

**BIOMEDICAL WASTE MANAGEMENT: A QUESTIONNAIRE STUDY ON ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES AMONG HEALTH CARE PROFESSIONALS IN ORANGE CITY HOSPITAL & RESEARCH INSTITUTE, NAGPUR.****Dr. Ramakrishna Shenoi¹, Dr. Jignesh Rajguru², Dr. Anup Marar³**¹Professor & Head, Department of Oral & Maxillofacial Surgery, V.S.P.M Dental College & Research Centre, Nagpur²Junior Resident, Department of Oral & Maxillofacial Surgery, V.S.P.M Dental College & Research Centre, Nagpur³Medical Director, Orange City Hospital & Research Institute, Nagpur.**Article Info:** Received 15 December 2019; Accepted 10 January, 2020**DOI:** <https://doi.org/10.32553/jbpr.v9i1.702>**Address for Correspondence:** Dr. Jignesh Rajguru**Conflict of interest statement:** No conflict of interest**ABSTRACT:**

Health care waste is a unique category of waste by the source of generation, the quality of its composition, its hazardous nature and the need for appropriate protection during handling, treatment and disposal. Little knowledge and inappropriate technique of handling of biomedical waste can lead to serious consequences on health of the individual handling the bio-medical waste, the community and environment. Biomedical waste management begins with sequential efforts from the early stage of waste generation, segregation at the source itself, storage at the site, disinfection and transfer to the terminal disposal site safely. A questionnaire study was conducted in a tertiary care hospital in Nagpur, India to assess the current knowledge, attitude and practices regarding Bio-medical waste management.

INTRODUCTION

Health care waste is a unique category of waste by the source of generation, the quality of its composition, its hazardous nature and the need for appropriate protection during handling, treatment and disposal.^[1] 'Bio-medical waste' (BMW) means any solid and/or liquid waste including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research pertaining thereto or in the production or testing thereof.^[2]

According to Biomedical Waste (Management and Handling) Rules^[3], 2016 of India, 'biomedical waste' is defined as "Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals or in health camps."

Health care waste comprises of human tissues, Blood soaked dressings, catheters, bottles, intravenous tubes, urine bags, other body fluids, discarded drugs and medicines, contaminated dressings and sharps such as needles, glass, blades. India approximately generates Bio-medical wastes approximately 2 kg/ bed/ day^[4]

Little knowledge and inappropriate technique of handling of biomedical waste can lead to serious consequences on health of the individual handling the bio-medical waste, the community and environment. Improper handling and inappropriate technique of managing waste leads to various infections like Tetanus, Hepatitis B & C, Acquired Immune Deficiency Syndrome (AIDS). Therefore, Segregation at its initial stage, storage and regular safe disposal of the waste are the key to the effective management of biomedical waste in hospitals.^[5]

Biomedical waste management begins with sequential efforts from the early stage of waste generation, segregation at the source itself, storage at the site, disinfection and transfer to the terminal disposal site safely. The various studies pertaining to Bio-medical waste management documented in the literature convey the gap in the knowledge among the health care professionals and inconsistency in practices among health care workers.^[6]

With this rationale, a questionnaire study was conducted in a tertiary care hospital to assess the current knowledge, attitude and practices regarding Bio-medical waste management.

Methodology

A Questionnaire study was conducted in a Tertiary care teaching hospital. Staff working in the different departments of the hospital who gave consent to be a part of this study were included.

Ethical approval: The study was conducted in Orange City Hospital, Nagpur after obtaining clearance from the Institute Ethics Committee.

Materials and Methods

The study included a closed ended questionnaire which comprised of 20 questions on Knowledge, Attitudes and Practices.

The questions on knowledge assessed the participant's knowledge on attributes related to the colour coding and their implications, various waste categories, segregation of wastes and hospital policies for biomedical waste management.

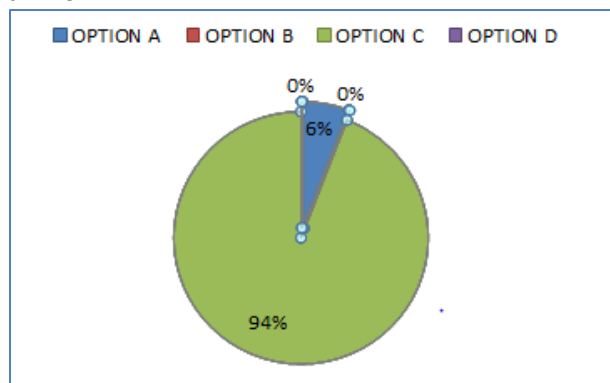
The questions on attitude pertained if management of BMW is an additional burden on health care professionals or burden on the finances of the hospital.

The questions on practice appraised if they were immunized against hepatitis B and if disinfection of sharps were carried out at the point of generation.

QUESTIONNAIRE

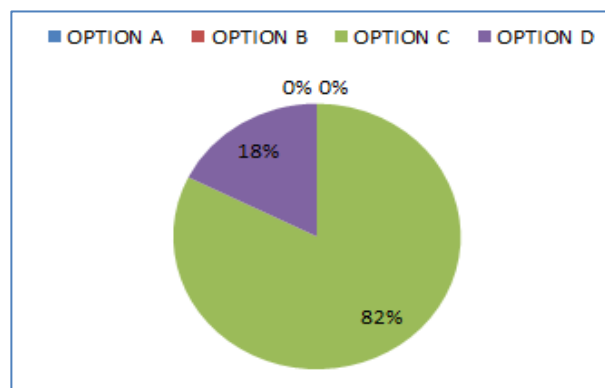
1. How many color coding containers are available for biomedical waste collection?

- 2
- 3
- 4
- 5



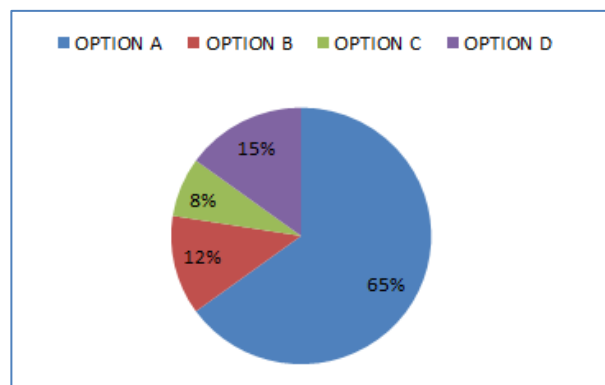
2. Which of the following is color coding for containers?

- Yellow, red, black & pink
- Pink, yellow, red & blue
- Yellow, red, black & blue
- Yellow, red, blue & pink



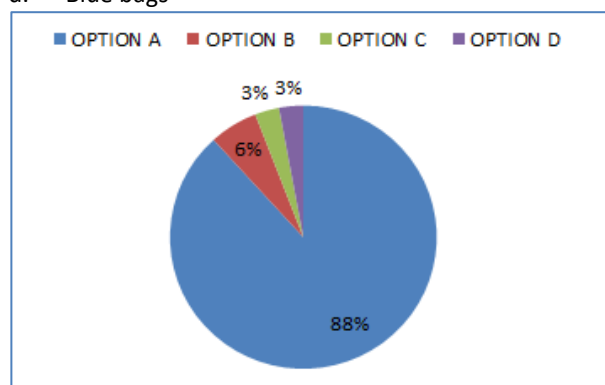
3. As per BMW rules waste should not be stored beyond?

- 24 hours
- 48 hours
- 72 hours
- 96 hours



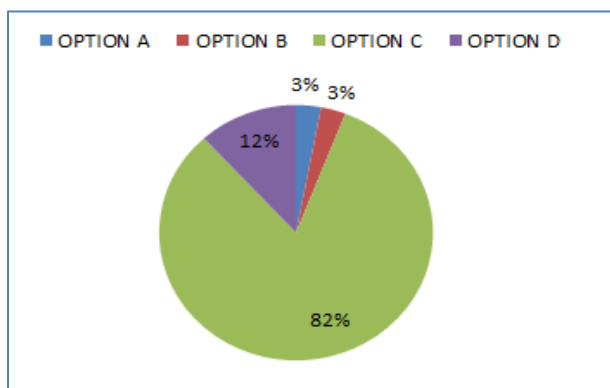
4. Bandages, gauzes and Cotton are disposed in :

- Yellow bags
- Red bags
- Black bags
- Blue bags

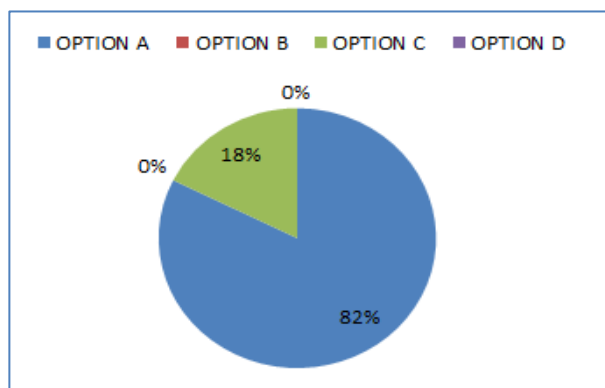


5. Catheters, syringes and Injections are disposed in:

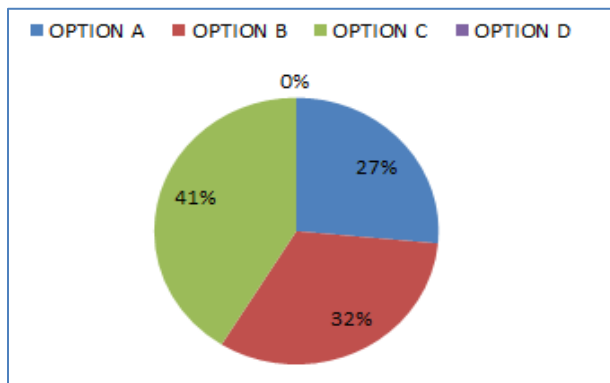
- Yellow bags
- Red bags
- Black bags
- Blue bags



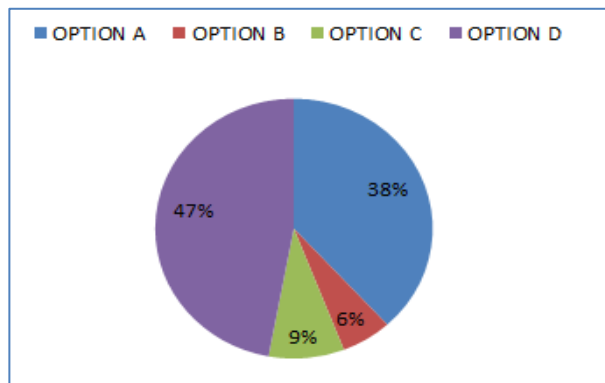
6. What materials are disposed in blue bags?
- Glass bottles
 - Sharp wastes
 - Both a & b
 - None of the above



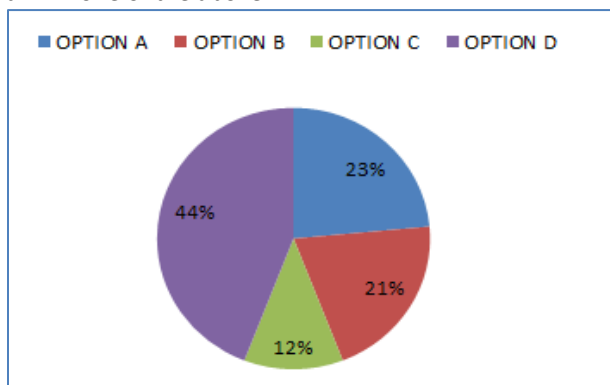
9. Segregation of hospital waste takes place at ?
- Operating room
 - Outpatient department
 - Laboratory
 - All of the above



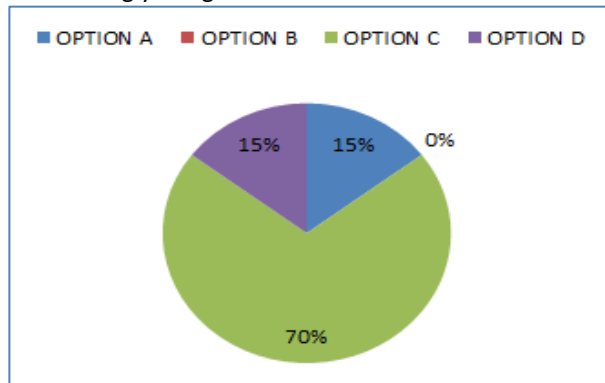
7. What materials are disposed in black bags?
- Discarded medicines
 - Cytotoxic wastes
 - Both a & b
 - None of the above



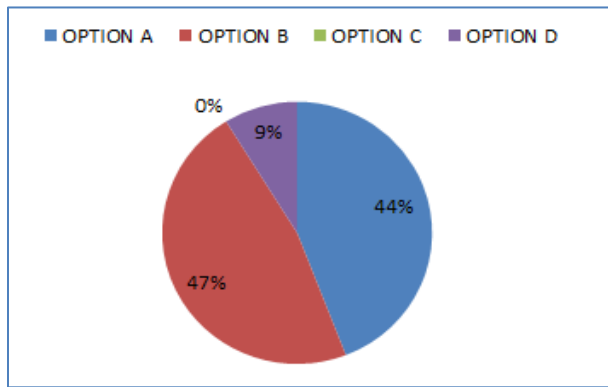
10. Safe management of health care waste is not an issue at all:
- Strongly agree
 - Agree
 - Disagree
 - Strongly disagree



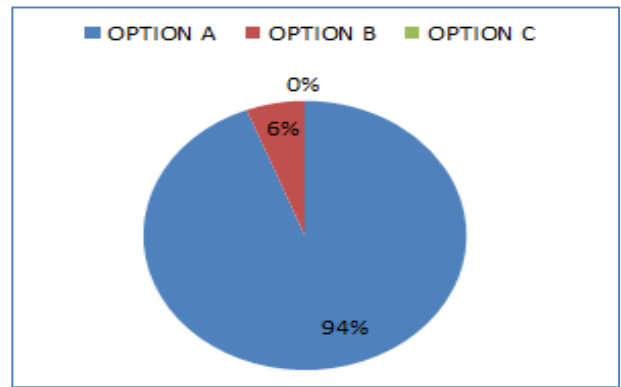
8. To whom do you report the needle injury ?
- Infection control doctor
 - Head of the department
 - Medical superintendent
 - Medical officer



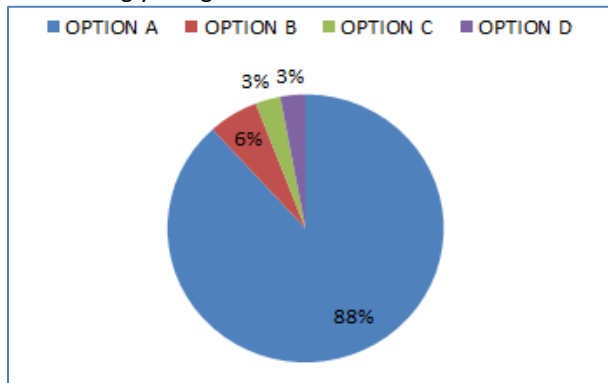
11. Waste management is a team work/ no single class of people is responsible for safe management.
- Strongly agree
 - Agree
 - Disagree
 - Strongly disagree



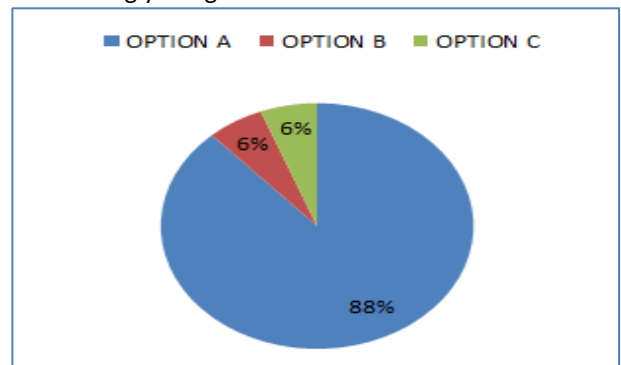
12. Is needle prick injury a concern?
 a. Strongly agree
 b. Agree
 c. Disagree
 d. Strongly disagree



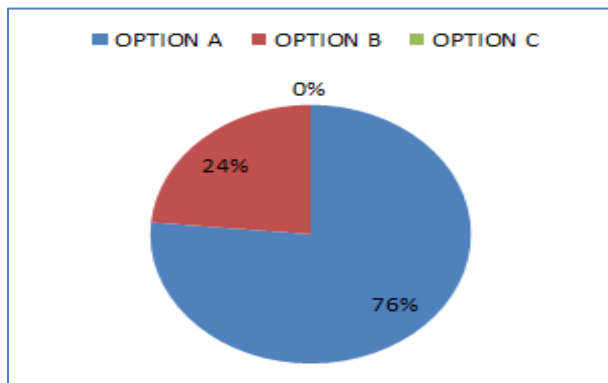
15. Knowledge up-gradation programs are required to enhance knowledge on biomedical waste management.
 a. Strongly agree
 b. Agree
 c. Disagree
 d. Strongly disagree



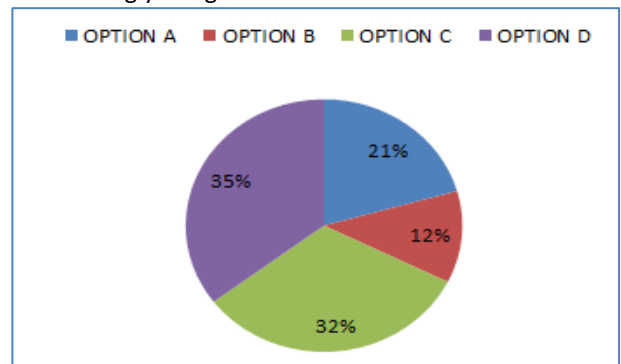
13. Do you discard the used needle immediately?
 a. Always
 b. Sometimes
 c. Never



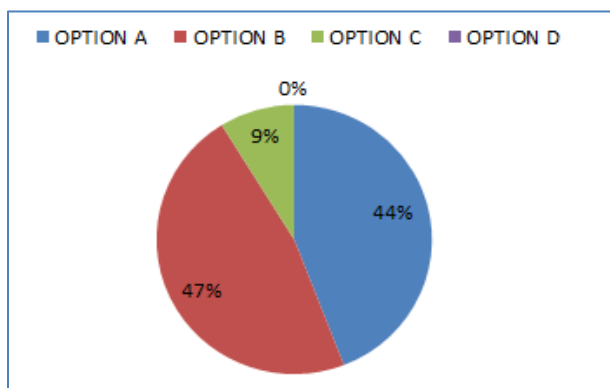
16. Safe management of health care waste is an extra burden of work :
 a. Strongly agree
 b. Agree
 c. Disagree
 d. Strongly disagree



14. Do you recap the used needle ?
 a. Always
 b. Sometimes
 c. Never

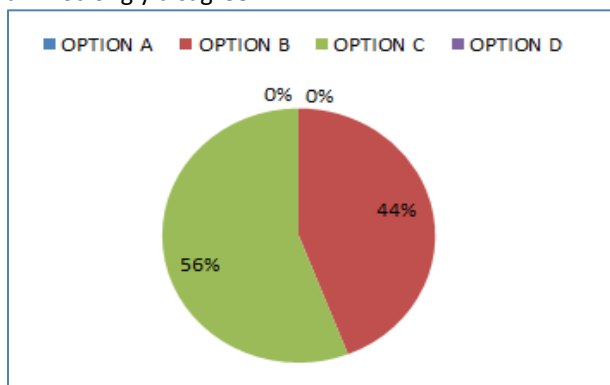


17. Infectious waste should be sterilized from infection by autoclaving before shedding and disposal:
 a. Strongly agree
 b. Agree
 c. Disagree
 d. Strongly disagree



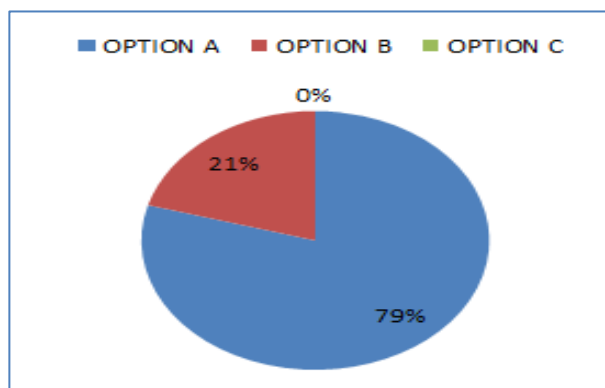
18. Safe management by hospital increases the financial burden on management:

- a. Strongly agree
- b. Agree
- c. Disagree
- d. Strongly disagree



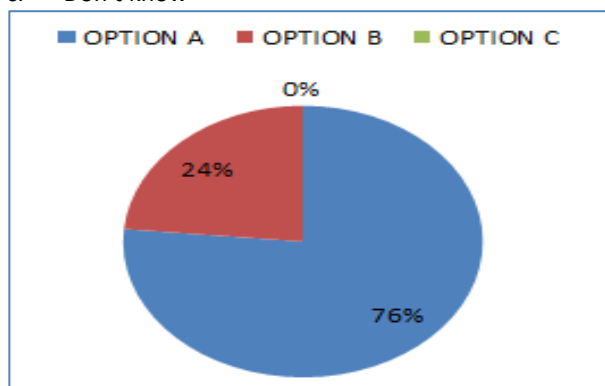
19. Do you think labeling the container before filling it with waste is of any clinical significance?

- a. Yes
- b. No
- c. Don't know



20. Have you been fully vaccinated for Hepatitis-B?

- a. Yes
- b. No
- c. Don't know



Discussion:

Segregation plays an important role in control of biomedical waste management.^[7] The waste is segregated according to different color coding system of waste containers which is given in Figure 1:

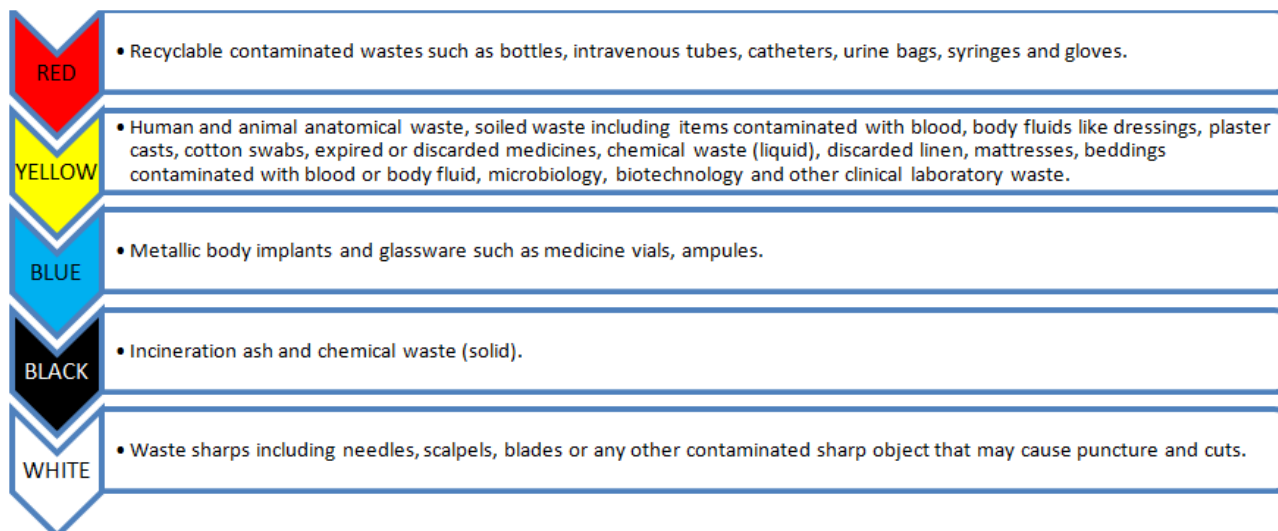


Figure 1: Color coding system for Biomedical waste management.

Interpretation of question 1 and 2 suggests that 94% and 82% of the study respondents answered correctly which shows good knowledge about the color coding system among the doctors.

Interpretation of question 3 suggests that maximum number of study respondents that is 65% marked option A as their answer while only 12% were able to identify the right answer. From the above question, we can infer that there is lack of knowledge regarding the storage period of bio-medical waste management.

Interpretation of question 4 & 5 demonstrates good knowledge among the study respondents regarding color coding and different waste materials while interpretation of question 6 & 7 suggests inadequate knowledge regarding the blue and black color coding of bio-medical waste management.

Interpretation of question 8 suggests that 82% of study respondents would report to infection control doctor which is the right answer. Interpretation of question 9 suggests that only 47% of study respondents knew that bio-medical waste management begins right from its inception. 38% marked their answer as operating room.

Interpretation of question 10 suggests that 70% of study respondents marked option C as their answer while interpretation of question 11 suggests that 44% strongly agreed for bio-medical waste management being a team work.

Interpretation of question 12 suggests that 88% of study respondents strongly agreed to needle stick injury being a concern. Interpretation of question 13 suggests 76% of study respondents discard the used needle immediately while interpretation of question 14 suggests that 94% of study respondents recap the used needle always.

Interpretation of question 15 suggests that 88% think Knowledge up-gradation programs are required to enhance knowledge on biomedical waste management.

Interpretation of question 16 suggests that 21% of study respondents considered bio-medical waste management as an extra burden on them while 35% strongly disagreed.

Interpretation of question 17 suggests 44% and 47% strongly agreed and agreed respectively that infectious

waste should be sterilized from infection by autoclaving before shedding and disposal.

Interpretation of question 18 suggests that Safe management by hospital increases the financial burden on management was agreed by 44% and disagreed by 56%

Interpretation of question 19 suggests that 79% consider labeling the container before filling it with waste is of any clinical significance.

Interpretation of question 20 suggests that only 76% of doctors were fully vaccinated for Hepatitis B

CONCLUSION

The Overall knowledge, attitudes and practices towards biomedical waste management among the study respondents was satisfactory

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