

A Study to Assess the Knowledge of Staff Nurses Regarding Biomedical Waste Management in Government Medical College Srinagar and its Associated Hospitals

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ABSTRACT

Hospital is a place, which is frequently accessed by the people irrespective of age, sex, caste, religion, region and even nationality. The main aim of the hospital is to reduce health problems, eliminate potential risk, treat sick people. The healthcare service unavoidably produce waste which itself are hazardous to health. As the nurses spend maximum time in the health care settings than any other member of the health team, it increases their exposure and risk to the hazards present in the hospital environment. Keeping this in mind the following study was undertaken. Problem statement: A Study to assess the knowledge of staff nurses about biomedical waste management in GMC Srinagar & Its Associated Hospitals. Objectives: 1) To assess the knowledge of staff nurses regarding biomedical waste management. 2) To compare the level of knowledge of staff nurses working in GMC Srinagar and its associated hospitals. Method: A descriptive design was used for the study. A sample of 120 staff nurses who were working in GMC Srinagar and its associated hospitals were selected by using purposive sampling technique. Results: The findings revealed that 60% belonged to age group of (20-30), 21% belonged to (31-40), 14% belonged to (41-50), and 5% belonged to above 51 age group. The study revealed that majority of the respondents (88%) were females and only 12% were males; half of the Respondents were having senior secondary as their educational qualification (52%), 1/4th of the respondents were having secondary as their educational qualification, only 4% were post graduates. The study depicted that 50% of the respondents have GNM qualification, 31% are graduate, 14% have MPH diploma and 5% have post basic nursing professional qualification. Regarding the experience, the study depicted that 88% of respondents have 0-10 years of experience, 9% have 11-20 years experience; only 3% have 21-30 years experience. The study also revealed that only 11% respondents have attended in-service Programme on BMW and majority of the respondents i.e. 89% have not attended any in-Service programme on BMW. Most of the respondents (87%) have average knowledge while as 8% have good knowledge and 5% have poor level of knowledge. Conclusion: While concluding this research it was found that the nurses working in the GMC and its associated hospitals have average level of knowledge. The mean score obtained by the Nurse working in: SMHS =13.975, LD HOSPITAL =15.45, BONE AND JOINT HOSPITAL= 15.97. Thus, while comparing the knowledge level of Nurses working in GMC and Associated Hospitals; it was found that Nurses working in bones and joints hospital has highest knowledge level followed by LD hospital and then SMHS hospital.

Keywords: biomedical waste management, occupational, hazards waste segregation, HIV

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INTRODUCTION

“Let the wastes of the sick not contaminate the lives of the others.” [1] Hospital is a place, which is frequently accessed by the people irrespective of age, sex, caste, religion, region and even nationality. The main aim of the hospital is to reduce health problems, eliminate potential risk, and treat sick people. The healthcare service unavoidably produce waste which itself are hazardous to health [2].

Waste can be well-defined as any unwanted residual matter arising from the hospital or activities related to the hospital. The biomedical waste is defined as the waste generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining there to or in the production or testing of biological including categories mentioned in the schedule-I of Biomedical Waste (Management and Handling) Rules 1998, Government of India [3]. This hospital solid waste can be classified mainly into 10 main categories; general wastes, pathological wastes, radioactive wastes, chemical wastes, infectious and potentially infectious wastes, sharps, pharmaceutical waste and pressurised containers [2]. The biomedical waste generated during entire course of healthcare activities is special in terms of its composition, quantity and their potential hazardous effect as compared to waste of other places, which involve special attentiveness for its management [4]. Hospital wastes, because of their infectious nature, are one of the most dangerous causes of pollution (SED). Hospital waste is potentially dangerous, since it may possess pathogenic agent. Some of the pathogenic organisms are more dangerous, because they may be resistant to treatment and possess high pathogenicity. Inadequate handling of the biomedical waste is more likely to cause problems such as blood borne pathogens to

the groups at highest risk, namely health care staff, scavengers and municipal workers (from needle sticks for example).

Bio medical waste management refers to systematic and scientific way of managing the healthcare waste through a step-by-step process such as segregation, storage, transportation, and disposal. It was observed that health system of developing countries like India is dysfunctional and it is a sad truth. Average quantity of hospital solid waste produced in Indian hospitals have been assessed by various workers and varied from 1 Kg/day/bed to 2.2 Kg/day/bed. In USA this quantity was found to be above 4 Kg/bed/day and has been attributed mainly to increase in use of disposables.

The improper management of biomedical waste poses significant hazardous risk to the patients, healthcare workers, the community and environments (WHO, 2007). The inappropriate healthcare waste management caused 21 million hepatitis B virus (HBV) infections (32% of all new infections); 2 million hepatitis C virus (HCV) infections (40% of all new cases); 260,000 HIV infections (5% of all new cases) in 2000. Epidemiological studies specify that a person who practices one needle stick wound from a needle cast-off on a diseased source patient has dangers of 30%, 1.8%, and 0.3% respectively of becoming infected with HBV, HCV and HIV [5]. Hospital-acquired infections have been probably at 10% of all fatal/life-threatening diseases in the South-East Asia region and have been identified as one of the indicators for the management of waste. Alarming, the World Health Organization (WHO) reported a 50% re-use in India of syringes and needles that are meant for single use. WHO estimated that 80% of the total healthcare waste is not infectious and only 20% is infectious

or poses risk of injury and is hazardous to human beings (WHO 2005) [6].

Health department finds waste disposal improper in Kashmir hospitals and planning to construct modern waste treatment facilities. Director health of J&K government is planning to construct biomedical treatment facilities at hospitals in Kashmir after a survey found the waste there, lifted by a private company, Is not disposed properly GK [7]. Indian newspapers and magazines have reported that the re-use of disposable syringes, catheters, bags, drugs, vials and bottles throwing highly infected hospital and human parts in municipal dustbins or landfill site, air pollution due to incinerators used for burning of hospital waste including plastic waste dumped in residential areas pose disease threat to the community and waste handlers. To avoid bad name to the hospital and medical profession many measures need to be undertaken. As per Jammu and Kashmir

state pollution control board the waste generated Government Medical College associated hospitals are about 2kg/bed/day. Thus, the safe collection, segregation and disposal is essential to make hospital a place where patients and health care givers will get no harm WASEEM [8].

Aim of the Study

The aim of the study is to assess the knowledge of staff nurses about biomedical waste management in GMC & its associated hospitals

Objectives

- (1) To assess the knowledge of staff nurses regarding biomedical waste management.
- (2) To compare the level of knowledge of staff nurses working in GMC Srinagar and its associated hospitals.

STEPS OF METHODOLOGY

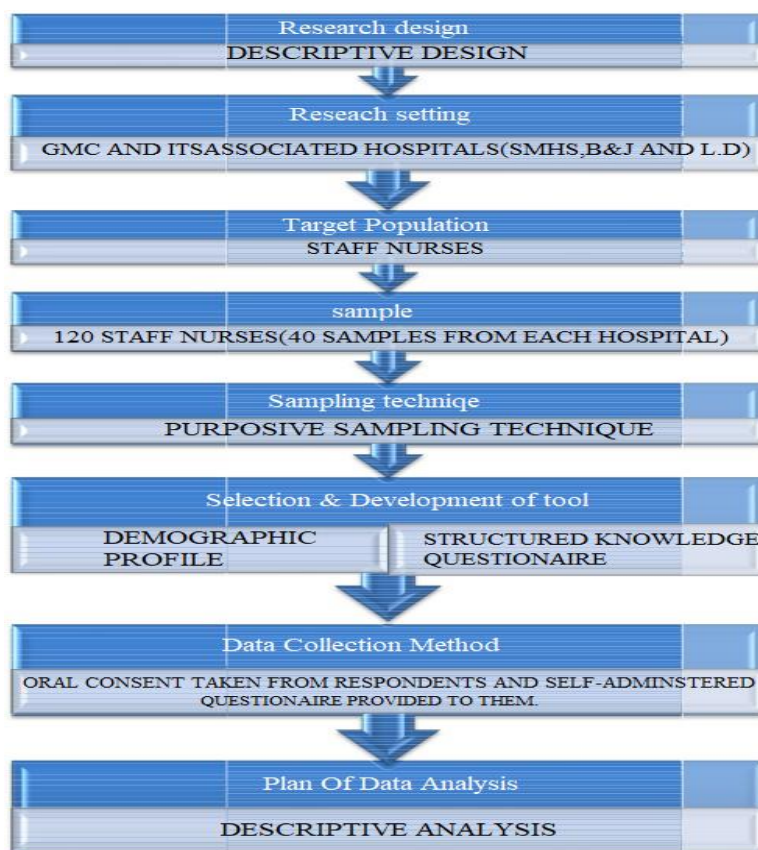


Fig. 1. Various steps showing Methodology.

The methodology aims at helping the researcher to answer the research questions effectively, accurately and economically with strong scientific Background [8]. This chapter deals with the description of research methodology and the different steps undertaken for gathering and organizing the data for investigation. It includes the following steps [9] (given in Figure 1).

- Research design
- Research setting
- Target population
- sampling technique and Sample size
- Inclusion criteria
- Exclusion criteria
- Selection and development of tool
- Description of the tool
- Validity of the tool
- Data collection method
- Ethical consideration
- Plan of data analysis Research design

The present study was to assess the knowledge of staff nurses regarding biomedical waste management in GMC and associated hospitals. Hence in the view of the nature of the research problem selected for the study, the descriptive research design was selected.

Research Setting

The study was conducted in selected GMC, Srinagar and associated hospitals.

- (1) Shri Maharaja Hari Singh Hospital Karan Nagar Srinagar (S.M.H.S. Hospital)
- (2) Lal Ded Hospital Wazir Bagh Srinagar (L.D. Hospital)
- (3) Bone and joint hospital Barzulla Srinagar.

Target Population

The target population of the present study consisted of staff nurses working in GMC and associated Hospitals.

Variables

- Independent Variables: Socio demographic status
- Dependent Variables: Knowledge of staff nurses Sampling technique and Sample size
- The sampling technique used was purposive sampling. The 120 staff Nurses were selected from the mentioned GMC and associated Hospitals (40 samples from each Hospital).

Inclusion criteria

- Male as well as female staff nurses were included.
- Staff nurses who were willing to participate in the research study were included.

Exclusion criteria

- Staff Nurses who were not available during data collection period. Selection and Development of the tool. The tool was developed after thorough review of literature on the relevant topic and after discussion with our guide and experts.

Selection of tool

- Demographic status
- Structured knowledge questionnaire was prepared to assess the knowledge of staff nurses regarding biomedical waste management in selected hospitals.

Description of Tool

The tool for data collection consisted of two sections:

Section 1: Demographic data

- (1) Age (in years)
- (2) Sex
- (3) Educational qualification
- (4) Professional qualification
- (5) Duration of work in the present hospital

- (6) Attended any in service education program on biomedical waste management (yes /no).

Objectives

- (1) To assess the knowledge of staff nurses regarding biomedical waste Management.
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Section 2: Structured Knowledge Questionnaire

It consisted of 28 questions which covered following areas of biomedical waste management. Each correct answer was given 1 score and wrong answer was given 0 score. The questionnaire included following areas of BMW management:

- Segregation
- Collection
- Composition
- Color coding
- Disposal
- Risks and
- Diseases associated with unsafe handling

Maximum score: 28

Minimum score: 0

Knowledge Score

Good 20–28

Average 10–19

Poor 0–9

Validity of the tool

Permission was given by the principal GMC, Srinagar (Dr. Rafiq Pampori) and was forwarded to Medical Superintendents of S.M.H.S., L.D. and Bone and Joint Hospitals; with letter no. PA/AAH/012/09. The prepared tool was sent to 6 experts for the establishment of content validity. The suggestions of the experts were incorporated into the tool and further modified with the consultation of the guide. The experts were from the nursing department of the AMT School Srinagar and other being the MS, SMHS hospital.

Data collection method

After getting the permission from the concerned authority, data was collected from the three selected hospitals. The investigators personally visited the staff nurses of the selected hospitals. The purpose of the study was explained to the subjects and oral informed consent was obtained from them. The study was conducted during:

Month: 02-12-2013 to 10-01-2014

Time: 2:00pm to 4:00pm

Days: Monday–Saturdays

Ethical consideration

The staff nurses were assured for the confidentiality. Anonymity of subjects and confidentiality of information was maintained. It was ensured that the study would not harm the participants in any way.

Plan of data analysis

The data was analyzed by using descriptive statistics. The analysis is related to the “categorizing, ordering, manipulating and summarizing of the data to reduce it to a tangible and interpretable form, so that research problem can be studied and tested including the relationship between the variables” [10]. This article deals with the descriptive analysis and interpretation of the data collected from respondents in Government Medical College and Its Associated Hospital, Srinagar.

Table 1. Frequency and percentage distribution of respondents as per the age ($n=120$).

Age (years)	Frequency	%
20–30	72	60
31–40	25	21
41–50	17	14
Above 51	6	5

Table 1 shows that the findings revealed that 60% belonged to age group of (20–30), 21% belonged to (31–40), 14%

belonged to (41–50), and 5% belonged to above 51 age group.

Table 2. Frequency and percentage distribution of respondents as per the sex. (n= 120)

Sex	Frequency	%
Male	14	12
Female	106	88

Table 2 reveals that majority of the respondents (88%) were females. So, this shows that nursing is a female dominated profession.

Table 3. Frequency and percentage distribution of respondents as per the educational qualification. (n= 120)

Educational qualification	Frequency	%
Middle	6	5
Secondary	27	22
S. Secondary	62	52
Graduate	21	17
P. Graduate	04	4

Table 3 depicts that the half of the respondents were having senior secondary as their educational qualification (52%), 1/4th of the respondents were having secondary as their educational qualification. Only 4% were post graduates. So it reflects that higher education people do not Opt. nursing as their carrier.

Table 4. Frequency and percentage distribution of the respondents as per the professional qualification. (n=20)

Professional Qualification	Frequency	%
MPHW	17	14
GNM	60	50
B.sc Nursing	37	31
Post basic	06	5

Table 4 depicts that 50% of the respondents have GNM qualification, 31% are graduate, 14% have MPHW diploma and 5% have post basic nursing

professional qualification. So it reflects that the majority nursing professionals have professional qualification.

Table 5. Frequency and percentage distribution of respondents as per their duration of work in present hospital (years).

Duration of work in present hospital(years)	Frequency	%
0–10	106	88
11–20	11	9
21–30	03	3

Table 5 depicts that 88% of respondents have 0–10 years of experience, 9% have 11–20 years of experience; only 3% have 21–30 years experience. So it represents that most of the nursing professionals have poor experience.

Table 6. Frequency and percentage distribution of respondents showing the in-service programme attended on Bio-medical waste management. (n=120)

In-service programme attended on BMW management	Frequency	%
Yes	13	11
No	107	89

Table 6 depicts that only 11% respondents have attended in-service programme on BMW and majority of the respondents' i.e. 89% have not attended any in-service programme on BMW. This reflects the need for the intensification of staff development programmes.

Table 7. Frequency and percentage distribution table showing level of knowledge of respondents about Bio-medical waste management.

Level of knowledge	Frequency	%
Good	10	8
Average	104	87
Poor	6	5

Table 7 depicts the level of knowledge of the respondents regarding BMW

management. Most of the respondents (87%) have average knowledge while as **Table 8.** mean and range of knowledge of respondents regarding Bio- medical waste management in GMC, Srinagar and associated hospitals. (n=120)

Level of Knowledge	Scores	Range	Mean
Good	(20–28)		
Average	(10–19)	(6–23)	15.13
Poor	(0–09)		

Table 8 depicts that the mean and range of the knowledge of the respondents regarding biomedical waste management in GMC, Srinagar and associated hospitals is 15.13 and (6–23) respectively.

Table 9. Table showing mean, median, mode and range of knowledge of respondents regarding Bio-medical waste management in SMHS Hospital. (n=40)

Level of Knowledge	Scores	Range	Mean	Median	Mode
Good	(20–28)				
Average	(10–19)	(6–22)	13.975	14	14
Poor	(0–09)				

Table 9 represents that level of knowledge of the respondents of SMHS hospital is average as depicted by range, mean, mode and median.

Table 10. Table showing mean, median, mode and range of knowledge of respondents regarding Bio-medical waste management in Bone & Joint Hospital. (n=40)

Level of Knowledge	Scores	Range	Mean	Median	Mode
Good	(20–28)				
Average	(10–19)	(10–23)	15.97	16	16
Poor	(0–09)				

8% have good knowledge and 5% have poor level of knowledge.

Table 10 represents that the level of knowledge of respondents is average as depicted by range, mean, mode and median.

Table 11. Table showing mean, median, mode and range of knowledge of respondents regarding Bio-medical waste management in LD HOSPITAL. (n=40)

Level of Knowledge	Scores	Range	Mean	Median	Mode
Good	(20–28)				
Average	(10–19)	(8–22)	15.45	15	15
Poor	(0–09)				

Table 11 represents that the level of knowledge of respondents is average as depicted by range, mean, mode and median.

Table 12. Frequency distribution table showing number of correct respondents against class intervals.

Class Interval (Scores)	Frequency
0–5	0
5–10	9
10–15	57
15–20	49
20–25	5
25–30	0

Table 12 depicts that 57 respondents answered 10–15 questions, 49 respondents answered 15–20, while 9 of them answered 5–10, and only 5 respondents answered 20–25 questions. This table also representative of the average knowledge level of the respondents.

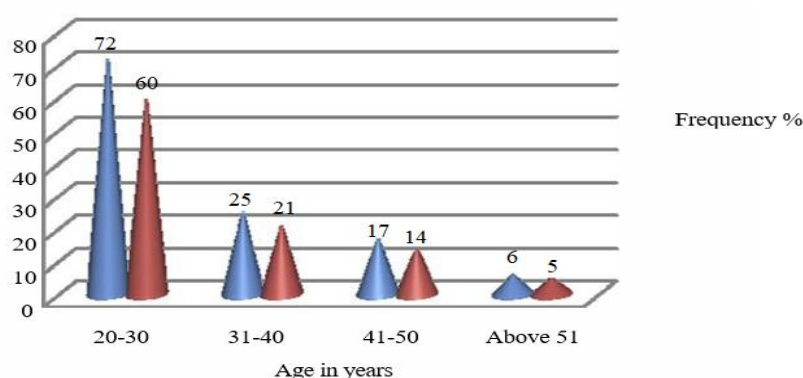


Fig. 2. Cone diagram showing distribution of respondents as per age.

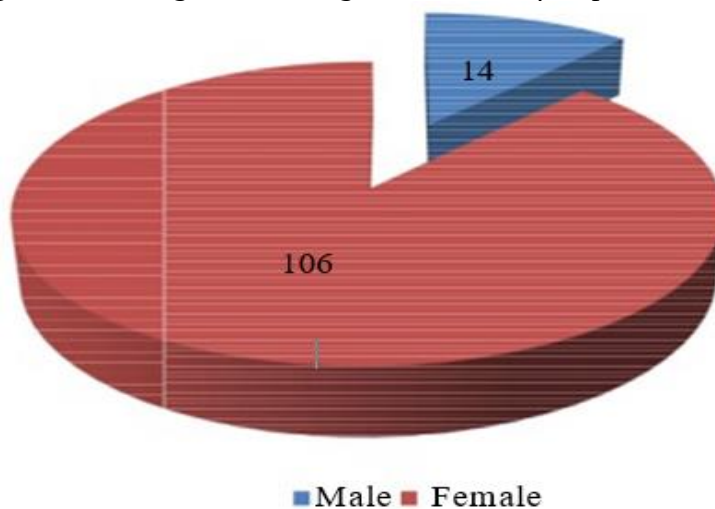


Fig. 3. Pie chart showing the sex of the respondent.

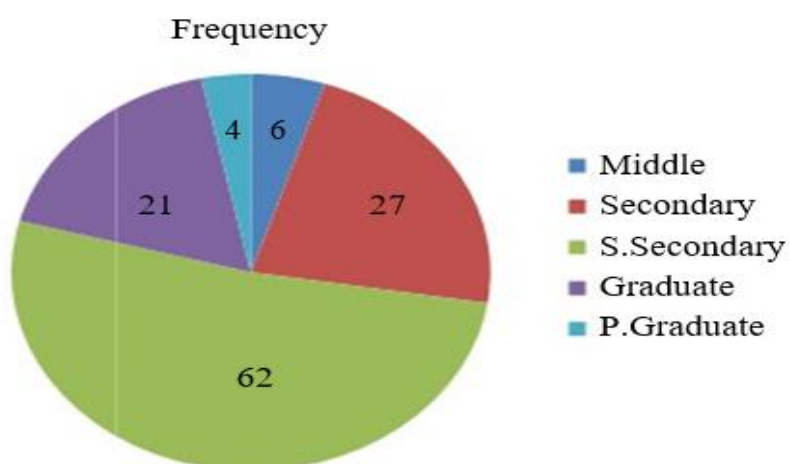


Fig. 4. Diagram showing the educational qualification of the staff nurses.

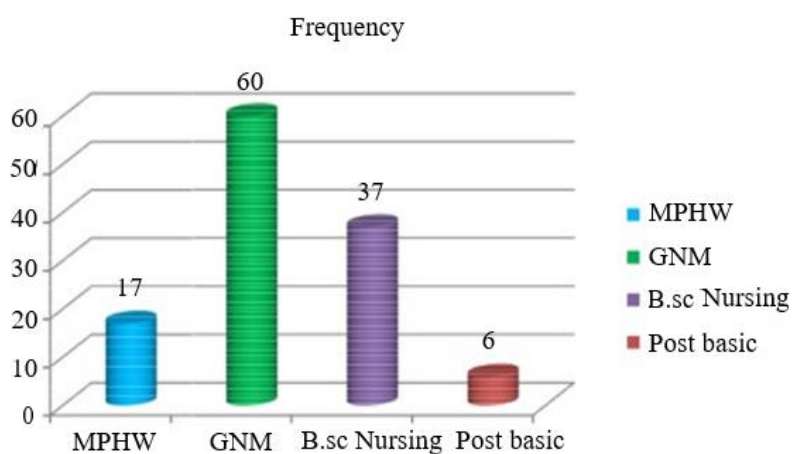


Fig. 5. Professional qualification of the respondents.

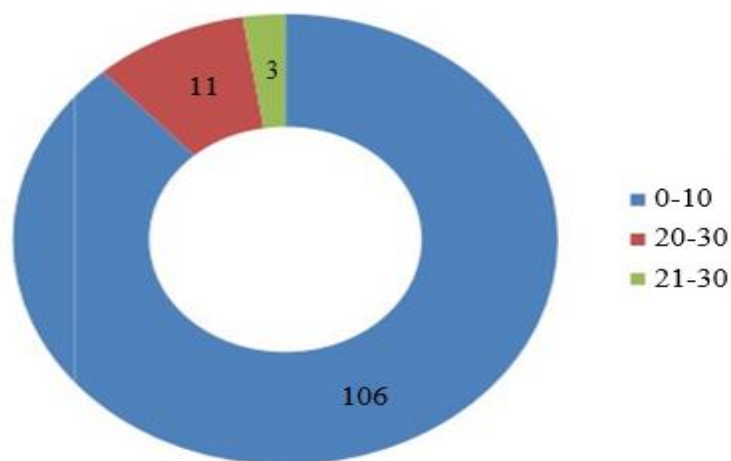


Fig. 6. The working experience of respondents.

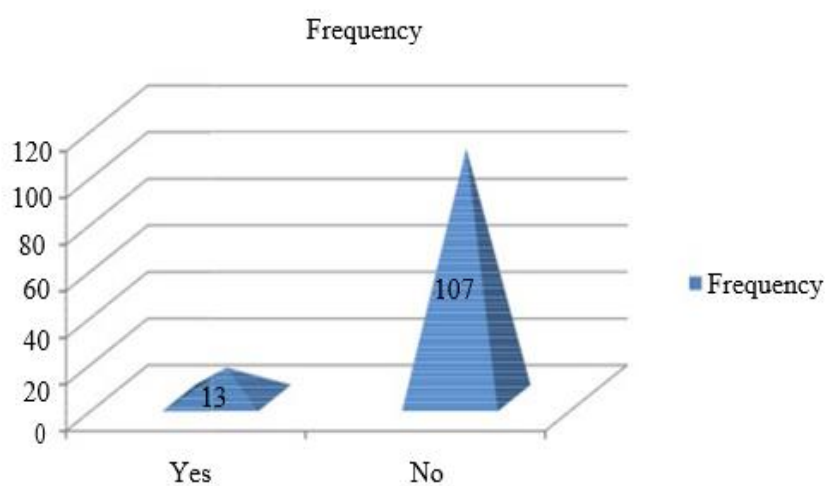


Fig. 7. Frequency of in-service programs attended by respondents.

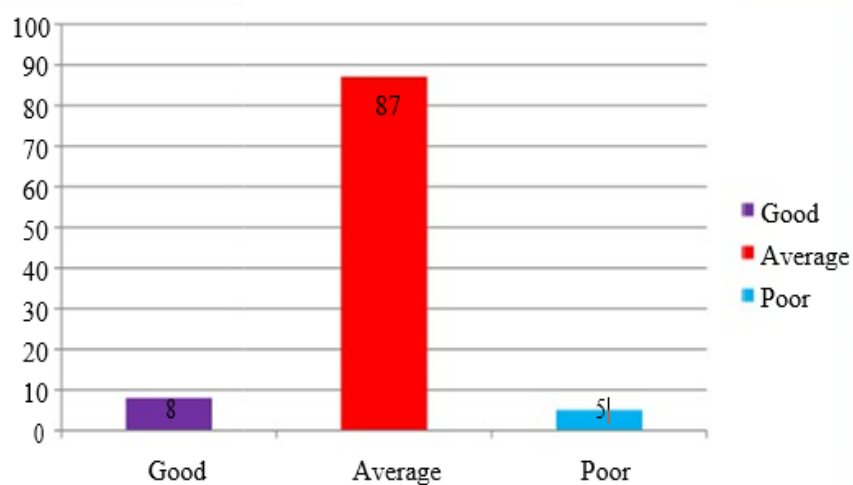


Fig. 8. BAR-Diagram showing level of knowledge of respondents regarding BMWM.

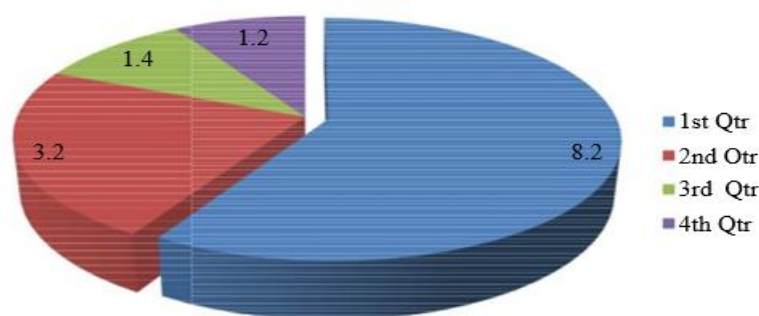


Fig. 9. Pie chart showing correct respondents against class intervals.

RESULTS

Figure 2 to figure 9 revealed the findings that the 60% belonged to age group of (20–30), 21% belonged to (31– 40), 14% belonged to (41–50), and 5% belonged to above 51 age group. The study revealed that majority of the respondents (88%) were females and only 12% were males; half of the Respondents were having senior secondary as their educational qualification (52%), 1/4th of the respondents were having secondary as their educational qualification, Only 4% were post graduates. The study depicted that 50% of the respondents have GNM qualification, 31% are graduate, 14% have MPHWH diploma and 5% have post basic nursing professional qualification. Regarding the experience, the study depicted that 88% of respondents have 0–10 years of experience, 9% have 11–20 years experience; only 3% have 21–30 years of experience. The study also revealed that only 11% respondents have attended in-service Programme on BMW and majority of the respondents i.e. 89% have not attended any in-service programme on BMW. Most of the respondents (87%) have average knowledge while as 8% have good knowledge and 5% have poor level of knowledge.

CONCLUSION

While concluding this research it was found that the nurses working in the GMC and its associated hospitals have average

level of knowledge. The mean score obtained by the Nurse working in: SMHS =13.975, LD HOSPITAL =15.45, BONE AND JOINT HOSPITAL= 15.97.

Thus while comparing the knowledge level of Nurses working in GMC and Associated Hospitals; it was found that Nurses working in B&J hospital has highest knowledge level followed by LD hospital and then SMHS hospital.

RECOMMENDATIONS

- After the completion of this research project, we came to the point that there is a need for intensive training programs at regular time interval to repeatedly train and re-train all the staff with special importance to the new comers and to periodically acquaint them with updated BMW management.
- There is also a need for orientation programs for the new comers to understand the hospital function and the proper collection and transport of hospital waste. □ The study recommends that strict supervision and surveillance should be followed in day-to-day hospital waste management activities.

SUMMARY AND CONCLUSION

- The study recommends that the concerned administration should support the strict and proper implementation of efficient and

effective biomedical waste management.

- The study recommends recognition and allotment of incentives as reinforcement to
- The healthcare workers with outstanding performance in biomedical waste management.
- The study also recommends that the 3 bin system still used in the hospitals to be completely replaced by the 4 bin system. Further an awareness programmes should be started to impart education to relatives/attendants about proper disposal of hospital waste.
- The study recommends that each hospital should have a dedicated committee on biomedical waste management that will hold meetings with health care workers supervise them, train them and redress their problems while handling biomedical waste.

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