



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

كلية نبتة  
NAPATA COLLEGE

**Napata College**  
**Faculty of Medicine**

**Knowledge and Attitude toward Occupational Health Hazards  
among applied medical students at Napata College 2021**

*A thesis Submitted in Partial Fulfillment for the Requirement of BCs Degree in Medicine*

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى :

( قُلْ لَوْ كَانَ الْبَحْرُ مِدَادًا لِكَلِمَاتِ رَبِّي لَنَفِدَ الْبَحْرُ قَبْلَ أَنْ تَنفَدَ كَلِمَاتُ رَبِّي وَلَوْ جِئْنَا بِمِثْلِهِ مَدَدًا )

سورة الكهف ، الآية (109)

(وَلَوْ أَنَّمَا فِي الْأَرْضِ مِنْ شَجَرَةٍ أَقْلَمٌ وَالْبَحْرُ يَمُدُّهُ مِنْ بَعْدِهِ سَبْعَةُ أَبْحُرٍ مَا نَفِدَتْ كَلِمَاتُ اللَّهِ إِنَّ اللَّهَ عَزِيزٌ حَكِيمٌ )

صدق الله العظيم

سورة لقمان ، الآية (27)

## *Dedication*

*We would like to dedicate to all those following people who contributed to the success of this research work:*

*To our parents whom we owe a great debt*

*To our family for giving us love, support and encouragement.*

*To our dear friends to whom we have a great admiration*

# *Acknowledgments*

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## **Abstract**

### **Knowledge and Attitude toward Occupational Health Hazards among applied medical students at Napata College 2021**

**Background:** Health professionals and medical students encounter a variety of occupational health problems. Although level of knowledge and awareness of medical students toward this problem plays an importance role to prevent and control of these medical hazardous, currently there is limited information available regarding the level of knowledge, attitude and practice among the Health worker and medical students in Sudan toward Occupational health hazard.

**Aim of study and Method:** A cross-sectional study among health colleges in their clinical training years in NAPATA College in Sudan to evaluate the impact of knowledge, Attitude of health college students towards Occupational Health Hazards during clinical Training. Questionnaire was used to collect data

**Results:** Overall response rate was 100%, 58% of students were females. According to the students responses, students know about the occupational health hazard (83%), (50%) of them got information's from Lecture in the curriculum. High percentage of students (92%) think OHH is related to their profession and effect it. Hepatitis B is most common acquired disease among health staff which answered by majority of students (72%). About the major hazard source, (55%) near to half of students answered Patient secretions, sharp tools, radiation and chemicals agent. High percentage (83%) know HIV and Hepatitis B are blood borne disease. (90.8%) of students choose Safety box is place to get rid of the sharp equipment. When asked about received hepatitis B vaccination majority 72% of students were not received. Questions related to HIV vaccine and transmission showed high percentage of students with correct answer. 95% of students giving also correct answer about Using of Mask can reduce the exposure of infectious T.B & COVID19

**Conclusion:** According to high percentage of medical students who gives a correct answers related about knowledge and positive attitude toward occupational health hazard, majority of medical students have a good knowledge toward occupational health hazard

***Table of Contents***

Content	Page No
The Verse	I
Dedication	II
Acknowledgment	III
Abstract (English)	IV
List of contents	V
List of tables	VII
List of figures	VII
List of Abbreviations	VIII
<b><i>Chapter One: Introduction, Rationale and Objectives</i></b>	
Background	1
Problem statement	2
Rational	3
Research Objectives	3
General objective	3
Specific objectives	3
<b><i>Chapter Two : Literature Review</i></b>	
Health hazards among health care personnel and medical students	4
Types of occupational Hazards among health care personnel and medical students	5
Physical Hazards	5
Biological Hazards	6
Chemical hazards	7
Radiation Hazards	8
Violence Hazards	8
Reproductive health Hazards	8
Stress disorders Hazards	9
Possibilities of Prevention/Reduction of Hazards	9
previous studies	10
<b><i>Chapter three :Materials and Methods</i></b>	
Study design	12
Study area (setting)	12

Study duration	12
Study population	12
Sampling techniques	12
Sample size	12
Inclusion criteria	13
Exclusion criteria	13
Study variables	13
Data collection	13
Ethical clearance	13
Data analysis	14
<b><i>Chapter Four : Results</i></b>	
Demographic data of respondents	15
Assessment Knowledge of student toward occupational health hazard	17
Assessment Attitude of student toward occupational health hazard	20
<b><i>Chapter Five : Discussion</i></b>	
Discussion	21
<b><i>Chapter six: Conclusion and Recommendations</i></b>	
Conclusion	23
Recommendations	23
References	24

**List of Tables**

<b>Table</b>	<b>Page. No</b>
Table 4.1 Frequency and Percentage of various responses to Knowledge questions	18
Table 4.2 Frequency and Percentage of various responses to Attitude questions	20

**List of Figures**

<b>Figure</b>	<b>Page. No</b>
Figure 4.1 Distribution of the study participants according to Gender (n = 120)	15
Figure 4.2 Distribution of the study participants according to academic year (n = 120)	16
Figure 4.3 Distribution of the study participants according to knowledge about the occupational health hazard (n = 120)	17

**List of Abbreviations**

<b>BP</b>	blood pressure
<b>COVID</b>	Corona virus
<b>HBV</b>	hepatitis B viruses
<b>HCFs</b>	Health care facilities
<b>HCP</b>	Health care personnel
<b>HCV</b>	hepatitis C viruses
<b>HIV</b>	human immunodeficiency virus
<b>ILO</b>	International Labour Organization
<b>LMICs</b>	low- and middle-income countries
<b>MSDs</b>	musculoskeletal disorders
<b>NSIs</b>	needle stick injuries
<b>PPE</b>	personal protective equipment
<b>WHO</b>	World Health Organization

# **Chapter One**

**Introduction, Rationale & Objectives**

## **1. Introduction, Rationale & Objectives**

### **1.1 Background**

Occupational hazards are defined as workplace issues that have likely to raise the hazard of our health, which can be categorized as biological and non-biological. Health care workers and medical students are at potential risk of harm from exposure to numerous hazardous agents encountered in their workplace [1]. The most recent and visible example is the ongoing COVID-19 pandemic, which has showcased the vulnerability of medical students and health care workers and demonstrated the importance of ensuring their safety [2]. In addition to exposures to emerging diseases, medical students and health care workers are routinely exposed to other infectious agents such as tuberculosis, influenza, HIV, and Hepatitis B, which have been the primary focus of research and safety programs [3]. Medical students and Health care workers are also exposed to various chemical hazards and agents that have been linked to long-term adverse health effects. Chemicals used in health care settings such as ethylene oxide, formaldehyde, and antineoplastic drugs have been linked to cancers and adverse reproductive outcomes [4, 5]. Exposure to latex and cleaning and disinfecting agents has been associated with occupational asthma among medical students [6]. Musculoskeletal disorders and injuries, and various psychosocial hazards such as workplace violence, stress, and burnout are other well-recognized occupational hazards among medical students and health care workers [7]. Recognizing these risks, safety measures and standards to protect health care workers and medical students have been instituted in high-income countries and have largely succeeded in mitigating these hazards [8]. However, in many low- and middle-income countries (LMICs) like Sudan, occupational health and safety is often neglected. These deficiencies in occupational health have been attributed to a lack of political commitment, insufficient resources, poor data collection systems, and weak enforcement of regulations. [9]. level of knowledge and awareness of medical students toward this problem plays an importance role to prevent and control of these medical hazardous. The number of studies that investigated the awareness and level of knowledge of medical students concerning occupational health and safety OHS is rather limited [10, 11], so this study carried to assess the knowledge, attitude and practice of medical students toward healthcare safety.

## **1.2 Problem statement**

Occupational health and safety is an important issue because of high rates of associated morbidity and mortality of exposed workers. An estimated 100,000 people die from occupational illnesses, while about 400,000 new cases of occupational diseases are diagnosed every year. This affects workers in various occupations as a result of their exposure to different types and varying degrees of hazards in the workplace. However, studies indicate that workers in the Health care facilities (HCFs) have the highest risk of exposure to high risk occupational hazards. In addition to health care employees, medical students spend the majority of their educational lives in a hospital setting and are also exposed to work accidents and occupational risk factors, Although level of knowledge and awareness of medical students toward this problem plays an importance role to prevent and control of these medical hazardous, currently there is limited information available regarding the level of knowledge, attitude and practice among the Health worker and medical students in Sudan toward Occupational health hazard

### **1.3 Justification**

Health professionals and medical students are an integral component of the health care delivery system. Health professionals and medical students encounter a variety of occupational health problems which may be categorized into mechanical hazards, biological hazards, chemical hazards, physical hazards, and psychosocial hazards. Medical students are younger, inexperienced, unskilled, less aware of self-protection, and lack of professional knowledge of protective measures as compared with the senior registered doctors, which make them more susceptible to occupational injury. Medical students manual skills are insufficient and their clinical experience is limited. At the same time, they might have insufficient background knowledge to recognize the level of risk that is posed by patients and insufficient knowledge about standard infection control principles, so aim of our study is to measure the knowledge, attitude and practice of medical students in Napata College toward occupational health hazard.

### **1.4 Objectives**

#### **1.4.1 General Objective**

- To assess Knowledge and Attitude toward Occupational Health Hazards among medical students at Napata College 2021

#### **1.4.2 Specific Objectives**

- To identify risk factors behind occupational health hazards among medical students in NAPATA college
- To determine common hazards facing medical students.
- To identify the knowledge and attitude of medical students toward occupational health hazard.

# **Chapter Two**

## **Literature Review**

## **2. Literature Review**

### **2.1 Health hazards among health care personnel and medical students**

According to the World Health Organization (WHO), reports that all healthcare workers, including healthcare professionals and medical trainees/students, are exposed to occupational hazards [12]. The International Labour Organization (ILO) reported that millions of healthcare workers suffer from work-related diseases and accidents, and many succumb to occupational hazards [13]. Health services require a broad range of workers-doctors, nurses, technicians, laboratory workers, social workers, responders at various levels, maintenance, security administration, food services, housekeeping, mortuary and so on [14]. Health care personnel (HCP) refers to all persons, working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces or contaminated air. Also, health services are provided at variety of settings, small/large, outpatient, inpatient, birthing places, operation theaters, emergency care, clinics, nursing homes, and at home also. Hazardous elements also include blood borne pathogens (biological), chemicals, drugs, anesthetic gases, laser, and workplace violence, those associated with laboratories, radioactive material, X-ray waste, ergonomic, lifting, and repetitive tasks. Some of the potential hazardous chemicals include formaldehyde (used for preservation of tissue, organs) and numerous other chemicals used in laboratories [15,16]. While trying to ensure health of patients and public, health care personnel and medical students face a wide range of hazards to their own health due to injuries (needle prick, musculoskeletal, allergens), infections (viruses, bacteria, parasites), violence, and so on. Health care personnel and medical students have the potential to get exposed to infectious material, including body substances, contaminated medical supplies, environment around including air and anesthetic gases, radiation equipment etc. Chances of hazards in health facilities are highly variable depending on type of health facility. Women represent 80% of the health workforce, so they are major sufferers, with effect on their reproductive health also. Nonfatal injuries and illnesses among the health care personnel and medical students are the highest of any industry. Even, agriculture and construction industries have become safer than health facilities. Prevention of infections, injuries, and violence all needs to be in place at health facilities [17]. Health care personnel and medical students are also the segment of society who

are in need of guidance for prevention of substance use and therapy of substance abuse [18]. Chemical exposure can occur from sterilants, disinfectants, cleaning compounds, hazardous drugs, mercury, anesthetic gases, latex etc. Biological hazardous items include viruses (hepatitis B and C viruses [HBV and HCV] human immunodeficiency virus [HIV], etc), bacteria, and parasites. Others injuries are ionizing and nonionizing radiation. Ergonomic injuries can occur from patient handling, lifting, shifting, lifting heavy equipment, and static postures. Psychological and work organization, shift work, stress, burnout, and the workplace violence especially gender related are other hazards [19].

## **2.2 Types occupational Hazards among health care personnel and medical students**

### **2.2.1 Physical Hazards**

The Centers for Disease Control and Prevention [19] report that more than 40% of the needle stick injuries (NSIs) are suffered by nursing personnel and medical trainees even in developed countries. The circumstances in which most NSIs occur involve manipulating a needle (26%), sharp disposal (21%), collision with a worker or sharp (10%), clean-up (9%), and recapping needles (5%) or surgery. Computer workstations, hand held devices, laboratories, minimally invasive surgery, patient handling, slips, trips, and falls due to wet floors of stairways, ramps or due to cables and cords, lighting, and spills also lead to various injuries. Orji et al [20] investigated occupational health hazards among medical trainees in an obstetrics and gynecology unit. The common occupational health hazards were work-relate stress (83.3%), needle-stick injuries (75.6%), bloodstains on skin (73.1%), sleep disturbance (42.3%), skin reactions (37.2%) assault from patients (24.3%), and hepatitis (8.9%). In a study by Ndejjo et al [21] overall, 50.0% of respondents reported experiencing an occupational health hazard. Among these, 39.5% experienced biological hazards while 31.5% experienced non-biological hazards. In biological hazards, sharp related injuries (such as needle sticks) were 21.5%, cuts and wounds were 17%, direct contact with contaminated specimens/ bio-hazardous materials were 10.5%, airborne diseases were 19.0%, infectious diseases and/or infections were 7.5%, and others (blood borne pathogens, vector borne diseases, and bioterrorism) were 7.5%. In non-biological hazards, health care providers with stress were 21.5%; physical, psychological, and/or verbal abuse were 10.5%; musculoskeletal injuries were 10.5%; slips, trips, and/or falls were 6.0%; fractures were 15.0%; and others (chemical spills, noise, burns, and radiations) were 10.0%. Major injuries are

musculoskeletal disorders (MSDs),[22-25] in all HCP and medical students trainees, seen highest in nurses[26] and orderlies. It is seen more than 7 times of other industries, due to patient handling, positioning, lifting, bed making in extremely awkward postures, transferring to bed, chair, toilet, for diagnostics and therapy. These problems are compounded by increasing number of obese patients. Ergonomic exposures include the use of excessive force, as in lifting, pushing, or pulling in awkward, constrained postures [27] Back, neck, shoulder, and knee problems are the most common complaints among medical, dental, and nursing personnel.[28-30] Tinubu et al. [30] report a high proportion of Nigerian nurses students having MSDs during their occupational lives, low backache being the most common. Munabi et al.[31] also found the same in more than 80% of nursing professionals in Uganda. Work-related MSDs may impact presenters. In 2012, injuries reported in residential care nurses were significantly higher than those in construction, and 2-3 times higher than in retail or manufacturing. Sprains, strains are reported very often. Shoulders, low back, calf muscles, and hand muscles are most affected body parts. A study revealed specialty-related MSDs afflicting dental professionals since very early stage of their careers [32]

### **2.2.2 Biological Hazards**

Medical students are exposed to a variety of infectious diseases. The primary routes of getting affected are direct contact, droplets, and airborne. Droplets containing infectious agents are generated through cough, sneeze, talking, or certain medical procedures, such as suction or endotracheal intubation [12] Latent tuberculosis in health care professional and students varies from 20% in the developed world,[33] 40% in Russia,[34] and about 70% in the developing world [35] The annual rate of tuberculosis among health care professional and students varies from 0.1% to 2% in unexposed hospital personnel compared to 1-10% among highly exposed health care professional and students. Influenza, measles, rhinovirus, varicella, and severe acute respiratory syndrome viruses can all be transmitted in healthcare settings by the airborne route [19]

The most common blood borne risks are of HBV, HCV, and HIV. The World Health Organization (WHO) estimates that in 2003 approximately 16,000 HCV infections, 66,000 HBV infections and 1000 HIV infections occurred in health care professional and students worldwide

from NSI. About one million annual accidental NSI have been reported every year in China, translating into one health care professional and students getting an NSI every 30 s [36]

### **2.2.3 Chemical hazards**

Health care professional and students are exposed to a variety of chemical hazards including cleaning agents used for housekeeping (excluding sterilization and disinfection of surgical or medical instruments), on floors, windows, washrooms, carpets, and other surfaces throughout the hospital and waiting areas. The primary routes of exposure to cleaning agents are inhalation of aerosolized droplets or vapors and skin exposure with the risk of skin, eye irritation. Ethylene Oxide is used to sterilize medical equipment that cannot be exposed to heat, moisture, and abrasive chemicals such as optical, rubber items, plastic instruments and devices,[19] Formaldehyde is primarily used as tissue preservative in operation theater, laboratories and autopsy suites, Glutaraldehyde is used as a cold high-level disinfectant for heat-sensitive medical equipment, primarily endoscopes. Mercury is mainly used in thermometers and blood pressure (BP) apparatus but is also found in dental clinics, in medical devices used in the digestive tract, and in eye surgery, in laboratory chemicals, in pharmaceutical products, etc. Many hospitals around the world are phasing out the mercury use in thermometers and BP apparatus. All these chemicals lead to irritation of the eyes, respiratory airways (causing sore throat, cough, and nasal irritation) and prolonged exposure may result in pneumonitis more permanent damage causing asthma and hypersensitivity [36]. Direct contact with the skin may result in itching, burning, redness, swelling, and cracking. Over exposure to Methyl methacrylate can result in headache, drowsiness, nausea, weakness, fatigue, irritability, dizziness, loss of appetite, and sleeplessness. Gaseous by-products “surgical smoke” produced with or without a heating process, during electro cautery, laser surgery or the use of ultrasonic scalpels, contain bio-aerosols with viable and nonviable cellular material consisting of a mixed variety of gases, carbon monoxide, acrylonitrile, hydrogen cyanide, and benzene particulates that cause irritation to the lungs leading to acute and chronic inflammatory changes which can damage the lungs and respiratory tract. Handling of many medications including antineoplastic and other drugs is hazardous as this can cause skin rashes, and cancer [19, 35, 36]

#### **2.2.4 Radiation Hazards**

Ionizing radiation from X-ray machines, fluoroscopes, and computed tomography used for diagnostic and therapeutic procedures, image-guided procedures, cardiac catheterization, angiograms, pain management, and others are hazardous. Nonionizing electromagnetic radiation has less energy and, therefore, is not powerful enough to cause ionization (or removal of electrons) of molecules [19].

#### **2.2.5 Violence Hazards**

Another hazard is violence of different forms to all categories of health providers specially women health care professional and students. WHO [37] reports that workplace violence, a phenomenon affecting every country, every workplace and every professional group, is such a common problem that it can be characterized as an epidemic. In all health care areas, employees face the risk of being a victim of violence. According to occupational health researchers, workplace violence is one of the most complex and dangerous hazard faced by resident doctors/nurses, helpers.[38] In healthcare, there is an increased anticipation of violence due to several factors, a patient population specially under the influence of intoxicants such as drugs and alcohol, metabolic disorders, trauma, psychosis, or personality disorders. It may also be due to increased stress levels in patients and relatives, long waiting hours, non-availability of money and drugs on a 24 h basis, unrestricted visitor access, overcrowding and so on. Workplace violence can have a negative impact on both HCP as well as patients and leads to negative consequences of violence like loss of professional self-esteem, loss of job satisfaction, trauma, disability, increased litigation costs, and staff absenteeism [19].

#### **2.2.6 Reproductive health Hazards**

Exposure to reproductive hazards in the workplace is an increasing health concern. Earlier studies focused on possible effects only on the fetus and not reproductive health in general. Later, it was realized that reproductive toxins may also induce hormonal alterations which might affect other aspects of reproductive health such as menstruation, ovulation, fertility, and quality life. Attention is now shifting from concern for the pregnant woman and the foetus, to the entire spectrum of health hazards in the reproductive system of both genders [39] Reproductive hazards may cause infertility, miscarriage, and birth defects. Potential health effects also include

development disorders in children [26] Agents which cause reproductive hazards include lead (chemical), radiation (physical) and viruses (biological). Workers may be exposed to reproductive hazards by inhalation or by contact with skin and by swallowing also.

### **2.2.7 Stress disorders Hazards**

Gorman et al.[19] reported that workplace stress is a condition, if left unresolved, can result in various disorders and in extreme circumstances, death also. Burn out syndrome of emotional exhaustion, depersonalization toward patients, and reduced sense of personal accomplishment is not uncommon. Some psychiatrists consider burn out to be a clinical form of depression. In the study of Martin et al.,[40] the prevalence of depression and burn out were very close, 17.1% and 15.7% among the women, 19.4% and 22% among the men, but 6.5% of the women and 9.4% of the men were both depressive and burn out.

Stalking of health professionals is a common hazard, yet it remains under-researched and underreported. It can lead to significant distress and psychiatric morbidity. A study revealed that 11% health professionals had been stalked, and in 90% cases the stalker was a patient under the direct care of the clinician [41] When Sandberg and colleagues[42] surveyed all clinical staff employed in an urban, university-based psychiatric inpatient unit, 53% reported having been the target of stalking, threatened by hazardous behavior. Professional exhaustion caused by aggression or other factors can reflect a deterioration in the HCP relationships.[43] As such HCP are also experiencing increase in workload because of HIV AIDS, which adds to stress.

### **2.3 Possibilities of Prevention/Reduction of Hazards**

Controlling and minimizing hazards to Health care professional and students in health care system present a unique challenge because the health and well-being of patients/relatives/ friends must also be considered. Health management system, technology, industry must work in synergy to control exposure in a way that does not interfere with safe patient care. Despite potential for exposure to hazardous elements, workplace policies are many times inaccessible to Health care professional and students who also lack awareness. Health facilities need to be geared toward knowing hazards, their causes, and use of appropriate measures for prevention/reduction. Also, following traditional concept, called the “hierarchy of controls,” is that exposure controls are most effective at the source and least effective at the level of workers; may be beneficial.

Solutions vary according to local situations such as types of patients, treatment options, building, climate, and access to resources such as water, power, and basic supplies. Front-line workers often can identify problems and most practical approach and solutions (exp in resource limited settings) that managers and supervisors may overlook [19] Administrative measures are critical to reduce the risks from persons with suspected or confirmed tuberculosis or other airborne illnesses. These measures include a written infection control plan, prompt detection and isolation of suspected cases as per the situation, training of staff, rapid reporting of diagnostic test results, education of patients and increasing awareness among Health care professional and students.[45]

Environmental controls by effective, low-cost intervention in high-risk situations in developing countries are also important lines of defense to prevent airborne infections, provided that there is adequate mixing of room air.[40] It is important that the ultraviolet lights are not placed lower in the room where exposure to the eyes of occupants of room can take place, even for seconds as it, can cause eye injury.[41] Employers need to establish surveillance program to protect workers who handle hazardous drugs.[30] Radiation control in hospitals generally falls under the supervision of specially trained professionals known as health physicists, medical health physicists, or radiation safety officers and needs to be taken care. Immunization for healthcare-associated infections is advocated, be it Influenza, West Nile virus exposure, or others as per the need. Safe use of glutaraldehyde mercury and quick appropriate smoke clearance from laser/electric surgical procedures in Operation Theater and other places is essential. It is essential to minimize leakage of anesthetic gases into the work environment, and exposure to these agents. Evaluation of the effectiveness of comprehensive program for reducing slip, trip, and fall, awareness of the risk factors for violence in hospitals and strategies for reducing exposure to these factors is essential. Education programs for prevention and coping strategies for everyone are recommended [42]

## **2.4 Previous studies**

Research has indicated that there is a higher annual prevalence of back pain (77%) among healthcare personnel and students compared to other occupational groups (Andersen et al.,2012; Ijzelenberg & Burdorf, 2005) [46, 47]. In fact, ergonomic related injuries pose a significant health risk to workers and yet it is the most prevalent occupational injury in healthcare industry (Ndejjo et al., 2012) [47]. One previous study on occupational health hazards of health personnel

found that public health dentists reported occupational health related problems such as dermatoses (40%), eye, respiratory and systemic complaints (13%) (Gambhir et al, 2011) [48]. Also, in India, a research among Navy dentists revealed that 47% of them experienced an injury from a sharp instrument during the past six months and backache was the commonest hazard in 70.6% of the personnel followed by occasional anxiety and wrist ache (Chopra & Pandey, 2007) [[49]. In Australia, latex allergy and glove dermatitis were reported in 9% and 22% of dental personnel respectively in a dental school (Gambhir et al., 2011) [48].

Another study was conducted by Caballero, Palencia and Cardenas (2010) [50] among the dental students studying at University of Cartagena reported that 80% of the students suffered from muscular pain due to the clinical practice; the clinical areas where more pain was observed were surgery and periodontics and 15% of the students reported pain in the neck and lumbar zone. Similarly, a study conducted among dentists and dental auxiliaries in Riyadh, Saudi Arabia about the prevalence of hearing problems in the last five years, 16.6% of respondents reported to be suffering from tinnitus, 30% of the subjects had difficulty in speech discrimination and 30.8% of the subjects had speech discrimination in a background noise (Al Wazzan et al, 2005) [51]. One study examined the occupational health hazards faced by healthcare workers and the mitigation measures and employed a cross-sectional study utilising quantitative data collection methods among 200 respondents who worked in 8 major health facilities in Kampala. The study found that overall, 50.0% of respondents reported experiencing an occupational health hazard. It was revealed that amongst this percentage, 39.5% experienced biological hazards while 31% experienced non-biological hazards. The study further indicated that predictors for experiencing hazards included not wearing the necessary personal protective equipment (PPE), working overtime, job related pressures, and working in multiple health facilities (Ndejjo et al., 2015) [47].

# **Chapter Three**

## **Materials & Methods**

### 3. Materials & Methods

#### 3.1 Study design

Descriptive cross sectional study

#### 3.2 Study area

This study was conducted at NAPATA College, located at kaforie –North Khartoum is meant to contribute more substantially to the promotion, modernization and advancement of higher education values. Has six faculties which are (Medicine, Dentist, Pharmacy, Laboratory, Nursing and IT ).

#### 3.3 Study duration

The data was collected from Nonember 2021 to December 2021.

#### 3.4 Study population

The study population were medical students at NAPATA College, Khartoum- Sudan

#### 3.5 Sampling techniques

It was conducted by a stratified random sampling technique

#### 3.6 Sample size

It was calculated by using this equation:

$$n = \frac{N}{1 + N(d)^2}$$

Where:

n = Sample Size

N = Total Population

d = Degree of Accuracy (0.05)

n = 120

### **3.7 Inclusion criteria**

- Students from the fourth and final year at faculty of medicine of Napata College from both gender were included in this study.

### **3.8 Exclusion criteria**

- Students in the first, second and third year were excluded because their practical training take place only in the faculty labs not in hospitals, henceforth they are not exposed to the field.

### **3.9 Study variables**

- Dependent variables: level of knowledge and attitude of medical student toward occupational health hazard
- Independent variables: sociodemographic data such as: gender and education level (number of year in college).

### **3.10 Data collection**

Questionnaire was used to collect the following data:

- Socio-demographic characteristics: gender and level of study.
- Question to measure Knowledge and attitude of student toward occupational health hazard, twelve questions assessing the knowledge, and five questions assessing the attitude. To ensure validity and reliability of the data collection instrument of the study, the questionnaire was reviewed by the research supervisor

### **3.11 Ethical clearance**

- Ethical clearance was obtained from research committee in community medicine department, NAPTA College.
- The purpose of study was explained to participants and no money or any form of incentive was given to the respondents before, during or after filling of the questionnaires.

### **3.12 Data analysis**

For analysis of data, Statistical Package for Social Sciences software, version 28.0 (IBM SPSS Inc., Chicago, IL) was used. Initially, all information gathered via questionnaire was coded into variables. Descriptive is used to present results. The demographic profile of study participants including frequencies Academic Year and Descriptive statistics for each item in the questionnaire are given in Tables

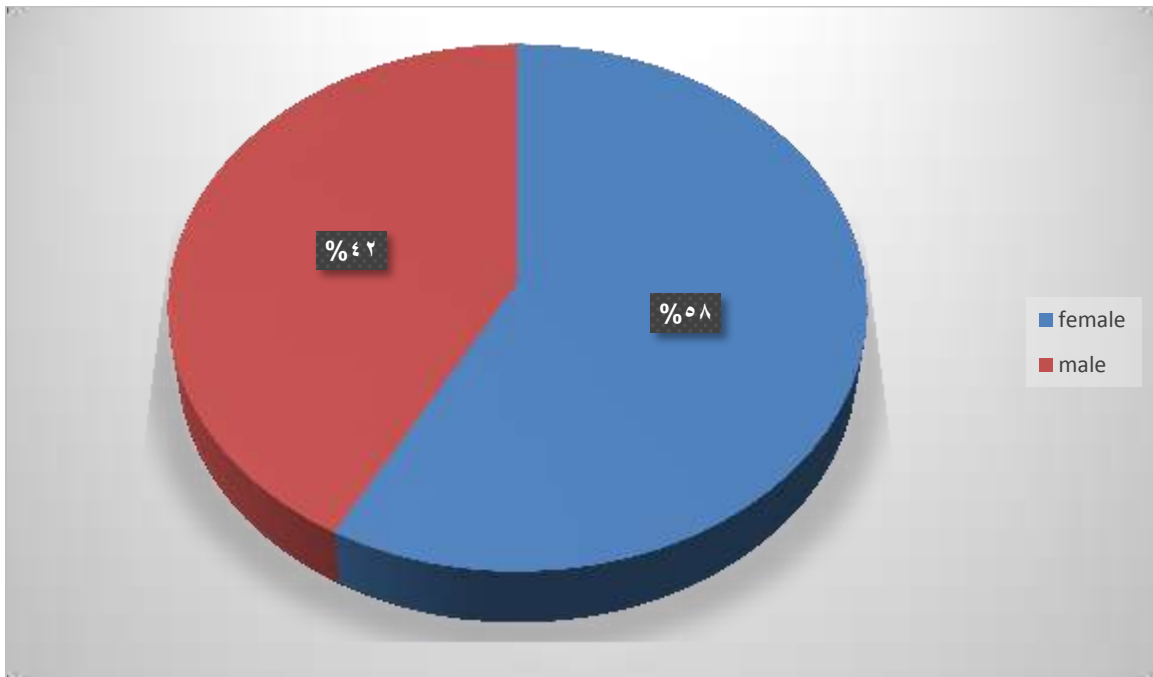
# **Chapter Four**

## **Results**

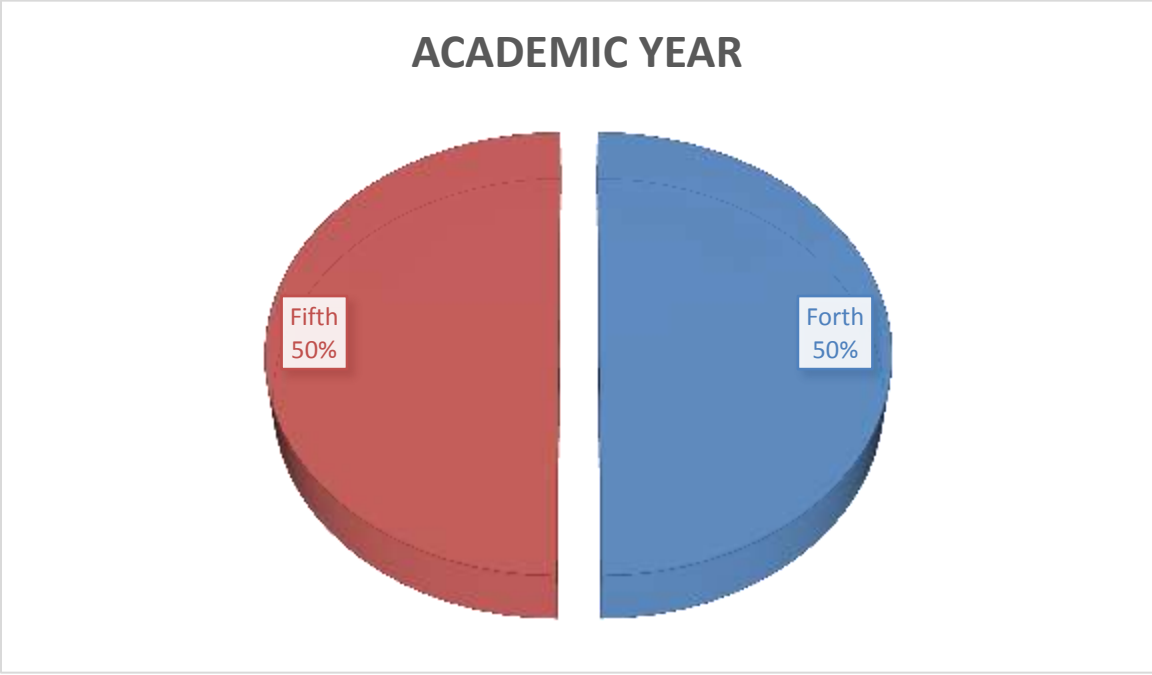
## 4. Results

### 4.1 Demographic data of respondents

This section presents the demographic profile of the respondents. It comprises of their Gender, and the number of years they have study. As shown in **figure 4.1**, our result revealed that, majority (48.0%) of the respondents were females and (42.0%) were males. Fifty percent were in fourth year and other fifty were final year shown in **figure 4.2**.



*Figure 4.1 Distribution of the study participants according to Gender (n = 120)*



***Figure 4.2 Distribution of the study participants according to academic year (n = 120)***

#### 4.2 Assessment Knowledge of student toward occupational health hazard

As shown in **figure 4.3**, when asked student “Do you know about the occupational health hazard” it was revealed that most 100 (83.3%) of the respondents said yes and 20 (16.7%) said no



**Figure 4.3 Distribution of the study participants according to knowledge about the occupational health hazard (n = 120)**

Knowledge among students toward occupational health hazard was assessed by questions related, According to the students responses, students know about the occupational health hazard (83%), (50%) of them got information's from Lecture in the curriculum followed by (25%) from workshops and books, while(8.3%) from Social media. High percentage of students (92%) think OHH is related to their profession and effect it. Hepatitis B is most common acquired disease among health staff which answered by majority of students (72%). About the major hazard source, (55%) near to half of students answered Patient secretions, sharp tools, radiation and chemicals agent. High percentage (83%) know HIV and Hepatitis B are blood borne disease. (90.8%) of students choose Safety box is place to get rid of the sharp equipment. When asked about received hepatitis B vaccination majority 72% of students were not received. Questions related to HIV vaccine and transmission showed high percentage of students with correct answer. 95% of students giving also correct answer about Using of Mask can reduce the exposure of infectious T.B & COVID19 presented in **Table 4.1**. According to high percentage of medical students who gives a correct answers related to Questions about knowledge toward occupational health hazard, majority of medical students have a good knowledge toward occupational health hazard

**Table (4.1): Frequency and Percentage of various responses to Knowledge questions**

<b>Questions</b>	<b>N (%)</b>
<b>Q1: Do you know about the occupational health hazard?</b>	
Yes	100 (83.3)
No	20 (16.7)
<b>Total</b>	<b>120 (100.0)</b>
<b>Q2 : If yes, from where you got your information's</b>	
Social media	10 (8.3)
workshops and books	30 (25.0)
Lecture in the curriculum	60 (50.0)
Others	20 (16.7)
<b>Total</b>	<b>120 (100.0)</b>
<b>Q3 : Do you think OHH is related to your profession and effect it</b>	
Yes	111 (92.5)
No	9 (7.5)
<b>Total</b>	<b>120 (100.0)</b>
<b>Q4 : The most common acquired disease among health staff is</b>	
Hepatitis B	85 (70.8)
HIV	30 (25.0)
I don't know	5 (4.2)
<b>Total</b>	<b>120 (100.0)</b>

*Q5: What are the major hazard source(s)?*

Patient secretions , sharp tools, radiation and chemicals agent	67 (55.8)
Patient body secretion	40 (33.3)
I don't know	13 (10.8)
<b>Total</b>	<b>120 (100.0)</b>

*Q6: Example of blood borne disease?*

HIV and Hepatitis B	100 (83.3)
Corona virus	7 (5.8)
Pneumonia	10 (8.3)
I don't know	3 (2.5)
<b>Total</b>	<b>120 (100.0)</b>

*Q7: Were you get rid of Patient related waste stuff in?*

Red coded basket	83 (69.2)
Blake coded basket	28 (23.3)
I don't know	9 (7.5)
<b>Total</b>	<b>120 (100.0)</b>

*Q8: The place we get rid of the sharp equipment is?*

Safety box	109 (90.8)
Red coded basket	5 (4.2)
Basket	2 (1.7)
I don't know	4 (3.3)
<b>Total</b>	<b>120 (100.0)</b>

*Q9 : Do you received hepatitis B vaccination*

Yes	10 (8.3)
No	87 (72.5)
Not aware	23 (19.2)
<b>Total</b>	<b>120 (100.0)</b>

*Q10 : HIV has a vaccine*

Yes	2 (1.7)
No	108 (90.0)
I don't know	10 (8.3)
<b>Total</b>	<b>120 (100.0)</b>

*Q11 : HIV transmission can take place by minute needle stick injury*

Yes	113 (94.2)
No	2 (1.7)
Don't know	5 (4.2)
<b>Total</b>	<b>120 (100.0)</b>

*Q12 : Use of Mask can reduce the exposure of infectious T.B & COVID19*

Yes	114 (95.0)
No	2 (1.7)
Don't know	4 (3.3)
<b>Total</b>	<b>120 (100.0)</b>

## 4.2 Assessment Attitude of student toward occupational health hazard

Attitude among students toward occupational health hazard was assessed by 5 questions related, According to the students answer, 75% of students use both gloves and mask as kind of safety. About one of students comply to their collage when face a dangerous situation and about half of students Squeeze out the blood with soap and water when contact with infected patient blood. Majority of students 91% follow proper biomedical waste disposal method presented in **Table 4.2**. According to high percentage of medical students who gives a correct answers related to Questions about Attitude toward occupational health hazard, majority of medical students have positive attitude toward occupational health hazard

**Table 4.2 Frequency and Percentage of various responses to Attitude questions:**

<i>Questions</i>	<i>N (%)</i>
<b><i>Q1: Whom did you notify in case of hazardous incident?</i></b>	
The supervisor	93 (77.5)
The responsible academicians	19 (15.8)
I didn't tell to anyone	8 (6.7)
<b>Total</b>	<b>120 (100.0)</b>
<b><i>Q2: What kind of safety equipment do you use in clinical practice?</i></b>	
Gloves	7 (5.8)
Mask	22 (18.3)
A&B	91 (75.8)
<b>Total</b>	<b>120 (100.0)</b>
<b><i>Q3: What is your priority when you face a dangerous situation?</i></b>	
I comply to my collage	45 (37.5)
My own health is top priority	43 (35.8)
My priority is my practice	32 (26.7)
<b>Total</b>	<b>120 (100.0)</b>
<b><i>Q4 : What the immediate action in case of blood contact with infected patient</i></b>	
Wash with soap and water	26 (21.7)
Apply antiseptic	24 (20.0)
Squeeze out the blood with soap and water	61 (50.8)
Don't know	9 (7.5)
<b>Total</b>	<b>120 (100.0)</b>
<b><i>Q5 : Do you follow proper biomedical waste disposal method</i></b>	
Yes	110 (91.7)
No	7 (5.8)
Sometimes	3 (2.5)
<b>Total</b>	<b>120 (100.0)</b>

# **Chapter Five**

## **DISCUSSION**

## 5. Discussion

Health professionals and medical students encounter a variety of occupational health problems. Medical students are younger, inexperienced, unskilled, less aware of self-protection, and lack of professional knowledge of protective measures as compared with the senior registered doctors, which make them more susceptible to occupational injury. Although level of knowledge and awareness of medical students toward this problem plays an importance role to prevent and control of these medical hazardous, currently there is limited information available regarding the level of knowledge, attitude and practice among the Health worker and medical students in Sudan toward Occupational health hazard.

The current study illustrated majority of medical students have a good knowledge and positive attitude toward occupational health hazard. The same study was done in Malaysia support our finding by that: they said medical students show good knowledge in comparison with other health worker regarding occupational safety and health [52] our result also similar to Labrague et al [53] in Samar, Philippines who found that most of the students were knowledgeable concerning standard precautions. Study done in Addis Ababa in which 45.3% of students had good knowledge, 35.3% had fair knowledge, 15.4%) had poor knowledge. In hospital- based study conducted in India by Acharya et al., it was reported that health care providers including both health workers and students who had good knowledge about infection control standard precautions and transmission of blood- borne pathogens constituted 79.9% and 64.5%, respectively[54] These findings go with the findings of the study in Nigria who revealed that majority (80%) of the studied sample had a positive attitude, while only (20%) had negative attitude towards occupational hazards [55] but our result is different from a study done in Nigerian teaching hospital, in which 37.1% had good knowledge, 19.4% had fair knowledge, and 43.5% of them had poor knowledge, on occupational hazards [55] This difference may be due to their interest in the profession.

In addition, a study conducted by Alavian SM et.al, 2005 [56] revealed that vaccination against HBV was done in 94.9% of dentists which is higher than that reported in our study 8% and majority of students no received vaccination against HBV. These findings are differ with those of Acharya et al [54] who reported that 77.5% of participants were aware about hepatitis- B vaccine.

Questions related to HIV vaccine and transmission showed high percentage of students with correct answer these finding in accordance to Yakob et al [57] reported that 76.3% of respondents thought that they were at risk of acquiring HIV infection during their work. Questions related to what is the best way to handling sharps instrument, at this knowledge question most of our studied population go with correct choice (put it in safety box). There are some studies support and agree with our finding , one of these studies were done by (Mariusz et al,2003) [58]who found that: from the best way handling of sharps through simple interventions as vaccination, education and providing containers for sharp instruments. Other studies were done by(Michelle Kermode, 2014)[59]suggestion that : Unsafe practices, including the re-use of unsterile needles and syringes which mean don not repeat use and put in safety box .Moreover, Alice et al [60] reported that 49.8% and 46.8% of participants had fair and good compliance to standard precautions, respectively

At our finding we found high agreement with using gloves and mask to reduce health risks, around (76%) agree with gloves using, And this result fit with other study conducted by occupational safety and health council (china united center) [61] which revealed that Gloves protect the hands from contacting blood, droplets, body fluids and other body tissue of the infected, or pathogen-contaminated objects and can avoid infection when touching the eyes, mouth or nose after wards

# **Chapter six**

## **Conclusion & Recommendations**

## **6. Conclusion & Recommendations**

### **6.1 Conclusion**

This study revealed that the majority of the respondents had good knowledge and positive attitude toward occupational health hazard but Low percentage of students received HBV vaccination.

### **6.2 Recommendations**

The main recommendations that arose from this study include the need of all teaching to; implement serious of training programs regarding occupational hazards, and review quality of past training related course

Further studies about knowledge, attitude and practice (KAP) of students toward occupational health hazard are suggested to confirm our finding.

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