
Occupational Hazards, Illnesses and Injuries Among Nurses Working in Different Clinical Areas of Work (Units)

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Abstract

Health and wellbeing of employees in the workplace are important concerns that should continue to receive attention in any organisation. Traditionally hospitals are directed towards curative services, not preventive services, it is very important to maintain optimum health of the staff in the healthcare industry as they take care of the sick clients. The study was conducted with the major objective to assess the risk and hazards faced by nurses in different clinical areas of work (Units). Quantitative descriptive cross-sectional method was used for the study. The study was conducted with a sample of 588 respondents (unit managers, registered nurses and assistant nurses). The findings revealed that nurses do encounter a considerable level of occupational hazards. Critical Care and Cardiology Unit were found to be the units with the highest risk of occupational hazards and injuries while the lowest risk was observed in the outpatient and day care unit. Chi square analysis of data revealed a significant association of Clinical Area of work (Unit) with exposure to blood borne pathogens & biological hazards, radiation, toxic fumes & anaesthetic agents, irritation from disinfectants & sterilants and chemical/toxic medication.

Introduction

Healthcare professionals form a huge global work sector, and are crucial for the healthy sustenance of people of any nation. The most constant injuries reported among healthcare professionals are musculoskeletal disorders, burns and fractures and the most commonly occurring illnesses are upper respiratory tract infections, skin and hepatic disorders and drug reactions. There are many identified chemicals used in the hospitals that have adverse effects on people working in the environment.

According to Bureau of Labour Statistics (2015), the most common nature of non-fatal injury or illnesses reported among nurses were sprain, strain, and tears. Many of these illnesses were serious resulting 31 or more days away from work. It is necessary to identify and reduce the exposure to risks in their working environment as these risks not only influence their own health but also affect patient care. In the nursing workplace environment, many stressors are present that can lead to diseases and injuries, these hazards can impair the health status acutely or in long term. The awareness of occupational hazards is minimum among the nurses [1]. As per the Bureau of Labor Statistics (2012) nurses are sustaining occupational injuries, particularly work-related musculoskeletal injuries and disorders almost twice the national rate of the general population due to their work. Most of the studies on occupational health have focused mainly on worker's compensation, insurance, absenteeism, and economic consequences towards the organisation. Very little focus is made towards the impact on the life of the workers affected due to workplace injuries and illnesses. The repercussions of these workplace injuries reach the victim's workplace, home, hospitals, courts, and the local community. The type and severity of the illnesses or injuries matter a lot to define its consequences and effects for e.g. an employee with a severe disabling back injury will face more consequences than an employee with minor sprain will.

The study was conducted with the major objective to assess the risk and hazards faced by the nurses in different clinical areas of work (Units).

Literature Review

The healthcare providers are rated third among major groups besides Labourers/freight workers and truck drivers who experience a high number of workplace injuries mainly because of direct patient care (Bureau of Labor Statistics, 2012). In a study on the effect of transfer, lifting and repositioning procedures among health care providers out of the total injuries among the health care providers, nurses were found to be the most affected, mainly with back, neck and shoulder injury [2]. Holman *et al.* (2010) [3] reported that in a shift, 20% of the time spent by nurses is on patient handling task and the job culture of nurses during patient handling situations is always to consider patient safety above their own. 40% of nurses believed that sprain, strain and a sore back is the part of their job. Approximately 20% of nursing jobs include patient handling and mobilisation; that is the reason adequate training on safe patient handling and mobilisation is essential. In a study conducted by Zaidi *et al.* (2012) [4] most of the health care providers preferred to treat themselves rather than opting to follow hospital protocol and incident reporting system. Shreedharan *et al.* (2011) [5] reported that 97% of nurses were familiar with the idea of standard precautions. 61.2% believed that all patients' blood and body fluids are potentially infected whereas 27.6% thought only diagnosed patients are infected and 11.2% believed only patients who are suspected of infection are infectious. The study

emphasised to implement an educational program to improve the knowledge of nurses on standard precautions. Collins (2010) [6] reported that health care workers are more prone to musculoskeletal disorders when compared with other jobs, which are physically more demanding like in construction, mining, and manufacturing. The main reason for musculoskeletal injuries in health care workers is due to positioning, transportation and assisting patients. (Schoenfisch *et al.*, 2013) [7]. Among all occupations, nursing is ranked highest for musculoskeletal disorders ranging from 40-80% among all populations [8]. Dawson (2012) [9] reported that 62% of nurses had reported disabling musculoskeletal injury was their major concern and 56% had experienced musculoskeletal pain, which was worsened due to the nature of their job.

The main reasons for leg and foot pain symptoms in nurses working in intensive care units are due to shift duties and longer working practice [10]. Prolonged untreated MSDs that is symptoms more than 6 months of the period can lead to sickness, absenteeism and significantly decreased productivity (Taylor and Green, 2015). Working condition of nurses includes several risk factors, for example, operation theatre nurses experience prolonged twisted and static postures [11], Roll, *et al.* (2012) [12].

Approximately £600,000 per year is the estimated cost towards needlestick injuries that is compensated by NHS in the United Kingdom, including prophylaxis treatment, lab investigations, treatment, counselling and legal procedures [13]. Many articles have reported that one of the reasons for needle stick injuries is a feeling of urgency. In a study of 33,327 Taiwanese nurses on work-related injuries and illnesses done by Chiou *et al.* (2013) [14], the findings revealed that the nurses working in critical care areas and operating rooms have highest levels of radiation exposures. Health care workers are more at risk for infections as they are in close contact with patients and handle human biological wastes like sputum, faeces, urine, blood and this can also lead to public health implications as health care workers can be a source of transmission to other patients and other people in the community associated with them [15]. Importance of respiratory protectors for direct patient caregivers should be emphasised. In 1.3 million workplaces, around 5 million U.S workers were asked to wear respiratory protection to minimise inhalation exposures (OSHA, 2016).

It is very important to explore factors that contribute to work-related injuries and illnesses for maintaining a healthy and safe work environment to enhance healthcare professional's health and promote quality patient care.

Materials & Methods

Quantitative descriptive cross-sectional method was used for the study by using a wide range of Demographical variables (age, work experience, professional experience, training, the risk associated with work etc). The study was carried out in a multi speciality 600 bedded hospital catering the needs of both nationals and multinationals being admitted in the hospital, in order to assess the association (if any) of risk factors with the clinical areas of work (Units).

The convenience sampling method was used for the study. The study was carried out among nurses (Unit Managers, Registered Nurses and Assistant Nurses) who were involved in direct or indirect patient care. The data was collected using **OHS Vulnerability Measure Tool**, developed at the Institute for Work and Health, Canada (2016). Approximately 60% of the total staff was taken as a sample group to achieve a desirable

result. A sample of 685 nurses was taken for the collection of data. The response rate was 87%, a total of 594 completed questionnaires were obtained back out of which 588 were complete in all aspects. Thus, the analysis was done on the data obtained from 588 respondents (*Critical Care & Cardiology Unit n=185, Medical and Surgical Unit n=181, Gynaecology, Maternity & Paediatrics Unit n=164 and Outpatient and Day Care Unit n=58*).

Table 1: Sample Profile

| Variable | Group | n(%) |
|-------------------------------|---|------------|
| JOB TITLE | Charge Nurse | 10(1.7) |
| | Senior Staff Nurse | 35(5.9) |
| | Staff Nurse 3 | 38(6.4) |
| | Staff Nurse 2 | 469(79.7) |
| | Assistant Nurse | 36(6.1) |
| UNIT (CLINICAL AREA OF WORK) | Critical Care and Cardiology Unit | 185(31.4) |
| | Medical and Surgical Unit | 181(30.7) |
| | Gynaecology, Maternity and Paediatric Units | 164 (27.8) |
| | Out Patient and Day Care Units | 58(9.8) |
| YEARS OF EXPERIENCE | 1-5 years | 223(37.9) |
| | 6-10years | 97(16.4) |
| | 11-15years | 133(22.6) |
| | 16-20years | 48(8.1) |
| | 21-25years | 25(4.2) |
| | 26-30years | 62(10.5) |
| AGE | 20-30 years | 131(22.2) |
| | 31-40 years | 255(43.3) |
| | 41-50 years | 130(22.1) |
| | 51-60 years | 72(12.2) |
| NATIONALITY | Indian | 365(62.07) |
| | Filipino | 188(31.9) |
| | Arab | 27(4.5) |
| | Others | 8(1.3) |
| DIRECT PATIENT CARE PROVIDER | Yes | 564(92.5) |
| | No | 24(4.08) |

| | | |
|--|-------------------|------------|
| TIME SPENT IN DIRECT PATIENT CARE ACTIVITIES | 0-2 hours | 36(6.1) |
| | 3-5 hours | 36(6.1) |
| | 6-8 hours | 244(41.4) |
| | 8 hours and above | 272(46.2) |
| USUAL LENGTH OF SHIFT/WORK DAY | 7-8 hours | 467(79.4) |
| | 9-10 hours | 118(20.06) |
| | 11-12 hours | 2(0.3) |
| | 13-14 hours | 1(0.1) |
| AVERAGE WORKING HOURS PER WEEK | 31-40 hours | 368(62.5) |
| | 41-50 hours | 220(37.4) |
| UNPLANNED OVERTIME PER MONTH | Never | 307(52.2) |
| | 1-2 times | 205(34.8) |
| | 3-4 times | 52(8.8) |
| | 5-6times | 24(4.08) |

A sample of 68 nurses was obtained using purposive sampling technique. The pilot study participants varied in diversity to ensure proper representation of the available population.

Findings of the Study

Clinical Area of Work (Units) and Exposure to Chemicals/Toxic Medication

The exposure to chemicals toxic medication was found to be the highest among Critical care and Cardiology Units, followed by Medical and Surgical Units, Gynaecology and Maternity and Paediatrics Units. Lowest level of exposure was found in nurses working in Outpatient and Day Care Units where only 15.5% respondents were exposed to the chemicals toxic medication on weekly basis, while 31.4% respondents in Critical care and Cardiology Units, 29.8% respondents in Medical and Surgical Units and 30.5% respondents in Gynaecology and Maternity and Paediatrics Units were exposed to the chemicals toxic medication on weekly basis.

Table 2: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Exposure to Chemicals/ Toxic Medication

| | Once a year | Every 6 months | Every 1-3 months | Weekly | N | p Value |
|--|---------------|----------------|------------------|---------------|-----|---------|
| Critical Care and Cardiology Units | 91 (49.2%) | 10 (5.4%) | 26 (14.1%) | 58 (31.4%) | 185 | 0.032 |
| Medical and Surgical Units | 65 (35.9%) | 24 (13.3%) | 38 (21.0%) | 54 (29.8%) | 181 | |
| Gynaecology, Maternity and Paediatrics Units | 73 (44.5%) | 15 (9.1%) | 26 (15.9%) | 50 (30.5%) | 164 | |
| Outpatient and Day Care Units | 30 (51.7%) | 7 (12.1%) | 12 (20.7%) | 9 (15.5%) | 58 | |

The p Value ($0.032 < 0.05$) derived from Chi-Square analysis of the data revealed a significant association among Unit and exposure of respondents to chemicals/ toxic medication.

Clinical Area of Work (Unit) and Irritation from Disinfectants and Sterilants

The exposure and irritation from disinfectants and sterilants was reported to be highest among respondents working in Medical and Surgical units, followed by those in Critical Care and Cardiology Units; Gynaecology, Maternity, and Paediatric Units compared to Outpatient Department and Day Care Units.

Table 3: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on experiencing Irritation from Disinfectants

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|--|---------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 76 (41.1%) | 9 (4.9%) | 22 (11.9%) | 78 (42.2%) | 185 | 0.017 |
| Medical and Surgical Units | 67 (37%) | 13 (7.2%) | 23 (12.7%) | 78 (43.1%) | 181 | |
| Gynaecology, Maternity and Paediatrics Units | 66 (40.2%) | 11 (6.7%) | 18 (11%) | 69 (42.1%) | 164 | |
| Outpatient and Day Care Units | 36 (62.1%) | 6 (10.3%) | 8 (13.8%) | 8 (13.8%) | 58 | |

The p value ($0.017 < 0.05$) obtained from Chi-square test analysis revealed a significant association among Unit and irritation from disinfectants and sterilants.

Clinical Area of Work (Unit) and Exposure to Toxic Fumes

Some highly toxic elements identified in surgical smoke are hydrocarbons, nitriles, fatty acids and phenols [16].

Table 4: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Exposure to Toxic Fumes

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|--|----------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 116 (62.7%) | 7 (3.8%) | 13 (7%) | 49 (26.5%) | 185 | 0.007 |
| Medical and Surgical Units | 126 (69.6%) | 8 (4.4%) | 20 (11%) | 27 (14.9%) | 181 | |
| Gynaecology, Maternity and Paediatrics Units | 111 (67.7%) | 15 (9.1%) | 15 (9.1%) | 23 (14%) | 164 | |
| Outpatient and Day Care Units | 45 (77.6%) | 3 (5.2%) | 6 (10.3%) | 4 (6.9%) | 58 | |

The p value ($0.007 < 0.05$) derived from Chi-square analysis revealed a statistically significant association among *Unit* and *Exposure to toxic fumes*.

In a similar study conducted by Moual *et al.*, (2013) [17] to compare the risk of severe persistent asthma between the nurses of operation theatre (where there is a high risk of exposure to certain inhaled agents) with administrative nursing staff, the risk of persistent asthma was reported to be significantly higher in operation theatre nurses.

Clinical Area of Work (Unit) and Exposure to Anaesthetic Agents

The effect of exposure to anaesthetic gases like chloroform, ether and nitrous oxide in higher concentration leads to a headache, irritability, fatigue, nausea, drowsiness, confusion, and effect on liver and kidneys [18].

Table 5: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Exposure to Anaesthetic Agents

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|--|----------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 102 (55.1%) | 10 (5.4%) | 22 (11.9%) | 51 (27.6%) | 185 | 0.001 |
| Medical and Surgical Units | 128 (70.7%) | 11 (6.1%) | 15 (8.3%) | 27 (14.9%) | 181 | |
| Gynaecology, Maternity and Paediatrics Units | 131 (79.9%) | 7 (4.3%) | 14 (8.5%) | 12 (7.3%) | 164 | |
| Outpatient and Day Care Units | 41 (70.7%) | 2 (3.4%) | 6 (10.3%) | 9 (15.5%) | 58 | |

The p value ($0.001 < 0.05$) derived from Chi-square analysis revealed a statistically significant association among *unit* and *exposure to anaesthetic agents*. The exposure to anaesthetic gases was highest among respondents working in Critical care and Cardiology Units, Medical and Surgical Units, Gynaecology and Maternity and Paediatrics Units, compared to Outpatient and Day Care Units.

Clinical Area of Work (Unit) and Risk of Slip and Fall

Falls are a growing concern in the health care industry. Yeoh *et al* (2013) [19] reported that non-fatal fall-related injuries are highest among the nursing profession, mainly in females aged between 45 to 64 years and around 25% of falls result in 31 work days being lost. Also, risk of fall was observed more in nursing aides when compared to registered nurses. Bureau of Labor Statistics (2009) [20]. reported that 11% of total occupational injuries result from falls in the workplace.

Table 6: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Risk of Slip and Fall

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|----------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 126 (68.1%) | 6 (3.2%) | 13 (7%) | 40 (21.6%) | 185 | 0.155 |
| Medical and Surgical Units | 134 (74%) | 8 (4.4%) | 17 (9.4%) | 22 (12.2%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 106 (64.6%) | 7 (4.3%) | 16 (9.8%) | 35 (21.3%) | 164 | |
| Outpatient and Day Care Units | 43 (74.1%) | 5 (8.6%) | 4 (6.9%) | 6 (10.3%) | 58 | |

The p value ($0.155 > 0.05$) obtained from Chi-square analysis revealed a non-significant association among *Unit* and *Risk of Slip and Fall*.

The risk of fall or tripping mainly happens due to the wet floors or cluttered space. Within the outpatient department and day care unit the risk is least as there is adequate space within the work environment due to less equipments and cleaning of the floors are not as frequent as in in-patient units.

Clinical Area of Work (Unit) and Latex Allergy

Health care professionals with type 1 hypersensitivity to natural rubber latex can continue to work by reduction of exposure to latex and use of low-allergen non-powdered natural-rubber latex gloves whenever possible [21].

Table 7: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Latex Allergy

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|--------------|-------|---------|
| Critical care and Cardiology Units | 108 (58.4) | 9 (4.9%) | 12 (6.5%) | 56 (30.3) | 185 | 0.141 |
| Medical and Surgical Units | 108 (59.7) | 6 (3.3%) | 16 (8.8%) | 51 (28.2) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 103 (62.8) | 9 (5.5%) | 8 (4.9%) | 44 (26.8) | 164 | |
| Outpatient and Day Care Units | 45 (77.6) | 4 (6.9%) | 3 (5.2%) | 6 (10.3) | 58 | |

The p value ($0.141 > 0.05$) obtained from Chi-square analysis revealed a non-significant association among *Area of Work (Unit)* and *Latex Allergy*.

Clinical Area of Work (Unit) and Exposure to Radiations

Radiation hazards are categorised as ionising radiation hazards (radionuclides in nuclear medicine, diagnostic imaging and radiation therapy, X-Rays) and non- ionising radiation hazards (magnetic resonance imaging, lasers, ultraviolet lights).

Table 8: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on Exposure to Radiation

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|----------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 70 (37.8%) | 13 (7%) | 23 (12.4%) | 79 (42.7%) | 185 | 0.001 |
| Medical and Surgical Units | 121 (66.9%) | 17 (9.4%) | 20 (11%) | 23 (12.7%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 98 (59.8%) | 8 (4.9%) | 22 (13.4%) | 36 (22%) | 164 | |
| Outpatient and Day Care Units | 47 (81%) | 2 (3.4%) | 3 (5.2%) | 6 (10.3%) | 58 | |

The p Value ($0.001 < 0.05$) obtained from chi-square analysis revealed a significant association among *Unit* and *Exposure to Radiation*.

A study by Chiou *et al.* (2013) [14] with same results found that nurses working in emergency rooms, intensive care units and wards have a more ill effect on health when compared to staff working in the outpatient department and administration. Nurses working in critical care units and operation theatres had high radiation exposures when compared to others.

Clinical Area of Work (Unit) and Low Back Pain

As per the U.S Bureau of Labor Statistics (2017), hospital personnel's routinely faced work-related injuries due to lifting, moving or shifting of patients.

Table 9: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on experiencing Low Back Pain

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|----------------|-------|---------|
| Critical care and Cardiology Units | 27 (14.6) | 14 (7.6%) | 32 (17.3%) | 112 (60.5%) | 185 | 0.194 |
| Medical and Surgical Units | 24 (13.3%) | 11 (6.1%) | 27 (14.9%) | 119 (65.7%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 36 (22%) | 9 (5.5%) | 19 (11.6%) | 100 (61%) | 164 | |
| Outpatient and Day Care Units | 12 (20.7%) | 3 (5.2%) | 14 (24.1%) | 29 (50%) | 58 | |

The p Value ($0.194 > 0.05$) obtained from chi-square analysis revealed no significant association between *Unit* and *Low back pain*.

Nurses working in intensive care units and neonatal intensive care unit nurses show the lowest prevalence of back pain and the highest prevalence of back pain is seen among medical intensive care unit staff. (Kyung & Sung, 2011).

Clinical Area of Work (Unit) and Shoulder Pain

Use of extreme force for lifting, pushing, pulling in awkward positions such as bending, twisting, repetitive motion, vibration, working overhead can lead to ergonomic exposures.

Table 10: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on experience of Shoulder Pain

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|----------------|-------|---------|
| Critical care and Cardiology Units | 47 (25.4%) | 14 (7.6%) | 23 (12.4%) | 101 (54.6%) | 185 | 0.495 |
| Medical and Surgical Units | 43 (23.8%) | 6 (3.3%) | 29 (16%) | 103 (56.9%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 39 (23.8%) | 6 (3.7%) | 24 (14.6%) | 95 (57.9%) | 164 | |
| Outpatient and Day Care Units | 20 (34.5%) | 3 (5.2%) | 6 (10.3%) | 29 (50%) | 58 | |

The p Value ($0.495 > 0.05$) obtained from Chi-square analysis revealed no significant association among *Unit* and *experience of shoulder pain among nurses*.

Lövgren *et al.* (2014) [22] reported that 50% respondents had constant prevalence and incidence of neck and shoulder pain even more than back pain which was reported by 40% respondents in a study conducted on student nurses.

Clinical Area of Work (Unit) and Wrist Pain

Musculoskeletal symptoms are very common in nurses, especially the direct patient care providers [23].

Table 11: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on experience of Wrist Pain

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|---------------|-------|---------|
| Critical care and Cardiology Units | 67 (36.2%) | 14 (7.6%) | 25 (13.5%) | 79 (42.7%) | 185 | 0.248 |
| Medical and Surgical Units | 76 (42%) | 6 (3.3%) | 25 (13.8%) | 74 (40.9%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 65 (39.6%) | 12 (7.3%) | 12 (7.3%) | 75 (45.7%) | 164 | |
| Outpatient and Day Care Units | 27 (46.6%) | 2 (3.4%) | 9 (15.5%) | 20 (34.5%) | 58 | |

The p Value ($0.248 > 0.05$) obtained from Chi-square analysis showed a non significant association among Unit and experience of wrist pain among nurses.

Clinical Area of Work (Unit) and Needle Stick Injury

In a hospital setting, needle stick injury is a serious occupational hazard. The main factors which lead to needle stick injuries are an urgency to complete work, shift duties, less experience, decreased skill etc [24]. The incidence of sharps injuries among health care providers was in nurses mainly due to recapping of the needles [25].

Table 12: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on incidence of needle stick injuries

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|--------------|-------|---------|
| Critical care and Cardiology Units | 126 (68.1) | 9 (4.9%) | 8 (4.3%) | 42 (22.7) | 185 | 0.138 |
| Medical and Surgical Units | 120 (66.3) | 7 (3.9%) | 14 (7.7%) | 40 (22.1) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 120 (73.2) | 8 (4.9%) | 13 (7.9%) | 23 (14%) | 164 | |
| Outpatient and Day Care Units | 47 (81%) | 2 (3.4%) | 5 (8.6%) | 4 (6.9%) | 58 | |

The p Value ($0.138 > 0.05$) derived from Chi-square analysis showed no significant association among Unit and incidence of needle stick injuries among nurses.

Factors that are associated with needle stick injuries are gender, age, department, and experience. Age and the area of work or the unit are the most important risk factor contributing to needle stick injuries [26].

Waleed *et al.* (2015) [25] reported that highest number of needle stick injuries occur in the emergency room followed by a dialysis unit.

Clinical Area of Work (Unit) and Exposure to Blood Borne Pathogens & Biological Hazards

The risk of infection is still a common risk to health care providers. Any hospital-acquired illness can lead to economic consequences which can be assessed by the total number of sick leave or absenteeism caused by the illnesses or by a cost of medical attention and compensation (Gestal, 2018). Health care workers are at continuous risk of blood-borne viral infections with hepatitis B virus, hepatitis C Virus and human immune-deficiency virus. During an epidemic like EBOLA and SARS or pandemic like COVID-19 health care workers are at very high risk for infections due to their contact time with patients.

Table 13: Percentage Distribution of respondents working in different Clinical Areas of Work (Units) on exposure to blood borne pathogens & biological hazards

| | Once a year | Every 6 months | Every 1-3 months | Weekly | Total | p Value |
|---|---------------|----------------|------------------|---------------|--------------|---------|
| Critical care and Cardiology Units | 65 (35.1%) | 9 (4.9%) | 24 (13%) | 87 (47%) | 185 | 0.001 |
| Medical and Surgical Units | 59 (32.6%) | 10 (5.5%) | 23 (12.7%) | 89 (49.2%) | 181 | |
| Gynaecology, Maternity and Paediatrics Unit | 73 (44.5%) | 8 (4.9%) | 26 (15.9%) | 57 (34.8%) | 164 | |
| Outpatient and Day Care Units | 42 (72.4%) | 1 (1.7%) | 5 (8.6%) | 10 (17.2%) | 58 (100%) | |

The p Value (0.001<0.05) determined by chi-square analysis revealed that there is a statistically significant association among *Unit* and *exposure to blood borne pathogens and biological hazards*.

Preventive measures include education, immunisation, adherence to universal precautions, post-exposure advice and prophylaxis [27].

Critical Care and Cardiology Unit were found to be the units with the highest risk of occupational hazards and injuries while the lowest risk was observed in the outpatient and day care unit. Chi square analysis of data revealed a significant association of clinical areas of work (Units) with exposure to blood borne pathogens & biological hazards, radiation, toxic fumes & anaesthetic agents, irritation from disinfectants & sterilants and chemical/toxic medication. On the other hand, a non-significant association was revealed among clinical areas of work (Units) with incidence of needle stick injuries; pain in wrists, shoulders & low back; latex allergy; and risk of slips and falls [28].

Conclusion

The healthcare workers face a lot of challenges in their day to day work life. There is a dire need to address these occupational hazards so that they can be well taken care of in time, in order to reduce incidences of illnesses and injuries among them. A strong medical workforce is the key to a healthy world. Proper precautions and standard procedures should be an integral part of work for every individual, especially those working in the healthcare work-sector. Injuries and hazards should be minimised in order to ensure a safe working environment for the personnel. Wherever required, guidelines and interventions should be provided to minimise the risk of workplace factors leading to injuries and illnesses.

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