

Personal and Social Perception of Occupational Hazards by Health Care Workers: A Study among Radiographers

Durairaj Rajan

PhD, Lecturer, Department of Business Administration, Faculty of Social and Management Sciences, University of Africa, Toru-Orua, Bayelsa State, Nigeria

Abstract

This descriptive research has been undertaken in Tirunelveli city, Tamilnadu with the objectives of understanding the perception of the radiographers working in private multi-speciality hospitals. The study has sampled 60 radiographers who were qualified with Diploma in Medical Radiographic Technology (DMRT) 1 year and 2 years courses using judgement sampling technique. The study has used both primary data and secondary data. Primary data have been collected using the questionnaire method. Secondary data have been collected from journals, books, and websites. Both mean and standard deviation have been administered to know the level of perception of the radiographers towards causes of an occupational hazard. Kruskal Wallis test has been used to find the relationship between demographic variables and causes of occupational hazards. The results of the study have indicated that among the nine main variables analyzed to understand the perception of the radiographers towards causes of occupational hazards, organization structure, and policy, radiographer's specific, fear and safety have the foremost dimensions of causes of occupational hazards. Resources, workload, work shift, environment and hygiene have the next foremost dimensions of the causes of occupational hazards. Interruption, patient and communication, training have been the least dimensions of causes of occupational hazards. The results of the study have also revealed that the level of perception of the radiographers towards these variables has been at a medium level.

Keywords: radiographers, occupational hazards, multi-speciality hospitals, workload, work shift, Tirunelveli city.

JEL Classification: J2, J4, I1.

Cite as: Rajan, D. (2018). Personal and Social Perception of Occupational Hazards by Health Care Workers: A Study among Radiographers. *Business Ethics and Leadership*, 2(4), 46-63. [http://doi.org/10.21272/bel.2\(4\).46-63.2018](http://doi.org/10.21272/bel.2(4).46-63.2018).

© The Author, 2018. This article is published with open access at Sumy State University.

Introduction

Background of the Study

Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 1946). Factors disturbing health status are termed as hazards. In other words, hazard refer to a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or another health impact, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage (WHO, 2009). Working condition has a strong impact on the well-being of the worker's health. The non-supportive working environment can cause harm if not controlled. This non-supportive working environment is termed as occupational health hazards. Occupational health hazards refer to the potential risks to health and safety for those who work outside the home (Maier, 2009).

Hospitals are moderate health risk industries as it accompanies many services and people from diverse professions. It is a service delivery industry, of high work demand profoundly reliant on staff for the efficient delivery of services (Sadleir, 2010). For health care facilities, hospitals are reliant on paramedical staff. In a hospital, the paramedical staff is exposed to many biological hazards (back injuries). Due to psychological factors, hospitals are a stressful place for staff (Sadleir, 2010). Job in hospitals combines with a high level of job demand and excessive workload, which create job strain and stress among health care workers. The psychological hazards like workload, highly demanded work, fatigue both mental and physical and burn out are common in a hospital environment, which creates stress depression and mental fatigue for its workers (Sadleir, 2010).

Paramedical staff is an integral part of hospital staff (Mittman, et al., 2002). Among the paramedical staffs, radiographers occupied a vital role in detecting the disease and broken bone. Radiographers use X-ray, Computed Tomography, Magnetic Resonance Imaging, and Ultrasound to create images of body parts and

organs for diagnostic purpose. The role of radiography varies depending on the type of X-ray the patient needs. Radiographers are of two types, namely Diagnostic Radiographer and Therapeutic Radiographer. Diagnostic Radiographers work within the radiology department, which includes X-ray, Ultrasound, Computed Tomography, and Magnetic Resonance Imagine. They provide a service for most departments within the hospital including Accident and Emergency, Outpatients, Operation Theatre and Wards. Close liaison and collaboration with a wide range of other health care professionals are therefore vital. Whereas Therapeutic Radiographers work closely with Doctors, Nurses, Physicist and other members of the oncology team to treat the patients with cancer.

The nature of the profession itself makes radiographer expose to various hazards. Radiation, chemicals, heavyweight aprons are some of the inseparable factors associated with this occupation. In addition to these factors, in the second-tier city like Tirunelveli, Tamilnadu, the work environment is commonly be seen with long working hours, two shift working system, low salary, lack of motivation, lack of training and development system, lack of infrastructure, lack of welfare facilities and lack of protective devices. These are some of the common factors affecting physical and mental health, which are an inevitable factor in the workplace for the employees. Although health care institutions such as hospitals, pharmacies, and diagnostic centres have developed remarkably in Tirunelveli city, still in many hospitals and diagnostic centres the factors producing hazards and affecting the health of the employees increasingly exist. Hence, the present research has been undertaken in the study area with the objectives of identifying the causes of occupational hazards among radiographers in private multi-speciality hospitals.

Statement of the Problem

Occupational hazards are widely existing in all kinds of occupations namely production, service and agriculture sectors. The severity of the hazards depends mainly on the nature of the job. Though employees working in these three sectors are exposed to occupational hazards both physically and mentally, the employees working in the service sector are exposed to occupational hazards mentally to a greater extent. Among the service sector employees, radiographers are vulnerable groups exposed to occupational hazards. Their nature of the job itself makes them undergo occupational hazards. Sustained exposure to radiation and exposure to chemicals when developing films are the essential nature of the job and unavoidable part of the job. The severity of occupational hazards varies from minor injuries to death of the employees.

Numbers of factors are associated with occupational hazards in the radiography profession that affect radiographers both physically and mentally. Adequate knowledge about the hazards arising in the occupation and way of prevention will help the employees to protect them from the hazards. At the same time, the role of the organization has a major part in protecting employees from exposure to hazards. Unless the employees develop adequate awareness about various causes of occupational hazards and organization take serious efforts to protect the employees by means of fulfilling their needs it cannot be stopped from exposed to occupational hazards. When the radiographers are continuously exposed to hazards both physically and mentally their productivity will also be affected. Then they will start availing leave to the duty, which will further affect the organization. Therefore, it remains important for the hospitals to know the perception of the radiographers towards various causes of occupational hazards associated with the radiographic profession. Hence, the present study is undertaken to undertaken to know their perception towards the causes of occupational hazards.

Scope of the Study

The study has focused on Tirunelveli city, Tamilnadu. The study has focused occupational hazards arising in the workplace and it has covered the laboratory technicians qualified with Diploma in Medical Radiographic Technicians 1 year and 2 years courses and working in private multi-speciality hospitals. The study has analyzed causes of occupational hazards of medical radiographic technicians under nine dimensions namely organization structure and policy, radiographer's specific, fear and safety, resources, workload and work shift, environment and hygiene, interruption, patient and communication, and training related factors.

Significance of the Study

The study has analyzed various causes of occupational hazards associated with the radiographic profession. The analysis and findings of the study will be majorly helpful for the administrators of the hospitals and other similar organizations to review their policies, rules, and regulations and make necessary changes in such a way that radiographers should not be affected with hazards. The factors discussed in this study and the findings discovered in this research give ample scope for the radiographers to enhance their knowledge about the various hazards associated with their job. Moreover, the findings of this research will serve as secondary data and fundamental for future research scholars.

Profile of the Study Area

This study has been undertaken in Tirunelveli city. Tirunelveli also known as Nellai, and historically (during British rule) as Tinnevely, is a city in the Indian state of Tamil Nadu. It is the headquarters of the Tirunelveli District in Tamil Nadu. It is situated 700 kilometers (435 miles) southwest of the state capital Chennai. It is located in the southern-most tip of the Deccan plateau. Tirunelveli is an important junction in the National Highway No 7 connecting India from the North to South (Kashmir to Kanyakumari). As of 2011 census of India, Tirunelveli has a total population of 474,838. Males constitute 49% of the population and females 51%.

Objectives of the Study

The following objectives have been established to guide the research:

- To identify the perception of radiographers towards causes of occupational hazards.
- To foresee the extent of perception of radiographers towards causes of occupational hazards.
- To compare the perception of radiographers towards various dimensions of causes occupational hazards.
- To understand the relationship between causes of occupational hazards and demographic characteristics of the respondents.
- To offer suitable suggestions to prevent and manage occupational hazards.

Hypotheses of the Study

In order to analyze the relationship between demographic variables and causes of occupational hazards the following hypotheses have been framed.

- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on age.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on marital status.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on native place.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on places of stay.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on educational qualification.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on salary.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on work experience.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on work shift.
- There is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on the job situation.

Conceptual Framework

The conceptual framework of the study is given as follows. This chart explains the independent variables and dependent variables of the study.

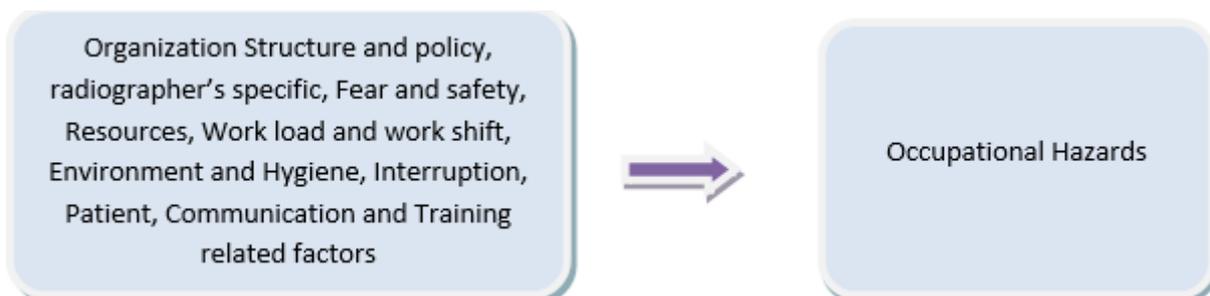


Figure 1. Conceptual framework composed of both indirect and direct variables

Source: Own elaboration

Literature Review

Occupational hazard can be defined as the risk to the health of a person usually arising out of employment. It can also refer to work, material, substance, process or situation that predisposes or itself causes accidents or disease at workplace. An occupational hazard is defined as a risk accepted as a consequence of a particular occupation (Oxford Dictionary). In the present research, the researchers defined occupational hazards that all the factors which affect both physical and mental health of the medical laboratory technicians.

Rajan D. (2014a) undertook a comparative study to identify and to differentiate the occupational hazards of medical laboratory technicians working in private hospitals and private diagnostic centres in Tirunelveli District, Tamilnadu, India. The study had sampled 200 medical laboratory technicians (100 from private hospitals and 100 from private diagnostic centres). The study analyzed nine variables to know about the sources of occupational hazards. They are as follows: organization structure and policy, ergonomics, fear and safety, resources, workload and work shift, environment and hygiene, interruption, patient and communication, and training related factors. The analysis of the study shows that all factors of occupational hazards were perceived at medium level by the majority of the respondents working in both kinds of organizations.

Rajan D. (2014b) identified the sources of occupational hazards of medical laboratory technicians working in private multi-speciality hospitals under nine dimensions namely organization structure and policy, ergonomics, fear and safety, resources, workload and work shift, environment and hygiene, interruption, patient and communication, and training related factors. The study identified that rigid leadership style and strict supervision by higher authorities, long sitting in front of computer, inadequate safety in the workplace, shortage of laboratory technicians and supporting staffs in accordance with volume of patients, two shift work system which are irregular, inadequate space in the workplace, receiving multiple instructions from many authorities, dealing with emotionally unstable, angry, urgency and blaming nature of the patients and their relatives and inadequate information about occupational hazards related to job were the major sources of occupational hazards of medical laboratory technicians. The analysis of the study also proved that all factors of occupational hazards are perceived at a medium level by the majority of the respondents.

Rajan D. (2014c) examined and differentiated the impact of occupational hazards on the health of medical laboratory technicians. The study sampled 120 medical laboratory technicians. The study found that the factors, pain in neck, shoulder, upper and lower back, waist and leg and joints, eye problem, loss of appetite or changes in appetite, digestive problem, stress and irritation, minute injuries, skin allergy e.g. irritation, ear pain due to prolonged exposure to air condition, breathing difficulties due to excessive cold, sleep disorder, low spirit, menstrual irregularities were perceived by medical laboratory technicians working in both kinds of organizations. Whilst, the factors, tiredness, fatigue, weight loss, anxiety and depression, lack of energy, difficulty paying attention, appendicitis, tuberculosis and other respiratory infection, hepatitis B and varicose vein have highly been experienced by medical laboratory technicians working in hospitals than diagnostic centres. The study also proved that all factors were perceived at medium level by medical laboratory technicians working in both kinds of organizations.

Awosile B., Oseni O., and Omoshaba E. (2013) examined hazards exposures of workers of animal-related occupations in Abeokuta South Western, Nigeria. Zoonotic diseases, animal bites, animal kicks, birds pecking, and scratching and dog bites were the commonest occupational hazards of exposure. Majority of the workers were known of the term occupational hazards and various hazards associated with their job. Physical stress due to work or body fatigue and back and or waist pain was the commonest physical hazards. Dust and animal dung were the allergic hazards of exposure and allergic rhinitis and conjunctivitis were the most common allergic conditions. Fumigants, insecticides, and pesticides were the common chemical hazards and respiratory irritation was the most commonly reported clinical condition. Skin diseases and respiratory diseases were the most common occupational diseases. Tuberculosis, avian influenza and brucellosis were the most common zoonotic diseases. Diseases, infections, and death were the common possible implications of zoonoses perceived by the workers. Less than 50% of the workers were aware of various preventive measures against work-related zoonotic diseases. Use of protective coverings, good hygienic practices, washing of hand after work period were the most common preventive measures against work-related zoonotic diseases noted by workers.

Rajan D. (2013) analyzed the awareness of medical laboratory technicians working in multi-speciality hospitals in Tirunelveli city, Tamilnadu, about safety measures of occupational hazards. The study showed that majority of the respondents have replied that they do not know anything at all about the safety measures of occupational hazards discussed in this research. From the total score of the Table it could be known that the

respondents have awareness about some safety measures such as use of hand gloves and face mask when collecting fluids from the patient, washing hand with bactericidal soap, use of foot wears to cope up with chillness of the floor, vaccination as they have occupied the high scores. The respondents have poor knowledge about the safety measures such as breathing exercises, cleaning eye with cold water at frequent interval, regular break and physical exercises as they have occupied less total score.

Ashok D. (2012) studied occupational hazards of supportive group of women employees in health care units in Tamilnadu from the samples of 197 supportive women employees. The analysis of study explained that lack of supervision and control, lack of training, usage of untrained employees, congested space in working area, use of old machinery and equipments, overloading of employees, violation of safety rules, overloading of employees and poor housekeeping practices were the employees' safety related factors associated with occupational hazards. The study also showed that respiratory diseases and hypertension were in top level experienced. Skin diseases, diabetes, cardio vascular diseases, menstrual irregularities, sleep disorder were next in level experienced. Around one fifth of respondents had experienced bacterial infections to fungal infections. One fourth of them had experienced various parasitic infections and one third of them had experienced viral infections. Anxiety, mental stress, depression and emotional disorder, ENT related problems, low back pain due to carrying heavy loads of work in a standing posture, head ache and body ache due to work stress, discomfort during travel time, worrying about welfare of children when at work were factors influencing occupational hazards.

Javed Sadaf and Tehmina Yaqoob (2011) studied gender based occupational health hazards among paramedical staff in public hospitals of Jhelum. The results of the study showed that females were more exposed to occupational health hazards as compare to males. There was no difference between male and female paramedical staff in exposure to occupational health hazards. Females are more exposed to psychological occupational health hazards as compare to males. Physiological health hazards are more influencing paramedical staff's health as compare to psychological health hazards in public hospital. The hypotheses of the study reflected that there was a significant effect of age in exposure to occupational health hazards among paramedical staff. There were no significant differences in exposure to occupational health hazards exist between on the basis of experience in different categories. The study concluded that over burden of work and deficient staffs were enormous hazards in public hospital faced by paramedical staff.

Amosu A.M., et al. (2011) analyzed the level of knowledge regarding occupational hazards among nurses in Abeokunta, Ogun state, Nigeria. The sample consisted of 100 nurses who had been randomly selected from 10 public and 2 privately owned health care facilities. Majority of the respondents were between 21-30 years of age, females, married and had 11 years and above in the nursing profession. Majority of the respondents agreed that the nursing profession is associated with occupational hazards. Back injury was the commonest occupational hazards followed by neck and back pain. Prolonged standing, negligence and carelessness, lifting of patients and equipments, failure to observe simple safety rules in the wards, shortage of staff and excessive workload are the foremost predisposing factors of occupational hazards. The respondents suggested that avoidance of lifting of patients and heavy equipments and proper training and retraining of nurses on safety measures are the ways of preventing occupational hazards.

Saldaria M.A.M., et al. (2012) examined the impact of occupational hazard information on employee health and safety. In the study, global farming, industry construction and services sectors have been focused. Farming and services sector have been given 17.5% hazard prevention communication, global, industry and construction sectors have been provided 16.8% and 14.8% respectively. Farming and construction sectors are experiencing 43.1% and 35.8% musculoskeletal symptoms. Global services and industry sectors experienced 32.3% 31% and 30.4% respectively. Services, industry and global sectors experience high psychological symptoms of 10.8%, 10.2% and 10.1% respectively where as farming and construction sectors experience 8.6% and 7.1% respectively. Construction, industry and farming sector experience high level of occupational accidents in the rate of 13.8%, 13.1% and 10.4% respectively. Farming and services sectors experience low level of occupational accidents at the rate of 9.9% and 9.2% respectively.

Ahmed H.O. and Mark S. Newson Smith (2010) analysed knowledge and practices of cement workers related to occupational hazard in United Arab Emirates. The study sampled 153 male workers in a cement factory in Ras Al Khaimah, UAE. The study highlighted that 52.9% of the respondents had known about the hazards associated with current job. The most commonly mentioned hazards were dust, heat, machines such as milling machine and falling materials, chemicals, fire and smoke. Majority of the workers mentioned that exposure to the dust was a serious hazard to their health. Respiratory symptoms (cough and sputum), eye problem have

been majorly experienced as dust related problems by respondents. Stomach, liver and heart problems were least experienced as dust related problems. Majority of the respondents indicated that mask was a safety device. Next to it, helmet, safety hoes, and goggles, were the protective devices used by respondents. Moreover, majority of the workers reported that masks were comfortable and not interfering with their communication while wearing them.

Fasunloro Adebola and Foluso John Owotade (2004) assessed the level of awareness of occupational hazards among clinical dental staff at a dental staff in Nigeria and it had sampled 38 respondents. Doctors (59%), nurses (8%), technologist (5%), therapists (10%), and dental surgery assistants (18%) have been focused in the study. Backache was the most frequently experienced hazard among 47% of respondents. 68.4% dental personnel had been vaccinated among them more were doctors than non-doctors. 35% had experienced an injury from sharp instruments in the past six months. 71% had regular exposure to dental amalgam. Use of eye goggles, proper waste disposal, wash hands with bactericidal soap, wear gloves routinely, change gloves between patients, use of face mask, wash hands before gloving and ensure instrumental sterilization were the mechanism followed by employees to control the cross infection. Amalgam blood level check, periodic check of clinic for amalgam vapour, use of goggles, water spray and suction, confine use to impervious surface, use no touch technique, store amalgam in sealed containers, clean up spilled amalgam, work in well ventilated space and use tightly closed capsules were the safety measures adapted while handling amalgam. The respondents were well known about injury, Hepatitis B, HIV and less known about TB, blindness, backache, litigation and others.

It could be understood from the above literature that the study undertaken in the study area with regard to occupational hazards has focused only medical laboratory technicians working in private multi-speciality hospitals and private single speciality hospitals. Research with regard to occupational hazards of radiographers working in private multi-speciality hospitals has not been undertaken. Therefore, there is a space to study about occupational hazards of radiographers working in private multi-speciality hospitals. Hence, the present study has been undertaken in the study area. Moreover, in the present study the researcher mean occupational hazard as the factor which affect both physical and mental health.

Research Methodology

Research Design

This survey-based research containing quantitative approach is descriptive in nature. It describes causes of occupational hazards among radiographers.

Sample and Sampling Technique

The element of this research is radiographer qualified with both DMRT 1 year and 2 years courses and working in private multi-speciality hospitals in Tirunelveli city, Tamilnadu. A total of 60 radiographers were sampled for the study from leading multi-speciality hospitals using judgement sampling technique.

Data Collection

The primary data have been collected through structured questionnaire constructed by the researcher. The researcher has also done personal observation and discussion with respondents in order to collect primary data. The secondary data for this study have been collected from various research journals, books and websites to add appropriate significance to the study.

Instrumentation

The questionnaire employed to collect primary data consisted of two sections. Section 'A' that talked about profile of the respondents and section 'B' that dealt with causes of occupational hazards. The part B of the questionnaire had been made with Likert's five points scale. The scale consisted of five responses called Strongly Agree, Agree, No Opinion, Disagree and Strongly Disagree. The responses in the scales carried the value of 5, 4, 3, 2 and 1 respectively.

Tools of Analysis

Mean, standard deviation and coefficient of variation have been administered to understand causes of occupational hazards. Kruskal Wallis test has been applied to find the relationship between demographic variables and dimensions of occupational hazards.

Results and Discussion

Demographic Variables

Table 1. Profile of the respondents

S No	Measure	Item	Frequency	Percentage
1	Sex	Male	40	66.67
		Female	20	33.33
2	Marital status	Married	47	78.33
		Unmarried	13	21.67
3	Age	Below 20 years	08	13.33
		Between 20 and 25 years	14	23.33
		Between 25 and 30 years	26	43.33
		Above 30 years	12	20.00
4	Native place	Rural	38	63.33
		Urban	22	36.67
5	Residential status	Owned house	34	56.67
		Rented house	26	43.33
6	Places of stay	Home	46	76.67
		Hostel	14	23.33
7	Educational qualification	DMRT 1 Year	39	65.00
		DMRT 2 Years	21	35.00
8	Strength of family member	Below 4 members	08	13.33
		Between 4 and 6 members	22	36.67
		Between 6 and 8 members	16	26.67
		Above 8 members	14	23.33
9	Salary (Rs)	Below 5000	12	20.00
		Between 5000 and 7000	26	43.33
		Between 7000 and 9000	12	20.00
		Above 9000	10	16.67
10	Year of working experience	Below 2 year	10	16.67
		Between 2 and 4 years	22	36.67
		Between 4 and 6 years	16	26.67
		Above 6 years	12	20.00
11	Job situation	Full time	54	90.00
		Part time	06	10.00
12	Work shift	Rotating eight hour shift	0	00
		Rotating twelve hour shift	42	70.00
		Permanent day shift	08	13.33
		Permanent night shift	10	16.67
13	Mode of travel	Public transport	38	63.33
		Two wheeler	14	23.33
		Walking	08	13.33

Source: Primary data

It would be understood from Table 1 that majority of the respondents were male (66.67), 78.33 married and they were in between 25 and 30 years of age (43.33). Majority of the respondents belonged to rural area (63.33) and had owned house (56.67). Moreover, majority of the respondents were staying in home (76.67) and they had the qualification of DMRT 1 year course (65). Most of the respondents were in between 2 and 4 years of experience (36.67) and they were receiving the salary between Rs. 5000 and 7000 (43.33). Besides, majority of the respondents were full time employees (90.00) and they had rotating twelve-hour shift duty (70.00) and also they were travelling through public transport (63.33).

Causes of Occupational Hazards

Table 2. Organization structure and policy related factors

S No	Organization Structure and Policy	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Rigid leadership style (in terms of off, leave and shift schedule) and strict supervision by higher authorities	26.61	2.55	14.33	70.00	15.67
2	Criticism (harsh words) by higher officers such as managers and doctors in front of co-workers, patients and their relatives	25.64	2.51	19.33	70.00	10.67
3	Disparity in treatment of the employees in terms of salary, promotion, shift schedule and recognition	25.12	1.98	12.67	68.33	19.00

Table 2 (cont.). Organization structure and policy related factors

4	Lack of welfare facilities such as health insurance, health check-up and so on	24.64	3.67	10.67	71.00	18.33
5	Inadequate and unfair increment and radiation allowance	24.53	3.78	20.00	60.67	19.33
6	Lack of communication system to convey personal issues and departmental issues to management	24.46	3.49	18.33	65.33	14.33
7	Inadequate space facilities to accommodate all manpower and equipments	18.03	3.19	16.67	69.00	14.33
8	Frequent changes in the organization policies and procedures	17.98	3.17	17.00	64.33	18.67
9	Food which is inadequate to meet over long working hours and it is contaminated in nature (especially for hostellers)	14.16	3.23	15.00	69.00	16.00

Source: Primary data

It could be understood from Table 2 that rigid leadership style (in terms of off, leave and shift schedule) and strict supervision by higher authorities, criticism (harsh words) by higher officers such as managers and doctors in front of co-workers, patients and their relatives and disparity in treatment of the employees in terms of salary, promotion, shift schedule and recognition are the foremost factors associated with occupational hazards. Lack of welfare facilities such as health insurance, health check-up and so on, inadequate and unfair increment and radiation allowance and lack of communication system to convey personal issues and departmental issues to management are the next foremost factors causing occupational hazards. Inadequate space facilities to accommodate all manpower and equipments, frequent changes in the organization policies and procedures and food which is inadequate to meet over long working hours and it is contaminated in nature (especially for hostellers) are the least factors associated with occupational hazards of radiographers.

Table 3. Radiographer's specific factors

S No	Radiographer's profession	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Prolonged exposure to radiation	18.38	2.54	11.67	69.00	19.33
2	Heavy weight of the mobile X-ray machine	22.02	3.70	19.33	66.33	14.33
3	Frequent walking and climbing in steps to take mobile X-ray	19.11	2.57	16.67	66.33	17.00
4	Sitting in front of computer for prolonged time	20.50	3.82	21.67	54.00	24.33
5	Prolonged exposure to chemicals to develop X-ray film	23.65	2.14	20.00	61.67	18.33
6	Bending and lifting of heavy weighted patients	20.72	3.93	17.67	70.00	12.33

Source: Primary data

It could be known from Table 3 that prolonged exposure to radiation, heavy weight of the mobile X-ray machine and frequent walking and climbing in steps to take mobile X-ray are the major factors of radiographer's occupation associated with occupational hazards. Sitting in front of computer for prolonged time, prolonged exposure to chemicals to develop X-ray film and bending and lifting of heavy weighted patients are the next foremost factors associated with occupational hazards.

Table 4. Fear and safety related factors

S No	Fear and safety	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Inadequate safety in the workplace (working alone at night especially on Sundays)	20.67	5.00	19.33	61.67	19.00
2	Lack of concern by staffs towards safety guidelines to be followed in the department	21.05	1.18	14.33	68.33	17.33
3	Protruded parts of machine and uncovered wires	19.38	2.54	16.00	70.00	14.00
4	Fear of committing mistakes in work process and report preparation which affect accuracy of the report	21.02	3.70	21.67	54.00	24.33
5	Assault by the patients	18.15	2.14	16.00	70.00	14.00
6	Fear of wastage of the X-ray films	21.72	3.93	20.00	66.33	13.67

Source: Primary data

It could be known from Table 4 that inadequate safety in the workplace (working alone at night especially on Sundays), lack of concern by staffs towards safety guidelines to be followed in the department and protruded parts of machine and uncovered wires are the major fear and safety related factors causing occupational hazards. Fear of committing mistakes in work process and report preparation, which affect accuracy of the report, assault by the patients and fear of wastage of the X-ray films are the next foremost factors causing occupational hazards among radiographers.

Table 5. Resources related factors

S No	Resources	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Inadequate radiographers and supporting staffs (e.g. computer operator and social workers) in accordance with volume of patients	19.35	2.57	16.00	66.67	17.33
2	Lack of protective devices of radiation	21.67	2.82	19.33	65.00	15.67
3	Absence of updated X-ray and scan machines	19.53	2.78	17.67	70.00	12.33
4	Poor functioning of equipments and their poor maintenance (these affect the accuracy of results) to meet over workload	19.79	2.46	17.00	64.33	18.67
5	Unavailability of doctors and waiting for doctors for intra venous injection required cases	21.98	2.94	11.33	73.67	15.00
6	Lack of resources during emergency situations (e.g., x- ray film, film developer)	19.96	2.89	17.33	69.33	13.33

Source: Primary data

It could be indicated from Table 5 that inadequate radiographers and supporting staffs (e.g. computer operator and social workers) in accordance with volume of patients, lack of protective devices of radiation and absence of updated X-ray and scan machines are the major resource related factors associated with occupational hazards. Poor functioning of equipments and their poor maintenance (these affect the accuracy of results) to meet over workload, unavailability of doctors and waiting for doctors for intra venous injection required cases and lack of resources during emergency situations (e.g., x- ray film, film developer) are the next foremost resource related factors associated with occupational hazards.

Table 6: Workload and work shift related factors

S No	Workload and work shift	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Two shift work system which are irregular	26.57	2.36	14.33	70.00	15.67
2	Long working hours and inability to leave duty in time	25.63	2.56	19.33	70.00	10.67
3	Encountering multiples work at the time (e.g., outpatient and inpatient, processing the film, attending scan patients, reporting the X-ray and scan result)	25.23	2.34	12.67	68.33	19.00
4	Excessive workload	23.23	2.34	10.67	71.00	18.33
5	Missing of food (e.g. breakfast, lunch and dinner) due to excessive workload	11.23	2.47	16.67	70.00	13.33

Source: Primary data

It could be understood from Table 6 that two shift work system which are irregular, long working hours and inability to leave duty in time and encountering multiples work at the time (e.g., outpatient and inpatient, processing the film, attending scan patients, reporting the X-ray and scan result) are the major workload and work shift related factors. Excessive workload and missing of food (e.g. breakfast, lunch and dinner) due to excessive workload are the next foremost factors associated with occupational hazards of radiographers.

Table 7. Environment and hygiene related factors

S No	Environment and hygiene	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Inadequate (congested) space in the workplace	24.23	2.43	09.67	71.00	19.33
2	Consuming air condition for long time which is more susceptible for infection	19.23	2.56	17.33	68.33	14.33
3	Improper segregation and disposal of medical wastes which is prone for infection	18.01	2.68	14.67	68.33	16.00
4	Inadequate ventilation and poor lighting	22.67	2.79	19.67	56.00	24.33
5	Inhaling of chemicals while processing X-ray films (e.g. poisonous gas)	23.42	2.45	11.67	70.00	18.33

Source: Primary data

It could be known from Table 7 that inadequate (congested) space in the workplace, consuming air condition for long time which is more susceptible for infection and improper segregation and disposal of medical wastes which is prone for infection are the major environment and hygiene related factors causing occupational hazards among radiographers. Inadequate ventilation and poor lighting and inhaling of chemicals while processing X-ray films (e.g. poisonous gas) are the next foremost environment and hygiene related factors causing occupational hazards among radiographers.

Table 8. Interruption related factors

S No	Interruption	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Pressure (urgency) from multiple areas (casualty, wards, operation theatre, outpatient departments, dialysis and so on) for quick result of blood and other fluid investigation which enhance stress	19.02	3.76	17.33	63.67	19.00
2	High involvement and advantages of outpatient department and doctors' personal assistants towards reports (e.g. urgency)	17.53	3.82	12.33	68.33	17.33
3	Receiving multiple instructions from many authorities (e.g. doctors, nurses, patients and OP assistants) which enhance work pressure	17.34	2.46	22.33	57.00	20.67

Source: Primary data

It could be known from Table 8 that pressure (urgency) from multiple areas (casualty, wards, operation theatre, outpatient departments, dialysis and so on) for quick result of blood and other fluid investigation which enhance stress, high involvement and advantages of outpatient department and doctors' personal assistants towards reports (e.g. urgency) and receiving multiple instructions from many authorities (e.g. doctors, nurses, patients and outpatient assistants) which enhance work pressure are the interruption related factors causing occupational hazards among radiographers.

Table 9. Communication and training related factors

S No	Communication and Training	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Inadequate information about occupational hazards related to job	26.67	3.57	16.67	69.00	14.33
2	Lack of guidelines with regard to handling procedures of equipments and work processes	26.40	3.60	20.00	67.33	12.67
3	Inadequate training in terms of work processes (e.g. handling of equipments and chemicals, preparation of report and dealing with patients) and occupational safety	23.04	4.73	11.67	69.00	19.33

Source: Primary data

It could be advocated from Table 9 that inadequate information about occupational hazards related to job lack of guidelines with regard to handling procedures of equipments and work processes and inadequate training in terms of work processes (e.g. handling of equipments and chemicals, preparation of report and dealing with patients) and occupational safety are the communication and training related factors associated with occupational hazards of radiographers. It would be known from the findings that the radiographers are not given adequate training and they have not been given enough guidelines and information about various hazards associated with occupational hazards. From the importance given to these factors it could be understood that the employees are in need of adequate information about the various hazards associated with their job. They are also in need of adequate guidelines and training with regard to work processes and handling of equipments and chemicals. Guidelines and training should also include various occupational safety measures to be followed during work.

Table 10. Patient related factors

S No	Patient	Mean	SD	Extent of Perception (%)		
				Low	Medium	High
1	Dealing with emotionally unstable, angry, urgency and blaming nature of the patients and their relatives	23.45	2.68	17.33	67.67	15.00
2	Attending multiple accident cases at the same time	21.07	2.36	15.67	67.67	16.67
3	Dealing with infectious patients (Tuberculosis, HIV)	20.89	3.72	15.67	66.00	18.33
4	Attending opposite sex patients	20.25	4.33	22.67	61.33	16.00

Source: Primary data

It could be noted from Table 10 that dealing with emotionally unstable, angry, urgency and blaming nature of the patients and their relatives and attending multiple accident cases at the same time are the foremost patient related factors causing occupational hazards. Dealing with infectious patients (Tuberculosis, HIV) and attending opposite sex patients are the next foremost factors causing occupational hazards among radiographers.

Table 11. Comparison of dimensions of causes of occupational hazards

S No	Dimensions of Occupational Hazards	Mean	Standard Deviation	Mean Ranking
1	Organization structure and policy	23.65	2.49	1
2	Radiographer’s specific	22.28	4.44	2
3	Fear and safety	21.89	3.96	3
4	Resources	21.81	3.66	4
5	Workload and work shift	21.65	3.75	5
6	Environment and hygiene	20.29	3.46	6
7	Interruption	20.20	3.19	7
8	Patient	20.08	3.17	8
9	Communication and training	19.15	2.15	9

Source: Computed from primary data

It could be known from Table 11 that organization structure and policy, radiographer’s specific and fear and safety are the foremost dimensions of causes of occupational hazards. Resources, workload and work shift and environment and hygiene are the next foremost dimensions of causes of occupational hazards. Interruption, patient and communication and training are the least dimensions of causes of occupational hazards.

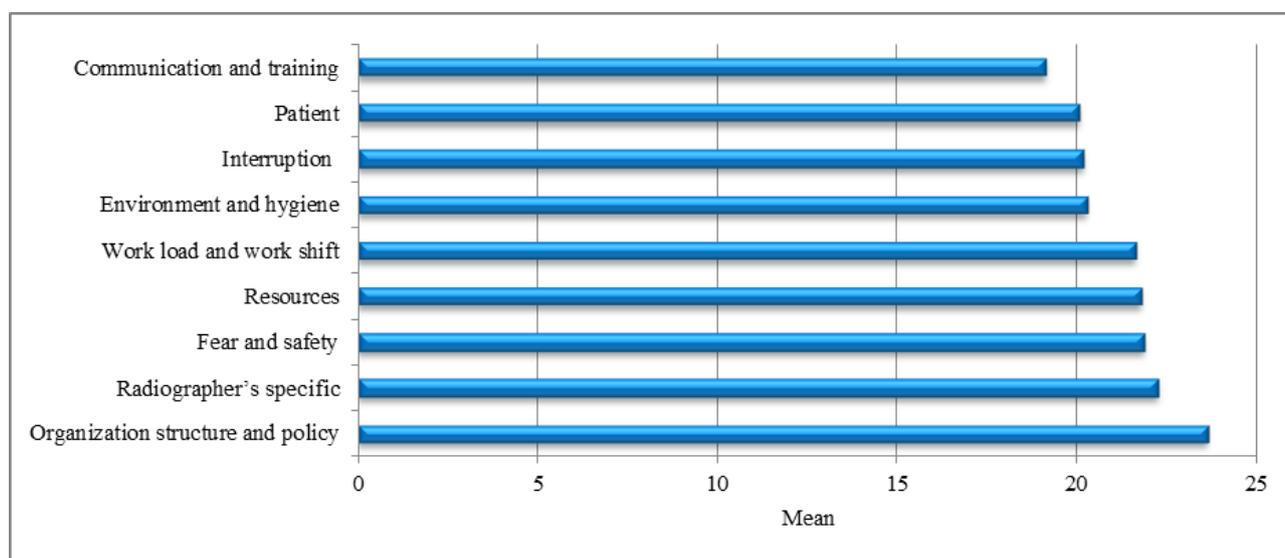


Figure 2. Comparative analysis of dimensions of occupational hazards

Source: Primary data

Relationships between demographic variables and causes of occupational hazards

Table 12. Relationship of age with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	10.052	0.013	Sig
2	Radiographer’s specific	17.999	0.000	Sig
3	Fear and safety	17.042	0.001	Sig
4	Resources	27.161	0.000	Sig
5	Workload and work shift	38.985	0.000	Sig
6	Environment and hygiene	16.352	0.001	Sig
7	Interruption	13.207	0.004	Sig
8	Communication and training	16.810	0.001	Sig
9	Patient	16.438	0.001	Sig
10	Total score	26.406	0.000	Sig

Degree of freedom: 3, at 5 per cent level

Source: Computed from primary data

It could be observed from the value of level of significance that there is a significant relationship between age and perception scores of all dimensions of causes of occupational hazards.

With regard to the total score, the value of level of significance (0.000) is less than 0.05 (5% level), and hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on age.

Table 13. Relationship of salary with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	10.417	0.015	Sig
2	Radiographer's specific	33.953	0.000	Sig
3	Fear and safety	13.110	0.004	Sig
4	Resources	22.812	0.000	Sig
5	Workload and work shift	13.614	0.003	Sig
6	Environment and hygiene	25.795	0.000	Sig
7	Interruption	4.373	0.224	Not sig
8	Communication and training	13.881	0.003	Sig
9	Patient	20.400	0.000	Sig
10	Total score	24.827	0.000	Sig

Degree of freedom: 3, at 5 per cent level

Source: Computed from primary data

It could be noted from the value of level of significance that there is a significant relationship between salary and perception scores of all dimensions of causes of occupational hazards except that of interruption.

With regard to the total score, the value of level of significance is less than 0.05 (5 percent level) and hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on salary.

Table 14. Relationship of marital status with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	1.075	0.300	Not sig
2	Radiographer's specific	0.545	0.460	Not sig
3	Fear and safety	0.581	0.446	Not sig
4	Resources	2.169	0.141	Not sig
5	Workload and work shift	2.023	0.155	Not sig
6	Environment and hygiene	3.880	0.049	Sig
7	Interruption	1.224	0.269	Not sig
8	Communication and training	12.415	0.000	Sig
9	Patient	0.118	0.731	Not sig
10	Total score	0.239	0.625	Not sig

Degree of freedom: 1, at 5 per cent level

Source: Computed from primary data

It could be known from the value of level of significance that there is no significant relationship between marital status and perception scores of all dimensions of causes of occupational hazards except those of environment and hygiene and communication and training related factors.

With regard to the total score, the value of level of significance is more than 0.05 (5 percent level) and hence the null hypothesis is accepted stating that there is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on marital status.

Table 15. Relationship of native place with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	4.637	0.031	Sig
2	Radiographer's specific	10.854	0.001	Sig
3	Fear and safety	0.231	0.631	Not sig
4	Resources	0.180	0.671	Not sig
5	Workload and work shift	4.578	0.032	Sig
6	Environment and hygiene	0.892	0.345	Not sig
7	Interruption	0.997	0.318	Not sig
8	Communication and training	25.969	0.000	Sig
9	Patient	0.751	0.386	Not sig
10	Total score	0.195	0.659	Not sig

Degree of freedom: 1, at 5 per cent level

Source: Computed from primary data

It could be understood from the value of level of significance that there is no significant relationship between native place and perception scores of all dimensions of causes of occupational hazards except those of patient and safety, resources, environment and hygiene, interruption and patient related factors.

With regard to the total score, the value of level of significance is more than 0.05 (5 percent level) and hence, the null hypothesis is accepted stating that there is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on native place.

Table 16. Relationship of places of stay with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	15.783	0.000	Sig
2	Radiographer's specific	15.107	0.000	Sig
3	Fear and safety	6.047	0.014	Sig
4	Resources	9.391	0.002	Sig
5	Workload and work shift	27.439	0.000	Sig
6	Environment and hygiene	15.556	0.000	Sig
7	Interruption	0.009	0.926	Not sig
8	Communication and training	12.791	0.000	Sig
9	Patient	49.855	0.000	Sig
10	Total score	24.678	0.000	Sig

Degree of freedom: 1, at 5 per cent level

Source: Computed from primary data

It could be revealed from the value of level of significance that there is a significant relationship between places of stay and perception scores of all dimensions of causes of occupational hazards except those of interruption related factors.

With regard to the total score, the value of level of significance is less than 0.05 (5 percent level), hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on places of stay.

Table 17. Relationship of educational qualification with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	2.805	0.094	Not sig
2	Radiographer's specific	12.958	0.000	Sig
3	Fear and safety	0.012	0.914	Not sig
4	Resources	23.055	0.000	Sig
5	Workload and work shift	10.507	0.001	Sig
6	Environment and hygiene	24.253	0.000	Sig
7	Interruption	18.581	0.000	Sig
8	Communication and training	18.479	0.000	Sig
9	Patient	3.061	0.080	Not sig
10	Total score	7.377	0.007	Sig

Degree of freedom: 1, at 5 per cent level

Source: Computed from primary data

It could be observed from the value of level of significance that there is a significant relationship between educational qualification and perception scores of all dimensions of causes of occupational hazards except those of organization structure and policy, fear and safety and patient related factors.

With regard to the total score, the value of level of significance is less than 0.05 (5 percent level), hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on educational qualification.

Table 18. Relationship of work experience with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	15.160	0.002	Sig
2	Radiographer's specific	2.784	0.426	Not sig
3	Fear and safety	12.472	0.006	Sig
4	Resources	39.103	0.000	Sig
5	Workload and work shift	29.202	0.000	Sig
6	Environment and hygiene	4.085	0.252	Not sig
7	Interruption	12.088	0.007	Sig
8	Communication and training	6.544	0.088	Not sig
9	Patient	3.675	0.299	Not sig
10	Total score	9.830	0.020	Sig

Degree of freedom: 3, at 5 per cent level

Source: Computed from primary data

It could be shown from the value of level of significance that there is a significant relationship between work experience and perception scores of organization structure and policy, fear and safety, resources and workload and work shift related factors. It could also be shown from the value of level of significance that there is no significant relationship between work experience and perception scores of radiographer's specific factors, environment and hygiene, communication and training and patient related factors. With regard to the total score, the value of level of significance is more than 0.05 (5percent level) and hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on work experience.

Table 19. Relationship of work shift with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	20.145	0.000	Sig
2	Radiographer's specific	13.263	0.001	Sig
3	Fear and safety	39.938	0.000	Sig
4	Resources	13.104	0.001	Sig
5	Workload and work shift	28.908	0.000	Sig
6	Environment and hygiene	3.147	0.207	Not sig
7	Interruption	0.768	0.681	Not sig
8	Communication and training	15.768	0.000	Sig
9	Patient	41.841	0.000	Sig
10	Total score	13.976	0.001	Sig

Degree of freedom: 2, at 5 per cent level

Source: Computed from primary data

It could be observed from the value of level of significance that there is a significant relationship between work shift and perception scores of all dimensions of causes of occupational hazards except those of environment and hygiene and interruption related factors.

With regard to the total score, the value of level of significance is less than 0.05 (5 percent level) and hence the null hypothesis is rejected stating that there is a significant difference in the perception scores of causes of occupational hazards among the group of respondents based on work shift.

Table 20. Relationship of job situation with perception scores of causes of occupational hazards

S No	Causes of occupational hazards	Critical value	Level of significance	Result
1	Organization structure and policy	26.318	0.000	Sig
2	Radiographer's specific	1.119	0.571	Not sig
3	Fear and safety	13.098	0.001	Sig
4	Resources	1.120	0.571	Not sig
5	Workload and work shift	40.408	0.000	Sig
6	Environment and hygiene	11.707	0.003	Sig
7	Interruption	31.746	0.000	Sig
8	Communication and training	20.959	0.000	Sig
9	Patient	2.695	0.260	Not sig
10	Total score	1.342	0.511	Not sig

Degree of freedom: 2, at 5 per cent level

Source: Computed from primary data

It could be understood from the value of level of significance that there is a significant relationship between job situation and perception scores of all dimensions of causes of occupational hazards except those of radiographer's specific factors, resources and patient related factors.

With regard to the total score, the value of level of significance is more than 0.05 (5 percent level) and hence the null hypothesis is accepted stating that there is no significant difference in the perception scores of causes of occupational hazards among the group of respondents based on job situation.

Discussion

The present study has indicated that lack of protective devices and inadequate guidelines are the causes of occupational hazards among radiographers. These finding provide support to the study of Kripa et al. (2005) who highlighted that in India, the reasons for not using personal protective equipment by 61.5 % of the salt workers were financial, non-availability or being not provided by the employers. These findings also go along with the study of Yassin et al. (2002) who reported that carelessness, discomfort, cost or unavailability as

reasons for not using protective equipment among farm workers in Gaza. The result of the present study has shown that exposure to infectious patients is the causes of occupational hazards. These findings is consistent with the study of Haiduven D.J. et al. (1999) who stated that the infection risk after accidents involving contaminated blood contact depends on various factors, such as type of exposure, inoculum size, host response, infectious material involved, and the amount of blood. These finding also go in line with the result of Gestan (1987) who advocated that paramedics had direct interaction with patients which made them more vulnerable to occupational health hazards and danger of contracting with Hepatitis B. was more common in departments in where is frequent interaction with blood at hospitals. The present research has indicated that inadequate training and environment programmes are the causes of occupational hazards. These findings provide support for the evidence of Gimeno et al. (2005) who showed that there was strong link between organizational factors (lack of safety training, low level of safety climate, practices in exposure to occupational health hazards) and important impact on work related injuries among healthcare workers.

The findings of the present study indicated that high workload, inadequate staffs and pressure are some the factors producing occupational hazards among radiographers. These findings are in agreement with the study of Verbrugge (1985) who explained that overburden of work and deficient staffs were enormous hazards in public hospital faced by paramedical staff. He also highlighted that in developing nations where health facilities are not developed and resources were limited, staffs are often vulnerable to these hazards and stress was common occupational health hazard for paramedics at hospital. The same findings are also corroborated with the study of Landsbergis (1988) who identified that identified job strain and stress, physical exertion, hazard exposure among health care workers. He also reported that jobs in hospitals were combined with high level of job demand and excessive workload which produce job strain and stress among health care workers. The results of the present study has pointed out that inadequate equipments, work environment and poor posture are the causes of occupational hazards. These findings are consistent with the studies of Hamann C., et al. (2001); Miller D.J., (1987); Lehto T.U., (1991); Rucker L.M., et al. (2002) and Boal et al. (2008) who highlighted that insufficient or inappropriate equipment, inappropriate work-area design, direct injuries, improper body posture; physical hazards from light, noise, and trauma, biological risks from irradiation and microorganisms, chemical detrimental sources, repetitive movements from working with dental instruments or sitting for extended times with a flexed and twisted back are sources of occupational hazards and they cause pain in neck, low-back and other musculoskeletal problems among dentists.

Suggestions and Conclusion

In this part, the researcher has presented suggestions, limitations of the study, future research directions and conclusion.

Suggestions

The following suggestions are given by the researcher based on findings of the study to deal with occupational hazards and prevent them.

1. Radiographers should be given job description that explains their roles and responsibilities explicitly. Moreover, it should explain what the hospital management is expecting from them as a radiographer. Clear job description will help them to know their boundaries and prevent them doing unnecessary work. The leadership style of the managers should be neither too rigid nor too flexible. The manager should follow empathetic approach in providing leave, off and shift schedule. Higher officials should avoid criticising the radiographers in front of patients and other employees. The hospital management should provide training for higher officials in these areas.
2. Shift work system and working hours should be regularised. Two shift work system should be converted into 3 shift system along with 8 hours duty. Shift should be scheduled in such a way that no one female employees should work in single in night shift. In unavoidable situations, she should be accompanied with any other technicians or supporting staffs in order to ensure her safety. Adequate number of radiographers and other supporting staffs should be appointed in accordance with volume of the patients and workload in order to reduce their work burden and thereby protect their health. Besides, performance appraisal, salary fixation, salary hike, promotion should be done fairly and disparity in these policies should be avoided so as to prevent the radiographers from undergoing depression and worry.
3. Information about hazards existing in radiography professions and guidelines to be followed when dealing with infectious patients, developing films in chemicals, positioning the patients, handling X-ray machines and scan machines should be given and also displayed in the department in written and pictures format.

Hygienic food with sufficient quantity should be provided for the radiographers who are staying in the hostel as they are looking after night shift with longer working hours and they are undergoing radiation for long time.

4. Training and counselling should be provided to enable them dealing with different nature of the patients such as emotionally imbalanced, complaining and angry nature of the patients. Ergonomics training in terms of sitting, standing, climbing and bending activities and relaxation techniques like breathing and stretching exercises which can be done during working hours should be taught so as to enable them to perform their work without physical strain, stress free and tired less. Safety materials such as aprons, hand gloves, face masks and shoes should be provided to protect them from infections. Hepatitis B and TT vaccines should be given as per the schedule recommended so as to prevent them from infections.
5. X-ray, scan machines, computers and other equipments required to perform their job should be made available adequately according to the number of patients. Their working conditions should also be checked at frequent intervals in order to enable them to work smoothly and safe them from high workload. The protruded parts of the equipments and uncovered electrical wires should be covered fully so as to prevent them from physical injuries and dangers.
6. The space in the department should be adequate to accommodate all personnel, equipments and the patients who are coming to the department. Ventilation, well equipped chairs and lighting facilities should be enriched so as to prevent stress, eye strain and head ache. The segregation and disposal of medical wastes within the department and hospital also should be performed properly and clearly so as to avoid radiographers from undergoing infections. All other departmental staffs should be instructed to follow proper system in receiving investigation report unless it is an emergency one in order to prevent the employees undergoing stress.

Limitations of the Study

The present research has confined to Tirunelveli city only and it has not focused entire district. The research has focused radiographers who have been qualified with DMRT (Diploma in medical radiographic technology) 1 year and 2 years courses and those who are working in private multi-speciality hospitals. It has not focused the radiographers who have done bachelor degree or master degree and those who are working in government hospitals, single speciality hospitals and diagnostic centres. The study has not focused any other occupational groups working in hospitals such as doctors, nurses, receptionists, medical laboratory technicians, pharmacists and so on. As a result of these limitations, it should be careful to extent the results of this research to other occupational groups and other districts.

Directions for Future Research

This study provides various directions for the future scholars to extend their view into the entire district. The future study can be undertaken with large samples and the radiographers who are qualified with bachelor and master degree in medical radiographic technology. More number of variables causing occupational hazards along with impact of occupational hazards can be studied. The future research can also be undertaken in the manner of comparative study i.e., occupational hazards of the radiographers can be compared with other paramedical and nonmedical employees.

Conclusion

This descriptive research undertaken in Tirunelveli city, Tamilnadu with the objectives of understanding perception of the radiographers working in private multi-speciality hospitals sampled 60 radiographers using judgement sampling technique. The results of the study proved that among the nine main variables analysed to understand the perception of the radiographers towards causes of occupational hazards, organization structure and policy, radiographer's specific and fear and safety were the foremost dimensions of causes of occupational hazards. Resources, workload and work shift and environment and hygiene were the next foremost dimensions of causes of occupational hazards. Interruption, patient and communication and training were the least dimensions of causes of occupational hazards. The results of the study also revealed that the level of perception of the radiographers towards these variables have been at medium level. In controlling and eliminating the occupational hazards associated with the occupation, both employees and employers should show equal interest and importance. Employees should attempt to develop knowledge about the causes of various hazards associated with their job and should learn how to overcome those hazards. Similarly, the employer should take necessary steps to prevent, control and eliminate the hazards by educating the employees

through training and health education and also enriching the facilities which are needed by the employees in order to enable them to work safely without hazards.

References

1. Adebola, F.A., and Owotade, F.J. (2004). Occupational Hazards among Clinical Dental Staff. *Journal of Contemporary Dental Practice*, 5, 134-52.
2. Ahmed, H.O., and Mark S. Newson Smith, (2010). Knowledge and Practices of Cement Workers Related to Occupational Hazard in United Arab Emirates. *J Egypt Public Health Assoc*, 85(3), 149-167.
3. Amosu, A.M., Degun, A.M., Atulomah, N.O.S., Olanrewju, M.F., and Adribigbe, K.A. (2011). The Level of Knowledge Regarding Occupational Hazards Among Nurses in Abeokuta, Ogun State, Nigeria. *Current Research Journal of Biological Sciences*, 3(6), 585-590.
4. Ashok, D. (2012). Occupational Hazards of Supportive Group of Women Employees in Health Care Units in Tamilnadu. *International Journal of Business and Management Tomorrow*, 2(7), 1-8.
5. Awosile, B., Oseni, O., and Omoshaba, E. (2013). Hazards Exposures of Workers of Animal Related Occupations in Abeokuta South Western, Nigeria. *Journal of Veterinary Advances*, 3(1), 9-19.
6. Boal, W.L., Leiss, J.K., Sousa, S., Lyden, J.T., Li, J., and Jagger, J. (2008). The National Study to Prevent Blood Exposure in Paramedics: Exposure Reporting. *American Journal of Industrial Medicine*, 51, 213-222.
7. Fasunloro Adebola and Foluso John Owotade, (2004). Occupational Hazards among Clinical Dental Staff. *The Journal of Contemporary Dental Practice*, 5(2), 1-10.
8. Gestal, J.J. (1987). Occupational hazards in hospitals: accidents, radiation, exposure to noxious chemicals, drug addiction and psychic problems and assault. *British Journal of Industrial Medicine*, 44(8), 510-520.
9. Gimeno, D., Felknor, S., Burau, K.D., Delclos, G.L. (2005). Organisational and Occupational Risk Factors Associated with Work Related Injuries among Public Hospital Employees in Costa Rica. *Occupational and Environmental Medicine*, 62(5), 337-343.
10. Haiduven, D.J., Simpkins, S.M., Phillips, E.S., and Stevens, D.A. (1999). A Survey of Percutaneous /Mucocutaneous Injury Reporting in a Public Teaching Hospital. *J Hosp Infect*, 41, 151-154.
11. Hamann, C., Werner, R.A., Franzblau, A., Rodgers, P.A., Siew, C., and Gruninger, S. (2001). Prevalence of Carpal Tunnel Syndrome and Median Mononeuropathy among Dentists. *J Am Dent Assoc*, 132, 163-70.
12. Javed Sadaf and Tehmina Yaqoob (2011). Gender Based Occupational Health Hazards among Paramedical Staff In Public Hospitals of Jhelum. *International Journal of Humanities and Social Science*, 1(3), 175-180.
13. Kripa, R.H., Sachdev, R., Mallure, M.L., Saiyed, H.N. (2005). Knowledge, Attitude and Practices Related to Occupational Health Problems among Salt Workers Working in the Desert of Rajasthan, India. *J Occup Health*, 47, 85-88.
14. Landsbergis, P.A. (1988). Occupational Stress among Health Care Workers: A Test of the Job Demands – Control Model. *Journal of Organizational Behaviour*, 9(3), 217-239.
15. Lehto, T.U., Helenius, H.Y., Alaranta, H.T. (1991). Musculoskeletal Symptoms of Dentists assessed by a Multidisciplinary Approach. *Community Dent Oral Epidemiol*, 19, 38-44.
16. Maier, K. (2009). What Are the Most Common Occupational Health Hazards, Retrieved on December 22, 2009, from <http://www.wisegeek.com/what-are-the-most-common-occupational-health-hazards.htm>.
17. Miller, D.J., and Shugars, D.A. (1987). The Health of the Dental Professional. *J Am Dent Assoc*, 114, 515-518.
18. Mittman, D.E., Cawley, J.F., and Fenn, W.H. (2002). Physician Assistants in the United States. *British Medical Journal*, 325(7362), 485-487.
19. Rajan, D. (2014a). Occupational Hazards among Medical Laboratory Technicians: A Comparative Study. *SIDDHANT*, 14(3), 189-208.
20. Rajan, D. (2014b). Occupational Hazards among Medical Laboratory Technicians. *SCMS Journal of Indian Management*, 11(1), 134-148.
21. Rajan, D. (2014c). Occupational Hazards and Health: A comparative study among medical laboratory technicians. *International Journal for Research in Applied Science and Engineering Research*, 2(7), 305-315.
22. Rajan, D. (2013). Awareness about Occupational Hazards: An Empirical Study. *Training and Development Journal*, 4(2), 162-168.
23. Rucker, L.M., and Sunell, S. (2002). Ergonomic Risk Factors Associated with Clinical Dentistry. *J Calif Dent Assoc*, 30, 139-48.
24. Sadleir, B. (2010, May 11). Environmental and Occupational Health Issues in Hospitals. Retrieved from: www.tropmed.org/rreh/vol1_2.htm.

25. Saldaria, M.A.M., Susana, G.H., Javier, G.R., and Dale, R. (2012). The Impact of Occupational Hazard Information on Employee Health and Safety: An Analysis by Professional Sectors in Spain. *International Electronic Journal of Health Education*, 15, 83-98.
26. Verbrugge, L.M. (1985). Gender and Health: An Update on Hypotheses and Evidence. *Journal of Health and Social Behavior*, 26(3), 156-182.
27. World Health Organization (1946). WHO definition of Health. (WHO Publication No.2, p. 100). New York, WHO Press.
28. World Health Organization (2009). Women and Health Today's Evidence Tomorrow's Agenda. Switzerland – WHO Press.
29. World Health Organization (1946). WHO definition of Health. (WHO Publication No.2, p. 100). New York, WHO. Retrieved from: <http://www.who.int/about/definition/en/print.html>.
30. Yassin, M.M., Abu Mourad, T.A., and Sali, J.M. (2002). Knowledge, Attitude, Practice and Toxicity Symptoms Associated with Pesticide Use among Farm Workers in The Gaza Strip. *Occup Environ Med.*, 59, 387-94.