



IMPLEMENTATION OF BIOMEDICAL WASTE MANAGEMENT IN HOSPITAL WITH SPECIAL REFERENCE TO KPM HOSPITAL, KANPUR NAGAR

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ABSTRACT

There are varieties of biomedical wastes which have been generated in the operational activities of the hospitals. Biomedical Waste Management practices are getting attention due to environmental and health concern. There are various issues and challenges associated with biomedical waste management in India. In the present research study researcher used descriptive survey research method which includes presentations of facts, class of events and involves procedure and enumeration of measurements to analyze awareness and implementation among doctors and staff members regarding biomedical waste management and its implementation in KPM hospital, Kanpur Nagar. In the present research Kolmogorov Smirnov test is used to test the hypothesis.

Keywords: Biomedical Wastes, Hospitals, Biomedical Waste Management practices.

INTRODUCTION

The Government of India describes that Hospital Waste Management is a chunk of hospital hygiene and maintenance activities. Bio-Medical Waste Management encompasses tasks for a scientific management of health care waste which is compulsory to be adopted by the



hospitals. There are varieties of wastes which have been generated in the operational activities of the hospitals. These wastes are hazardous for the human life and also effect the environment very much. So greater attention is required to manage the bio-medical waste for the survival of human beings as well as for safeguard the environment from deteriorate.

The disposal of biomedical waste needs a particular process in the hospitals to safeguard the health of people as the wastes are very hazardous in nature. Improper waste management creates various types of problems in the society. Therefore for effective management of bio-medical waste management is a primary concern for health of public and environment.

The bio-medical waste legislation elaborately mentions the suggestions for its management. Different methods were developed for rendering sustainable biomedical waste management. The hazardous nature of the biomedical waste is due to the following:

- Infection
- Toxicity
- Exposure to radioactivity
- Injury

Biomedical Waste Management practices are getting attention due to environmental and health concern. There are various issues and challenges associated with biomedical waste management in India are as follows:

1. Lack of awareness and Training,
2. Unclear role of local authorities,
3. Lack of Segregation Practices,
4. Lack of Proper Operational Strategy,



5. Financial Constraints,
6. Waste-picking and Reusing,
7. Lack of Adequate Facilities.

In hospitals it is necessary to bring the awareness among the doctors and staff members related to biomedical waste and its management techniques.

SIGNIFICANCE OF THE STUDY

The biomedical waste management is an important aspect in the life of every doctors and staff member of the nursing homes, clinics, hospitals, dispensaries etc. In today's time the protection of the environment is essential part of the life of human beings to survive as well as for sustainable development and growth. The Government is also very concern about the biomedical waste management and it is the duty of every stakeholder to protect our environment. So, it is essential to implement biomedical waste management techniques in hospitals to protect the environment. Therefore, the research study is entitled **“IMPLEMENTATION OF BIOMEDICAL WASTE MANAGEMENT IN HOSPITAL WITH SPECIAL REFERENCE TO KPM HOSPITAL, KANPUR NAGAR”** to analyze the awareness among doctors and staff members regarding biomedical waste management and implementation of its techniques in KPM hospital, Kanpur.

REVIEW OF LITERATURE

Singh K. (2004) conducted the research in the rural and urban areas of Chandigarh. The research included nursing homes, clinics, hospitals, dispensaries etc. The researcher has found that no proper waste management has been implemented and it needs to be improving in Chandigarh.



Radha, K.V. (2009) in the research found that the hospitals do not have any proper biomedical waste management. The staff members were also not trained and aware about the proper waste management system. So, the researcher suggested that proper training, education, and commitment is required in the hospitals to manage the biomedical wastes.

Nandwani, S. (2010) has done the research in a private tertiary care situated at Delhi. In the research, researcher has found that the hospital staffs were not segregating the waste properly. The hospital has its own incinerator, but it was underutilized.

Kishore J. (2014) conducted the research in south and east zones of Delhi among the private hospitals. The research has found that biomedical waste management practices were not followed properly by these hospitals.

Pawan, P. (2014) emphasized the importance of training to create awareness among paramedical workers of a tertiary care hospital of Meerut. The research has found significant impact of training on the awareness and implementation of management practices in the hospitals.

According to Bhagawati G., Nandwani S., Singhal S. (2015) in their study found that very less number of doctors, nurses and other staff members were aware about the number of categories of biomedical wastes.

Joseph, L. et al. (2015) study was conducted to find out the impact of training on the awareness of biomedical waste management in the hospitals.

Pullishery, F. et al. (2016) A cross-sectional study was conducted in Mangalore, Karnataka. The study found that the disposal of biomedical waste is not properly managed by the hospitals.



Anand M. Dixit *et al.* (2021) in their study suggested that the awareness of the biomedical wasteguidelines and the importance of its implementation is the essential requirement in today's time.

Sharad Chand *et al.* (2021) study concluded that biomedical waste is a serious health concern. Further they suggested the importance of the guidelines given by the government to manage the biomedical wastes to protect the environment and whole community.

OBJECTIVES OF RESEARCH PAPER

- To analyze the awareness among doctors and staff members regarding biomedical waste management in KPM hospital.
- To analyze the implementation of biomedical waste management in KPM hospital.

RESEARCH METHODOLOGY

Research methodology shows the set-up of the research, the design of the research and the pattern of the research. It is blue print and planning sheet of the whole research. Methodology is required for every researcher for getting the information related to research work.

Research Design

It is the cross sectional study in which researcher used descriptive survey research method which includes presentations of facts, class of events and involves procedure and enumeration of measurements to analyze awareness among doctors and staff members regarding biomedical waste management and its implementation in KPM hospital.

Sample Design

In the present study, researcher used convenience to collect the information from different respondents. The Sample used in the Study:



Total number of Respondents –53 (Including doctors & staff members)

Collection of Data

Primary Data: Data has been gathered from 53 respondents from KPM Hospital, Birhana Road, Kanpur Nagar.

Secondary data: Secondary data have been collected through research papers, journals, reviews for articles etc.

HYPOTHESIS

Null Hypothesis (H_0): There is no role of biomedical waste management techniques in reducing the hazards of biomedical waste.

Alternate Hypothesis (H_1): There is significant role of biomedical waste management techniques in reducing the hazards of biomedical waste.

STATISTICAL TECHNIQUE USED IN THE STUDY

In the present research Kolmogorov Smirnov test is used to test the hypothesis. It is mostly used when the researcher is interested in comparing a set of values and questions are in the form of 5 point likert scale. The researcher has to find the value of largest absolute difference which is known as the Kolmogorov-Smirnov D value.

ANALYSIS OF DATA

1. Analysis related to awareness among doctors and staff members regarding biomedical waste management in KPM hospital.

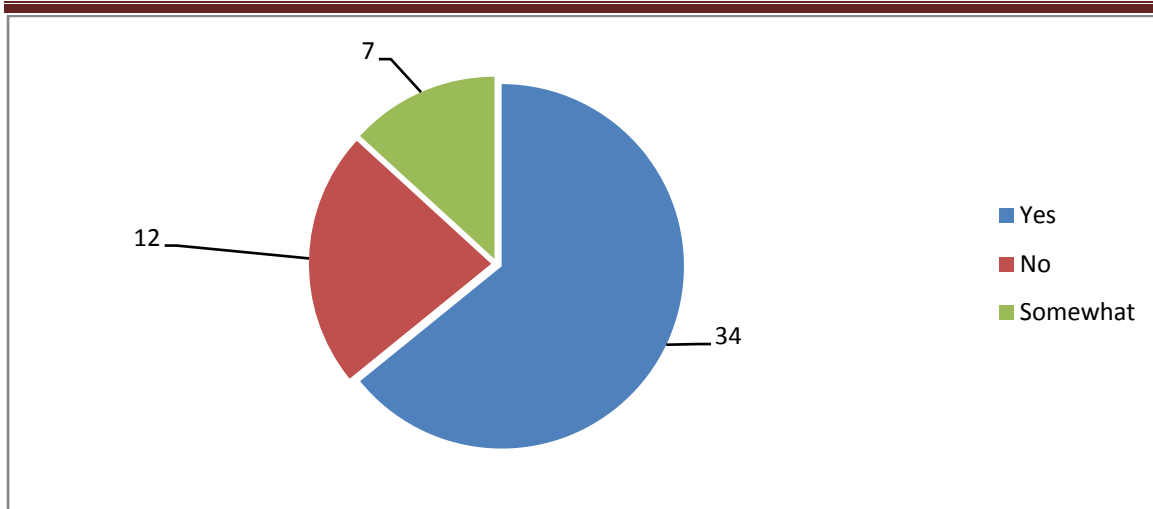


Figure 1: Response to the statement “Do you know the hazards associated with bio-medical waste?”

Analysis: Among all respondents, 34 agreed that they know about the hazards associated with bio-medical waste, 12 respondents don't know and 7 respondents give response to somewhat.

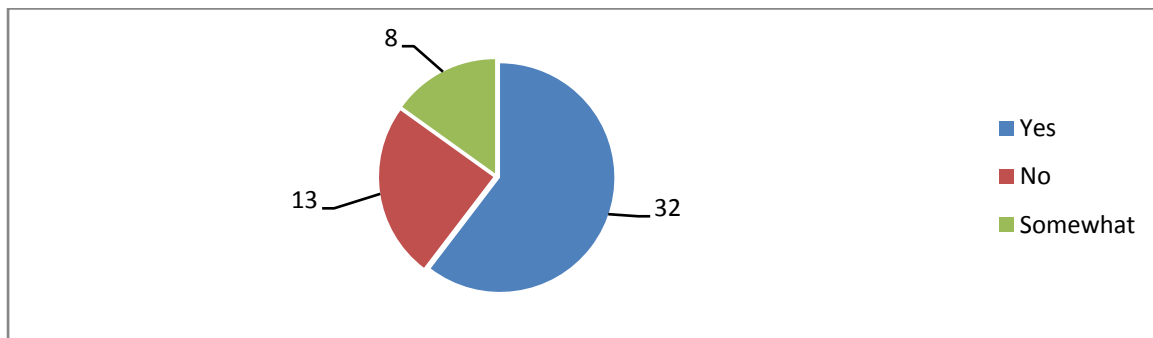


Figure 2: Response to the statement “Do you know the prevention of hazards associated with biomedical waste?”

Analysis: Among all respondents, 32 agreed that they know about the prevention of hazards associated with biomedical waste, 13 respondents don't know and 8 respondents give response to somewhat.

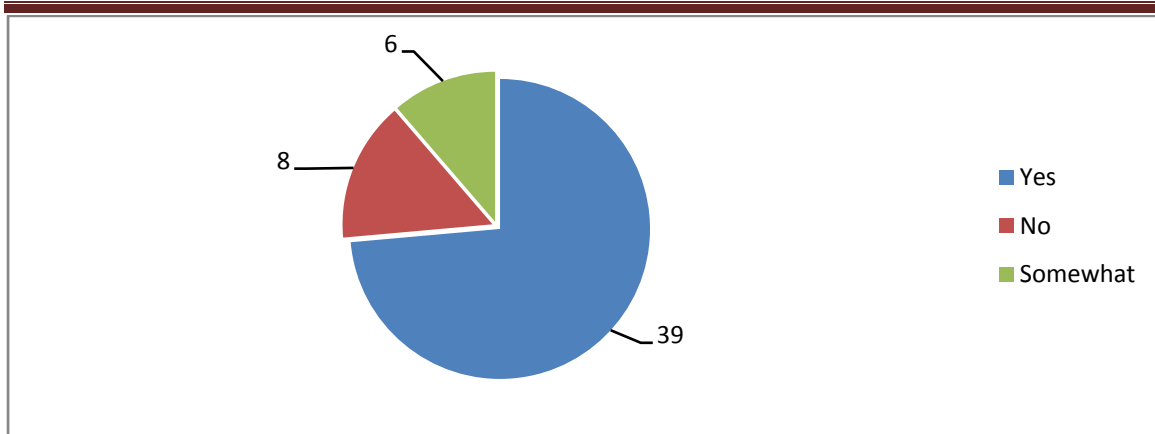


Figure 3: Response to the statement “Do you know the color coding used for Bio medical waste?”

Analysis: Among all respondents, 39 agreed that they know color coding used for Bio medical waste,8 respondents don’t know and 6 respondents give response to somewhat.

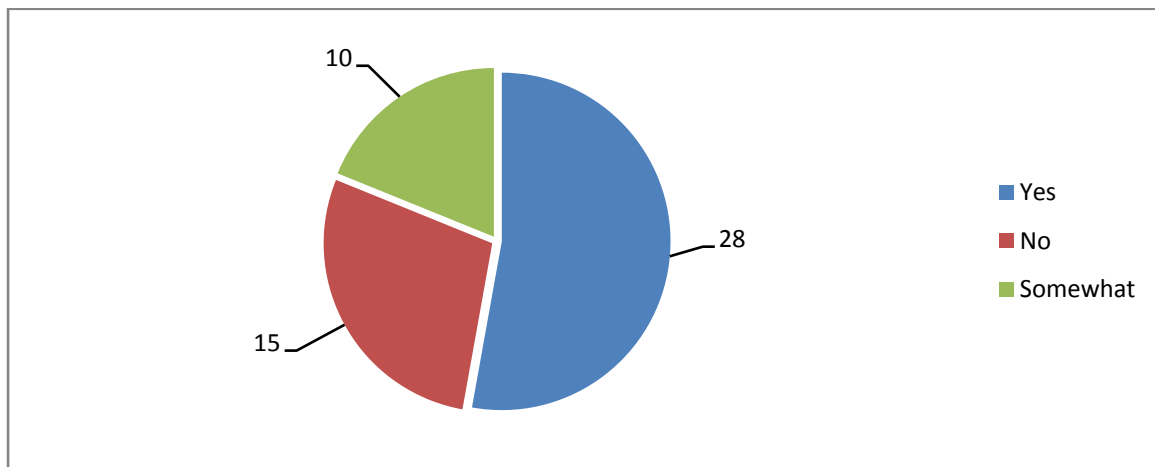


Figure 4: Response to the statement “Do you know about the used sharps and needles segregated in?”

Analysis: Among all respondents, 28 agreed that they know about the used sharps and needles segregated in, 15 respondents don’t know and 10 respondents give response to somewhat.

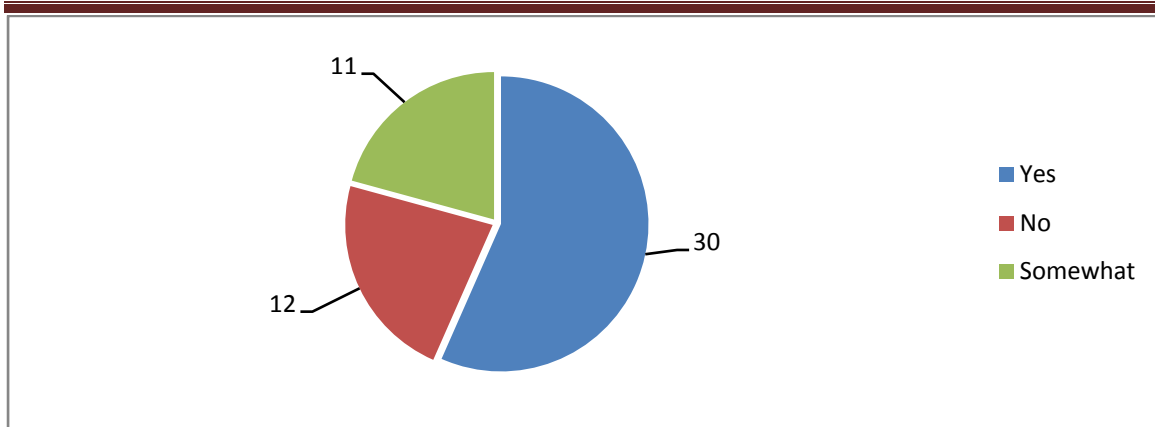


Figure 5: Response to the statement “Do you know about the Reusable plastic material segregated in?”

Analysis: Among all respondents, 30 agreed that they know about the Reusable plastic material segregated in, 12 respondents don’t know and 11 respondents give response to somewhat.

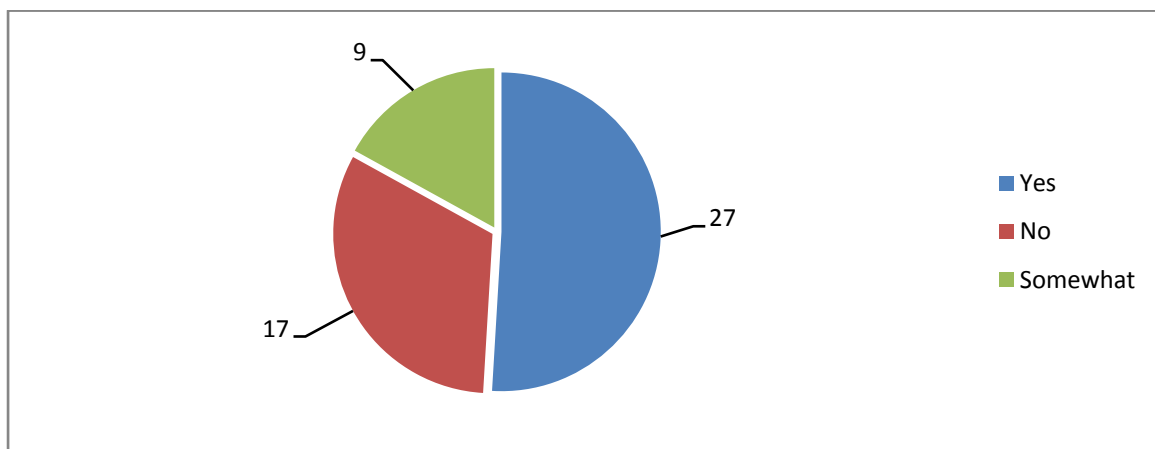


Figure 6: Response to the statement “Do you know about the Glassware, ampules segregated in?”

Analysis: Among all respondents, 27 agreed that they know about the Glassware, ampules segregated in, 17 respondents don’t know and 9 respondents give response to somewhat.

2. ANALYSIS RELATED TO THE IMPLEMENTATION OF BIOMEDICAL WASTE MANAGEMENT IN KPM HOSPITAL

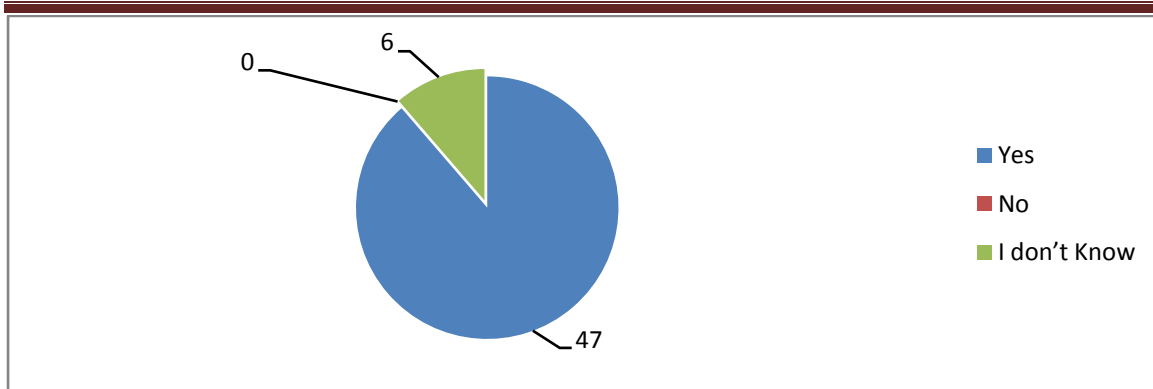


Figure 7:Response to the statement “Do your hospital implementing the biomedical waste management techniques?”

Analysis: Among all respondents, 47 agreed that their hospital implementing the biomedical waste management techniques, no respondents said no to it and 6 respondents don't know about the management techniques adopted by the hospital.

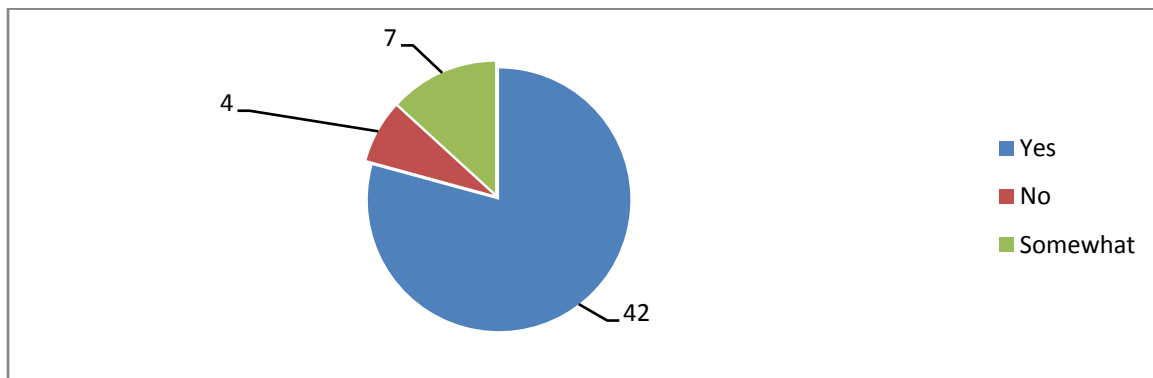


Figure 8:Response to the statement “Regular trainings have been provided to doctors and staff regarding bio-medical waste management?”

Analysis: Among all respondents, 42 agreed that regular trainings have been provided to doctors and staff regarding bio-medical waste management, 4 disagreed to it and 7 respondents give response to somewhat.

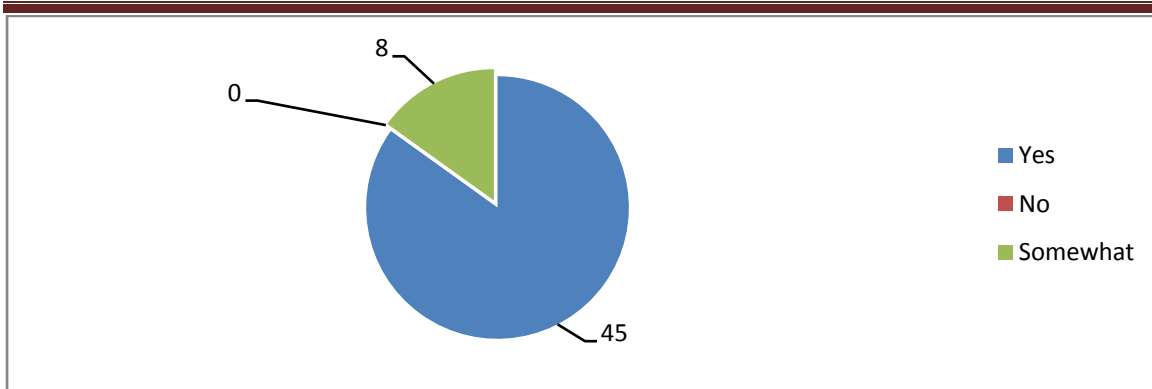


Figure 9:Response to the statement “BMW vehicles be covered properly to prevent the waste from leaking in your hospital”

Analysis: Among all respondents, 45 agreed that BMW vehicles be covered properly to prevent the waste from leaking, no one disagreed to it and 8 respondents give response to somewhat.

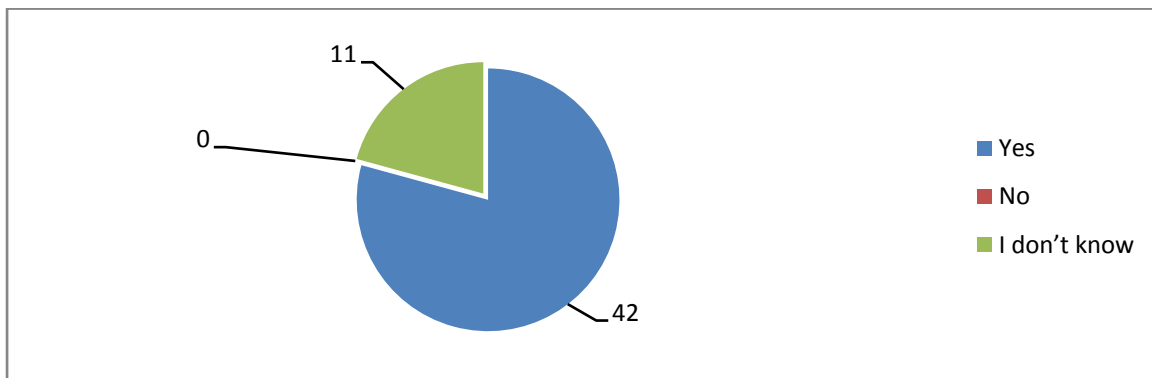


Figure 10:Response to the statement “Biomedical waste not mixed with other municipal waste in your hospital”

Analysis: Among all respondents, 42 agreed that Biomedical waste should not be mixed with other municipal waste, no one disagreed to it and 11 respondents give response to somewhat.

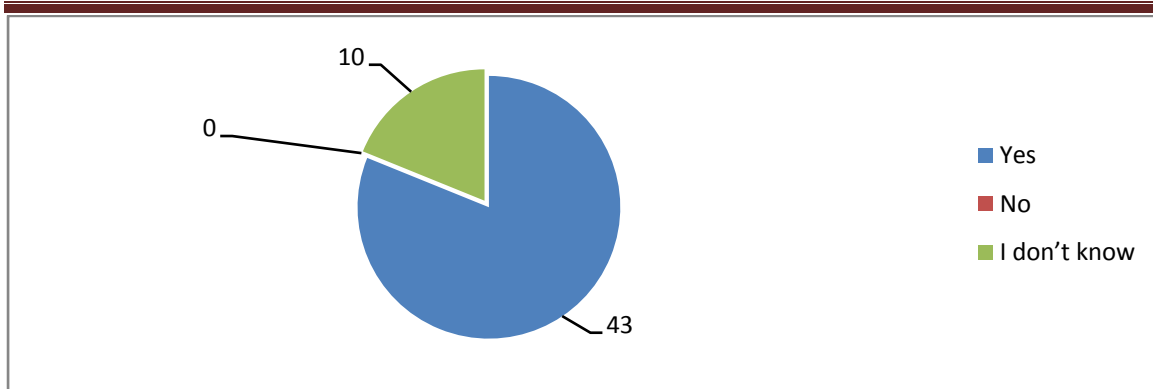


Figure 11:Response to the statement “Colour coding for biomedical waste has been followed in your hospital”

Analysis: Among all respondents, 43 agreed that colour coding for biomedical waste has been followed in your hospital, no one disagreed to it and 10 respondents give response that they don’t know about this.

Hypothesis Testing: Null Hypothesis (H₀): There is no role of biomedical waste management techniques in reducing the hazards of biomedical waste.

Alternate Hypothesis (H₁): There is no role of biomedical waste management techniques in reducing the hazards of biomedical waste.

Statement 1:Do you think that biomedical waste management techniques play a vital role in reducing the hazards of biomedical waste.

Calculation of Kolmogorov Smirnov D Value:

Group	FO	PO	PCO	NP	NCP	ADON
SA	19	.36	.36	.2	.2	.16
A	25	.47	.83	.2	.4	.43
N	7	.13	.96	.2	.6	.36
D	1	.02	.98	.2	.8	.18
SD	1	.02	1.00	.2	1.0	.00

Kolmogorov Smirnov D value = the largest absolute difference Value



$$= .43$$

Calculation of Critical Value of D

$$D= 1.36/\sqrt{53}= .186$$

Result: KS D Value i.e. .43 > table value i.e. .186, so H_1 is accepted, biomedical waste management techniques play a vital role in reducing the hazards of biomedical waste.

Abbreviations Used:

1. Observed Frequency- FO
2. Observed Proportion- PO
3. Observed Cumulative Proportion- PCO
4. Null Proportion- NP
5. Null Cumulative Proportion- NCP
6. Absolute Difference Observed and Null- ADON

FINDINGS

In present study data has been gathered from 53 doctors and staff members of KPM Hospital, Birhana Road, Kanpur Nagar. Kolmogorov Smirnov test is the most appropriate statistical techniques, which used to test the hypothesis in the present research.

Findings related to awareness among the respondents related to biomedical waste management:

1. Among all respondents, 32 agreed that they know about the prevention of hazards associated with biomedical waste, 13 respondents don't know and 8 respondents give response to somewhat.
2. 39 agreed that they know color coding used for Bio medical waste, 8 respondents don't know and 6 respondents give response to somewhat.



3. 28 agreed that they know about the used sharps and needles segregated in, 15 respondents don't know and 10 respondents give response to somewhat.
4. Among all respondents, 30 agreed that they know about the Reusable plastic material segregated in, 12 respondents don't know and 11 respondents give response to somewhat.
5. 27 agreed that they know about the Glassware, ampules segregated in, 17 respondents don't know and 9 respondents give response to somewhat.

2. Findings Related to Implementation of Biomedical Waste Management in KPM Hospital

1. Among all respondents, 47 agreed that their hospital implementing the biomedical waste management techniques, no respondents said no to it and 6 respondents don't know about the management techniques adopted by the hospital.
2. Among all respondents, 42 agreed that regular trainings have been provided to doctors and staff regarding bio-medical waste management, 4 disagreed to it and 7 respondents give response to somewhat.
3. 45 respondents agreed that BMW vehicles be covered properly to prevent the waste from leaking, no one disagreed to it and 8 respondents give response to somewhat.
4. 42 agreed that Biomedical waste should not be mixed with other municipal waste, no one disagreed to it and 11 respondents give response to somewhat.
5. Among all respondents, 43 agreed that colour coding for biomedical waste has been followed in your hospital, no one disagreed to it and 10 respondents give response that they don't know about this.

3. Findings of Hypothesis Testing

Result: KS D Value i.e. .43 > table value i.e. .186, so H_1 is accepted, biomedical waste management techniques play a vital role in reducing the hazards of biomedical waste.

CONCLUSION



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- The present study concluded that the most of the doctors and staff members are well aware about the biomedical waste management in their hospital. They are well aware about the color coding used for biomedical waste, they know about the prevention of hazards associated with biomedical waste.
 - In relation to the implementation of Biomedical Waste Management in KPM Hospital, very high majority of respondents agreed to it in all parameters.
 - The very high majority of respondents also agreed that biomedical waste management techniques play a vital role in reducing the hazards of biomedical waste.

RESULTS & DISCUSSION IN THE LIGHT OF OTHER AUTHORS

According to Singh K. (2004) no proper waste management has been implemented and it needs to be improving in Chandigarh in the hospitals, *Radha, K.V. (2009)* in the research also found that the hospitals do not have any proper biomedical waste management. *Nandwani, S. (2010)* has found that the hospital staffs were not segregating the waste properly **whereas the present research** found that most of the doctors and staff members are well aware about the biomedical waste management in their hospital and they are well aware about the color coding used for biomedical waste, they know about the prevention of hazards associated with biomedical waste.

Pawan, P. (2014) & *Joseph, L. et al. (2015)* have found significant impact of training on the awareness and implementation of management practices in the hospitals. In the present study the majority of respondents agreed that regular trainings of bio medical waste management have been provided to them.

REFERENCES



- Bhagawati, G., Nandwani, S., Singhal, S. (2015). Awareness and practices regarding bio- medical waste management among health care workers in a tertiary care hospital in Delhi, *Indian Journal of Med. Microbiology*, 33(1), 580- 582.
- Chand, S., Shastry, C.S, Hiremath, S., Joel, J., Krishnabhat, C.H. &Mateti, U.V. (2021). Updates on biomedical waste management during COVID-19: The Indian scenario, *Clinical Epidemiology and Global Health*, 1-6.
- Dixit, A.M., Bansal, P., Jain, P., Bajpai, P.K., Rath, R.S. &Kharya, P. (2021). Assessment of Biomedical Waste Management in Health Facilities of Uttar Pradesh: An Observational Study, *Ceurus*,13(2), 1-11.
- Joseph, L., Paul, H., Premkumar, J., Rabindranath, P.R., Michael, J.S. (2015). Biomedical waste management: Study on the awareness and practice among healthcare workers in a tertiary teaching hospital,*Indian J Med Microbiol*, 33(1), 129- 31.
- Kishore, J., Agarwal, R., Kohli, C., Sharma, P.K., Kamat, N., Tyagi, S. (2014). Status of biomedical waste management in nursing homes of Delhi, *Indian Journal of Clinical Diagnostic Research*, 8 (1), 56- 8.
- Nandwani, S. (2010). Study of biomedical waste management practices in a private hospital and evaluation of the benefits after implementing remedial measures for the same. *J Commun Dis*, 42(1), 39- 44.
- Pawan, P., Kapil, G., Sartaj, A., Rahul, B., Gurmeet, K. (2014). Impact of training on awareness of bio-medical waste management among paramedical workers of a tertiary care hospital, Meerut,*Int J Contemp Med*, 2(1),128-132.



- Pullishery, F., Panchmal, G.S., Siddique, S., Anna A. (2016). Awareness, knowledge and practices on bio- medical waste management among health care professionals in Mangalore – A cross sectional study. *Int Arch Integr Med* 2016;3(1), 29- 35.
- Radha, K.V., Kalaivani,K. &Lavanya, R. (2009). A Case Study of Biomedical Waste Management in Hospitals, *Global Journal of Health Science*, 82-88.
- Singh, K., Arora, S.K., Dhadwal, P.J., Singla, A., John, S. (2004). Bio- medical waste management in the U.T. Chandigarh, *Journal of Environmental Science & Engineering*, 46 (1), 55- 60.