

Study on Knowledge and Practice of Hospital Waste Management among Nursing Staff in a Tertiary Care Hospital in Srikakulam, Andhra Pradesh

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ABSTRACT

Background: According to BMW Rules 2016 Bio-Medical waste is any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of Biologicals. Hospitals are the major contributor of Bio-Medical Waste, and Hospital waste refers to all waste generated by hospitals, including infectious and non-infectious waste materials and hazardous waste.

Materials and methods: A Hospital based Cross sectional Study was done in Great Eastern. Medical School & General Hospital, Srikakulam, during the period of October 2020 to November 2020. A convenient sample of 178 nursing staff in different cadre of 8 departments were selected randomly. A Predesigned & Pretested questionnaire was used and data regarding knowledge and practice was recorded.

Results: A total of 178 study participants are interviewed and their responses were recorded.

Most of them were Female (87%), 53.3% of them had MSc Nursing as qualification. Among the BSc Nursing staff 97.6% of them are aware of definition of hospital waste, 89.8% of staff nurses and 80% of A.N.M.s are aware of definition of hospital waste.

Conclusion: The majority of nurses have good knowledge about infectious and non-infectious waste. The findings are in correlation with Saini et al. Majority of Nursing Staff had knowledge regarding storage time for infectious is less than 48 hrs. Good knowledge was seen in highly qualified nursing staff regarding disposal of hospital waste. BSc qualified nurses have better knowledge and practice about hospital waste than A.N.M. group.

Key words: Bio-medical waste Management, Hospital waste, Nursing staff, Knowledge

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INTRODUCTION

Bio-Medical waste definition as per BMW Rules 2016 is "Any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biologicals" [1]. As per the Annual report of the Central Pollution Control Board of India published in 2018, India generates 517 tonnes of biomedical waste every day [2].

Hospitals are the major contributor of Bio-Medical

Waste, and Hospital waste refers to all waste generated by hospitals, including infectious and non-infectious waste materials and hazardous waste. Hospital is complex institutions which are frequented by people from every corner of society. These health care facilities produce waste, which is increasing in quantity and types due to advances in knowledge and is creating its impact [3].

In addition to the risk for patients and personnel who handle these wastes, the hospital waste poses a threat to public health and the environment [4]. Healthcare and medical waste contains mainly infectious wastes (cotton, gloves, syringes, and others) and pathogenic wastes (sharps and pharmaceutical wastes, chemical wastes, and pressurized containers). These are generated inwards, X-ray departments, operating theatres, pharmacies, and laboratories.

Mohee et al. found that around 90% of hospital waste consisted of general wastes that had properties similar to domestic waste. The remaining 10% was infectious

and hazardous wastes [5]. Pruss et al. also found that "10-25% of healthcare waste pose a variety of health and environmental risks was termed as infectious, pharmaceutical, radioactive or chemical," [6].

Hospital waste if not managed properly can transmit deadly diseases like Hepatitis and H.I.V. and present with additional risk to hospital staff, patients and to the community. Good hospital waste management depends on good administration, proper planning, suitable legislation, adequate financing and full participation of the staff.

In our hospital the biomedical waste management rules are in place since many years and periodic trainings have been conducted. Though the biomedical waste management rules are in place they have never been analyzed for implementation and level of knowledge. Hence we undertake this study to assess the knowledge & practice of hospital waste management among nursing staff.

OBJECTIVES

- ✓ To study the knowledge & practice of hospital waste management among nursing staff of hospital.
- ✓ To determine the sociodemographic variables in relation to practice of hospital waste management.

MATERIALS AND METHODS

We had conducted a Hospital based Cross sectional Study in Great Eastern Medical School & General Hospital, Srikakulam, during the period of October 2020 to November 2020.

Inclusion and exclusion criteria

Firstly 8 departments were selected randomly (Medicine, Surgery, OBGY, Paediatrics, Orthopaedics, Casualty, Pulmonary Medicine, E.N.T.). Then a convenient sample of 178 full time employed nursing staff in different cadre of the selected departments who gave consent on a voluntary basis to participate in the study were included. Those who did not comply with the inclusion criteria were excluded. Further for confirmation of age and to avoid recall bias, only those people were selected who any kind of identity card had issued by the institution. Importance of the study was explained to the participants and informed consent was taken. After which a Predesigned & Pretested questionnaire was used and data regarding knowledge and practice was recorded.

Statistical analysis

The collected data was entered in Microsoft excel spreadsheet and double checked for errors. Data was analysed using SPSS software version 22.0. Descriptive statistics were expressed as percentage. Chi-square test was applied to find an association between two categorical variables. P value of <0.05 was deemed statistically significant.

Ethics statement

The study was approved by the Ethical Committee of the Institute. Informed consent was obtained from each participant.

RESULTS

A total of 178 study participants are interviewed and their responses were recorded. Most of them were Female(87%), Most of the study participants(48.3%) belong to the age group of 21-30 years ,55% of them follow Christianity. 71.9% of them are living in nuclear families. In regards to education, 53.3% of them had MSC Nursing as qualification followed by G.N.M. and A.N.M. qualification. 60% of the study subjects are married (Table 1).

Among the BSc Nursing staff 97.6% of them are aware of definition of hospital waste, 89.8% of staff nurses and 80% of A.N.M.s are aware of definition of hospital waste (Figure 1). During the course of study when asked regarding definition of Hospital Waste, 55% of BSc nursing staff answered correctly whereas only 30%

Table 1: Sociodemographic profile of study subjects.

Variable	Frequency	Percentage
Sex		
Male	23	13%
Female	155	87%
Age		
21-30	86	48.30%
31-40	58	32.50%
>40	34	19.20%
Total	178	100%
Type of family		
Nuclear	128	71.90%
Extended	32	18%
Joint	18	10.10%
Total	178	100%
Variable	Frequency	Percentage
Religion		
Christianity	98	55%
Hinduism	76	42.80%
Islam	4	2.20%
Total	178	100%
Education		
BSc Nursing	95	53.30%
General Nursing Midwifery (G.N.M)	52	29.20%
Auxiliary Nursing Midwifery (A.N.M)	31	17.50%
Total	178	100%
Income		
<10000	34	19.10%
10000-20000	88	49.40%
>20000	56	31.50%
Total	178	100%
Marital status		
Currently Married	108	60.60%
Never married	63	35.50%
Divorced	5	2.80%
Widowed	2	1.10%
Total	178	100%

of Staff Nurses and 17% of A.N.M.s have answered the definition correctly (Figure 2).

Among the nursing staff interviewed 98.32% of them had access to colour coded bin. 96.62% of them have knowledge regarding difference between infectious and non-infectious waste, 82.58% have knowledge of correct disposal of injection waste. all of them are knowledgeable about the status of label on top of the bin (Table 2).

Most of the nursing staff (82%) had a colour coded bin within 10 feet from their station, 13% of them had within 10-20 feet, only 2% of them had the bin in a distance more than 30feet (Figure 3). During the interview when asked regarding the sealing of the bin 37.4% of them have answered that the bin has to be sealed when it is completely full, 34.7% have answered that it should be sealed when it is ¼ full whereas 27.9% of them answered

as ½ full (Figure 4).

Majority of the nursing staff with BSc nursing qualification (85.2%), 73% of the staff with G.N.M. qualification knew the correct method of hospital waste disposal whereas only 25.9% of A.N.M.s were aware of correct method of disposal (Table 3). Most of the BSc nursing qualified staff (61%) and 29.2% of A.N.M.s have agreed that the storage time for infectious waste is less than 24 hours, 46% of the staff with G.N.M. qualification believe that the storage time for infectious waste is 24 to 48 hours (Table 4).

Most of the study subjects are disposing the waste correctly (90-98%). Pathological waste was disposed correctly by 98% of the study subjects, the waste from isolation wards was disposed into the correct colour coded bins by 94% of the staff. Human blood and related

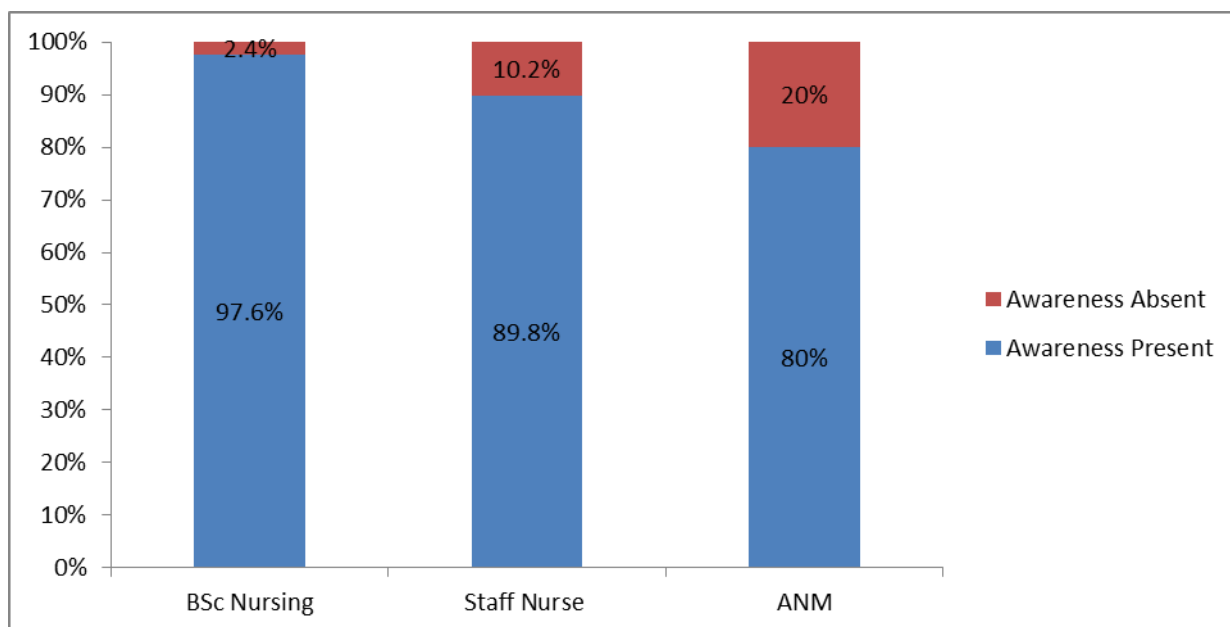


Figure 1: Qualification of nursing staff in relation to awareness about definition of hospital waste.

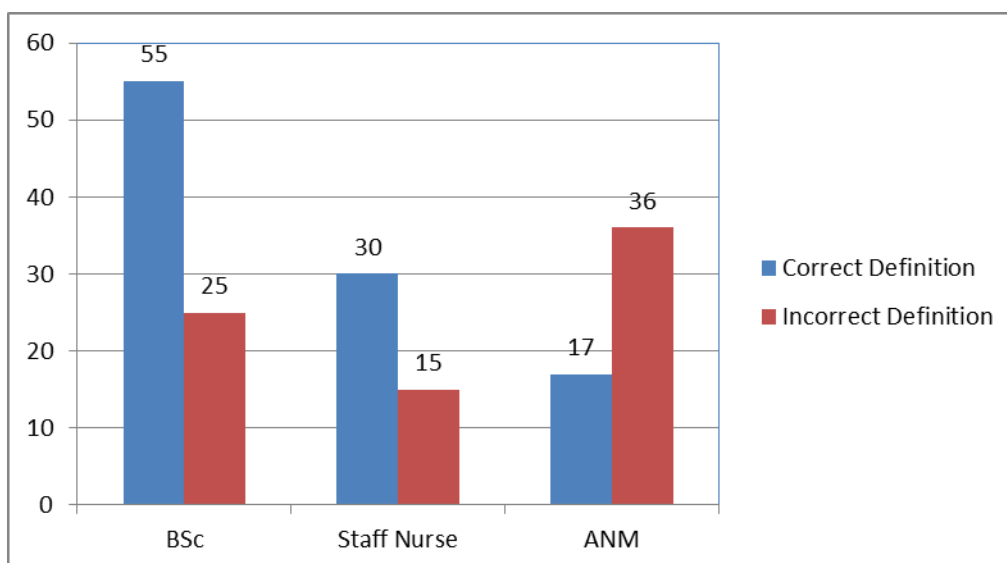


Figure 2: Qualification of nursing staff in relation to correct definition of hospital waste.

Table 2: Knowledge among nursing staff in different category.

Category	Knowledge Among Nursing Staff		Total
	Yes	No	
Accessibility To Colour Code Bin	175(98.32%)	3(1.68%)	178
Status Of Label On Top Of Bin	178(100%)	0	178
Infectious & Noninfectious Waste	172(96.62%)	6(3.38)	178
Correct Disposal of Injection Waste	147(82.58%)	31(17.42%)	178

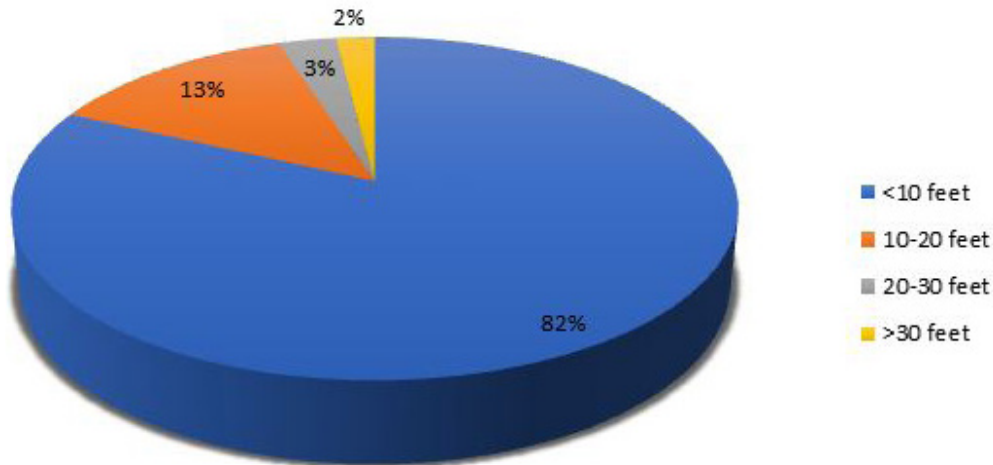


Figure 3: Accessibility of colour coding bin in relation to distance from nursing station.

Table 3: Knowledge about storage time for infectious waste in relation to qualification of nursing staff.

Qualification	<24 Hrs.	24-48 Hrs.	>48 Hrs.	Total
BSc Nursing	58(61.0%)	34(35.7%)	3(0.3%)	95
G.N.M.	23(44.1%)	24(46%)	5(0.9%)	52
A.N.M.	9(29.2%)	11(35.4%)	11(35.4%)	31
Total	90	69	19	178

Table 4: Qualification of nursing staff in relation to hospital waste disposal.

Qualification	Correct Disposal	Incorrect Disposal	Total
BSc Nursing	81(85.2%)	14(14.8%)	95
Staff Nurse	38(73%)	14(27%)	52
A.N.M.	8(25.9%)	23(74.1%)	31
Total	127	51	178

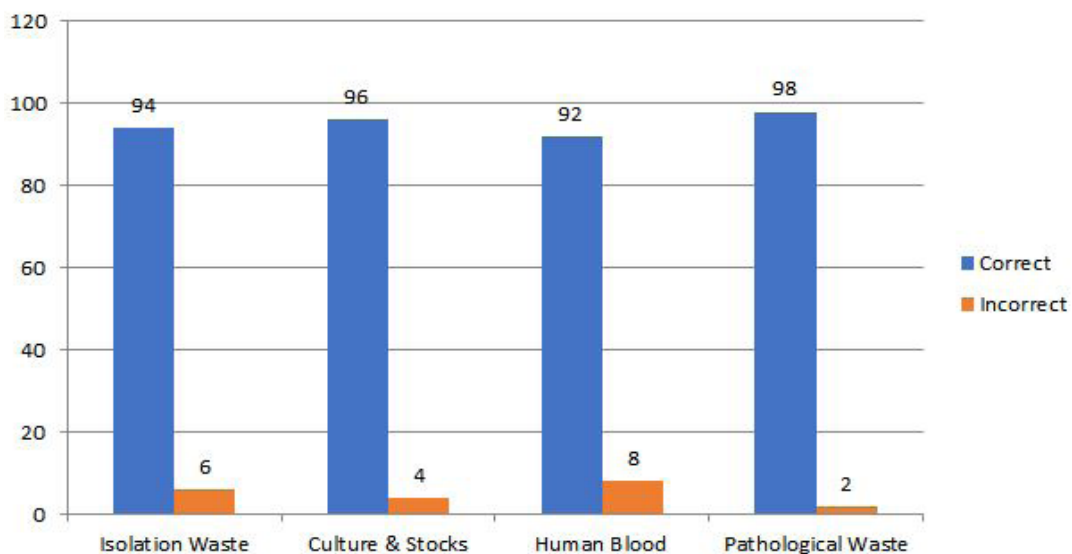


Figure 5A: Practice of hospital waste disposal according to bin.

products were disposed into the correct coloured bin by 92% of the study subjects. Human organs are disposed correctly by 90%. Mostly Discarded medicines were disposed incorrectly (20%) (Figure 5A and 5B). Most incorrect disposal was noted among nurses aged 20-25 years which is 5% (Figure 6).

DISCUSSION

Pandit et al. in 2005 claimed that nurses play a key role in the management of bio-medical waste, among other health care providers in hospitals, they need to segregate

the waste and store it at the point of generation in the correct color-coded bins, so that they can perform this task effectively, it is important that they have proper and adequate knowledge of the importance of segregation and How to classify the various bins and containers for different forms of bio-medical waste, the health risk of bio-medical waste, effective waste handling techniques and methods, and the practise of safety measures will go a long way towards safe disposal of hazardous bio-medical waste and protecting themselves, their patients, their families, and the communities and the environment [7].

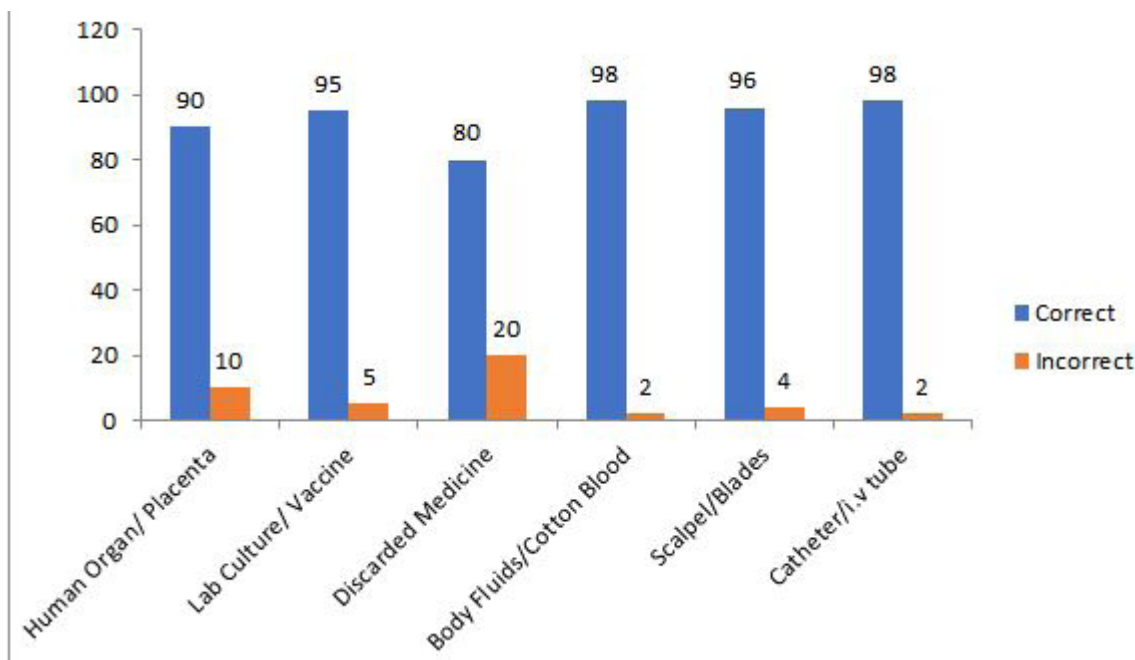


Figure 5B: Practice of hospital waste disposal according to bin.

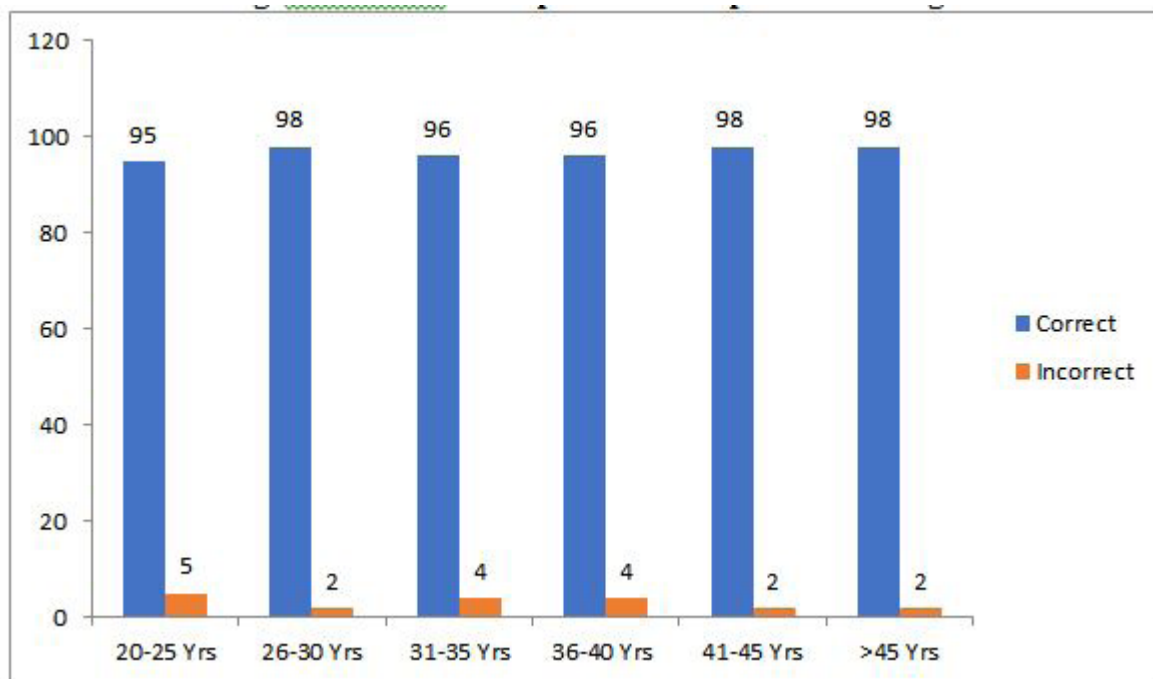


Figure 6: Hospital waste disposal in relation to age of nursing staff.

Sociodemographic and professional characteristics of respondents

Female workers dominated the healthcare workers at 87.0%. Our finding is more than the report from Morocco in 2015 with female accounting for 40.0% of health workers [8].

The findings of the present study showed that almost 97% of nurses have good knowledge about infectious waste and noninfectious waste. These findings are in correlation with Saini et al. (2005) who evaluated the biomedical waste management among staff of a tertiary level hospital in India, showed that 85% nurses had good knowledge about biomedical waste management [9]. Also, in studies done to assess the knowledge, attitude & practice of health care team regarding biomedical waste management methods, Nirupama et al. (2009) found that 95.8% of nurses had knowledge about the health hazards of biomedical waste management [10], while 69.7% of the nursing staff were having knowledge about occupational hazards of hospital waste in our study. While in a study by Sarma et al. showed that the nurses knowledge related to biomedical waste management rules was 60% [11].

In our study 98% nurses have knowledge regarding disposal of pathological waste according to colour coded bin and the knowledge regarding correct disposal of discarded medicines was poor i.e.80%. The findings of the present study showed that 55% of the BSc nursing staff written correct definition of hospital waste. Furthermore, the WHO (2010) has emphasized that occupational health and safety committee and infection control committee should cooperate on the task to setup, implement, and evaluate a comprehensive health surveillance program for the health care workers [12]. 85.2% of the MSc nursing staff was practicing biomedical waste management rules regarding disposal of hospital waste in our study. Similarly Shafee et al. (2010) showed that (50.5%) of nurses collected waste into colour coded bags, segregation and separation of plastic waste was done better by the nurses (50.4%) [13]. Whereas Nirupama et al. (2009) stated that 45.4% of nurses were practicing/following biomedical waste management. Shafee et al. showed that all nurses (100%) were practicing rules of health care waste according to the rules. In the same respect, Yadavannavar et al. mentioned that biomedical waste (BMW) proper collection and disposal has become a great concern for both the medical and the general community [14].

The present study findings revealed a statistically significant correlation between nurse knowledge and practice scores. Also, the knowledge & practice scores have statistically significant correlation with the unit of work, while there is a statistically significant correlation between the practice score and the educational qualification. Also, Sarma et al. (2011) found that the nurses with good knowledge, however, practice percentage is also very high. The same author shows that nurses with a higher level of education have a greater awareness of the national and international activities on biomedical waste management [11].

CONCLUSION

- ✓ The majority of nurses have good knowledge about infectious and non-infectious waste. The findings are in correlation with previous studies.
- ✓ Majority of Nursing Staff had knowledge regarding storage time for infectious is less than 48 hrs.
- ✓ Good knowledge was seen in highly qualified nursing staff regarding disposal of hospital waste
- ✓ BSc nursing qualified nurses are having better knowledge and practice about hospital waste than A.N.M. group.

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CONFLICTS OF INTEREST

None of the authors declare any conflicts of interest.

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