Study on "Assessment of Knowledge on Biomedical Waste Management Among Healthcare Workers in Ranthambore Savika Hospital Sawai Madhopur, Rajasthan"

By

Nishu Yadav

Dissertation submitted in partial fulfillment of the requirements of the degree

MBA Hospital and Health Management

Academic year, 2017-2019

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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that **Nishu Yadav**, student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at The Ranthambore Savika Hospital Sawai Madhopur, Rajasthan from **19th Feb. to 07th May 2019.**

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.
The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

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Ranthambhore Sevika Hospital

(A Unit of Prakratik Society)

This certificate is awarded to

Nishu Yadav

In recognition of having successfully completion of her

Internship in the department of

Bio Medical Waste Management

And has successfully completed her Project on

Assessment of Knowledge on Bio Medical Waste Management among healthcare workers.

Date of Submission - 7th May 2019

She seems to be committed and sincere with a keen interest for learning. She is wished all the best in her future endeavours.

For-PRAKRATIK SOCIETY

Authorised Signatory

Abhimanyu Singh
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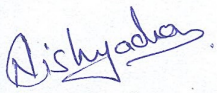
CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"Assessment of knowledge on Biomedical Waste Management among healthcare workers "** and submitted by **Nishu Yadav,** Enrollment No. **IIHMR/MBAHM/2017-19/ 0614** under the supervision of **Dr. Piyusha Majumdar** for award of MBA in Hospital and Health Management in Health and Hospitals of the University carried out during the period from 19th February 2019 to 7th May 2019 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.



Signature

Acknowledgement

The Internship opportunity I had with Ranthambore Savika Hospital, Sawai Madhopur was an enriching experience, it was a great chance for learning and professional development. It helped me develop an ability to understand healthcare issues from various perspectives.

Bearing in mind the previous, I would like to take this opportunity to express my deepest gratitude and special thanks to my mentor, Dr. Piyusha Majumdar, Associate Professor, IIHMR University, Jaipur, for guiding and keeping me on the correct path throughout the two months of internship.

It is my radiant sentiment to place on record my best regards, deepest sense of gratitude and indebtedness to Rupinder Kaur, Executive Director, and Ranthambore Savika Hospital, for his immense support and faith and for allowing me to carry out the study with ease at his esteemed organisation during the internship.

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I perceive the opportunity as a big milestone in my professional development. I will strive to use the gained skills and acknowledgement on the best possible way, and will continue to work on their improvement, to attain the desired career objectives.

The list would be incomplete without saying a special thanks to my friends for their support and help in the completion of this report.

Sincerely,

Nishu Yadav

Abstract

Background: The healthcare services while providing curative, promotive or preventive services inevitably produce waste which may be hazardous to health of patients and hospital staff as well as to the environment. The bio medical waste (management and handling) rules were recently updated by Government of India notification 2016. The present study was carried out assessment of knowledge BMW management among healthcare workers in Ranthambore Savika Hospital Sawai madhopur.

Objective: To assess the levels of knowledge, attitudes and practices among doctors, staff nurses, laboratory technicians and house-keeping staff in the Ranthambore Savika hospital. And

To assess the gaps in knowledge, attitudes and practices among these health care workers in the Ranthambore Savika hospital.

Methods: A observational & cross-sectional study was carried out to assessment of knowledge on BMW management among healthcare workers in the hospital using structured questionnaire contain 40 questions on knowledge, behavior/attitude and practice. Observation was the predominant method for data collection.

Results: The present cross-sectional study recognized certain inadequacies in the knowledge component amongst the different cadres of health care workers. The attitude towards BMW management of housekeeping staff was low. The practice of recapping the needles was very low across cadres. Recapping of needles is one of the important risk factors for needle stick injuries; the prevalence was very low in the organization. Higher practice found in the house keeping staff and nursing staff in the present study.

Conclusions: Knowledge regarding the BMW generation, hazardous, rules, and disposal of biomedical waste management is more among nursing staff and Doctors compared to other health care workers. Hence, emphasis on adequate training is required among health care workers for the safe handling and disposal of biomedical waste management. Nursing staff and doctors had fair knowledge and positive attitude regarding health care waste management where Lab technician and Group IV employeesa regular training and monitoring of BMW management at all hospitals is the need of the hour and has a long way to go for environmental and human health.

Keywords: Attitude; Biomedical Waste; Healthcare personnel; Knowledge; Practice

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Abbreviations	Full Form/Explanations
BMW	Bio-Medical Waste
CPCB	Central Pollution Control Board
WHO	World Health Organization
NGO	Non-Governmental Organisation
Hg	Mercury
SWM	Sawai Madhopur
KAP	Knowledge, Attitudes and Practices
HMC	Hospital management committee
HIV	Human immunodeficiency virus
AIDS	Acquired immune deficiency syndrome

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BIOMEDICAL WASTE MANAGEMENT

INTRODUCTION

Biomedical waste is generatethroughanalysis, treated&inoculationprocedures in healthcare formations. It contains wastethe same asshrill, human skin or body portions and other transferrablethings. These wastes are possiblyunsafe/transferable and their discriminate and unscientific management carriages serious intimidations to humanoid health.

MEDICAL WASTE AND THE LAW

- Throughout the year 1994-1995, the Administration of India, "under the directions of the Supreme Court, ordered medical instructed not to leave biomedical waste in the municipal cans, but to burn it into incinerators installed in the premises."
- In 1998, the Indian government framed "Biomedical waste" (Management and Handling) rules, to confirm that biomedical waste is heldsecurely in human and environment (Gazette of India 1998). Bio Medical waste (Management and Handling) Guidelines, 1998.

Fig 2 – Bio medical waste and the law

In India, hospital and another health care establishment produce animportantamount of waste, they generate serious difficulties for discarding, aproblem that has been paying attention (figure -1). The greattroublearises when the hospital's refusal is thrown unlock and many types of hazards are given with domestic waste.

Infectious and dangerous hospital public who came in make contact with garbage can have serious health complications, which hold it, specially to extinguishaccumulators or rag pickers and the atmosphere. It can also turn out to be the basis of many transmissibleviruses. Medical waste is classified as infectious and non-infectious.

Infectious waste materialinclude articles like human being tissue, body liquids, ordure, urine vessels, shrilledge and glass pieces, various of which can be dirtied. The issue of mainworry is the spread of HIV / AIDS, and hepatitis B and C, also concluded the injury and infections of workers handling these waste constituents, and also, a major public health rising out of transit and danger transportation.

UNSAFE MEDICALWASTE DISPOSAL IN INDIA

- According, to the All India Syringe and Needles Manufacturers Association, at least 20% of syringes sold are from recycled sources.
- Used syringes may harbour noxiousviruses such as those causing hepatitis B and C.
- Second-handmedical cotton and bindings are often used to make quilts and mattresses.

Fig 3 – Unsafe Medical waste in India.

It is important to look that not all hospitals have the ability to spread infection in the junk. It is assessed that 80-85% of non-infectious general garbage is 10% infectious and 5% is other dangerous waste. Nevertheless, if the communicableelement is assorted with normal non-infectious waste, then the complete bulk of the hospital garbage becomes infectious.The partialdiscarding practice of hospital waste affect those people who came in direct contact with it. Waste masses attract numerousforms of disease vectors, including parasites and flies. In this way, unsuitable waste managing practices is a big problem which is not only elaborate in the hospital management but also in the humanity.

"In the developing countries, law and better practice guidelines define the bio medical waste and explain various possible methods of assortment, transportation, storing and discarding of such waste. Separately from this, the best accessiblemethods are used to develop options for the discard of biomedical waste with minimum risk for public health and the atmosphere. In evolving countries like India, thoughmedicinal waste materials have not received sufficient attention.The BMW (Managing and Handling) Rules, 1998 (The Paper of India 1998) was established under the Environment Protection Act 1986, which is a very significantrule for the running of hospital waste. Accordance to the "Medical waste (Management and Handling) Rules)", BMW has been excluded from otherswaste and it has been classification into 10 separate classes, each of which has a definite method of handling. Handling Method A safe land filling (or mixture of these methods) contains incinerator, autoclaving, microwaving, chemical treatment, deep burial and discard."

The possession of healthcare facility is responsible for separate, collection and proper discarding of BMW. The community body is in authority for the collection and discarding of non-biomedical waste produced from the hospital.Separately from this, it is essential to provide suitablediscarding or actionservices to the municipal authorities for health amenities. In towns with less than 3 million people, these treatment facilities must be in process for hospitals and nurture homes with 200 and 300beds meanwhile December 31, 2000. Hospitals with size of 50 and 200beds and treatment and waste management facility would have been till December 31, 2001.

"For minor hospitals and nursing homes and other institutes, dealing and waste handling facilities must be required by 31 December 2002. Every year, in different hospitals, hugetotals of wasteful waste are formed in hospitals. Dependent on the facilities, such trash may include general waste (office lunchroom waste), infectious waste dangerous waste or poisonousbiochemical waste."

In practice, waste torrents often occasionally, which rises the difficulty of the clearanceconclusion. This includes waste such as waste, muted waste, disposables, physical wastes, rejection of cultures, chemical waste. These are possiblyunsafe, infectious and their undiscriminating and unempiricaldiscarding is a serious risk to humanoid health.

LITERATURE REVIEW

- Rao D et al (2018)carried out a study on"to determine the levels of and the stretch of gaps in knowledge, attitudes and practices among surgeons, post graduate students, staff nurses, lab technicians, group IV employees in a tertiary care teaching hospital in Mysuru, Karnataka". A cross-sectional study and accomplish that knowledge in relative to BMW Managingtogether with the hospital BMW protocols was extra desirable amongst doctors, but practical facades were well in nurses and the lab operators.

- Gupta S et al (2006) carried out the study affects to the biomedical waste managingperforms at Balrampur Hospital, a leading healthcare launch in Lucknow, in North India. The study displays that infectious and non-infectious wastes are discarded together within the hospital premises, resulting in a mixture of the two, which are then disposed of through municipal waste at the discarding sites in the town. The outcomes of the study determine the need for severeimplementation of lawful provisions and a better environmental managingstructure for the dumping of biomedical waste in the Balrampur Hospital, and as well as others healthcare establishments in Lucknow city.

- Kumar D et al (2018) carried out a study on to measure the knowledge on biomedical waste managingamongst the staff nurses. To subordinate the level of knowledge on waste managing among staff nurses with particular demographic variables. The quantitative approach is used to access the biomedical waste management and the illustration was taken from the hospital among the nurses of the total no is 100 by the non-probability sampling technique. The outcome of the study determined that 75% of staff nurses were having insufficient knowledge 25% of the staff nurses takingmodest knowledge and none of the staff nurses having satisfactory knowledge on biomedical waste management.

- Bariya BR et al (2017) carried out a cross sectional study was carried out to assessment of BMW management performs in the hospital using BMW Checklist. Outcome of the study is Separation of BMW at the location of generation was found in 72.73%. Sharp and non-sharp infectious waste was correctly separate out in 72.73% and 100% of parts respectively. Bio

medical Waste was initiate covered in bins, but congested in 81.82%. In 6 out of 11, BMW was kept more than 48 hours. IV set, bottles, syringe, latex gloves, catheters etc. were cut by scissors previously disinfection in 45.45%. Staff nurses were using gloves while management syringe and needles in 10 out of 11 places. Conclusion of the study is Staff nurses were well-informed about separation of BMW, but storing and pre-treatment of BMW before its final discarding needs to be enhanced. Adirection programme about new-fangled guidelines may recover the present practice.

- Hiremath RN et al (2017) the study was to assessment the Bio-Medical Waste (BMW) Management operational system in a multi-specialty hospital and debate the condition in terms of recently introduced BMW Rules 2016. A hospital based crosssectional study was accepted by gathering data by means of self-determining surveys involving on-ground operational system of BMW management across diverse wards, out-patient departments, emergency departments, ICU and laboratories in the hospital. It can be settled that the hospital had adisciplined and a well-organized BMW management system in place that was even in compliance to the latest BMW Management Rules 2016 to some extent. Moreover, the hospital mightadvancement the techniques of BMW management as per the afresh introduced latest rules. As far as the classification of BMW is concerned, it has to be changed consequently to the new rules. Needless to say, a consistent training and monitoring of BMW Management at all hospitals is the need of the time and has a long way to go for environmental and human health.

- Arab M et al (2008) carried out crosssectional study, assess the main steps of hospital waste managing including parting, suppression, removal and discarding of waste materials in civic hospitals affiliated with Tehran University of Medical Sciences (TUMS). particular 108 units of 6 hospitals (three general hospitals and three subspecialty hospitals) from those hospitals managed by TUMS using the cluster sampling method. According to the outcomesfound by the questionnaire, most of the studied wards countedtemperately in terms of excellence of their presentation in all stages of waste management. Around one-fifth of the wards were sorrow from unfortunate management of their biomedical waste alsoindividual a minority of wards obtained upright scores for handling their waste constituents. The findings also revealed importantrelations between impermanent waste storage and gathering and the level of education of the managers ($P = 0.040$, $P = 0.050$, respectively). In summary, the study showed a modest management in all processes of separation, assemblage, containment, elimination and discarding of waste things in hospitals with numerous observed problems in the process.

- Carried Sutha Irin A (2018) conducted “analytic study on biomedical waste management in particular hospitals situated in the city of Chennai. Anorganized questionnaire was spreadamongst 140 health workforces in the hospitals of Chennai city, in which 70 defendants from Government Hospital and 70 defendants from a private hospital respectively.Simple random sample method was used in the study. Result shows that health care services in private and government hospital tranquilscuffle with inappropriate medical waste managing which have not been adequately worried. In the measured hospitals, lack of implementation of training courses about health care waste management.Therefore, in direction to growbiomedical waste management in Chennai city, the Ministry of Health and Healthcare and hospitals should pay more attention to rules for appropriate management and discarding of hospital waste. In command to current proper and satisfactory waste discarding system in health organizations, the study was determined with commendations for educating biomedical waste handling and treatment.”

PROBLEM STATEMENT

In many hospitals, one of the mainproblems related to current BMW management is that hospitals are positioning of wastes in waste, unsuitable and undiscriminating manner. As aoutcome of the absence of parting practices, the whole waste stream is unsafe by addition hospital waste to ordinary waste. Unsuitablesegregation is eventually the result of anincorrect method of discarding of waste. In this way inadequate BMW managing will leading to environmental contamination, development and growth of vectors such as pests, rodents and worms, and can lead to spread of disease such as typhoid, cholera, hepatitis and AIDS and through damages from human infected needles. Numerous communicable diseases which are imported to stop the spread of water, sweat, blood, body fluids and contaminated organs.

RESEARCH QUESTION

- Are health care workers aware of BMW generation, hazards and legislation?
- Level of knowledge about BMW management among healthcare workers?

OBJECTIVES OF STUDY

- To assess the level of knowledge, attitude and behavior between doctors, nursing staff, lab technicians and Group IV employees at Ranthambore Savika Hospital.
- To assess the gap among knowledge, behavior and behavior between these health care workers at Ranthambore Savika Hospital.

LIMITATION OF STUDY

1. The illustration for study is limited to single hospital, so, the conclusions cannot be general.
2. The size of the valid sample is limited to 120.

METHODOLOGY

Study Design:

Observational &Cross-sectional Study.

Study Setting:

Ranthambore Savika Hospital Sawai Madhopur Rajasthan.

Study Population:

Staff employed in diverse departments of the hospital.

Eligibility Criteria:

Among all the units of the staffs, all the settledindividuals were included in the study. There were 120 qualified participants, who were occupied as a sample frame.

Sampling Strategy:

On the source of their designation, the populace of study was classified according to differentsections as doctors, nursing staff, lab technicians and class IV employees. Population distribution accordingly

Strata	***Participants***
Doctors	23
Nursing Staff	67
Lab technicians	16
Class IV employees	14
Total	120

Materials and Methods:

The equipment used for the study was a structured closed ended questionnaire, which included 40 questions on knowledge, approach and practice.

The questionnaire on knowledge assessed the participant's knowledge on features related to the waste categories for the identification of BMW generation, risks, rule, colour coding, sign of biomedical menace, and biomedical waste management.

The question on attitude was related to matters like, biomedical waste was dangerous, its management would be burdened with additional burden on their work, or even if the management burden of their proper management on finance, and legislative measures for waste management.

The questions on the practice were evaluated if the respondents of the study had acknowledged any training on biomedical waste managing, if they were immunized against hepatitis B and if Sharpe disinfection was done at the point of generation.

The study equipment included 20 questions for measuring knowledge, 10 cannot comment as answer to the assessment of the approach with yes / no / and answer 10 question practices.

Applicants filled the self-administered questionnaire without the scope of improper help. To accommodate housekeeping staff, the questionnaire was converted from English to Hindi language.

ANALYSIS OF STUDY

Among 120 health care workers, a total of 120 were consented to participate in the study, of which 67 were nursing staff, 17 doctors, 6 house surgeons, 14 Class IV employees and 16 were laboratory technicians.

96.6% (116) knew about BM waste Generation and regulation and knew that it is important to know about the BMW generation, hazardous and regulation. 81.7% (98) knew that biomedical waste management and handling rules broadcasted in the year 1998, of which (64) nursing staffs, (18) doctors, (4) Class IV employees and (12) lab technicians correctly answered, which show that nurses are more attentive of rules than doctors and others.(81) correctly answer that alterations to BMW (Management & Handling) Rules were made in 2016, the result show that doctors are more attentive of update than others departments. (92) correctly opined that biomedical waste should not be kept at hospital setting beyond 48 hrs, of which (66) nursing staffs, (22) doctors, (1) class IV employee and (3) were lab technicians respectively.(42) were know that 1gram mercury is enough to contaminate the following surface area of a lake: 20acres. (76) knew that pollution control board will regulate biomedical waste management and handling practices, of which (48) nursing staffs, (17) doctors, (6) class IV employee and (5) were lab technicians.Givenrom Table -1.

TABLE -1: Knowledge of BM waste generation, hazard and legislation among the healthcare workers:

Knowledge of BMW generation, hazards and legislation	**Doctors**	**Nurses**	**Group VI employee**	**Lab technician**
Know about BMW generation and regulation?	23(19.1%)	66(98.5%)	11(78.5%)	16(100%)
Agency(ies) legalizes waste generate at health care services? State/Private	23(19.1%)	62(S) (92.5%)	6 (S) (42.8%)	10(S) (62.5%)
It is significant to know about biomedical waste generate, hazards and regulations?	23(19.1%)	67(100%)	10(71.4%)	16(100%)
Biomedical Waste (Managing& Handling) Guidelines were primary proposed in 1998	18(15%)	64(95.5%)	4(28.57%)	12(75%)
Modifications were made in 2016 in the BMW Waste (Managing and Handling) Guidelines	23(19.1%)	53(79.1%)	1(7.14%)	4(25%)
In which statement a type of BM waste is defined: Waste which is drenched at the fact of saturated blood with body fluid or blood.	23(19.1%)	67(100%)	10(71.4%)	10(62.5%)
Giving to the medical Waste (Managing& Handling) Guidelines, waste would not be kept beyond: 48hours	22(18.3%)	66(98.5%)	1(7.14%)	3(18.7%)
One gram of mercury is enough to pollute the lessersuperficial area of a lake: 20 acres	9(7.5%)	32(47.7%)	0(0%)	1(6.25%)
Who controls the harmlesstransportation of biomedical waste? (PCBI) Pollution Control Board of India	17(14.1%)	48(71.6%)	6(42.8%)	5(31.25%)
Do younecessity a distinct permit to transportation medical waste? Yes	21(17.5%)	62(92.5%)	9(64.2%)	12(75%)

TABLE- 2: Level of awareness on BMW management practice among health care workers:

Level of Awareness	**Doctors**	**Nursing staff**	**Group IV employees**	**Lab Technician**
Do you recognize about Colour-coding parting of Biomedical waste?	23(100%)	67(100%)	8(57.14%)	11(68.7%)
Do you survey Colour-coding for BM waste?	23(100%)	67(100%)	10(71.42%)	14(87.5%)

Is the waste discarding practice correct in your hospital?	23(100%)	66(98.5%)	6(42.8%)	16(100%)
Such items that might be able to puncture or cut, which may come in contact with blood or body fluids, including scalpel, needle, glass ampoules, test tube and slide, are measured biomedical waste. How would these items be disposed of? Sharpe container	19(82.6%)	64(95.5%)	2(14.2%)	7(43.7%)
Documents with confidential information of the patient have to be sent to the paper recycling bins. right wrong	23(100%)	67(100%)	12(85.7%)	13(81.25%)
The Colour code for the BM waste to be autoclaved, disinfected is: Red, Blue and White	16(69.5%)	53(79.1%)	4(28.5%)	2(12.5%)
The assessedtotal of infectious waste in the total waste generated by the health care facility is: 10-20%	7(30.4%)	32(47.7%)	5(35.7%)	3(18.75%)
The Colour code for discarding of normal waste from the hospital is: Black	20(86.9%)	66(98.5%)	13(92.8%)	6(37.5%)
Following the introduction of infected blood / body fluids and contaminated Sharpe, all the following stages should be followed: In the antiseptic lotion, an angular finger should be kept.	23(100%)	50(74.6%)	1(7.14%)	3(18.75%)
All of the succeedingdeclarations about dangerous waste vessels are accurate, except that: Any container, with food containers, can be used to keep hazardous waste.	23(100%)	62(92.5%)	10(71.42%)	4(25%)

76.6% (92) correctly answer Items that may be able to perforation or cut, which may be showing to blood or body fluids together with the skull, needle, glass flasks, test tube and slide, are considered biomedical waste. How would these stuffs be discard of? Sharps Container39.1% (47) correctly opined that around 10-20% of the waste generated from the hospitals is infectious waste, in that (32) nursing staffs, (7) doctors, (5) Group IV employee and (6) were lab technicians.

Majority of them(105) opined that general waste generated at hospital settings should be disposed in Black colour bins of which (66) nursing staffs, (13) Group IV employees, (20) doctors, and(6) laboratory technicians opined correctly. (table-2).

TABLE -3: Attitude / Behaviour assessment towards BM waste:

Attitude/behaviour assessment	Doctors	Nurses	Class VI employee	Lab technician
Harmless management of health care waste is not a problem at all.	23(yes) (100%)	67(100%)	13(92.8%)	16(100%)
Waste management team work / no one section of persons is responsible for harmless management	21(91.3%)	65(97.01%)	14(100%)	10(62.5%)
The financial burden on the management increases with the management efforts of the hospital.	23(100%)	64(95.5%)	10(71.42%)	16(100%)
Harmlessmanaging of health care waste is an additionalload on work. Yes	6(26.08%)	26(38.8%)	13(92.8%)	13(81.25%)
Do you think that the hospital should conduct a workshop on BMW management to upgrade present knowledge about biomedical waste management? Yes	21(91.3%)	65(97.01%)	14(100%)	6(37.5%)
Would you prefer to contribute in the program voluntarily to increase and enhance your knowledge of waste management?	9(39.1%)	61(91.04%)	11(78.5%)	13(81.25%)
Do you think that the polluted waste before the shredding and disposal should be aborted by the autoclave infection?	20(86.9%)	49(73.1%)	3(21.4%)	2(12.5%)
Do you reflect a waste treatment plant should be set up in the hospital for the disinfection of the infected water?	23(100%)	67(100%)	14(100%)	15(93.7%)
Do you think it is significant to notify the PCBI about a specific hospital if it is not following the rules for biomedical waste management?	22(95.6%)	48(71.64%)	9(64.2%)	5(31.25%)
Would you select to contribute in the program voluntarily to enhance and enhance their knowledge of waste	23(100%)	62(92.5%)	14(100%)	12(75%)

management?				

Furthermost of the health employees said that harmless management of health care waste is not a problem in 119 (99.1%), the work of the waste management crew is accountable for safe management (91.6%), 113 (94.1%) That the efforts of secure management rise financial load on administrationof the hospital. 94 (78.4%) prefer to contribute in the program voluntarily, which enhancetheir knowledge of the waste management and upgrade.

84 (70%) It is significant to report to the PCBI about a specific hospital if it is not following the rules for biomedical waste management, in which lab technician is at least 5 (4.1%) interested Keep them.

74 (61.7%) trusts that before removing and discarding, the contaminated waste must be aborted by autoclave infection, but from Table 3, lab technicians and Group IV employees are not show positive attitude towards it.

106 (88.4%) believes that the hospital must conduct a workshop on BMW management to upgrade present knowledge about BMW management.

Figure-4: Level of knowledge among nurses, doctors, group – D and lab technicians on needle-stick injuries:

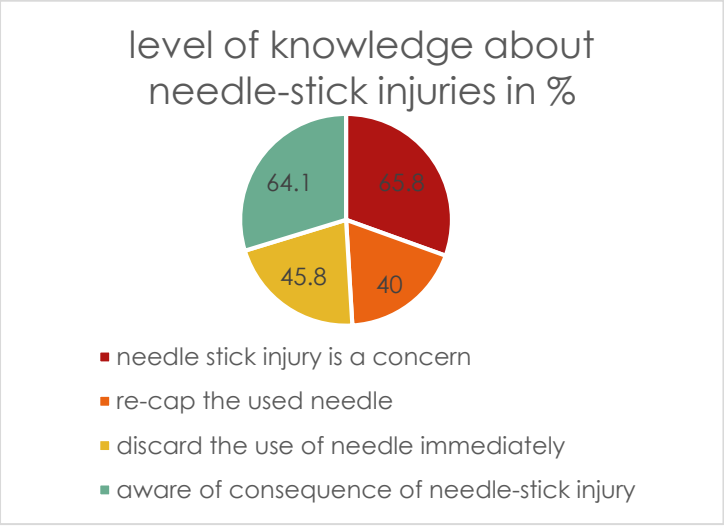
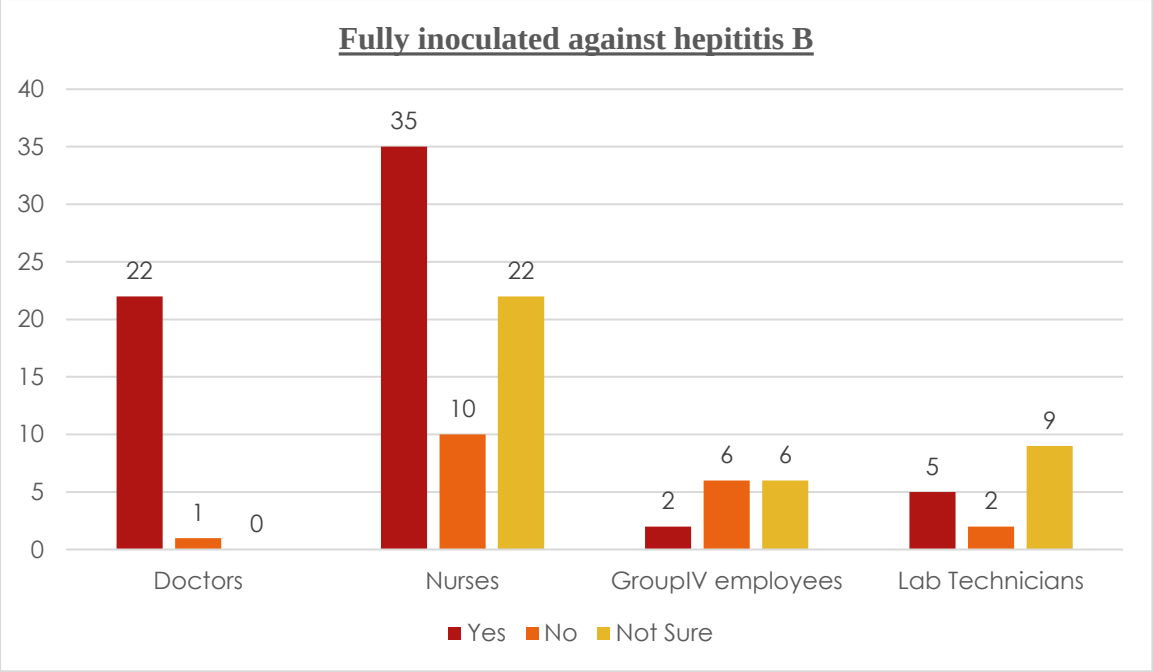


Figure-4 fully inoculated against hepatitis B



Immunisation against hepatitis B.

Fully immunised 35 were nursing staff, (5) laboratory technicians, (2) Class IV employees and (22) doctors, respectively. From the above graph, majority Group IV employees, Lab Technicians and nursing staff is not inoculated against hepatitis B or they didn't recognise when they get vaccination against Hepatitis B.

DISCUSSION:

The current cross-sectional study identified some inadequacies in the knowledge component between the different cadres of health care employees. The acquaintanceelement of cliniciansremainedextra desirable than their performs, however on the conflicting it was true for nurtures. The informationconstituent was not as much ofamongstcleaning staff and lab operators, which was comparable to the outcomes of additionalalike studies done earlier.

The behaviour of the housekeeping staff was less towards BMW managing. Low-slunginformation was accreditedmainly to new employees coming to revolution in hospice, as well as to decrease the theoretical level of cleaningsupervise. The exercise of workers of all teams will help in the analytical evaluation of appropriate and applied management of biomedical waste.

The practice of recasting needles in cadres was very little. Reprocessing of spikes for needle stick damages is an important risk factor; The generality in the organization was actuallow-slung. It can be associated to the awareness of the staff in the hospital.

More studies found in the present study community and the nursing staff house may be due to the high responsibilities assigned to them in dealing with BMW.

CONCLUSION

Knowledge about the disposal of BMW generate, unsafe, guidelines and biomedical waste managing is more between nursing staff and doctors than other health care employees. Therefore, importance is located on satisfactory training between health care workers for the safe operation and disposal of biomedical waste management.

Nursing workers and medics had reasonableinformation and positive attitude regarding health care waste management where Lab technician and Group IV employeesa consistent training and monitor of BMW management at entirely hospitals is the requirement of the time and has a long way to go for environmental and human health.

RECOMMANDATION:

Solidmanagement skills are important to implement the BMW rules and there is anessential to rise its dimensions so that the monitoring is systematic. Cleaning staff wear well-known equipment such as handbags, face masks, management waste.

On the waste carriage bag and waste resonant trolley, the tag is categorized biomedical and sideways with a description of the category of trash, a print is sited on the wall of the cubicle (nearby), in which giving to the biomedical waste managinginstructions, to do. They also consume a bio-hazard mark in the carry bag.

Consistent training programme must be organised for the staff.

Another possibilitytransportationrequirement be second-hand to collect the waste in case the driver is not present or bad condition of vehicles.

BMW marked vehicles must be increased.

SUPPLEMENTARY (QUESTIONNAIRES)

Assessment of Biomedical Waste

Tick the appropriate answer:

Your position:

a) Doctor / Dentist b) Class IV employee c) Nurse d) Lab technician

Section 1: Knowledge of biomedical (BM) waste generation, hazards and legislation

1. Do you know about BM waste generation and legislation?
   a) Yes b) No c) Not sure
2. What agency(ies) regulate(s) wastes generated at health care facilities?
   a) State b) Private c) Do not know
3. Do you think it is important to know about BM waste generation, hazards and legislation?

   a) Yes b) No c) Somewhat

4. Biomedical Waste (Management & Handling) Rules were first proposed in:

   a) 1997 b)1998 c) 1999 d) 2000

5. Amendments to the Biomedical Waste (Management & Handling) Rules were made in:

   a)2000 b) 2001 c) 2003 d) 2004

6. Which statement describes one type of BM waste:
   a) Materials that may be poisonous, toxic, or flammable and do not pose disease-related risk.
   b) Waste that is saturated to the point of dripping with blood or body fluids contaminated with blood.
   c) Waste that does not pose a disease-related risk.
7. According to the Biomedical Waste (Management & Handling) Rules, waste should not be stored beyond:
   a) 12 hours b) 48 hours c) 72 hours d) 96 hours
8. One gram of mercury (source from dental amalgam) is enough to contaminate the following surface area of a lake:
   a) 20 acres b) 30 acres c) 25 acres d)15 acres
9. Who regulates the safe transport of medical waste?
   A) Pollution Control Board of India.
   b) Transport Corporation of India.
   c) College Administration.
10. Do you need a separate permit to transport biomedical waste?
    a) Yes b) No c) Cannot say

Section 2: Level of awareness on biomedical waste management practice

11. Do you know about Colour-coding segregation of BM waste?
    a) Yes b) No c) Not sure
12. Do you follow Colour-coding for BM waste?
    a) Yes b) No c) Sometimes

13. Is the waste disposal practice correct in your hospital?
    a) Yes b) No c) Cannot comment
14. Objects that may be capable of causing punctures or cuts, that may have been exposed to blood or body fluids including scalpels, needles, glass ampoules, test tubes and slides, are considered biomedical waste. How should these objects be disposed of?
    a) Black bags b) Yellow bags c) Clear bags d) Sharps container
15. Documents with confidential patient information are to be disposed of into the paper recycling bins.
    a) True b) False c) Do not know
16. The Colour code for the BM waste to be autoclaved, disinfected is:
    a) Red Black b) Yellow Blue/white
17. The approximate proportion of infectious waste among total waste generated from a health care facility is:
    a) 10-20% b) 30-40% c) 50-60% d)80-90%
18. The Colour code for disposal of normal waste from the college is:
    a) Red b) Black c) Yellow d) Blue
19. All the following steps should be followed after an exposure with infected blood/body fluid and contaminated sharps EXCEPT:
    a) Exposed parts to be washed with soap and water.
    b) Pricked finger should be kept in antiseptic lotion.
    c) Splashes to eyes should be irrigated with sterile irrigants.
    d) Splashes to skin to be flushed with water.
20. All of the following statements about hazardous waste containers are true, except for:
    a) Containers must be closed except when removing or adding waste.
    b) Containers must be clean on the outside.
    c) Contents must be compatible with the type of waste containers.
    d) Any type of container, including food containers, can be used to contain hazardous waste.

Section 3: Attitude/behaviour assessment towards biomedical waste

21. Safe management of health care waste is not an issue at all.
    a) Agree b) Disagree c) Cannot comment

22. Waste management is team work/no single class of people is responsible for safe management. a) Agree b) Disagree c) Cannot comment

23. Safe management efforts by the hospital increase the financial burden on management.

a) Agree b) Disagree c) Cannot comment

24. Safe management of health care waste is an extra burden on work.

a) Agree b) Disagree c) Cannot comment

25. Do you think that the Hospital should organize separate Learning programs to upgrade existing knowledge about biomedical waste management?

a) Yes b) No c) Cannot comment

26. Will you like to attend voluntarily Programme that enhance and upgrade your knowledge about waste management?

a) Yes b) No c) Cannot comment

27. Do you think that infectious waste should be sterilized from infections by autoclaving before shredding and disposal?

a) Yes b) No c) Cannot comment

28. Do you think that an effluent treatment plant for disinfection of infected water should be set up in hospital?

a) Yes b) No c) Cannot comment

29. Do you think it is important to report to the Pollution Control Board of India about a particular hospital if it is not complying with the guidelines for biomedical waste management?

a) Yes b) No c) Cannot comment

30.Do you think that labelling the container before filling it with waste is of any clinical significance?

a) Yes b) No c) Cannot comment

Section 4: Level of knowledge among nurses, doctors, attendants, lab technicians on needle-stick injuries

31. Is needle-stick injury a concern?

a) Yes b) No c) Do not know

32. Do you re-cap the used needle?

a) Yes b) No c) Do not bother

33. Do you discard the used needle immediately?

a) Yes b) No c) Have not noticed

34. Are you aware of consequences of needle-stick injury?

a) Yes b) No c) Not concerned

35. Have you sustained a needle-stick injury during the last 12 months?

a) Yes b) No c) Do not remember

36. If yes, how many injuries?

37. How did the most recent incident happen?

a) Poor disposal of needle b) Individual carelessness/accident c) Cannot remember d) Other (specify)

38. To whom did you report the injury?

a) Line manager b) Occupational health c) Infection control d) Nobody

e) Cannot remember f) Other (specify)

39. Did you fill in an incident report?

a) Yes b) No c) Cannot remember

40. Have you been fully inoculated against hepatitis B?

a) Yes b) No c) Not sure

Thank you for your valuable time and cooperation.

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