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A SYSTEMATIC REVIEW ON AWARENESS OF HEALTHCARE WORKERS TOWARDS HEALTH HAZARDS AND SAFETY

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Abstract

Healthcare workers are at high risk in hospitals as they are facing various type of health hazards which are commonly known as occupational hazards which are categorised as physical, chemical, biological and ergonomic hazards. Hazards are associated with various risks which increase the illnesses or injuries among them. Due to advancements in technology and knowledge occupational hazards and safety are taken as serious concern than earlier times still there is lack of awareness among healthcare workers regarding occupational safety and hazards. This study was done through intensive literature review and the data was taken from Google Scholar, PubMed and Scopus database. The articles written in English and published from 2006 to 2022 were included in for the study. Only original papers that described health care worker's knowledge on health hazards and protective measures in the hospitals or healthcare facility included. Based on the available literature it was found that the awareness level of healthcare workers was low regarding Occupational health and safety in different countries.

Keywords: *Occupational Hazards, Health Hazards, Occupational Safety, Awareness, Healthcare Workers.*

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1. INTRODUCTION

Healthcare facilities have a very diverse and complex workplace in which healthcare workers face different type of hazards and related injuries [1].

There are different kinds of health hazards related to occupation thus these are known as occupational hazards which are mainly divided into following categories: 1) Physical hazards and risks which are associated with exposure to noise, ionizing radiation, and temperature; 2) Chemical hazards and risks which are associated with exposure to gases, vapours, fumes, and chemicals; 3) Biological hazards and risks related to exposure to viruses, bacteria, blood and blood products; 4) Ergonomic hazards and risks associated to improper posture, monotony, repetitiveness, work shifts, and stress causing situations; and 5) other hazards and risks of accident that include arrangement of inappropriate work environment, improper lighting, potential accidents with electricity and fire [2].

Physical Hazards and Risks

Physical hazards present in hospital are mainly slippery floors, electrical hazards, noise, improper lighting, and insufficient ventilation. Accidents are the most commonly outcomes and is highest among documented category of outcomes as a result of occupational stress [3].

Chemical Hazards and Risks

As per US department of labour, OSHA 2012e, among the most cited chemical hazards in surgical and medical hospitals are asbestos, formaldehyde, lead, methylene chloride and glutaraldehyde. Toxicities like liver failure may develop as a result of use of chloroform and risk of fire and explosion may occur secondarily due to use of cyclopropane and ether [4].

Biological Hazards and Risks

Healthcare workers are more prone to get infection of Hepatitis B, hepatitis C and HIV as a result of contamination from bloodborne pathogens through needlestick and sharp injuries. Needle prick injuries have highest rate of incidence among healthcare with the difference in inoculation of pathogens i.e. around volume of 1ml by 22-gauge hollow bore needle and 1ml is sufficient quantity to contain 100 infectious doses of HBV [5].

Ergonomic Hazards and Risks

Risk of Injury at workplace may increase as a result of changing the work shift to nonstandard shift from a routine or normal shift [6]. Some studies related to biomechanics have proved that a high level of compressive forces are exerted on lower back structures during patient transfer and shifting activities which exceeds the recommended lifting limits by US NIOSH [7]. Highly affected body parts are shoulder, knee and other disorders are also associated with patient lifting and transfer [8].

Recent research suggests that musculoskeletal injuries in healthcare facilities are associated with non-patient handling activities like patient related assaults, [9, 10] slip, trips and falls [11] and maintenance work [12].

Occupational Safety

A healthy and positive work environments encourage the healthcare staff to do high performance work, effective use of resources, achievement of organisational goal due to designated policies, procedure and system are satisfied by their work and they enjoy while working [13-15]. The positive environment ensures good health of employees, their safety welfare in workplace that provide them dignity and in result they provide good quality care as they are highly motivated. As a result their

personal and organisational productivity increases [16].

Aim of the Study

This study put emphasis on healthcare workers' knowledge regarding health hazards and safety measures used by them at workplace. This literature review helps in identification the awareness gap from different countries.

2. MATERIALS AND METHODS

In order to identify relevant articles related to awareness of health hazards and safety in healthcare were searched on PubMed, Google Scholar, Scopus databases. The Search strategy was executed using keywords like "Occupational Hazards", "Health Hazards", "Occupational Safety", "Awareness" and "Healthcare Workers",

published from 2006 to 2022. A total of 1785 articles were searched from the mentioned databases with the help of keywords among which 156 articles were searched from PubMed, 1390 articles from Google Scholar and 239 articles from Scopus database as given in Table 1. Graphical presentation of articles searched from different databases is shown in Figure 1. Furthermore, articles obtained were screened based on titles, abstracts, and full texts available for inclusion, without which, the articles were automatically removed. Articles written in English were included in the study. The articles which contains the study of knowledge or awareness about health hazards and safety were included for the purpose of systematic review. Only Original Articles were taken in inclusion category. The Study is not limited to any particular country.

Table 1: Table showing articles from different databases

S.No.	Database	No. of articles searched	Total Percentage (N=1785)
1	Pubmed	156	8.739
2	Google Scholar	1390	77.871
3	Scopus	239	13.389

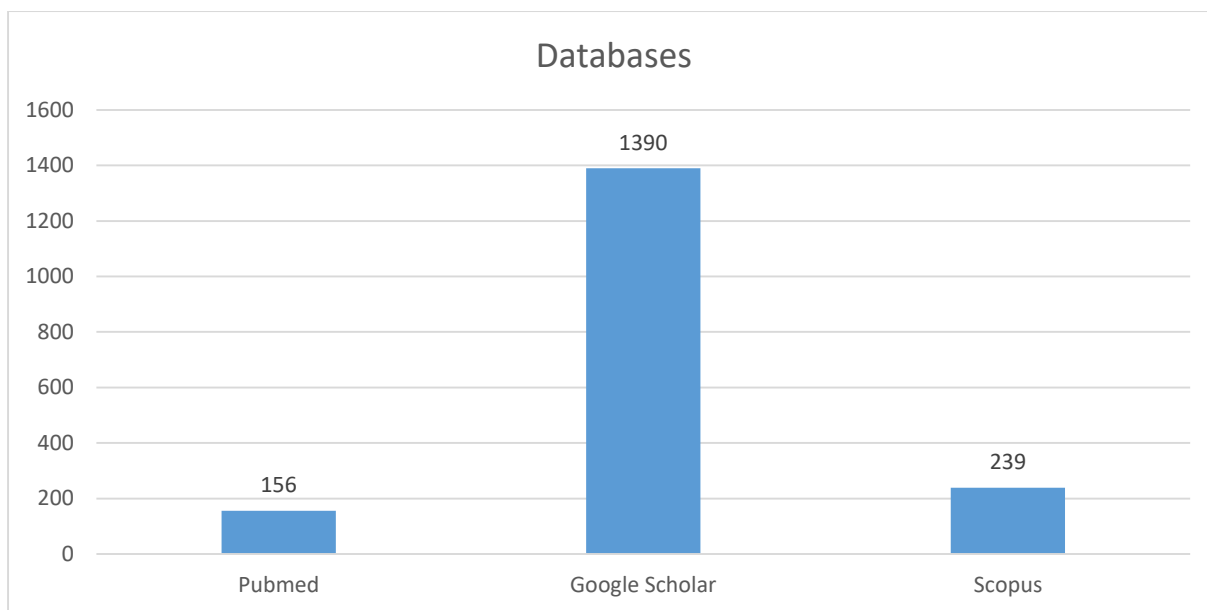


Figure 1: Figure showing searched articles from different databases

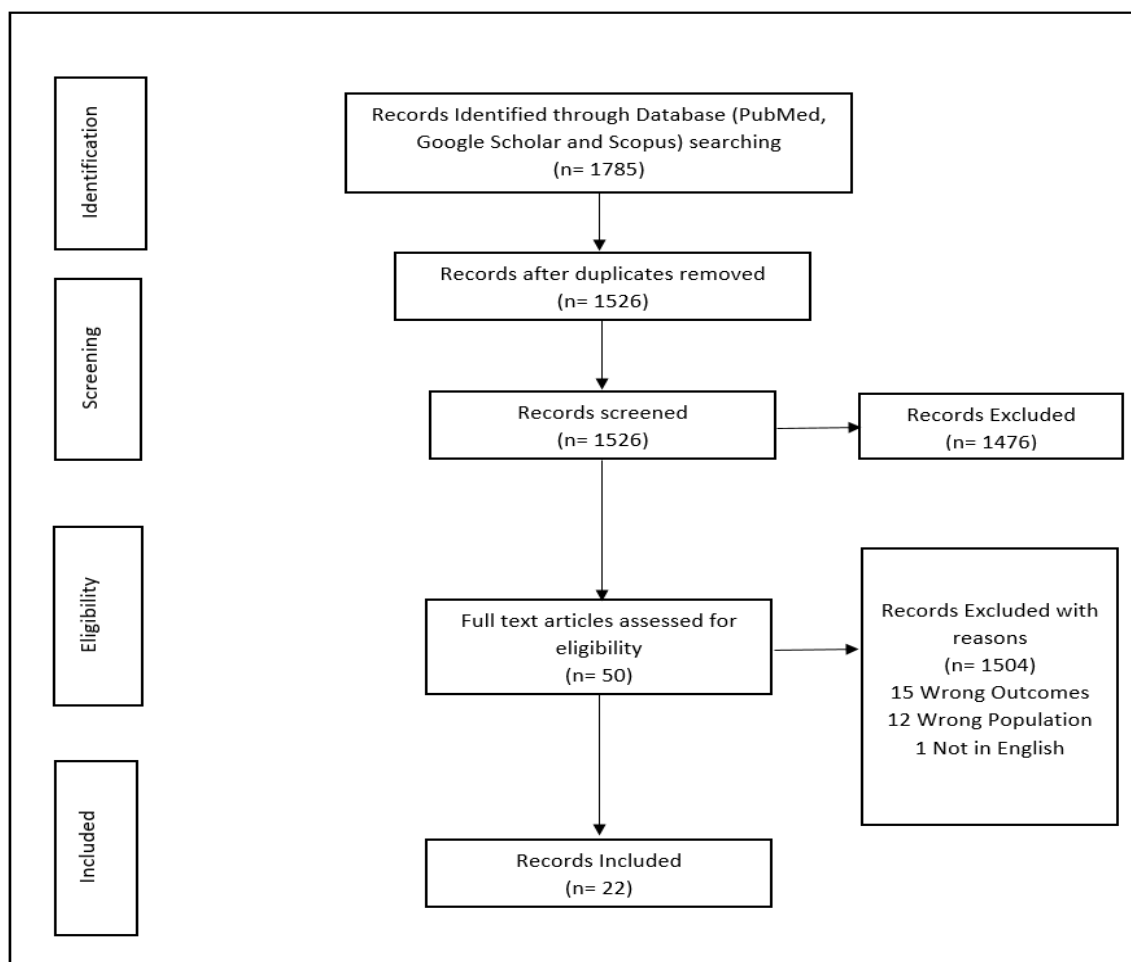


Figure 2: Prisma Diagram for search strategy

Out of 1526 articles only 50 articles were selected as these were associated to certain variables used in study. But out of 50 only 22 articles were meeting the desired criteria for awareness study.

3. RESULTS:

This study includes the articles from 14 countries which meets the inclusion

criteria. Country wise distribution of articles is given in Table 2. Nigeria has the highest no. of articles out of 22, Ethiopia has second highest no. of articles, then third highest Pakistan and rest of the countries has only one article published which meets the inclusion criteria among 22 articles. Figure 3 shows graphical presentation of country wise study.

Table 2. Country Wise Distribution of Included Studies

S. No.	Country	No. of Study	Percentage (N=22)
1	Nigeria	5	22.7%
2	Ethiopia	4	18.2%
3	Pakistan	2	9.1%
4	Bangladesh	1	4.5%
5	Bhutan	1	4.5%
6	Egypt	1	4.5%
7	Germany	1	4.5%
8	Ghana	1	4.5%
9	India	1	4.5%
10	Italy	1	4.5%
11	Malaysia	1	4.5%
12	Zambia	1	4.5%
13	Thailand	1	4.5%
14	Turkey	1	4.5%

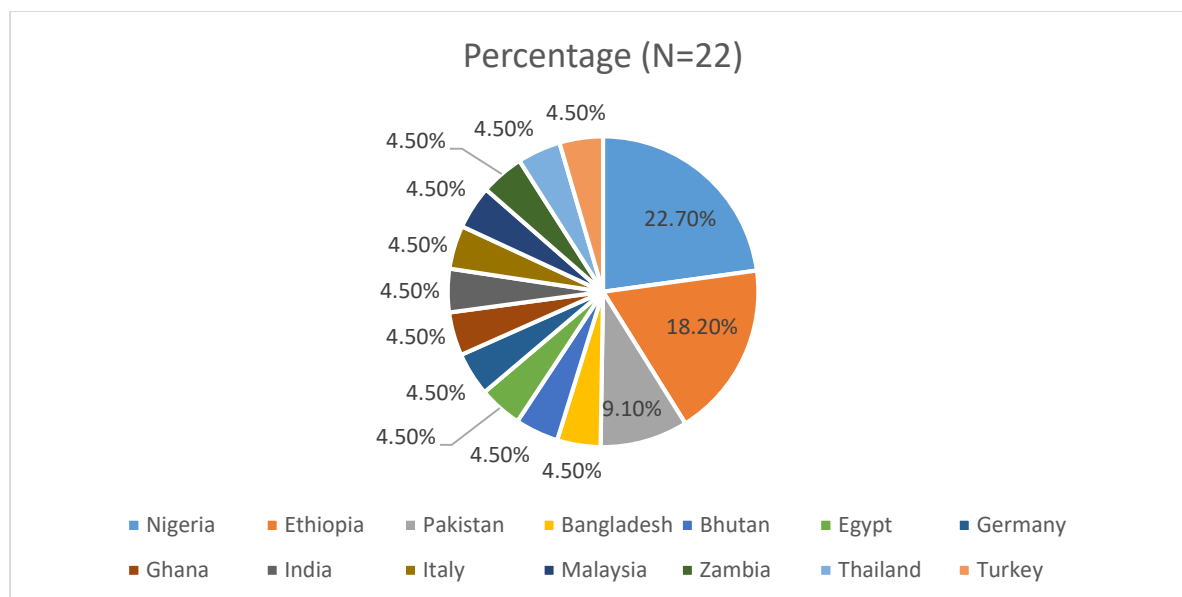


Figure 3: Distribution of country wise studies

A brief description of included articles from different countries is concluded in Table 3 which included Descriptive data for each reviewed study country, study population, sample size, awareness level of healthcare workers and the results are presented in Table 3.

Table 3. Descriptive Data of included Studies

S. No.	Title of Paper	Year of Publication	Country	Target Group	Sample Size	Knowledge Level	Author
1	Knowledge, attitude, and practices on occupational health and safety principles among cleaners: the case of Tikur Anbassa Specialized Referral Hospital, Addis Ababa, Ethiopia	2022	Ethiopia	Cleaners	70	Poor	Getachew Dagnew Gebreeyessus
2	Healthcare Workers' Knowledge, Attitude, and Practice Regarding Personal Protective Equipment for	2022	Bangladesh	Physician, Nurse, Pharmacist, Laboratory technician	393	99.50%	Hossain et al.

	the Prevention of COVID-19						
3	Knowledge, Attitudes and Practice among Healthcare Workers towards Covid-19 Preventive Measures at Women and New-Born Hospital, University Teaching Hospital, Lusaka, Zambia	2021	Zambia	Nurse, Doctor, General worker, Laboratory Technologist, Radiographer	264	63.40%	Shampile et al.
4	Knowledge, attitude, and practice of healthcare workers toward COVID-19 and its prevention in Ethiopia: A multicenter study	2021	Ethiopia	Nurse, Physician, Anesthetist, Pharmacist	422	88.20%	Jemal et al.
5	Exploring Gaps in Healthcare Workers Knowledge, Attitude, Perception and Practice of COVID-19 Prevention and Control in Rivers State Nigeria	2021	Nigeria	Doctor/Dentist, Nurse/Midwife, Pharmacist, Medical Laboratory Scientist, Community Health Officer, Physiotherapist/Optomist, Hospital Admin/ Finance/ Support	555	Excellent approx. 85%	Owhonda et al.

				Services			
6	Appraising the Knowledge, Perception, Attitude and Practice of Occupational Health and Safety among Physiotherapists in an Under-Staffed Healthcare Settings	2021	Ghana	Physiotherapists	103	Adequate	Bello et al.
7	Awareness and practice of medical waste management among healthcare providers in National Referral Hospital	2021	Bhutan	Doctors, Nurses, Health Assistants, Technicians	340	Adequate	Letho et al.
8	Knowledge, attitude, and practice among healthcare workers towards COVID-19 outbreak in Nigeria	2020	Nigeria	Medical doctors, Veterinary doctors, Public Health officers, pharmacists, medical laboratory scientists and nurses, and others	346	88.75%.	Ejeh et al.
9	Assessment of Knowledge, Attitude, and Practice in respect of Medical Waste Management among Healthcare	2020	Thailand	Doctor and staff	344	Good	Akkajit et al.

	Workers in Clinics						
10	Hepatitis B and C Viral Infection: Prevalence, Knowledge, Attitude, Practice, and Occupational Exposure among Healthcare Workers of Jimma University Medical Center, Southwest Ethiopia	2019	Ethiopia	Nurse	240	Good approx. 70%	Hebo et al.
11	Knowledge and practice of injection safety among healthcare workers in a Nigerian secondary healthcare facility	2019	Nigeria	Doctors, Nurses, Lab staff	88	Poor	Abubakar et al.
12	Knowledge and Practice of Health Workers about Healthcare Waste Management in Public Health Facilities in Eastern Ethiopia	2019	Ethiopia	Medical doctor, Health officer, Nurse, Midwifery, Medical laboratory Anesthetist	400	47.7%, poor	Doylo et al.
13	Assessment of knowledge, attitude and practice of adverse drug reaction reporting among healthcare professionals in	2018	Pakistan	Physicians and pharmacists	384	16.90%	Nisa et al.

	secondary and tertiary hospitals in the capital of Pakistan						
14	A Knowledge, Attitude and Practice Study of Biomedical Waste Management and Bio-safety among Healthcare Workers in a Tertiary Care Government Hospital in Western India	2018	India	Laboratory technicians, nurses and resident doctors	210	72.49% for doctors, Low level of knowledge among nurses	Mehta et al
15	Occupational exposure to HIV in a developing country: assessing knowledge and attitude of healthcare professional before and after an awareness symposium	2018	Pakistan	Doctors, nurses, students	364	Low before symposium and improved after symposium	Ismail et al.
16	The Factors Affecting the Occupational Health-Safety Practice of the Hospital Workers with the Knowledge-Attention Status	2018	Turkey	Nurses, health workers	506	Moderate	Durduran et al.
17	Physical hazard safety awareness among healthcare workers in Tanta university hospitals, Egypt	2017	Egypt	Physicians, Nurses, technicians, and workers	401	Poor	El-Sallamy et al.

18	Knowledge, Attitude and Practice of Healthcare Managers to Medical Waste Management and Occupational Safety Practices: Findings from Southeast Nigeria	2017	Nigeria	Healthcare Managers	54	Poor	Anozie et al.
19	What do healthcare workers in elderly care know about occupational health and safety? An explorative survey	2015	Germany	Geriatric Healthcare workers	132	66%	Schonrock et al.
20	Knowledge and Practice of Injection Safety among Workers of Nigerian Prison Service Health Facilities in Kaduna State	2013	Nigeria	Doctors, Nurses, Lab staff, Auxillary staff	138	Good approx. 65%	Onyemoch o et al.
21	Healthcare workers and health care-associated infections: knowledge, attitudes, and behavior in emergency departments in Italy	2010	Italy	Nurses	550	High	Parmeggiani et al.

22	Training of occupational safety and health: knowledge among healthcare professionals in Malaysia	2010	Malaysia	Doctor, Nurse, Medical support staff, Administrative officer, hospital attendants, security personnel and technicians	284	Poor	Lugah et al.
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It is observed that relevant or included articles or studies vary from year to year which are mentioned in table 4 and graphically presented in figure 4. The year wise trend of articles among included studies is shown in figure 4.

Table 4: Year Wise Distribution of included studies

Year	2022	2021	2020	2019	2018	2017	2015	2013	2010
No. of Studies	2	5	2	3	4	2	1	1	2

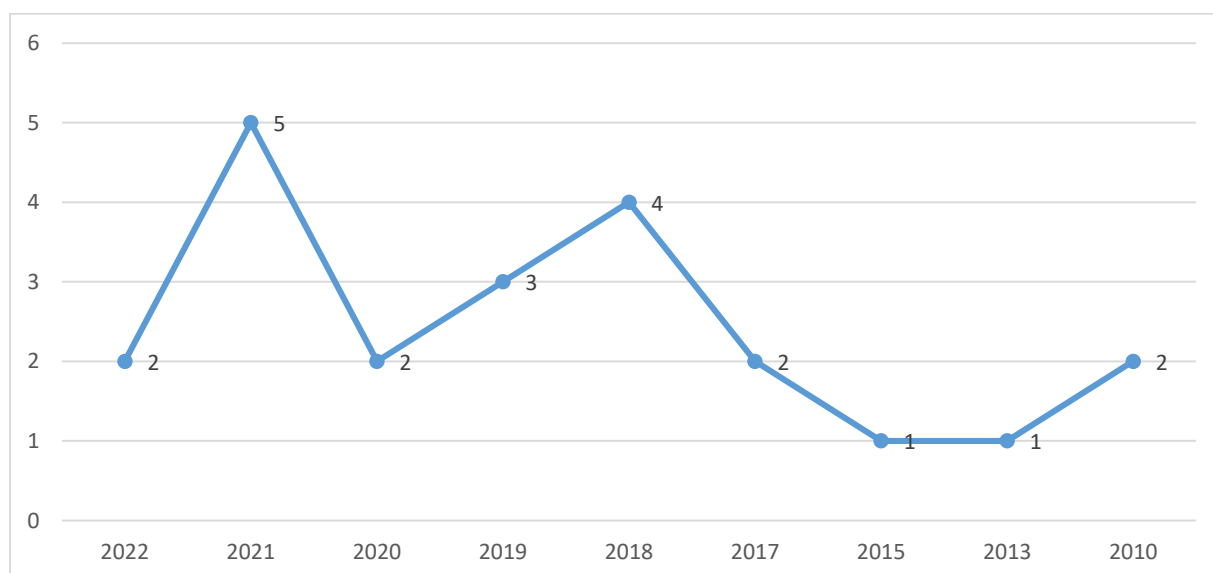


Figure 4: Year wise trend of included studies year wise

According to Getachew Dagne Gebreeyessus, level of awareness on occupational health and safety principles among cleaners working in Tikur Anbessa Specialized Referral Hospital was very poor [17]. According to Hossain et al. healthcare workers including Physician, Nurse, Pharmacist, Laboratory technician has overall 99.50% level of knowledge about of protective measures against Covid- 19. This study was conducted in Bangladesh in 2022 [18].

According to Shampile et al. knowledge among Healthcare Workers (Nurse, Doctor, General worker, Laboratory Technologist, Radiographer) towards Covid-19 Preventive Measures at Women and New-Born Hospital, University Teaching Hospital, Lusaka, Zambia was around 63.40% [19]. Jemal et al. conducted a study on topic "Knowledge, attitude, and practice of healthcare workers toward COVID-19 and its prevention in Ethiopia: A multicenter study" and 88.20% knowledge level was found among Healthcare workers [20]. Owhonda et al. conducted a study in Nigeria and found that Knowledge level of 85% among Healthcare workers [21].

Bello et al. conducted a study on Healthcare workers in Ghana regarding occupational safety [22] and Letho et al. conducted a study in Bhutan about medical waste management [23] there was adequate knowledge among both the study. According to Ejeh et al. there was 88.75% knowledge level among healthcare workers [24]. Akkajit et al. found good knowledge among doctors and nurses in Thailand regarding medical waste management [25]. Hebo et al. had done a study Nurses regarding occupational exposure of HCV and HBV viral infection and the nurses has good knowledge level [26]. Abubakar et al. conducted a study on Healthcare workers (Doctors, Nurses, Lab staff) and knowledge was poor among them regarding injection safety [27].

Doylo et al. conducted a study on healthcare waste management in public health facilities in Ethiopia and found that poor knowledge among the healthcare workers [28]. Two Study conducted in Pakistan one by Nisa et al. regarding Adverse drug reaction reporting [29] and other by Ismail et al. regarding occupational exposure to HIV [30] and result of both the study show that knowledge level was very low among healthcare workers.

Mehta et al. conducted a study Biomedical Waste Management and Bio-safety among Healthcare Workers in a Tertiary Care Government Hospital in Western India and found that doctors has knowledge level about 72.49% but the nurses has poor knowledge about Biomedical waste management and Biosafety [31]. A study done Durduran et al. show moderate level of awareness among Healthcare workers about occupational Health and safety [32]. A study was done by El-Sallamy et al. in Egypt regarding physical hazards awareness among healthcare and it was found that awareness was poor amongst them [33].

Anozie et al. conducted a study on healthcare workers about medical waste management and concluded that poor knowledge among healthcare workers [34]. Schonrock et al. conducted a study in Germany about occupational safety in elderly care among healthcare workers and found that 66% knowledge among them [35]. Study done by Onyemocho et al. show that good knowledge among prison healthcare workers about injection safety in Nigeria [36].

A study done in Italy by Parmeggiani et al. show good knowledge level among healthcare workers [37]. According to Lughah et al. the awareness level of healthcare workers towards occupational health and safety was poor. This study was conducted in Malaysia in 2010 and the target population was Doctor, Nurse, Medical support staff, Administrative

officer, hospital attendants, security personnel and technicians [38].

4. DISCUSSION

Like any other industry healthcare workers faces various types of hazards and associated risks. Occupational hazards are physical, chemical, biological and ergonomic hazards among hospitals or any other healthcare organisation. After reviewing all the articles included that most of the studies were regarding Occupational health and safety aspects related to Covid-19, Injection Practices, Healthcare associated infections, Medical waste management and physical hazards.

Occupational hazards and risks increases, injury and illness among healthcare workers, reduces their workplace performance, increase absenteeism and reduce employee satisfaction. These overall impact the productivity of an organisation. All the healthcare workers working in healthcare organisation either clinical staff or non- clinical staff, both category staff are at risks of various levels.

Safe injection practices ensure staff to work in an environment where blood and body fluid is not exposed and staff remain safe at workplace, ignorance of this may lead to Hepatitis- B, C and HIV related illness which are very dangerous if not cured at time. Two studies has been conducted in Nigeria regarding injection practices in which one study shows poor knowledge among staff and one study shows good knowledge about injection practices.

Medical Waste management is a very important part of occupational safety as it is highly infectious and Housekeeping staff and nurses are highly exposed to infectious waste because it can lead to infections due to sharp or exposure to infectious waste. Total Five studies were found regarding Medical waste and out of five, few studies show poor knowledge among healthcare workers.

Although Cleaners or housekeeping staff are exposed to occupational hazards in healthcare one few studies were conducted regarding occupational health and safety among cleaners. Poor knowledge was found among cleaners.

The main gap after reviewing all the included articles was that although some studies show adequate knowledge among healthcare workers but still there some studies also show that healthcare workers have poor knowledge about occupational hazards and safety.

Another gap is that most of the studies focused upon biological hazards rather focusing on physical, chemical and ergonomic hazards. Only one study was related to physical hazards.

All the non- clinical staff who work in close proximity to occupational hazards must be identified and trained accordingly.

The above mentioned gaps must be identified and addressed so that healthcare workers can be protected from health hazards or occupational hazards in workplace. Regular training sessions, workshops, activities enhancing safety at workplace, Public health campaigns etc must be promoted to decrease the mortality related to occupational hazards and a healthy workplace safety culture should be built to increase employee morale.

5. CONCLUSION

This study shows certain gaps regarding occupational health and safety in healthcare facility and healthcare workers. On job training, safety workshops or activities, safety campaign, awareness camps etc. should be promoted to enhance workplace safety and to create a healthy culture in an organisation. Occupational safety must be considered for each category of employees from class 1 to class 4 and clinical to non- clinical staff. All are exposed to different type of hazards at workplace. Thus they should be provided high end protection gears or

shields to prevent risks occurring from these hazards.

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