indicates that five out of ten nurses at the hospital have experienced MSD, with symptoms gradually appearing within 5 and 10 years of service. MSD affects mainly the upper and lower back. In general, MSD affects male nurses more than female nurses at a national referral hospital. The study also establishes that MSD does not discriminate on physical characteristics (e.g. height and weight) and experiences. Working even after experiencing work related injury and inadequate breaks during shifts are the most probable factors that would contribute to higher prevalence of MSD.

Keywords: Coping mechanisms, Ergonomics, Musculoskeletal disorders, Nurse, Prevalence, Risk factors.

1. INTRODUCTION

1.1 BACKGROUND INFORMATION

Musculoskeletal disorders (MSDs) are injuries to the soft-tissue caused by abrupt or continuous exposure to repetitive movement, vibration, and awkward positions (CDC, 2017). MSD can also be defined as disorders that affect the movement of the human body's movement or musculoskeletal system including tendons, ligaments, muscles, nerves, discs, and blood vessels (Middlesworth, 2017). The development of MSD is associated with exposure to work related (ergonomic) risk factors or individual-related risk factors (HSE, 2017). Middlesworth (2017) explains that ergonomic risk factors comprise of high task repetition, forceful exertions, and repetitive or sustained awkward postures, whereas individual risk factors include poor work practices, poor overall health habits, poor rest and recovery, and poor nutrition, fitness and hydration. MSD has been cited as the single largest category of workplace injuries and are responsible for almost 30% of all worker's compensation costs (CDC, 2017). Essentially MSDs are reported to significantly impact on quality of life (Punnet & Wegman, 2004), cause lost work time or absenteeism, increase work restriction, transfer to another job or disability than any other group of diseases with a considerable economic toll on the individual, the organization and the society.

Musculoskeletal disorders are common among health care workers, with the nursing population that constitutes about 33% of the hospital workforce potentially most affected (Smith & Leggat, 2003). Nurses are the most important health care

International Journal of Novel Research in Healthcare and NursingVol. 8, Issue 1, pp: (199-217), Month: January - April 2021, Available at: www.noveltyjournals.com

workers available in healthcare facilities where they perform a broad range of tasks in settings where no other health workers including physicians are available (Punnet & Wegman, 2004). Nursing professionals are commonly identified as being at risk for patient handling injuries which has been identified as a significant contributor to musculoskeletal injuries to the back, neck, and shoulders (Punnet & Wegman, 2004). In 2008, bureau of labor statistic rated nurses as the highest professionals with MSDs which could be attributed to the physical demand in the nursing profession and patient care. Nursing involves manual handling of patients whereby excessive muscular force or effort is used to lift, move, push, pull, hold and carry patients. It also includes repetitive activities. These constrained working postures, repetitive movement, carrying of heavy patients and performance of other physically demanding tasks makes nurses highly prone to MSDs (Smeldey, et al., 2003).

Task repetition that nurses are continuously subject to – because of inadequate staffing is another risk factor that increases the potential for MSDs amongst nurses. Tasks such as transferring patients from a bed to stretcher or vice versa may be done over alone and manually due to lack of staff and equipment. Studies analyzing the relationship between staffing variables (including the ratio of nurse to patients, the availability of nursing aides to assist in patient transfers, and the reported worker injuries) conclude that high injuries occurred in areas with low staffing levels and working for more hours. This has contributed to increased exposure to physical demands and reduced recovery time between work shifts, resulting in increased MSDs (Lipscomb, Brady, & Brown, 2004). A study done in Sweden Shows that nurses working over 35 hours were at increased risk of back injuries (Engkvist, Hagberg, Wigaeus, Menckel, & Ekenvall, 1998). Similar findings were also documented in Netherlands (Engels, Van der Gulden, Senden, & Holf, 1996). At the hospital, all nurses work for at least 40 hours per week. The nurse patient ratio stands approximately 1:15 which is considered high in nursing profession. Majority of the studies done at the institution focuses on patients' wellbeing over nurses' wellbeing. Therefore, this study focused on demographic and employment characteristics as risk factors that could lead to MSDs. With little reported in the subject matter in Kenya, the findings of this study will be appropriate for improving nurses' health.

1.2 PROBLEM STATEMENT

Musculoskeletal disorder (MSD) have been described as one of the main occupational hazards among health care workers in whom they present as a major occupational problem and a significant cause of morbidity. MSDs have been related to economic burdens (HSE, 2017; Middlesworth, 2017). Many studies have been conducted to determine the risk factors of MSDs but it remains the most prevalent and common cause of disability among nurses worldwide. The U.S. Bureau of Labor Statistics (BLS) conducted annual surveys from 1972 and provided baseline information about occupational injury of which MSDs accounted for the largest proportion of these cases (BLS, 1997). Various studies have been done on the prevalence of MSDs among nurses in the developed countries but not in developing countries like Kenya. This calls for further investigation into the risk causing factors and analysis of the MSDs, to find out the magnitude of the problem, and the effectiveness of the control measures put in place.

1.3 JUSTIFICATION OF THE STUDY

A knowledge gap exists in scientific literature on the prevalence of Musculoskeletal Disorders (MSDs) and associated factors among nurses in Sub-Saharan Africa. This study will add to existing knowledge about the impact of MSDs on nurses and can serve as a reference material for further research. The findings will contribute on efforts to prevent more MSDs occurring on other health workers in the hospital. The study will assist in reducing costs due to hospitalization and rehabilitation of its employees. This will also help the hospital management come up with policies to improve strategies of integrating proper ergonomic principles in the practice of nursing.

1.4 OBJECTIVES OF THE STUDY

The overall objective of the study was to determine the prevalence of musculoskeletal disorders and risk factors leading to the disorders among nurses in a national referral hospital. The specific objectives included:

- i. To determine demographic characteristics of nurses with work related musculoskeletal disorders in the national referral hospital.
- ii. To identify risk factors leading to musculoskeletal disorders among nurses in a national referral hospital.
- iii. To determine the prevalence of musculoskeletal disorders among nurses in a national referral hospital.

1.5 LIMITATIONS OF THE STUDY

The study relied on self-reported data; the respondents may not have reported all incidences of MSDs or might give vague answers or exaggerate their MSDs. It is also possible that some of the respondents perceived their musculoskeletal disorders as work related MSDs regardless of whether they were caused by work or not. The study only investigated the prevalence of MSDs and other factors of interest as they exist in the nursing profession at a particular time, regardless of what may have preceded. Ergonomic problems investigated were restricted to the physical and environmental stressors. The study did not address psychological aspects that may have caused MSDs because of limitation of time.

2. LITERATURE REVIEW

Musculoskeletal disorders are a group of inflammatory and degenerative conditions that affects the muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood vessels with consequent ache, pain or discomfort (Punnet & Wegman, 2004). Musculoskeletal disorders (MSDs) are defined as musculoskeletal disorders that results from an event (Smith & Leggat, 2003). MSDs occur often among health care workers, with the nursing population that constitutes about 33% of the hospital workforce at a higher risk and accounting for 60% of the reported occupational injuries (Vingard, 2006). MSDs have a significant impact on quality of life (Punnet & Wegman, 2004), and socio-economic impact. This drives up the cost for the workers and the hospital in general. This also applies to both direct costs (compensation of victims and Medicare) and indirect costs (loss of production, replacements, costs and absenteeism) associated with occupational disease and industrial accidents (Alexapaulo, Burdorf, & Kalokerinou, 2003).

MSD can take different forms. The onset and development of these injuries is still not known. It is generally agreed that the injuries results from overuse, beyond the body's recovery capacity. It occurs because a structure is abused repetitively and is made to endure work load that it cannot tolerate without negative consequences (Alexanderson & Norlund, 2004). The process may very well set in surreptitiously with no apparent symptoms, only to one day appear suddenly and develop rapidly. Mostly discomfort is felt which worsen gradually until they make one stop working. The disorder can only take a few days to develop, but more often it stretches out for weeks, months and even years (Allen, Altchek, Marx, & Jones, 2001).

MSDs do not constitute a disease that can be contracted, but a process that develops overtime. The fact that MSD develop gradually is both an advantage and disadvantage. It's an advantage because unlike an accident which is unpredictable and sudden, this can be anticipated, since they develop gradually. Action can therefore be taken before the process gets too far. If the overuse is stopped in time, the body can recover and the problem can recede without leaving any trace. Complete recovery is possible and prevention can be termed effective if it occurs early. The gradual appearance of MSD can also be a disadvantage because not being forewarned means not being forearmed against symptoms that appear very gradually. The body gets used to the pain which can be blamed on age or other causes. It becomes a normal presence and the feeling is that the discomfort will go away. This increases the risk of the situation getting worse, to the point where complete recovery is impossible (Welles, Moore, Potvin, & Norman, 1995).

The starting point of MSD is overuse. These overload stems from a combination of factors and not from a single cause. Be it repetition, posture or effort, no single risk factor is essential in and of itself. A very demanding effort made in a particularly bad posture can suffice to create musculoskeletal problems, even if the rate of repetition is very low. A less demanding task performed in a more or less adequate posture can cause damage if it is repeated thousands of times per day (Welles, Moore, Potvin, & Norman, 1995). Different MSDs have similar symptoms. The overloaded region is often painful and sensitive when touched. In worse situation, the pain is felt even when the region is at rest. More often there is swelling and sometime numbness. Mobility may be limited by swelling or the pain. Workers know well before the overuse generates negative consequence, through a feeling of localized fatigue and discomfort (Smith & Leggat, 2003).

MSDs can be caused by numerous work situations in hospitals. The exact cause is often unclear, but back pain is more common in jobs that involve heavy manual handling, manual handling in awkward positions, repetitive tasks, sitting for a long period of time (if the workplace is not correctly arranged or adjusted to fit the person), poor posture, pushing, pulling or dragging loads that require excessive force, working beyond normal capacity and limits (Eriken, Bruusgaard, & Knardahl, 2004).

A Kenya experience a lot of brain drain, most nurses migrates to the US is due to lack of job satisfaction. This lack of job satisfaction maybe a risk factor in the etiology of MSDs amongst nurses in Kenya (OECD,2017). Several studies have indicated that there is a relationship between demonization and MSDs(Alexapaulo, Burdorf, & Kalokerinou, 2003). This immigration has led to inadequate staffing thus increasing the rate of MSDs amongst nurses. It is confirmed that half of the nursing positions in Kenya are unfilled and yet a third of qualified nurses are unemployed (OECD, 2017). During the highlights from the international council of nurses in 2003 it was reported that Kenya has a high percentage of nurses, however, there is a lot of disparity in the national distribution of nurses resulting in shortages in some areas. The shortage leads to the remaining nurses being overworked and thus being exposed to injuries. It was noted that nurses have big problems related to the infrastructure of the organization and administrative support (Allen, Altchek, Marx, & Jones, 2001).

A study done in Korea reported that the shoulder to be the most susceptible to MSDs, followed by the knee, lower back hand and wrist, neck and ankle, respectively. It also indicated that the departments in which the participants worked were significant in the determination of the relationship between work departments and MSDs. The prevalence of MSDs was highest in the intensive care unit, followed by the surgical wards. It was lowest in the emergency room. The study did not indicate the risk factors found in these wards and units (Kee & Seo, 2003).

In Iran, 90% of the paramedics experienced one episode of MSDs. The most prevalent site affected was the neck (64%) followed by the head (62.1%) and the knees (54.7%). MSDs were more common in female workers and increased with age and years of service (Shafizadeh, 2011).The incidence was also notably high in New Zealand where 88% of the respondents had experienced pains lasting more than one day18% of the workers took time off work(Harcombe, McBride, Derret, & Gray, 2009).

A study conducted on occupational disease and MSDs among nursing staff showed that there were major differences in the location and occurrence of MSDs. MSDs were found to be most prevalent among the Japanese nursing staff at almost all body sites. The study did not indicate the reasons for these findings (Smith & Leggat, 2003). Another study compared the prevalence of MSDs in different countries and established that Korea had the lowest number of nurses suffering from MSDs as compared to Japan and Sweden (Kee & Seo, 2003). A similar study was carried out in the US, Japan and England. The outcome showed that Japan had the highest percentage of MSDs whereas England had the smallest percentage of MSD, which is 47 and 24.2%, respectively (Smith, Wei, Kang, & Wang, 2004).

Sick leave due to MSDs was noted to be higher among health care workers, especially the nurses and nursing aides. In Sweden, disorders of MSDs cause approximately a third of all sick leaves. This includes impaired working ability, long term sick leave and disabilities (Vingard, 2006). Effectiveness in the treatment of MSDs included a cognitive behavioral component which is aimed at increasing self-efficiency (Bergman, 2007). According to a systematic review of the studies on sickness absence, it was noted that despite the magnitude of the problem, few studies have focused on this aspect.

Surveys carried out in low, middle and high-income countries showed that the high-income countries which comprise of less than 15% of the world's population had higher low back pains rates than low income countries (Volinn, 1997). Data on MSDs amongst nurses in Kenya is limited so this study is geared towards establishing the level of injuries and characterizes them according to prevalence and frequently incurred injuries.

3. METHODOLOGY

3.1 STUDY SITE

This study was conducted at in a national teaching and referral hospital in Kenya. It has a bed capacity of 937.The number of employees is currently at 3700 with the nursing population of 991.

3.2 STUDY POPULATION

The target populations were all the nurses working at the hospital

3.3 STUDY DESIGN

A descriptive cross-sectional design was used to collect data from a sample of 258 nurses. Data was gathered from a specified population, at a single point in time. The aim of the study was to determine the prevalence of MSDs amongst nurses at the hospital

3.4 SAMPLING TECHNIQUE

Simple random sampling was employed to draw the respondents from each site since it is a technique which provides a sample highly representative of the population of interest (Cochran-Smith, 2008). The distribution of the participants was as follows: medicine-45, surgery-105, pediatrics-60, specialized wards (ICU, HDU, CCU)-35 and accident and emergency (A&E)-35.

3.5 SAMPLE SIZE DETERMINATION

Simple random sampling was used to interview nurses from the wards in the hospital. A list of all primary nurses involved in patient care prior to the study was generated and each assigned a random number from 1-991, then 258 random numbers was generated using the "Quick Random Number Generator" by CWE software for Android operating system. The chosen nurses' corresponding random numbers were then approached and recruited in the study.

3.6 INCLUSION AND EXCLUSION CRITERIA

a) Inclusion criteria:

- Nurses who have been involved in clinical patient care for at least one month.

b) Exclusion criteria:

- Nurses who had not directly been involved in clinical patient care.

3.7 ETHICAL CONSIDERATIONS

Formal ethical approval to conduct the research was sought from Institutional Research and Ethics Committee (IREC). Permission to carry out the study was also sought from the hospital administration. The purpose of the study was explained to the potential participants to gain their written consent during the study. Participants were assured of confidentiality and anonymity.

3.8 DATA COLLECTION INSTRUMENT

A self-administered semi-structured questionnaire was used. The questionnaire had three parts (demography, prevalence of MSDs and ergonomic risk factors) and was used in this study to acquire data in order to address the stated objectives. The developed questionnaire was based on the standardized Nordic questionnaire (Kuorinka, Kilbom, & Vinterberg, 1987). This questionnaire allowed for both qualitative and quantitative data to be collected. The demographic and employment characteristics variables which comprised of age, gender, height, weight, experience, and the workplace area were part one of the questionnaire. The second part addressed the risk factors which included ergonomic factors. Part three included the prevalence of MSDs.

3.9 DATA ANALYSIS

Quantitative data was collected, double checked and entered into the computer software, statistical package for social sciences (SPSS) for analysis. Descriptive and inferential statistics was used to describe categorical variable in percentages and frequencies. P-values less than 0.05 was accepted as being statistically significant. A confidence level of 95% and confidence interval of 5% were used. The results are presented in frequency tables, pie chart, and percentages deductively with the study objectives. Qualitative data analysis software was used to develop coding based on the original terms used by participants and then be followed by identifying the most frequently observed category. This led to development of emergent themes.

4. FINDINGS OF THE STUDY

This chapter presents the results of the study to answer the objectives.

4.1 DEMOGRAPHY

In this section, the characteristics of the nurses in the study is presented, including; the gender, age, height and weight, experience in nursing in general and experience in clinical practice, current working place and duration in the place, as well as the hours of work per month. The section presents the main characteristics to compare the prevalence of MSD against.

4.1.1 Gender

The study included both male and female nurses, as presented in Figure 1.

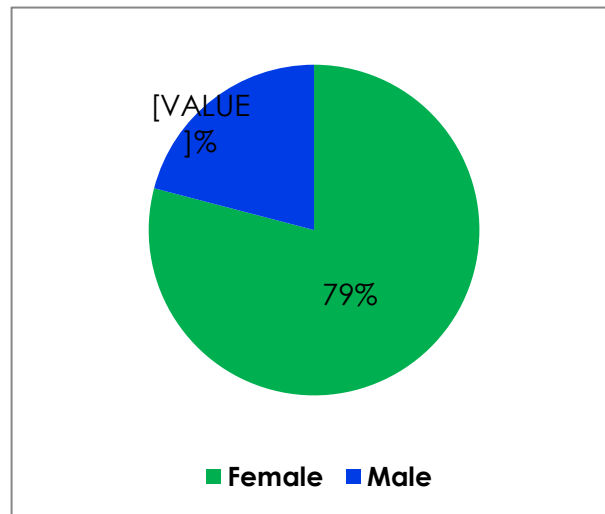


Figure 1: Sex of the nurses in the study (n=258)

The study incorporated majority (79%) of females, and 21% of males in the 258 respondents. The segregation of more female than male respondents is a factor of nursing staffing, with nursing described as a female dominated profession (Kouta & Kaite, 2011; Ossai, 2014).

4.1.2 Age

The respondents in the study ranged from 18 years to over 50years old as shown in Figure 2.

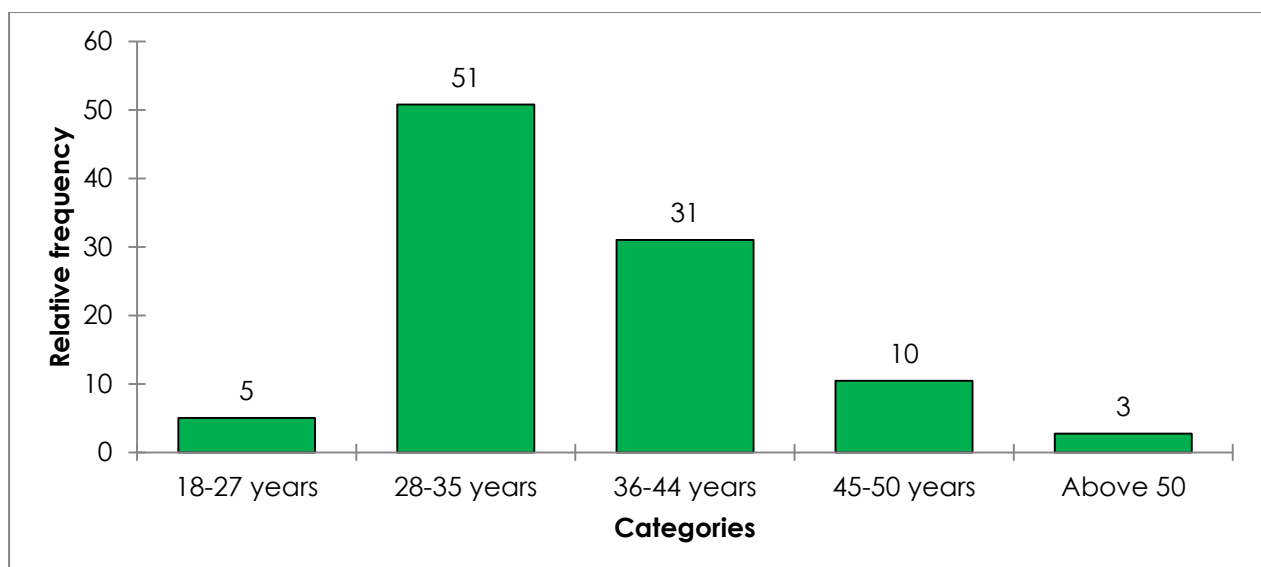


Figure 2: Age distribution of the respondents (n=258)

More than 50% of the respondents were nurses between the ages of 28 and 35 years followed by the age groups of 36 to 44years at 31%. In general, the age group between 28 and 44 years comprised the majority (82%) of the respondents. This age bracket is associated with heightened professional activity in all fields (OECD, 2017), and with the activity related to nursing, the ages between 30 and 45 years has been cited as the most common age groups for clinical nurses (Kouta & Kaite, 2011). As such, the age demographics of the respondents agree with the general expectation of the ideal nurses' working environment.

4.1.3 Height and weight

The study also considered height and weight as part of the characteristics of the respondents with the results presented in Figure 3 and Figure 4.

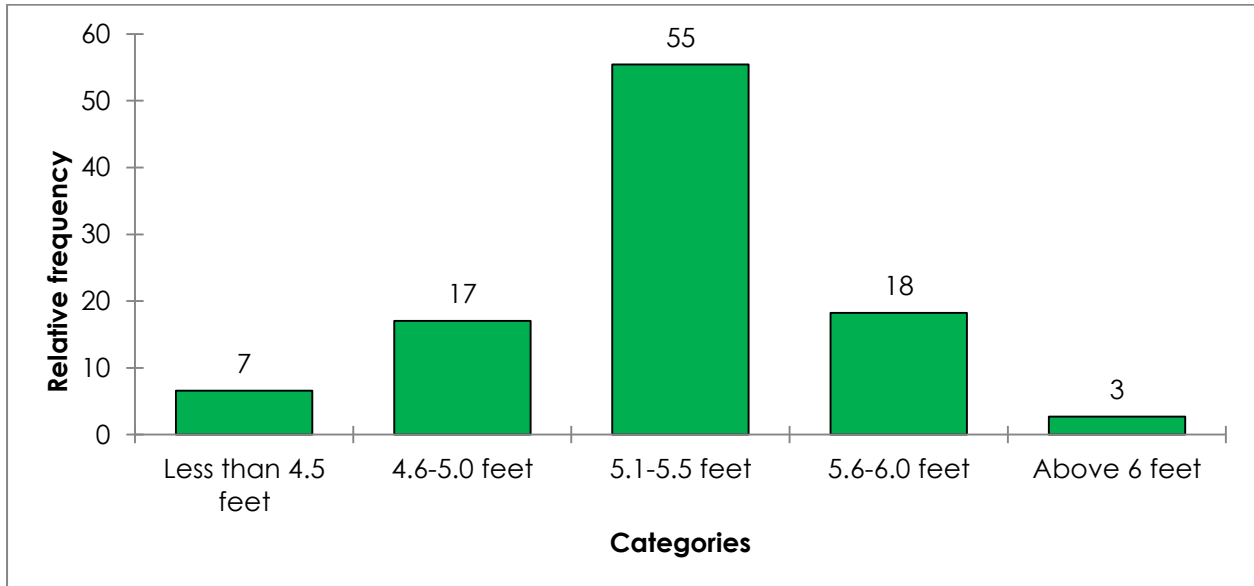


Figure 3: Height distribution of the respondents (n=258)

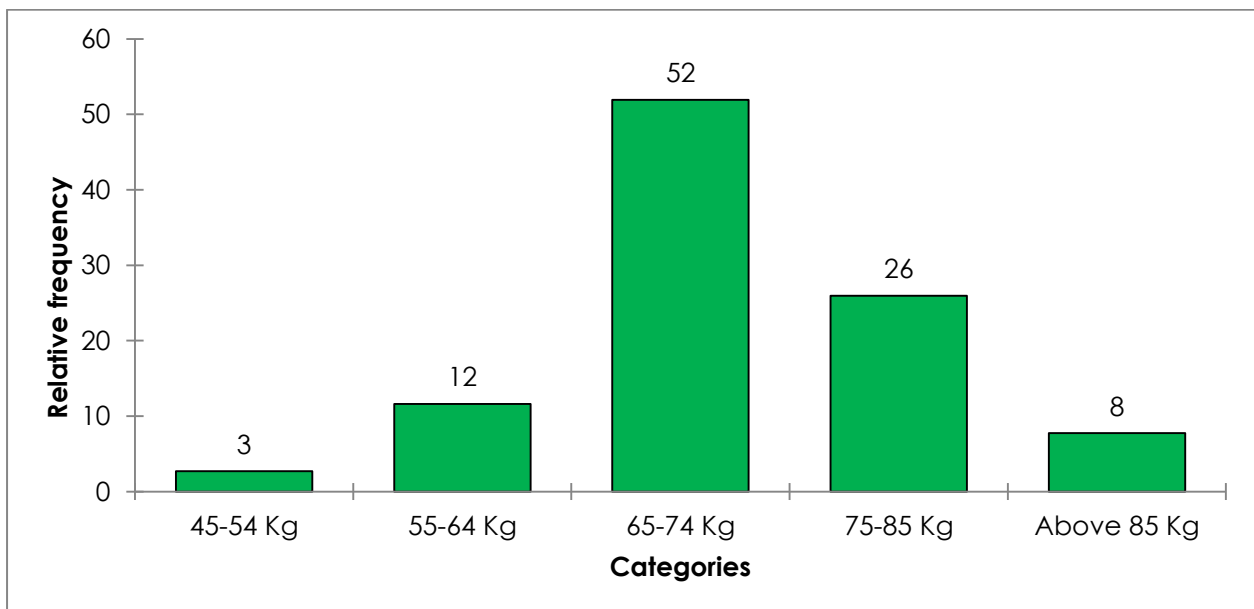


Figure 4: Weight distribution of the respondent (n=258)

Five out of ten respondents in the study can be described as averagely weighing between 65 to 74Kg at a height of between 5.1 to 5.5 feet. According to (DW, 2017), the average height of females in Kenya is approximately 5.3 feet, and since majority (79%) of the respondents, it follows that the modal height is between 5.1 to 5.5 feet. At the same time, the average weight of women ranges between 60Kg to 70Kg (UNICEF, 2013), which is in line with the characteristic 65Kg to 74Kg in the current study.

4.1.4 Experience in nursing

The respondents' experience, comprising of years in nursing practice and years in clinical practice, was also characterized as presented in Figure 5.

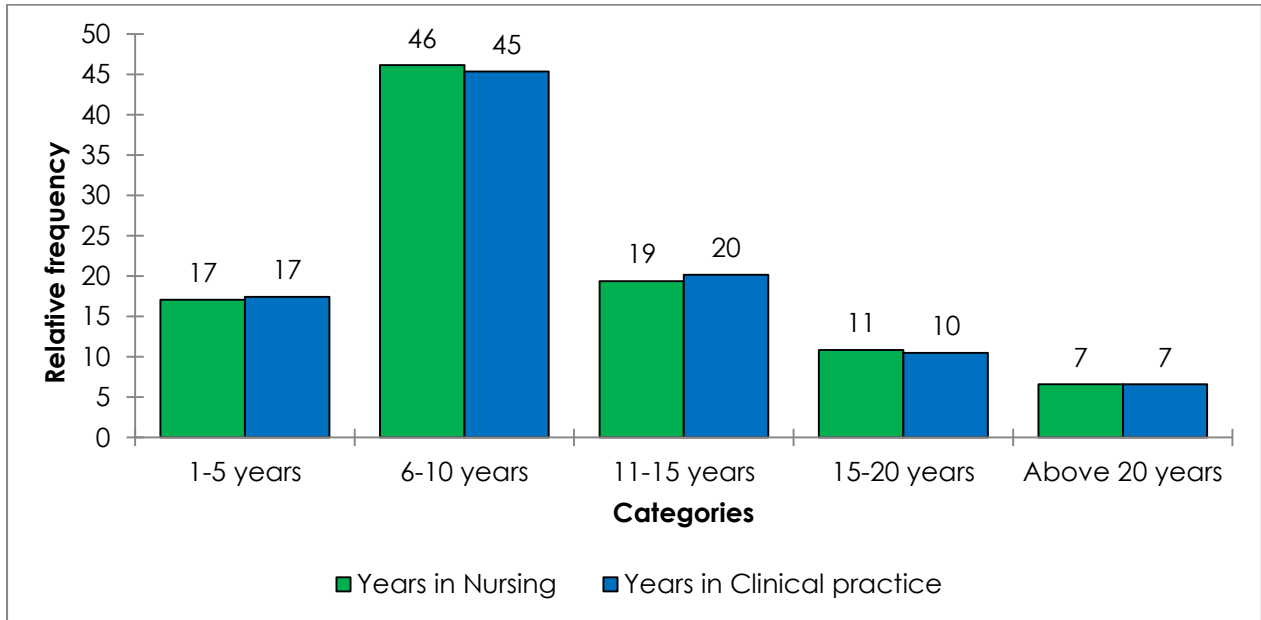


Figure 5: Experience in nursing (n=258)

Majoring of the respondents have between 6 and 10 years of both nursing and clinical practice. Over 5 years' experience in many professions is considered adequate to practice effectively and to "know the job" (Lucas, 2011). This would mean that the experience of the respondents in nursing was adequate for them to comment on the MSD situation at A NATIONAL REFERRAL HOSPITAL.

4.1.5 Work placement at the hospital

The place of work in a hospital can be a determining characteristic to the occurrence of MSD, as such the study explored the current place of work as well as the duration in that work place and the hours logged on duty. The results are presented in Figure 6 and Figure 7.

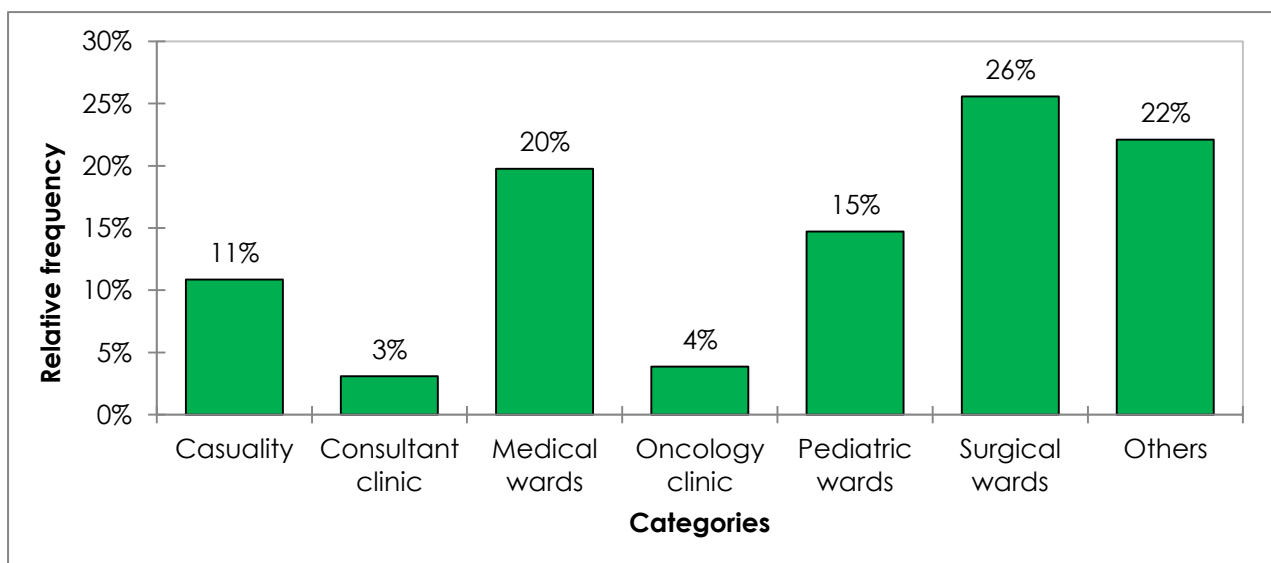


Figure 6: Present work placement for the respondents

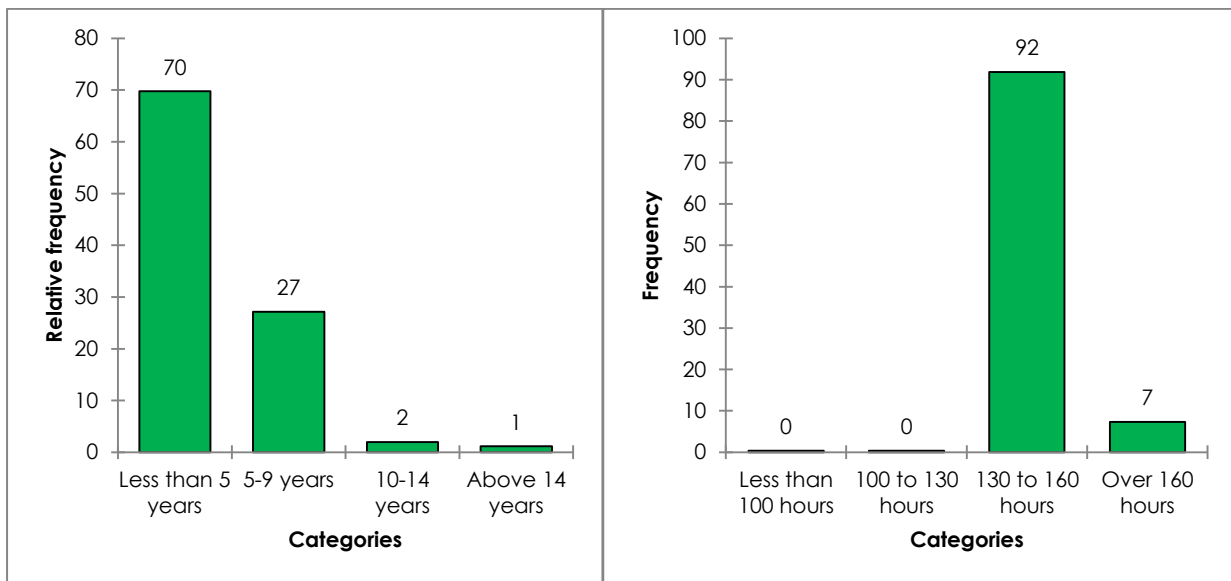


Figure 7: Duration in present working place and monthly hours allocation (n=258)

The respondents in the study were mainly from the surgical (26%), medical (20%) and pediatric (15%) wards, possibly an indication of highest demand for the nursing services at. Most (70%) of the respondents have been at their current work placements for less than 5 years. 92% respondents clock the regular hours of between 33hours and 40hours a week cumulating to 130 hours to 160 hours a month.

4.2 Prevalence of MSD

The occurrence of MSD in A NATIONAL REFERRAL HOSPITAL was documented through assessing whether the nurses have experienced work-related pains, the pain areas, the onset of the pains, whether they sought treatment and follow-up actions to experiencing the pain.

4.2.1 Work related injuries

The study sought to find out whether the nurses at the hospital had experienced work related pains that can be attributed to MSD. The finding of the study is presented in Figure 8.

The findings of the study indicate that 5 out of ten nurses in the hospital have experienced work related pains. This could be an indication that MSD contributes at least 54% of work place injuries. The findings of this study are comparable to Vingard(2006) that reported that MSD could be associated to 60% of work place injuries.

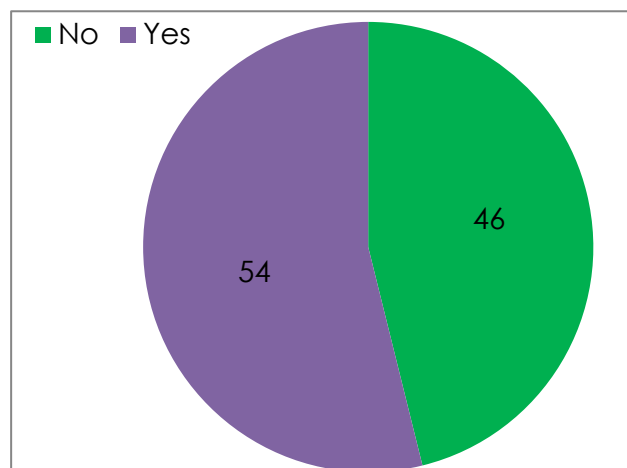


Figure 8: Whether the respondents have experienced work related pains (n=258)

Further analysis indicate that work related pains are independent of gender, age, height, weight, duration as a nurse and place of work, whereas duration in the place of work and hours logged per month was dependent of potential for work related pains (Table).

Table i: Relationship between respondents’ characteristics and experiencing work related pains

| Respondents characteristics | Statistics related to work related pains |
|-----------------------------|---|
| Gender | X-squared = 4.0968, df = 1, p-value < 0.05 |
| Age | X-squared = 40.785, df = 4, p-value < 0.05 |
| Height | X-squared = 26.588, df = 4, p-value < 0.05 |
| Weight | X-squared = 23.815, df = 4, p-value < 0.05 |
| Years in Nursing | X-squared = 42.183, df = 4, p-value < 0.05 |
| Work place | X-squared = 43.338, df = 24, p-value < 0.05 |
| Duration in work place | X-squared = 0.58966, df = 3, p-value = 0.8988 |
| Hours logged | X-squared = 18.456, df = 17, p-value = 0.3606 |

The findings of this study agrees with the study by Engkvist, Hagberg, Wigaeus, Menckel, & Ekenvall (1998) and Engels, Van der Gulden, Senden, & Holf (1996) that cited a relationship between hours of work and experiencing work related injuries. The study also explored the onset of the work-related pains in terms of when the pain was first experienced and whether it was sudden or gradual. The results are presented in Figure 9.

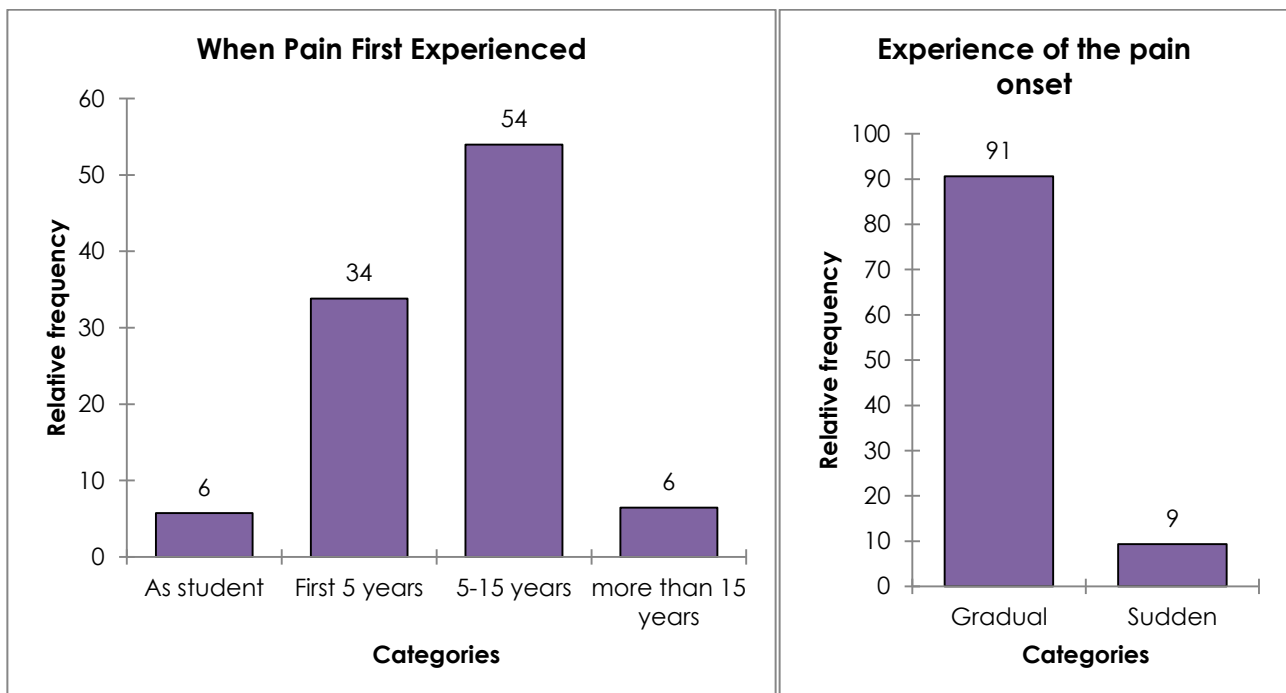


Figure 9: Onset of pain (n=139)

The results show that majority (54%) of the nurses who experienced work related injuries, started experiencing the pain between 5 and 15 years since they started practicing. This agrees further that the work-related pains were gradual as cited

by 91% of the respondents. The findings in the study agrees with Middlesworth(2017) that MSD onset is slow and takes until actual effects are seen in the context of realized pain. The lag phase between the first experiences of pain and eventual realization, could be attributed to the fact that for actualization of MSD, the causative actions need be over time, repetitive or continuous (CDC, 2017). This requires systemic action as soon as nurses start practicing avoiding the cumulative effect either as a factor of work area management or personal practices. Statistical analysis shows independence between onset of work related pains and age, height, weight and duration as a nurse, while gender and how long the nurse has worked at a specific place has potential dependence (Table).

Table ii: Relationship between respondents’ characteristics and onset of work related pains

| Respondents characteristics | Statistics related to first pain experience |
|-----------------------------|---|
| Gender | X-squared = 0.78164, df = 3, p-value = 0.85 |
| Age | X-squared = 43.892, df = 12, p-value < 0.05 |
| Height | X-squared = 24.614, df = 12, p-value < 0.05 |
| Weight | X-squared = 26.207, df = 12, p-value < 0.05 |
| Years in Nursing | X-squared = 105.78, df = 12, p-value < 0.05 |
| Duration in work place | X-squared = 11.931, df = 9, p-value = 0.21 |

4.2.2 Body areas where pain is experienced

The study sought to find out which areas of the body were affected by the pains experienced by the nurses. The results are presented in Figure 10.

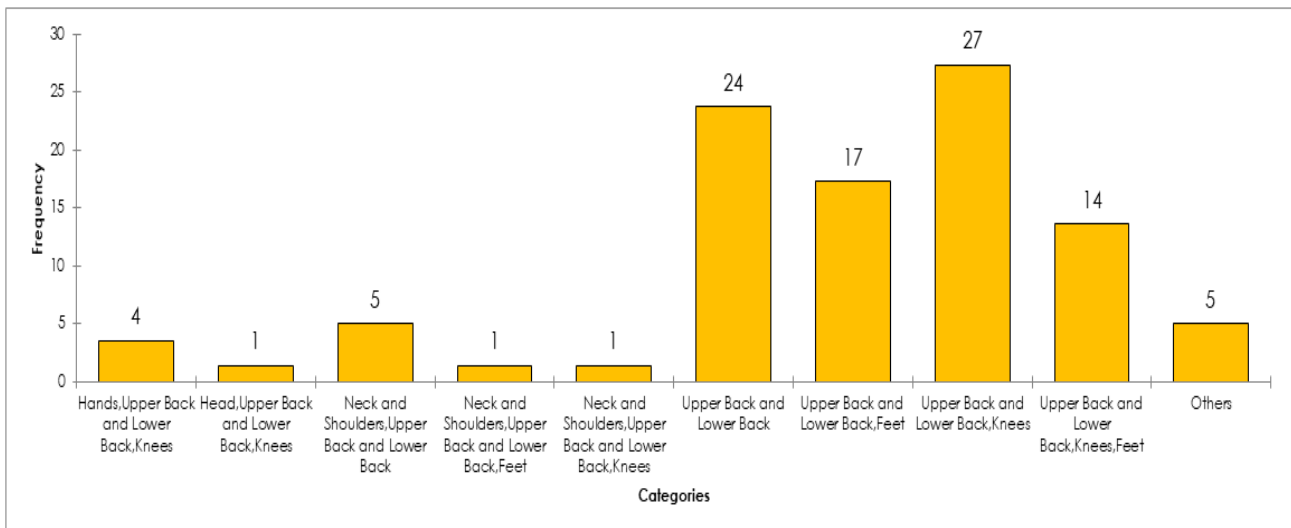


Figure 10: Areas of pain pointed out by the respondents (n=139)

From the results, the study indicates that work related pains are experienced in a variety of combination of body parts ranging from the upper and lower back, knees, feet, neck and shoulders, and hands. The body pain combination most experienced was noted to be upper back, lower back, and knees (by 27% of the respondents) and upper back and lower back (by 24% of the respondents). Further asked which single body areas were the most significantly affected by work related pains, 95% of the respondents pointed out that the upper and lower back areas, while 2% cited feet, 2% neck and shoulders and 1 knees, 2%. The findings of the study emphasize the publication by the HSE(2017) that identify upper and

lower back areas as the most affected areas of the body with regard to MSD. Middlesworth (2017) and CDC (2017) further recommends that physical fitness is important to reduce the potential of upper and lower back pains.

In relating the body points of work related injuries, the study established statistical significant independence between significant pain points and experience in nursing. Suggesting that the potential points of MSD injuries are more related to age, gender, height and weight, and how long a nurse has been working at a specific location.

Table iii: Relationship between respondents’ characteristics and significant pain areas

| Respondents characteristics | Statistics related to significant pain areas |
|-----------------------------|--|
| Gender | X-squared = 6.6176, df = 3, p-value = 0.085 |
| Age | X-squared = 5.4776, df = 12, p-value = 0.94 |
| Height | X-squared = 4.1854, df = 12, p-value = 0.98 |
| Weight | X-squared = 4.2747, df = 12, p-value = 0.98 |
| Years in Nursing | X-squared = 21.039, df = 12, p-value < 0.05 |
| Duration in work place | X-squared = 2.9697, df = 9, p-value = 0.97 |

4.2.3 Actions following the injuries

The study further asked the respondents the actions they took since realizing the work-related injuries. The indicators explored comprised of whether they sought medical attention, or changed specialties/place of work. The results are presented in Figure 11.

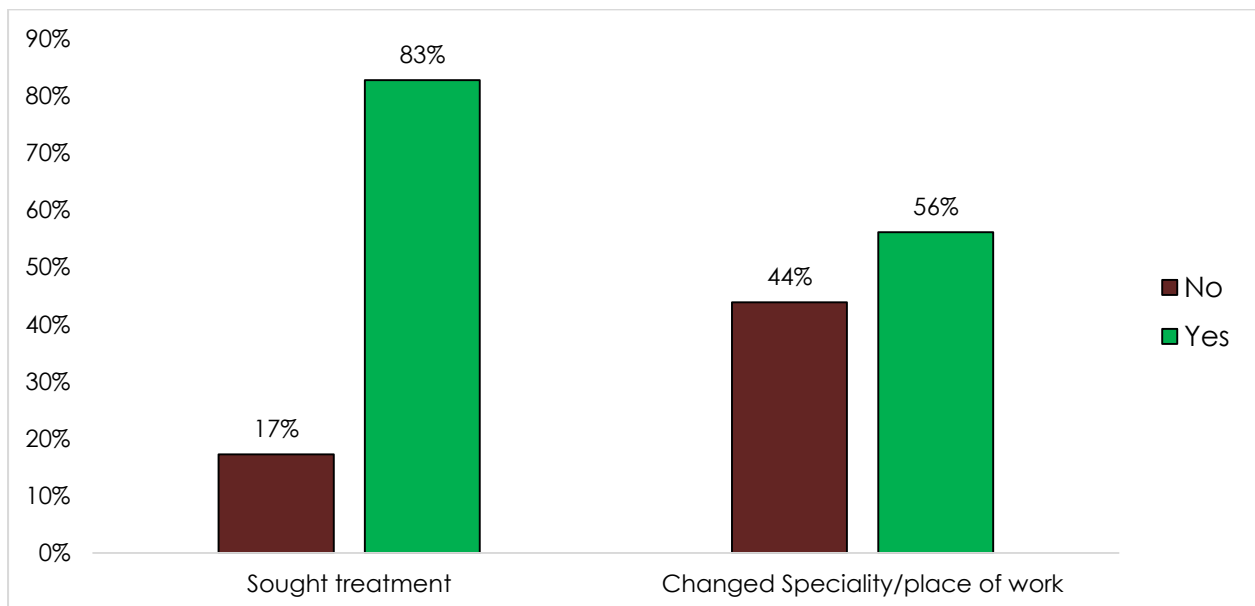


Figure 11: Actions taken after onset of work related injuries (n=139)

The findings indicate that the main cause of action taken by 83% of the nurses after realising the pains, is seeking treatment. This could potentially contribute to cumulative sick offs, which in turn would cause lost work days. Lost work days has been cited by Punnet & Wegman (2004) as an attribute to MSD prevalence. Essentially, the sick days become a burden to the nurses with MSD financially and could further jeopardize their work (BLS, 1997; HSE, 2017).

Every five out of ten nurses that have experienced work injuries have tended to change nursing specialty or area of work, the study established. As such, the study sought to identify which specialty/places of work the nurses' change from and where they opted for. The results are presented in Figure 12.

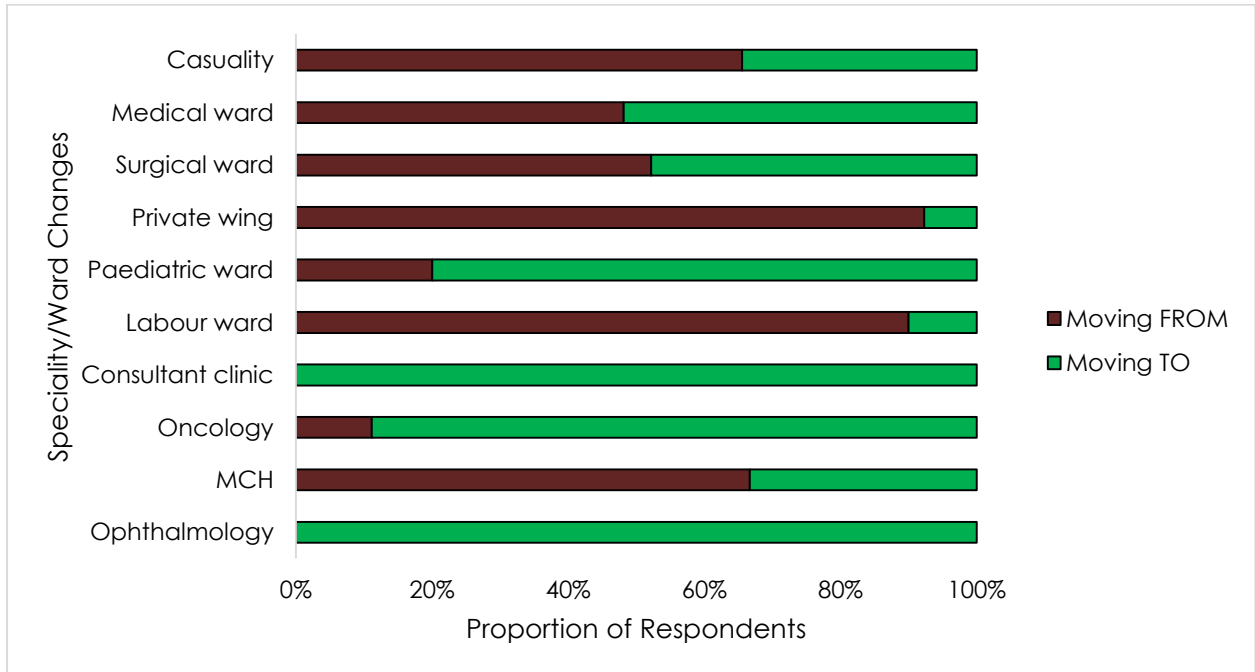


Figure 12: Specialty Changes at A NATIONAL REFERRAL HOSPITAL (n=78)

The findings of the study indicate that the Private wing, Labour ward, MCH and Casualty are the most transferred from wards which could be an indication that they are areas of potential high MSD zones. On the other hand, Ophthalmology, Consultant clinic, Oncology and Paediatric ward are the most transferred to areas. The study indicates therefore that there are wards associated with potential MSD cases, whereas others are considered safer and more bearable.

The study also asked the respondents whether they have undertaken any ergonomics training, the results are presented in Figure 13.

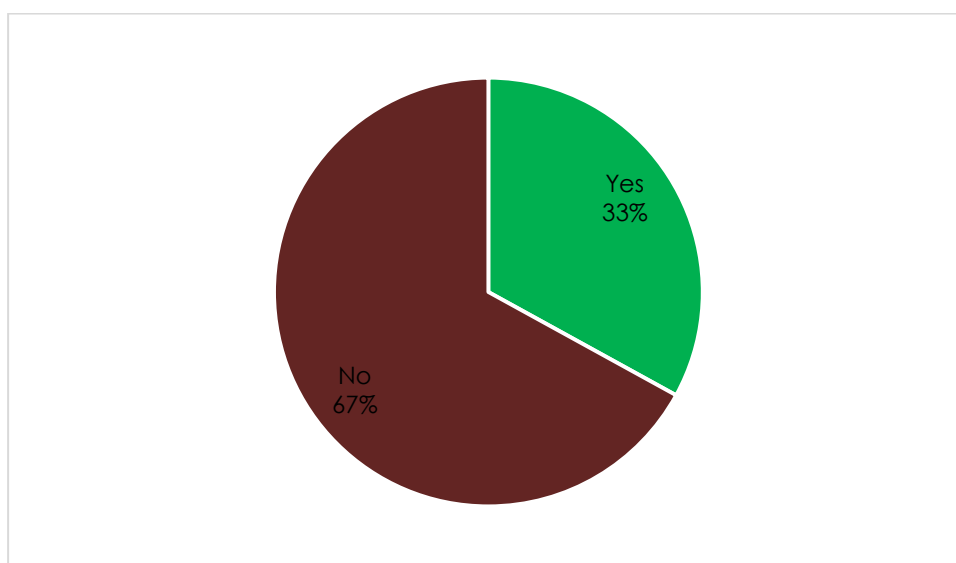


Figure 13: Ergonomics training among the nurses at A NATIONAL REFERRAL HOSPITAL as MSD management (n=139)

Some (33%) of the affected nurses have taken to ergonomics training including training on appropriate bending positions, optimized ways of lifting patients, work organization and work planning, as well as creating adequate space of work and patients’ control. These trainings are widely recommended in avoiding work related injuries (CDC, 2017; HSE, 2017; Middlesworth, 2017).

4.3 Demographics of nurses experiencing MSD

The study focused on the respondents that indicated that they had experienced work-related injuries, and explored their characteristic distribution. This section details the results recorded.

4.3.1 Gender and age

The study explored the gender and age of the nurses who had cited to have experienced work-related injuries. The results are presented in Figure 14 and Figure 15

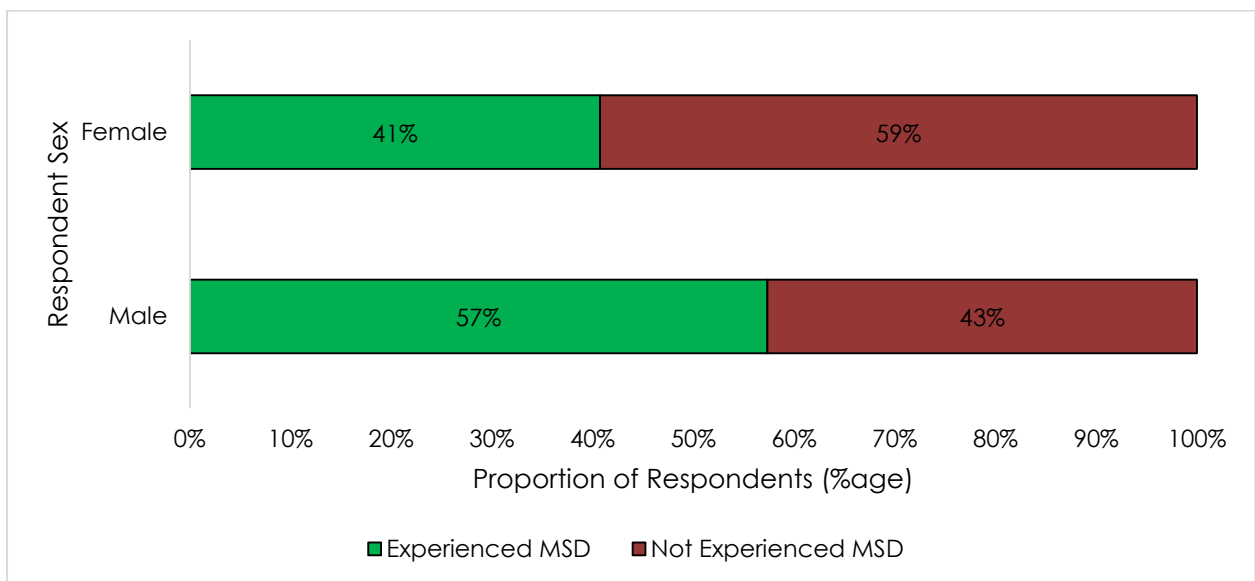


Figure 14: Relationship between sex of nurses and prevalence of MSD (Male n=54; Female n= 204)

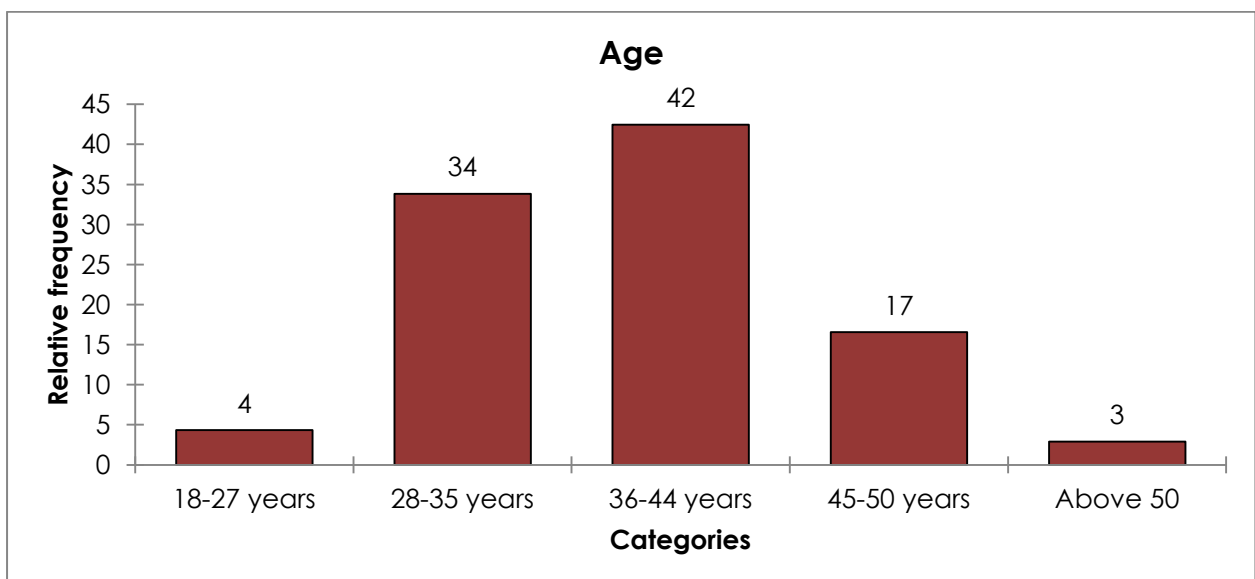


Figure 15: Age of nurses in relation to MSD (n=258)

The findings of the study suggest that male (57%) nurses are more affected by MSD compared to female (41%) nurses. Although there are demographic biases to females in the nursing profession (Ossai, 2014), the study indicate that the

prevalence of MSD among male nurses is higher. Whereas majority (51%) of the respondents is aged between 28 and 35 years, most of the nurses who are affected by MSD are aged between 36 and 44 years. This indicates that with age, MSD is likely to occur especially since it is chronic (Alexapaulo, Burdorf, & Kalokerinou, 2003).

4.3.2 Height and weight

Further, the study explored the relationship between height and weight, and potential development of MSD among the nurses with the results presented in Figure 16.

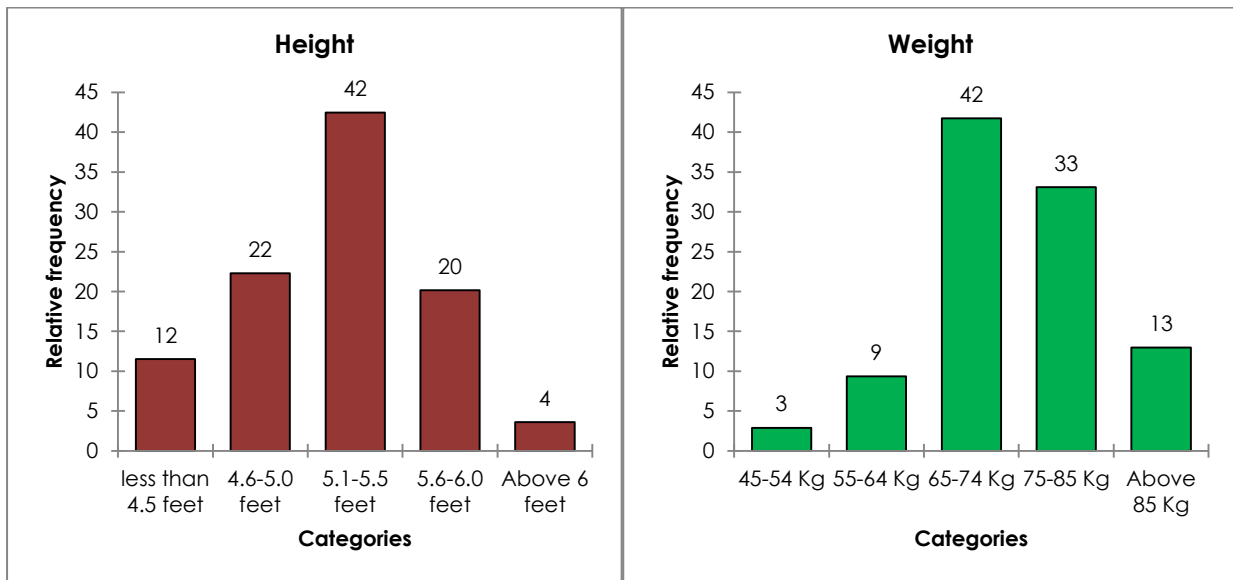


Figure 16: Height and weight of respondents with MSD (n=139)

The findings of the study indicate that the distribution of nurses with MSD follows a similar trend to the general demographics of the study. This could be an indication that MSD affects all nurses irrespective of height and weight. As such, MSD is not discriminatory to physical features (CDC, 2017).

4.3.3 Experience in nursing

The study also explored the experience of the nurses with MSD and whether their work-related injuries could be attributed to their duration in practice. The results are presented in Figure 17.

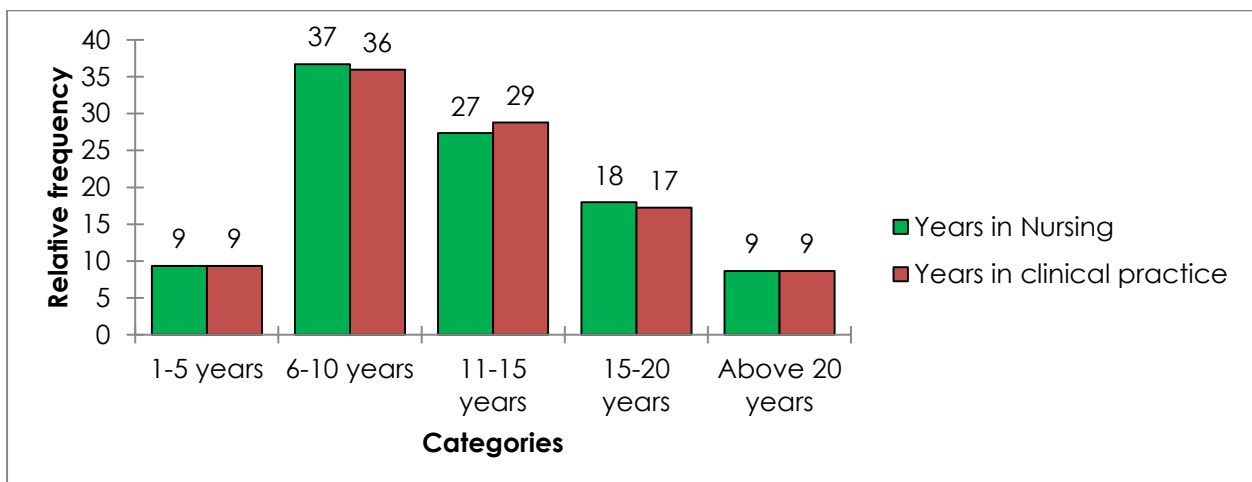


Figure 17: Experience of nurses with MSD (n=139)

The findings show similar trends compared to the overall demographics of the nurses considered in the study. This could potentially indicate that years of service would not prevent the prevalence of MSD among practicing nurses.

4.4 Ergonomic risk factors

In the study, it was important to identify risk factors that could contribute to MSD at A NATIONAL REFERRAL HOSPITAL. The findings of the main key risk factors are shown in Figure 18. The risks were scored from low to high probability of contributing to work related injuries.

The findings of the study indicate that more than 90% of the respondents in the study cited the requirement to work even after experiencing work related injury, inadequate breaks during shifts and excess patients (high nurses to patients ratio) as the most probable factors that would contribute to higher prevalence of MSD. These factors have been attributed to MSD in other cases in the United Kingdom and in the United States of America (CDC, 2017; HSE, 2017). The factors have been described by Middlesworth (2017) as ergonomic risk factors which require the active management of the health care facility rather than individual nurses. Low risk factors identified in the study include stretching beyond physical limit, lifting heavy materials, handling tasks away from the physical body, gait activities and working in cramped positions. These low risk factors could be considered individual based risks. The fact that the high risk factors for MSD at the hospital are related to the actual working environment, is a call for action to the hospital management to reduce the potential impact of MSD among the nurses.

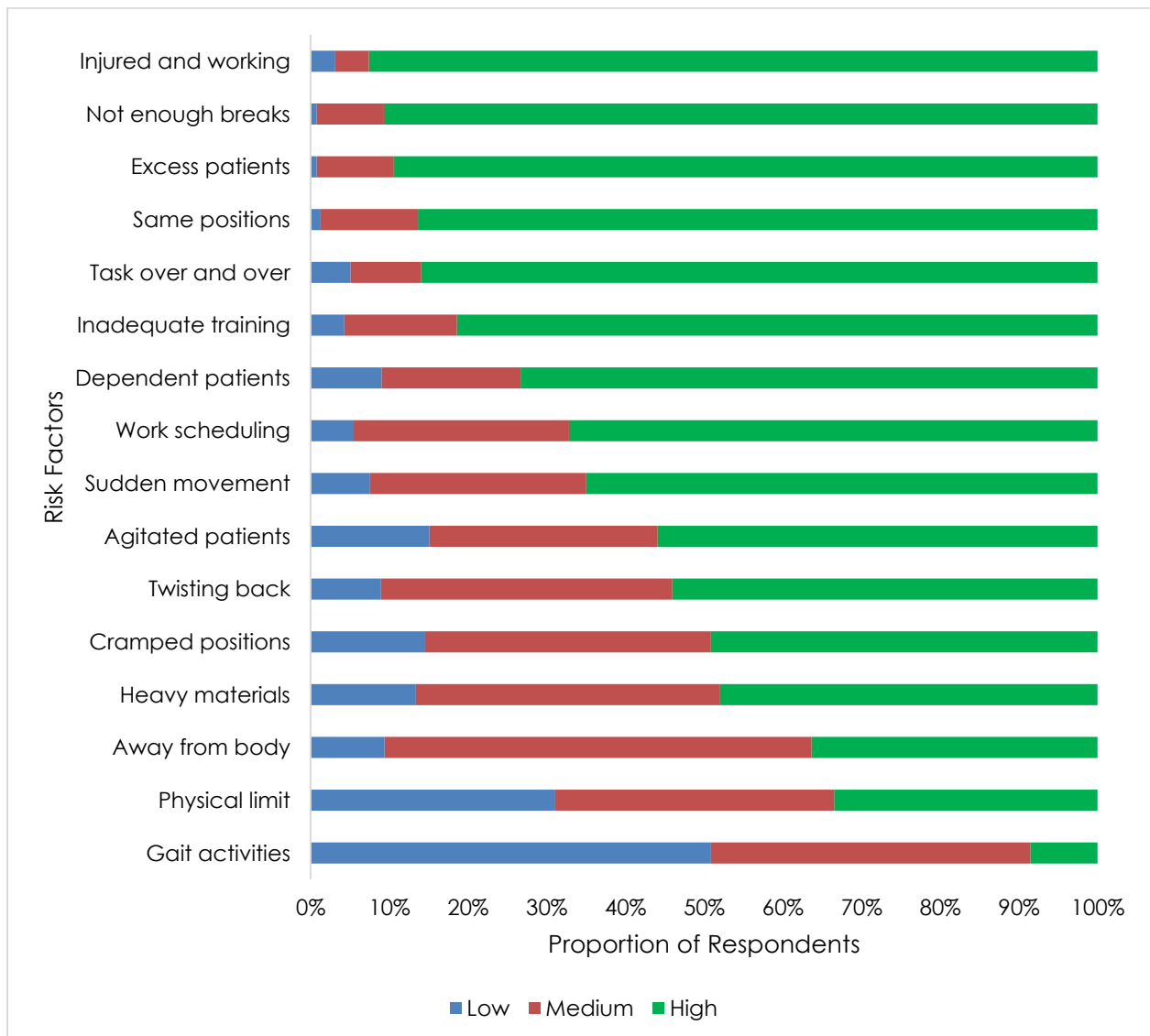


Figure 18: Significance of MSD risk factors (n=258)

The study explored ways in which the nurses themselves handle the stated risk factors, with the results presented in Figure 19.

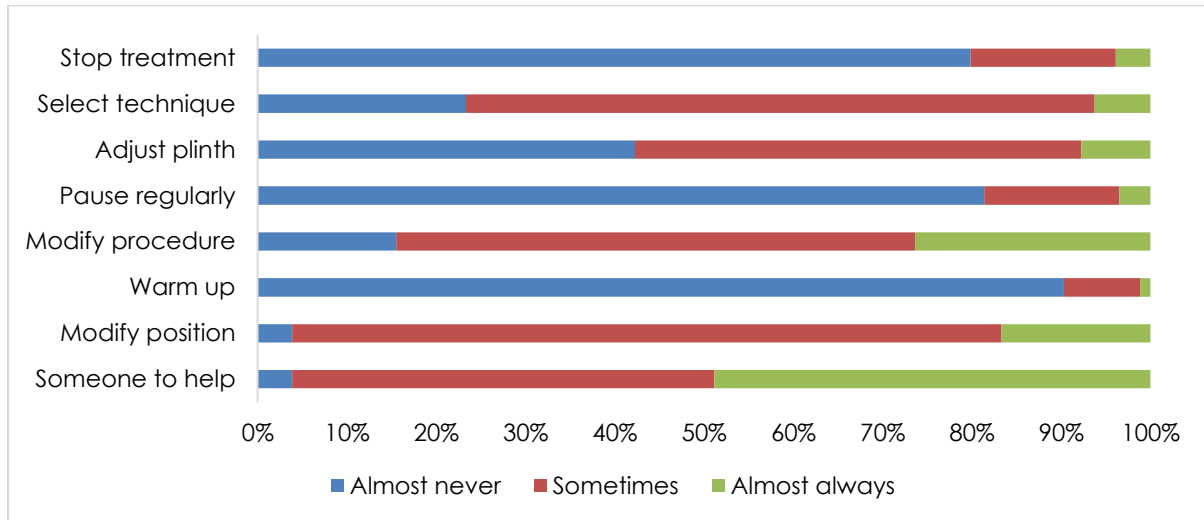


Figure 19: Individual actions to curb risk factors (n=258)

The study found out that the nurses almost never stop procedure, pause, nor warm up as mechanisms to handle the risk factors. Instead, they mainly request for extra help, modify positions and procedures administration, and select techniques that would be less risky to cause a work injury. These individual interventions are useful to prevent MSD, although in some instances might jeopardize treatment and patient’s wellbeing (HSE, 2017). For instance, asking for extra help with low staffing ratios could prolong the overall response time, which in turn could have negative effects on patient management.

5. CONCLUSIONS

This section details the conclusion based on the findings of the study, focusing on the principal characteristics of the nurses in the study, prevalence of MSD, relationship between demographics and MSD prevalence and the ergonomic risk factors. It further recommends actions that would yield constructive services for the nursing community at large.

Majority of the nurses at the hospital were female, which can be attributed to the fact that nursing is seen as a female dominated profession. Majority of whom are aged between 28 and 44 years, weighing 65Kg to 74Kg at a height between 5.1 to 5.5 feet. Essentially, the nurses were of normal to overweight with respect to body mass index (BMI). The nurses are highly experienced having worked for over 5 years. The nurses work in the medical, surgical and pediatric wards. Some nurses had worked for up to 9 years, clocking between 130 to 160 hours a week. The nurses considered for the study were well qualified and experienced, indicating that their opinions are useful in guiding the outcome of nurses’ welfare regarding MSD. The nurses at the hospital had suffered from MSD related injuries. As experienced nurses, and having worked for almost ten years, the nurses at the hospital have high prevalence of MSD. The injuries had been experienced gradually within 5 years of work, mainly on the upper and lower back areas. As a result, most of the affected nurses seek treatment. MSD therefore has had impact on quality of life, causing absenteeism and transfer to other departments, with potential economic toll on the individual nurses. Nonetheless, male nurses are more affected by MSD, particularly those aged between 36 and 44 years. The height and weight of nurses on the other hand, have no contribution to MSD prevalence, an indication that all the nurses have potential of being affected. The high-risk factors to MSD (the requirement to work even after experiencing work related injury, and inadequate breaks during shifts) are related to actual working environment.

The study recommends actions by hospital management to reduce the potential of high risk factors of MSD through offering ergonomic training to nurses, enhancing breaks during shifts and providing time off on occurrence of MSD. Further, the study recommends creating a working environment that would reduce stretching beyond physical limit and handling tasks away from the physical body by the nurses, and promoting gait activities.

International Journal of Novel Research in Healthcare and Nursing

Vol. 8, Issue 1, pp: (189-198), Month: January - April 2021, Available at: www.noveltyjournals.com

REFERENCES

- [1] Alexanderson, K., & Norlund, A. (2004). Sickness absence- causes, consequences, and physicians' sickness certification practice. A systematic literature review by the Swedish Council on technology assessment in health care. *Scandinavian Journal of Public Health*(32), 263.
- [2] Alexapaulo, E. C., Burdorf, A., & Kalokerinou, A. (2003). Risk factors for musculoskeletal disorders among nursing personnel in a Greek hospital. *International Archives of Occupational and Environmental Health*(76), 289 – 294.
- [3] Allen, A., Altchek, D. W., Marx, R., & Jones, E. C. (2001). Reliability, Validity, and Responsiveness of Four Knee Outcome Scales for Athletic Patients.
- [4] Bergman, S. (2007). Management of musculoskeletal pain. Best Practices and Research Clinical Rheumatology. *PubMed*, 21, 153-166.
- [5] BLS. (1997). *Survey of Occupational injuries and illness*. Retrieved January 2009, from Bureau of Labour Statistics: <http://www.champion>
- [6] Burns, N., & Grove, S. K. (2010). Understanding nursing research: Building an evidence-based practice. *Elsevier Health Sciences*.
- [7] CDC. (2017, October 27). *Musculoskeletal Health Program*. Retrieved from The National Institute for Occupational Safety and Health (NIOSH): <https://www.cdc.gov/niosh/programs/msd/>
- [8] Cochran-Smith, Z. K. (2008). *Studying teacher education: The report of the AERA panel on research and teacher education*. AERA panel.
- [9] DW. (2017, January 1). *Height Chart of Men and Women in Different Countries*. Retrieved from Disabled World: <https://www.disabled-world.com/artman/publish/height-chart.shtml>
- [10] Engels, J. A., Van der Gulden, J. W., Senden, T. F., & Holf, B. (1996). Work related risk factors for musculoskeletal complaints in the nursing profession: results of a questionnaire survey. *Occupational and Environmental Medicine*, 53, 636-641.
- [11] Engkvist, L., Hagberg, M., Wigaeus, H., Menckel, E., & Ekenvall, L. (1998). PSOA study group: The accident process preceding over exertion back injuries in nursing personnel. *Scandinavian Journal of Work Environment and Health*, 24, 367-375.
- [12] Eriken, W., Bruusgaard, D., & Knardahl, S. (2004). Work factors as predictors of intense or disabling low back pain, a prospective study of nurses' aides. *Journal of Occupational and Environmental Medicine*(61), 398 – 404.
- [13] Harcombe, H., McBride, D., Derret, S., & Gray, A. (2009). Prevalence and impact of musculoskeletal disorders in New Zealand nurses, postal workers and office workers. *Australian and Newzealand Journal of Public Health*, 33(5), 437–441.
- [14] HSE. (2017, November 1). *Musculoskeletal Disorders (MSDs)*. Retrieved from Health and Safety Executive: <http://www.hse.gov.uk/msd/msds.htm>
- [15] Kee, D., & Seo, S. (2003). Musculoskeletal disorders among nursing personnel in Korea. *International Journal of Industrial Ergonomics*(37), 207 – 212.
- [16] Kouta, C., & Kaite, C. P. (2011). Gender Discrimination and Nursing: A Literature Review. *Journal of Professional Nursing*, 27(1), 59–63.
- [17] Kuorinka, J. B., Kilbom, A., & Vinterberg, H. (1987). *Standardised Nordic questionnaires for the analysis of musculoskeletal symptoms*.
- [18] Lipscomb, J., Brady, B., & Brown, J. (2004). Health care system changes and reported musculoskeletal disorders among registered nurses. *American journal of public health*, 94, 1431-1435.
- [19] Lucas, S. (2011, September 23). *Are "Years of Experience" Requirements Fair to Younger Workers?* Retrieved from Money Watch: <https://www.cbsnews.com/news/are-years-of-experience-requirements-fair-to-younger-workers/>

International Journal of Novel Research in Healthcare and Nursing

 Vol. 8, Issue 1, pp: (189-198), Month: January - April 2021, Available at: www.noveltyjournals.com

- [20] Middlesworth, M. (2017, November 1). *The Definition and Causes of Musculoskeletal Disorders (MSDs)*. Retrieved from Ergonomics Plus: <http://ergo-plus.com/musculoskeletal-disorders-msd/>
- [21] OECD. (2017, November 1). *Working age population*. Retrieved from OECD Data: <https://data.oecd.org/pop/working-age-population.htm>
- [22] Ossai, K. O. (2014, January 1). *Gender Inequality in Nursing: Implication for Nursing Education, Practice and Management*. Retrieved from Academiaedu: http://www.academia.edu/8615158/Gender_Inequality_in_Nursing_Implication_for_Nursing_Education_Practice_and_Management
- [23] Punnet, L., & Wegman, D. H. (2004). Work-related musculoskeletal disorders: the epidemiologic evidence and the debate. *Journal of Electromyography and Kinesiology*, 14, 13-23.
- [24] Shafizadeh, K. R. (2011). Prevalence of Musculoskeletal Disorders among Paramedics Working in a Large Hospital in Ahwaz, Southwestern Iran in 2010. *International Journal of occupational and Environmental Medicine*, 2.
- [25] Smeldey, J., Inskip, H., Tervelyan, F., Bucke, P., Cooper, C., & Coggon, D. (2003). Risk factors for incident neck and shoulder pains in hospital nurses. *Journal of Occupational and Health*, 241-245.
- [26] Smith, D. R., & Leggat, P. A. (2003). Musculoskeletal disorders in nursing. *Australian Nursing Journal*, 11, 1-4.
- [27] Smith, D. R., Wei, L., Kang, L., & Wang, R. S. (2004). Musculoskeletal disorders among professional nurses in Mainland China. *Journal of Professional Nursing*, 20, 390-394.
- [28] UNICEF. (2013, December 27). *Statistics*. Retrieved from UNICEF: https://www.unicef.org/infobycountry/kenya_statistics.html
- [29] Vingard, E. (2006). Major Public health problems-Musculoskeletal disorders. *Scandinavian Journal of public health*,(67), 104-112.
- [30] Volinn, E. (1997). The epidemiology of low back pain in the rest of the world.A review of surveys in low and middle income countries. *Spine*, 22, 1747 – 1754.
- [31] Welles, R., Moore, A., Potvin, J., & Norman, R. (1995). Assessment of risk factors for development of work-related musculoskeletal disorders. *RSI*.