THE KNOWLEDGE AND PRACTICE REGARDING BIOMEDICAL WASTE MANAGEMENT AMONG PARAMEDICAL WORKERS IN SELECTED PRIMARY HEALTH CENTER AT MANAMADURAI IN SIVAGANGAI DISTRICT.

A DISSERTATION SUBMITTED TO THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

MARCH – 2010

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MARCH – 2010

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he is the source of my strength”

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ABSTRACT

PROBLEM STATEMENT

A study to determine the knowledge and practice regarding biomedical waste management among paramedical workers in selected primary health center at Manamadurai in Sivagangai District.

METHODOLOGY

The quantitative research approach with descriptive design was used in this study.The purpose of the study to asses the knowledge and practice of biomedical waste management among paramedical workers. Semi structured questionaire to asses the knowledge regarding biomedical waste management verbal response / checklist to asses the practice of biomedical waste management. The Inferential descriptive statistics was used.

OBJECTIVE

1. To assess the knowledge regarding biomedical waste management among Paramedical workers in selected PHC.

2. To assess the practice regarding biomedical waste management among paramedical workers in selected primary health center.

3. To find out the relationship between knowledge and practice regarding biomedical waste management.

4. To find out the association between the knowledge of paramedical workers and selected demographic variable like age, sex, religion and occupation status, income and experience, and training.

5. To find out the association between the practice on biomedical waste management of paramedical workers and selected demographic variables like age, sex, religion, and occupation, income and experience and training

HYPOTHESIS

- There is a significant relationship between the knowledge and practice of paramedical workers regarding Biomedical waste management.

- There is a significant association between the knowledge and selected variable such as age, sex, religion, marital status and occupation income, and training.

- There is a significant association between the practice and selected variable such as age, sex, religion, marital status and occupation income, and training.

MAJOR FINDINGS OF THE STUDY

Majority of paramedical workers 37(37%) between above 31 years.

- Majority of paramedical workers 84 (84%) were females.
- Majority of paramedical workers 70(70%) were married.
- Majority of paramedical workers 74(74%)were Hindu

- ♣ Majority of paramedical workers 37(37%) were general nurse and midwives.
- ♣ Majority of paramedical workers 48(48%) were 1-5 years of experience.
- ♣ Majority of paramedical workers 47(47%) were 12,001-17,000 income
- ♣ Majority of paramedical workers 100 (100%) were attended training.
- ♣ Majority of paramedical workers have 58% moderate level of knowledge.
- ♣ Majority of paramedical workers 77% were having moderate level of practice.
- ♣ Overall results showed that association between knowledge and selected demographic variable such as religion, experience, income, training and occupation.
- ♣ Overall results showed that there is no association between practice and selected demographic variables such as age, sex, marital status, year of experience income and training.

- ♣ Overall results showed that there is a relationship between knowledge and practice. The computed 'r' value is +0.515 the positive correlation was found between knowledge and practice. Hence it was interpreted that paramedical workers who had adequate knowledge follows satisfied level of practice.

RECOMMENDATION FOR FURTHER RESEARCH

- ♠ On the basis of present study following recommendation are made.
- A similar study could be done with large samples.

- ♠ An experimental study could be conducted with structured teaching program on knowledge and practice

♠ A similar study could be conducted in the hospital ,nursing homes and clinics.

♠ A similar study could be done on longitudinal basis.

♠ A similar study may be conducted to find the incidence of infectious disease related to biomedical waste management.

♠ A similar study could be conducted with Health care providers.

CONCLUSION

From the above findings the investigator would like to conclude that majority of paramedical workers have moderate level of knowledge; but none of them having adequate level of practices. It was noticed that the primary health centers were not providing adequate facilities to practice bio-medical waste management. The concerned authorities should also be vigilant and providing the proper facilities such as dust bin in different colors for the disposal of hospital waste material. The medical officer should create awareness among paramedical workers regarding bio medical waste management in primary health center and also motivate them to do practice of biomedical waste management; The success of the various scheme implemented by the Government through the medical department in eradicating certain diseases depend on the basic implementation of bio-medical waste management. In primary health centre and also motivate them to do practice of biomedical waste management.

CHAPTER – I

INTRODUCTION

"Never tell people how to do things
Tell them what to do and they will surprise
you with their ingenuity"

- George patton

BACKGROUND OF THE STUDY

The waste produced in the course of healthcare activities have higher potential for infection and injury than any injury than any other type of waste. Therefore it is essential to have safe and reliable method for its handling. Inadequate and inappropriate handling of health care waste may have serious public health consequences and a significant impact on the environment. Appropriate management of health care waste needs a crucial component of environment health protection and it should become an integral feature of health care services.

Bio medical waste means is any waste generated during the diagnoses, treatment or immunization of human beings or in research activity. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Biomedical waste generated in the hospital falls under two major categories. Non hazardous and bio hazardous constituents of Non hazardous waste and non infected plastic card board, packaging material, paper etc.,

a) Infections waste – sharp, non sharp, plastic, plastic disposables, liquid waste etc.,

b) Non infections waste radioactive waste discarded glass, chemical waste, cytotoxic waste incinerated waste etc.,

Approximately 75-90% of biomedical waste in non hazardous and as harmless as any other municipal waste. The remaining 10-25% as hazardous and can be injurious to human or animals and deleterious to environment. It is important to realize that if both these types are mixed together then the whole waste becomes harmful.

A major hospital contribute substantially to the quantum of biomedical waste generated them smaller hospitals, nursing homes, clinics, pathological laboratories, blood banks etc and also contribute a major chunk.

No effort needs to be spared to ensure implementing strategies for safe & sound management of hospital waste.

Hazardous waste when ineffectively managed may compromise the equality of client care, additionally, the present occupational health risk to those who generate handle, package, store transport, treat and dispose of them. They also present environment and public health risk through inappropriate treatment & or disposal which may contribute to infectious such as aids, Hepatitis Tuberculosis, cholera, enteric infections & many others.

A survey done in Bangalore reveals that the quantity of solid waste generated in hospital and nursing homes generally varies from ½ to 4kg per day in government hospital ½ to 2kg per bed per day in private hospital and ½ to 1kg per day in nursing homes. The total quantity of hospital waste generated in Bangalore is about 40 tonner per day out of this nearly 45 to 50% is infectious.

According to WHO (1998) Biomedical waste has been a growing concern because of recent incident of public exposes to discarded blood vials, needles, empty prescription bottles and syringes. Particularly from the municipal garbage bins and disposal site. The waste produced in the course of health care providers carries a higher potential for infection & injury than any other type of waste. Hazardous hospitals waste are unique forms of solid and liquid waste generated in the diagnosis treatment and prevention of human disease each year league amount of hazardous waste are Produced by various health care setting.

Hospital waste management has been brought into focus recently particularly with the ruling by Honourable Supreme Court of India and notification of the Biomedical waste (management and handling) Rules 1998 which makes it mandatory for health care establishment to segregate disinfect and dispose their waste is an eco friendly manner.

- Exposes to hazardous health care waste can result in disease or injury due to one or more of following characteristics.
- It contains infections agent.
- It contains toxic or hazardous chemical or pharmaceuticals
- It contains sharp
- It is genotoxic
- It is radioactive

All individual exposed to such hazardous healthcare was are potentially at risk including those who generate the waste are those who either handle such waste or exposed to it as a consequence of biomedical waste management .

NEED FOR THE STUDY

According to WHO with regard to life threatening virus infection such as HIV AIDS and Hep.B and C health care workers particularly nurses are at greater risk of infection through injuries from contaminated sharp.

Hospital waste management is an important subject that needs urgent Action. In most circumstances. It is appropriate to consider an incremental approach realizing that an improvement is of greater value even if resources do not allow achievement of highest standard immediately.

It is recognized that the management of hazardous waste is not only a technical problem but is intimately influenced by cultural social and economic circumstances. At the local level healthcare setting are encouraged to work together to address the economic, public health and environment impact concern of hospital waste management.

Mostafa GM etal.2009 conducted a study to assess the knowledge and practice of healthcare personnel in surgicasl department. This is a cross sectional study was carried out in the eight surgical department at Al-mansoura university hospital. The study finding shows that only 27.4% of the nurses, 32.1% of housekeepers, 36.8% of the doctors had satisfactory knowledge. A questionnaire for nurses and doctors. Observation cheek list were used.

According to who report 2002-2.5% of HIV cases among health care workers and 40% Hepatitis B and C and health workers wide are the result of occupational exposure to blood and body fluids.

A study conducted in India 2007 reported that the overall incidence of occupational exposure of blood and body fluids during the study period of one year was 32-75 the incidence of accident exposure o potential infections material was the highest among the staff nurses at 37.34% technician 26.92% and least among the resident doctors at 21.01%.

Hence the investigator to assess the knowledge and practice regarding Biomedical waste management among the health care workers.

PROBLEM STATEMENT

A study to determine the knowledge and practice regarding Biomedical waste management among paramedical workers in selected primary health center at Manamadurai.

OBJECTIVE

1. To assess the knowledge regarding Biomedical waste management among Paramedical workers in selected PHC.
2. To assess the practice regarding Biomedical waste management among paramedical workers in selected PHC.
3. To find out the relationship between knowledge and practice regarding biomedical waste management.
4. To find out the association between the knowledge of paramedical workers and selected demographic variables like age, sex, religion and occupation status, income and experience, training.
5. To find out the association between the practice on biomedical waste management of paramedical workers and selected demographic variables like age, sex, religion, and occupation, income and experience and training

HYPOTHESIS

- There is a significant relationship between the knowledge and practice of paramedical workers regarding biomedical waste management.

- There is a significant association between the knowledge and selected variable such as age, sex, religion, marital status and occupation income and training.

- There is a significant association between the practice and selected variable such as age, sex, religion, marital status and occupation income and training.

OPERATIONAL DEFINITION

KNOWLEDGE

In this study knowledge refer to the verbal response expressed by the paramedical workers regarding biomedical waste management which is measured by knowledge questionnaire.

PRACTICE

In this study practice refers to the action related to biomedical waste management as measured by check list.

BIOMEDICAL WASTE MANAGEMENT

In this study biomedical waste means the discarded materials which are generated during the diagnosis treatment or immunization of human being.

PARAMEDICAL WORKERS

In this study paramedical workers refers to staff nurses and auxiliary nurses, nursing assistants, midwives, Lab technicians working in Primary health centre.

ASSUMPTIONS

- Adequate knowledge regarding biomedical waste management will enable the paramedical workers implement in clinical and community care setting.

- Implementing biomedical waste management practice will ensure safety for health personnel.

- Safe practice will prevent the cross infection in health care setting.

PROJECTED OUT COME

This study useful to reveal the knowledge and practice of Paramedical workers regarding biomedical waste management.

This study help to motivate the paramedical workers to gain awareness and improve their Practice regarding biomedical waste management.

CONCEPTUAL FRAME WORK

Conceptual frame work is a group of related ideas, statement or concept. The term conceptual model is often used interchangeably with conceptual frame work and some time with grand theories those that articulate a broad range of the significant relationship among the concept of a discipline.(**Kozier Barbara 2005)**

The conceptual frame work serves as a spring board for theory development ,theoretical and context the importance of the study ,where a model symbolically represent a phenomenon .The present study is aimed at assessing the knowledge and practice of paramedical workers with biomedical waste management.

The conceptual framework for this study is based on the Health belief model .Health belief are persons ideas and attitude about health and illness they may be based on factual information and using information.

Rosenstock (1974) Beckers Health Belief model addressed relationship between the person belief and behavior . it is a way of understanding and practicing now Para medical workers will behave in relation to their health care therapy use of the model is based on client perception of susceptibility to an illness and the seriousness of illness .This model helps the nurses to understand various behavior including individual perception ,belief and various behavior in order to plan the most effective care In this context the investigator felt that the Becker's model is suitable as conceptual frame work for this study.

INDIVIDUAL PERCEPTION

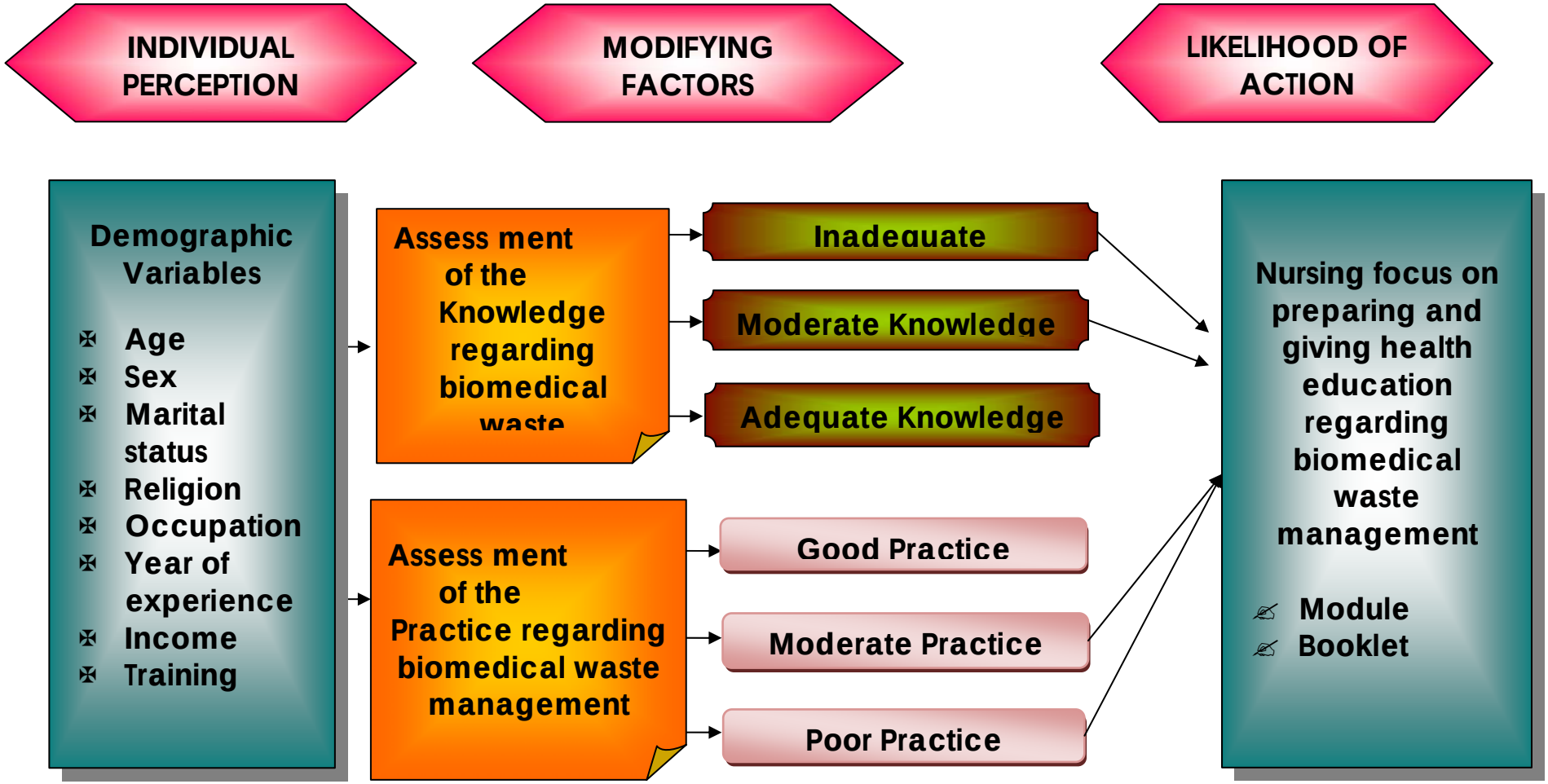
The first component in this model is the individual perception of susceptibility an illness .In this study paramedical workers perception regarding biomedical waste management are thought to be influenced by age, sex, marital status, occupation ,year of experience, income, training .Individual perception may vary with these variables.

MODIFYING FACTOR

In this study modifying factor are the knowledge level of Para medical workers regarding biomedical waste management. These factors can be modified through health education .The knowledge of paramedical workers about biomedical waste management was assessed with the help of questionnaire. Assess the practice of para medical workers about biomedical waste management was assessed with the help of check list.

The knowledge level of paramedical workers was graded as adequate, moderate, and inadequate knowledge. The practice level of paramedical workers was graded as adequate, moderate, and inadequate level of practice.

Likely hood action refers to perceived benefit of preventive action minus perceived threat of preventive action. In this study the individual perception and modifying factor together influence perceived threat of disease s. The health education should also be given based on paramedical workers level of knowledge and practice. Therefore the investigator planned a health education using different aids to improve paramedical workers knowledge regarding biomedical waste management.



CONCEPTUAL FRAMEWORK BASED ON HEALTH BELIEF MODEL
ROSENSTOCKE'S & BECKER, 1974(MODIFIED)

CHAPTER – II

REVIEW OF LITERATURE

This chapter deals with Review of Literature related to biomedical waste management a review of related Literature is an essential aspect of scientific research. It involves the systematic identification. Location security and survey of written material that contain information of a research problem (polit & hingles) keeping this in mind the investigator probed into the accessible some & gained an in-depth understanding from the related studies.

For the purpose of logical sequence the chapter is divided into 2 section.

1. Knowledge regarding biomedical waste management.
2. Practice regarding biomedical waste management

STUDIES AND LITERATURE RELATED TO KNOWLEDGE OF BIOMEDICAL WASTE MANAGEMENT.

Pandit NB etal(2009) cross sectional study was conducted in a Pnamukh Swami medical college if P.Gujarat in involving 30 hospital with more than 30 beds were randomly selected from Sabarkantha District the doctors and auxiliary staff of those 30 hospitals were the study population the result showed that Doctor's were aware of risk of HIV and Hepatitis B and C where as Auxiliary staff (ward boys, Ayabens, sweepers) had very poor knowledge.

. **Gupta S. Boojh(2008)** conducted a study in Babrampus hospital Lucknow .The study was conducted in Lucknow at the infectious and non infectious waste are dumped together with in the hospital premises resulting in a mixing of the two which are then disposed of with

municipal waste at the dumping sites in the city. All type of wastes are collected in common bins places outside the patients wards for disposal of this waste the hospital depends on the generosity of the Lucknow municipal corporation. Whose employees generally collect it every 2 or 3 days. The hospital does not have any Treatment facility for infectious waste.

Usha prabakar and Neelam makhija (2008) conducted a study to assess the knowledge on Biomedical waste management among 30 nursing personal in Delhi. The study finding revealed that 66% were having knowledge on Biomedical waste generation 77.7% were having knowledge on Biomedical waste category and segregation 92.22% were having knowledge regarding Biomedical waste transportation 70% had knowledge on needle disposal 70% had knowledge on universal precaution.

Escaf M. Shurteff (2007) suggested a program for reducing Bio medical waste. The wellesly hospital. That a programme included redefining bio medical waste reviewing waste practices throughout the hospital educating staff & Monitoring outcome. Resulted in bio medical waste within month. Saving realized were approximately 67,000. This progrmme is easily reproducable.

Rev. Gauch Enferm (2006) Conducted a descriptive study of BMWM health professional in Brazil 60 Professionals. This study reported that lack of knowledge the professionals.

Grodizitaska (2006) et.al Conducted a descriptive study to assess the knowledge and understanding of bio medical waste management in Poland. This study reported that in all groups. The study result shows that

30% of the respondent showed a satisfactory level of knowledge of Individuals People with higher level of knowledge under took such action slightly more often.

Oanchaivijit etal (2005) this study was conducted to identify the problem in management of medical waste in Thailand. The sample size 39. hospitals Questionnaire method was used. This study Result show improper management of medical waste was present in all hospitals. Risk exposure and indicate of infection selected to the management were at concerned level.

Rsheed S etal (2005) conducted a study cross sectional study of 8 teaching hospital to evaluate the current practices of sectional study of 8 teaching hospital to evaluate the current practices of segregation approaches, storage arrangement collection and disposal system in the teaching hospital of Karachi using a Questionnaire method and checklist. The study reported that sharp, pathological waste, chemical infectious waste pharmaceutical and pressurized container, 25% provided protect years, 12.5% arranged training section 62.5% hospital disposed of their hazard waste by nursing incinerator. 25% disposed of by municipal land fill. 12.5% was burning waste in open air without any specific treatment.

Pandit. NB etal (2005) conducted a study on awareness and Practices in a district of Gujarat. 30 hospital were the study population. This study reported that Doctors were aware of risk of HIV & Hepatitis B & C where as auxiliary staff (ward boys, ayah, sweepers) had very poor knowledge about it.

Sharma S Chauchan SV (2004) This study was conducted to assessment of knowledge attitude and practice and checking the amount

of medical waste. Problems identified were inadequate knowledge in management, improper practices, high incidence of sharp. Injury at work.

Belour A etal 2003. Conducted a case study to assess waste management and recycling practices of the urban poor. The findings of the study showed that the urban poor and low income communities have environmentally friendly solid waste management. The study suggest that policies should be formulated to focus on promoting knowledge, education and the skills of the urban poor.

Pandit. WB etal (2003) this study was conducted assessing the level of knowledge. 30 beds randomly selected sample auxiliary staff had very poor knowledge there was no effective waste segregation, collection, transportation and disposal system .

Natraj. G. Baveja. S. etal (2003) this study was conducted to assess the level of practices. 100 samples were taken. The result indicated reveal a statistically significant improvement in waste suggestion practices occurred in all areas. Thus a large hospital with a medical college can identify student or a similar group for monitoring waste of biomedical waste management.

Pandit NB (2002) conducted a study on assessing the biomedical waste and disposal practices. The cross sectional study was conducted. The Result shows that doctors were aware of risk of HIV & Hepatitis B & C where as auxiliary staff hard very poor knowledge.

H abwatchs H (2002) reported about social waste disposal on district health facilities of developing countries the author describe that a hospital waste is not necessary difficult to dispose in most cases it can be

safely clumped in a properly designed waste pit. Waste management problem at district hospital in developing countries are usually casual more by lack of information then by financial or technical difficulties.

Hayashi Y. Shegmitsum (2001) conducted a project regarding proper disposal of medical waste infection, prevention & waste management at Hiroshima city. The project Outlined that in order to prevent pollution & infection in near the hospital since it establishment Hiroshima city as a hospital has been implementing a clean project which has nasocominal infection, prevention committee & medical waste treatment & disposal examination committee & medical waste treatment & disposal examination committed lead these effort.

REVIEW RELATED PRACTICE OF BIOMEDICAL WASTE MANAGEMENT.

Mostafa etal (2009) the study assessed the knowledge and practice of health care personnel. A sample size 200 Data collection was done via questionnaire the result shows only 27.4% of the nurses 32.1% of housekeepers and 36.8% of doctors had satisfactory knowledge concerning practice 18.9% of the nurses 7.1% of housekeepers and none of the doctors had adequate practice.

Mostafa G.M, shazly MM (2009) a study conducted at Egypt as study on assess the knowledge and practice related to waste management the study result shows that only 27.4% of nurses 22.1% of home keeper and 36.8% of the doctor’s had satisfactory knowledge. Concerning practice 18.9% of nurses 7% of housekeepers and none of the doctors had adequate practices.

Gupta S. Booj R. etal (2008) study conducted that biomedical waste at Vivekananda polychlinic. Study shows that hospitals and other health care establishment have a “duty of care” for the evnironment and for public health and have particular responsibilities in relation to the waste produce.

Many els, sr etal (2006) this study assessed the existing medical waste management system in Tazanian hospital. the main disposal methods comprised of open pit burning (50%) and burying (30%) of the waste A large proportion 71% of the hospitals used dust bin for transporting waste from generation points to incinerator without plastic bag. The results showed that the knowledge level in medical waste management issues very low among the health workers. It is concluded that hospital waste management in Tanzania is poor. There is need for proper training and management regarding awareness and practices of medical waste management to cover all cases of health workers in the country.

Rasheed S, Iqbals etal (2005) this study assessed the cross sectional study was conducted in a teaching hospital of Karachi using convenient sampling technique. This result shows that 25% were segregating sharp, pathological waste, chemical waste, infectious pharmaceutical and pressurized container at source. For handling potentially dangerous waste two (25%) hospitals provided essential protective measures. There should be proper training and management regarding awareness and practices of waste disposal.

Karthick subramanian (2004) reported in Kodungiyan ground. Biomedical waste where stray dogs devous, human fresh. The article revealed that it has been a regular occurrence at the kodungaiyur dumping

ground. Where hospital waste has been dumped in the open by Corporation garbage carries the rag pickers said there they are quite used to the sight of the dog raming across. The dumping ground, eating human flesh.

Akter N. Huzzain Z etal 2002 conducted a study to evaluate the current status of hospital waste management in Bangladesh an its probable health effect of the existing practice to determine the awareness level of doctors and nurses about hospital waste to identify the weakness & to provide suggestion for improvement. Hospital staff waste pickers and local resident were interviewed while in depth field observation which included sample collection & laboratory analysis was also conducted. The study revealed that it has been quite evidence satisfactory hospital waste & several private clinician in severely lacking some staff members interviewed were suffering from various kinds of infectious disease, such as viral, hepatitis B, typhoid, skin diarrhoea, dysentry, Tuberculosis, Malaria. The study indicate that there is a need to improve the handling & disposal method of hospital work almost all the available meeting facilities. Based on the analysis of the situation several suggestion & Recommendation have been made to aid in the development of waste management system.

Matsumoto (2001) Report the present status of nosocominal infection & biohazards of medical waste. The attitude reveals that nasocominal infections are already a major problem & are having a growing concern to all medical staff & among the general public therefore an effective infection control programmed especially against transmit mode of infection is essential for the well being of the patient and the safety of hospital personnel various categories of medical waste

should be segregated adequately & appropriate management is necessary adequate handling technique can protect personnel from injury & bio-safety manual should be available prevent injury.

Matsu mob (2001) conducted a study on proper disposal management of medical waste the appropriate management of medical waste in laboratory in Tanab GH. The study several in accordance the manual for management of infectious. Waste which is based on the waste management law as a counter plan for the appropriate management of medical waste must be carried out in every hospital since the law requires hospital to take responsibilities for disc arching medical waste hospital must adopt product policy for waste management.

Karthick Subramanian (2000) reported that hospital dumping body parts in dust bin the article reported that a portion of a several limb found to its way into a chennai corporation corog lorry which cleared garbage from the Royapettah Govt. hospital on June 5th 2004.

A hospital official admitted that a severed limb found its way into the garbage bin but denied that body parts were being dumped regularly sanitary work to blow it out of proportion

CHAPTER – III

RESEARCH METHODOLOGY

This chapter comprises the methodology for the study, research approach, and design for the study, study setting. Sample size and sampling technique of data collection the pilot study and for data analysis. This study was done with the purpose to assess the knowledge and practice of Biomedical waste management among paramedical workers.

RESEARCH APPROACH

The quantitative approach was used in this study.

RESEARCH DESIGN

Descriptive design is used in this study.

SETTING OF THE STUDY

This study was conducted in primary health centers in Sivagangai district. 246 Primary health centers available in Sivagangai district out of these I selected 14 Block primary health centers were selected. The total population of one primary health center is 5000,Each primary health center 11 paramedical staff are present .The primary health centers is situated in 4to5KM away from Matha college of nursing .

POPULATION

The target population of the study were paramedical workers working in Primary health centers.

SAMPLE

Workers those who are working in primary health centers at Sivagangai District were selected as sample.

SAMPLE SIZE

The sample size consists of 100 paramedical workers who are working in primary health centers who full filled the inclusion criteria of sample selection.

SAMPLING TECHNIQUE

Convenience sampling techniques was used to select the sample.

CRITERIA FOR SAMPLE COLLECTION

INCLUSION CRITERIA

- Paramedical workers who are willing to participate in this study.
- Paramedical workers who can read and understand Tamil and English
- Paramedical workers who are working in selected primary health center.
- Who had undergone the training in biomedical waste management (or) had not underwent the training.

EXCLUSION CRITERIA

- Paramedical workers who are not willing to participate in the study.
- Paramedical workers of health educator, counselors, village health nurse, housekeeping staffs.

DESCRIPTION OF THE TOOL

PART – I

It consists of demographic variables such as age, sex, religion, education, occupation, year of experience and Training.

PART – II

It consists of 25 multiple choice questions to assess the level of knowledge paramedical workers regarding biomedical waste management under the following area such as definition, segregation, Treatment and management.

SCORING PROCEDURE

In knowledge aspect each multiple choice questions consist of 4 alternatives with one correct response and three distracters. Each correct response carries the score of one the three distracters carry the score of 20. The maximum possible score was 25. The subjects were classified as follows based on their score.

- Adequate level of knowledge above 75%
- Moderately adequate level of knowledge 50 – 74%.
- Inadequate level of knowledge –Below 49%

PART – II

Assess the practice of paramedical workers regarding biomedical waste, Yes/No type (or) verbal response checklist was used.

The maximum possible score was 20. The subjects were classified into as follows based on their scores.

- Satisfied level of practice above 75%.
- Moderate level of practice 50 – 74%
- Inadequate level of practice – below 49%

TESTING OF THE TOOL

Validity

The constructed tool along with blue print and objectives of the study were given to five experts for content validity. Questionnaire was modified after establishing the validity. The tool was translated into Tamil and again translated into English to validate the language.

Reliability

The test retest method was used to establish the reliability of observation checklist and questionnaire ‘r’ value is 0.515.

PILOT STUDY

Pilot study was conducted in primary health centers, Sivagangai. The study was carried out on ten paramedical workers who full filled the inclusion criteria of the sample. It was carried out in the same way as final study was done. In order to test the feasibility and practicability it was conducted after obtaining permission from 10 paramedical workers who met the inclusion criteria were selected by using convenient sampling method. Pilot study was conducted using Questionnaire checklist to assess the knowledge and practice. The samples selected for the pilot study was excluded from the final study.

DATE COLLECTION PROCEDURE

The data were collected for a period of 6 weeks at the Primary health centers, Sivagangai District. Before the interview the purpose of interview was explained to all the paramedical workers with self introduction. It lasted from Monday to Saturday. The time scheduled for data collection was from 9.30 am to 4.30 p.m. The time taken for each worker was 30 minutes 3-5 workers were interviewed. Data were collected through interview scheduled by using semi structured questionnaire and checklist to assess the knowledge and practice regarding biomedical waste management.

DATA ANALYSIS

The data was analysed based on the objectives frequencies and percentage were computed for describing the samples characteristics. Karl pear ‘r’ (correlation) was computed to find out the relationship between knowledge and Practice among paramedical workers those who are working in Primary health centre.

PROTECTION OF HUMAN SUBJECT

The dissertation committee approved the research proposal prior to the pilot study and main study permission was obtained from Head of the department of community health nursing, Matha College of nursing, Manamadurai and from District health service office in Sivagangai. Written permission was obtained from the study subjects and the data collection were kept as confidential. Assurance was given to the study subject thats anonymity of each individual would maintain.

CHAPTER- IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the analysis of the sample and interpretation of data to determine the Knowledge and practice regarding biomedical waste management among paramedical workers in selected primary health center at Manamadurai, Sivagangai district, Tamilnadu, India.

The obtained data has been classified grouped, and analyzed, statistically based on the objectives by descriptive and inferential statistics.

OBJECTIVES OF THE STUDY

1. To assess the level of knowledge regarding biomedical waste management among paramedical workers in selected primary health center .
2. To assess the level of practice regarding biomedical waste management among paramedical workers in selected primary health center.
3. To find out the relationships between Knowledge and practice regarding biomedical waste management.
4. To find out the association between knowledge of paramedical workers and selected demographic variables like age, sex, marital status, Religion, occupation, income, years of experience, and training.
5. To find out the association between practice of paramedical workers and selected demographic variables like age, sex, status, Religion, , occupation, income, years of experience, and training.

PRESENTATION OF THE DATA:

The analysis of data was organized and presented under the following headings.

Section – I

Frequency and percentage distribution of the samples according to their selected demographic variables.

Section – II

Distribution of level of knowledge regarding biomedical waste management among paramedical workers

Section – III

Distribution of level of practice regarding biomedical waste management among paramedical workers in selected PHC

Section – IV

Relationship between Knowledge and practice regarding biomedical waste management

Section – V

Association between knowledge of paramedical workers and selected demographic variables regarding biomedical waste management.

Section – VI

Association between practice of paramedical workers and selected demographic variables regarding biomedical waste management.

SECTION – I

Table- I : Frequency and percentage distribution of the samples according to their selected demographic variables.

n = 100

S. No	Demographic variables	Frequency	Percentage (%)
1	**Age (in yrs)**		
	a) 21 - 25	29	29
	b) 26 - 30	34	34
	c) 31& above	37	37
2	**Sex**		
	a)Male	16	16
	b) female	84	84
3	**Marital status**		
	a) Unmarried	30	30
	b) married	70	70
4	**Religion**		
	a) Hindu	76	76
	b) Christian	13	13
	c) Muslim	7	7
5	**Year of experience(in yrs)**		
	a) 1-5	48	48
	b) 6-10	40	40
	c) 11 & above	12	12
6	**Occupation**		
	a) General nurse & midwives	37	37
	b) Lab technician	23	23
	c) Auxillary nurse midwives	25	25
	d) Pharmacist	15	15

7	**Income**		
	a) Below 7,000	39	39
	b) 7,001-12,000	47	47
	c) 12,001 & above	14	14
8	**Training**		
	a) Yes	100	100
	b) No	0	0

Table I –Shows frequency and percentage distribution of samples based on the demographic variables such as age, sex, education, occupation, income, years of experience, and training.

The data presented in the above table shows that 29(29%) samples were between 21-25 years, 34(34%) samples were between the age group of 26-30 years and 37(37%) samples were between the age group of above 31 years. About sex 16(16%) samples were males and 84(84%) samples were females. In marital status 30(30%) samples were unmarried and 70(70%) samples were married. Among religion Majority (76%) samples were Hindu's, 13(13%) samples were Christian's and 7(7%) samples were Muslim's. Regarding experience, 48 (48%) samples were 1-5 years of paramedical workers, 40(40%) of samples were 6-10 years and above 12(12%) of samples were above 10 years. In occupation 37(37%) samples were general nurse and midwives, 23(23%) samples were Lab technician, 25(25%) samples were Auxillary nurse midwives, 15(15%) samples were Pharmacist. About income 39(38%) samples were below 7,000, 47(48%) samples were 7001-12,000, 14 (14%) were Above 12,000. In training majority (100%) samples were attended the Biomedical waste management training.

Fig 2: Percentage distribution of samples in terms of age of paramedical workers

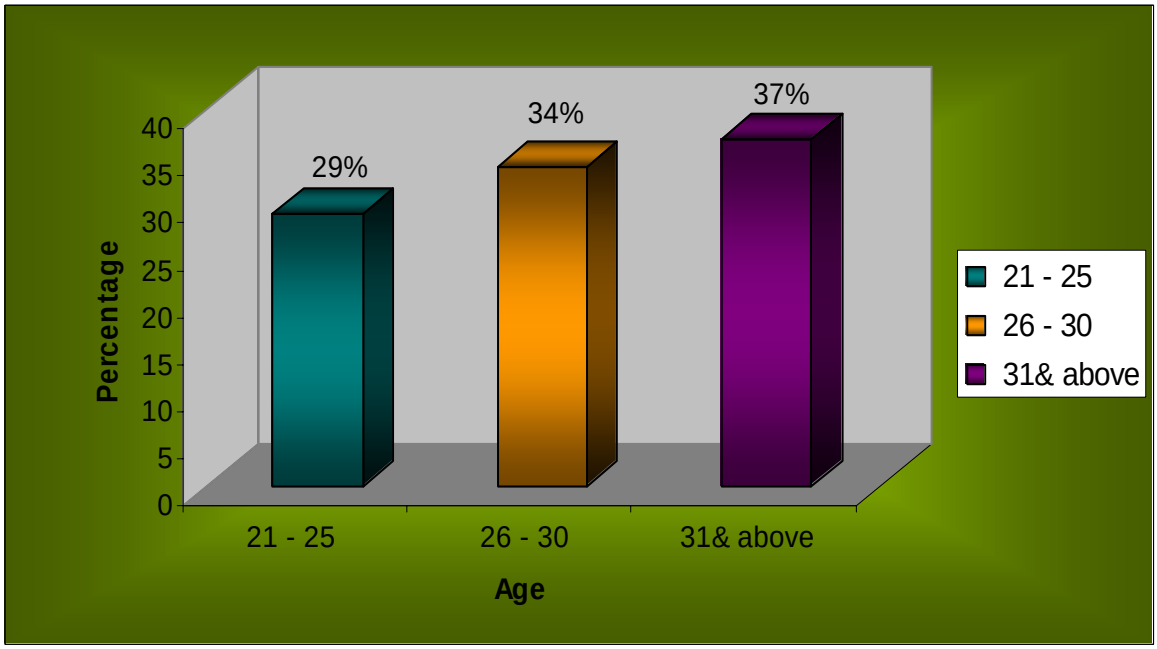


Fig 3: Percentage distribution of samples in terms of sex of paramedical workers

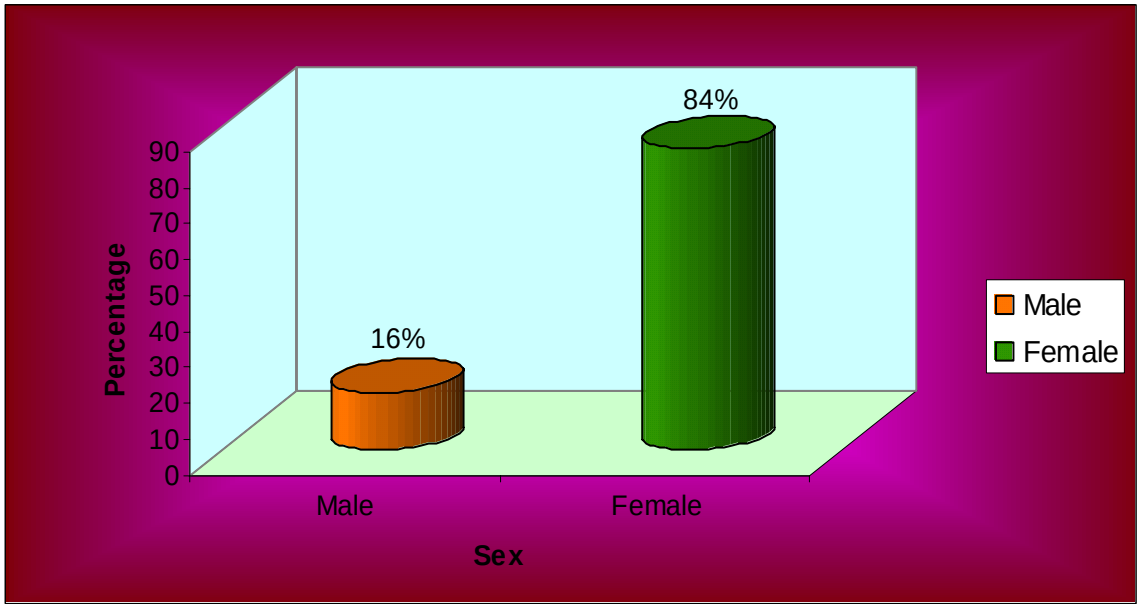


Fig 4: Percentage distribution of samples in terms of marital status of paramedical workers

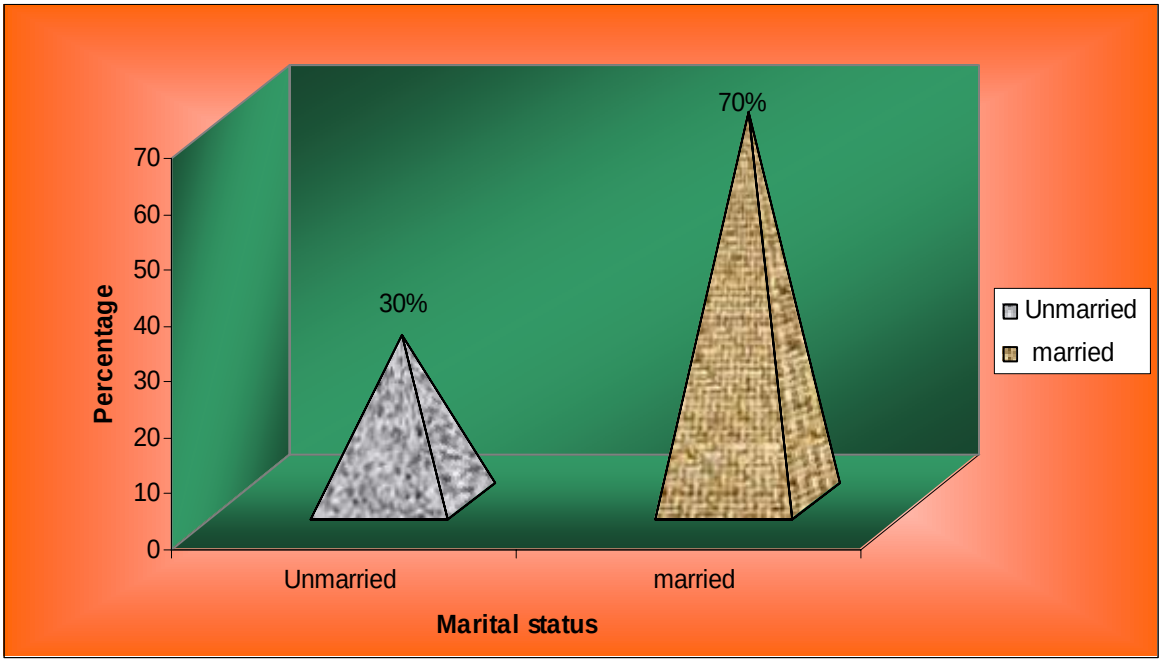


Fig 5: Percentage distribution of samples in terms of Religion of paramedical workers

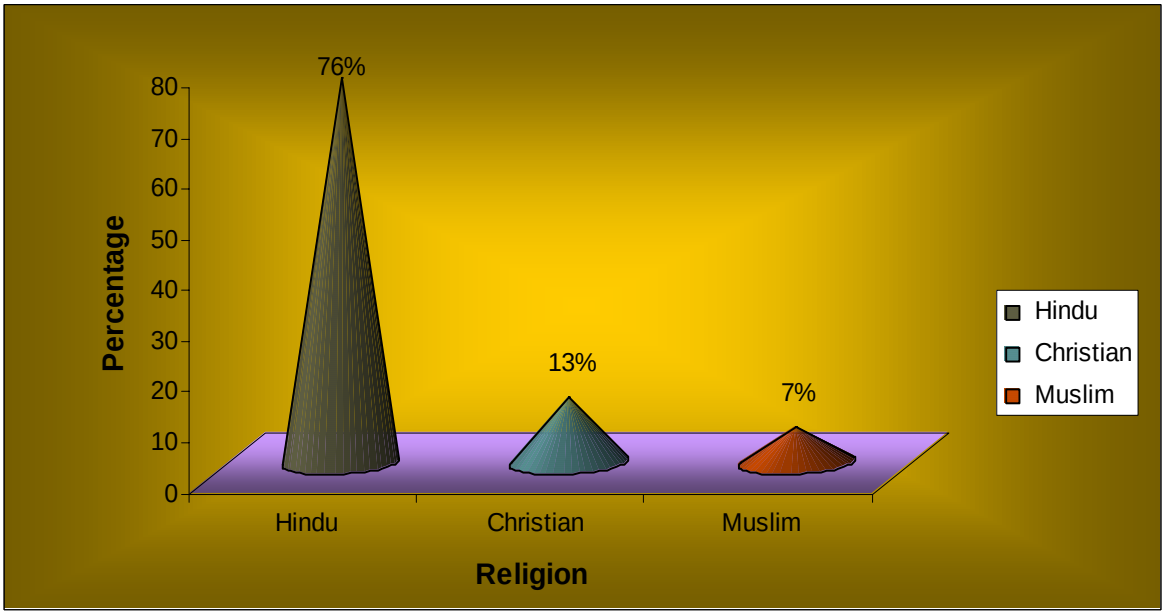


Fig 6: Percentage distribution of samples in terms of experience of paramedical workers

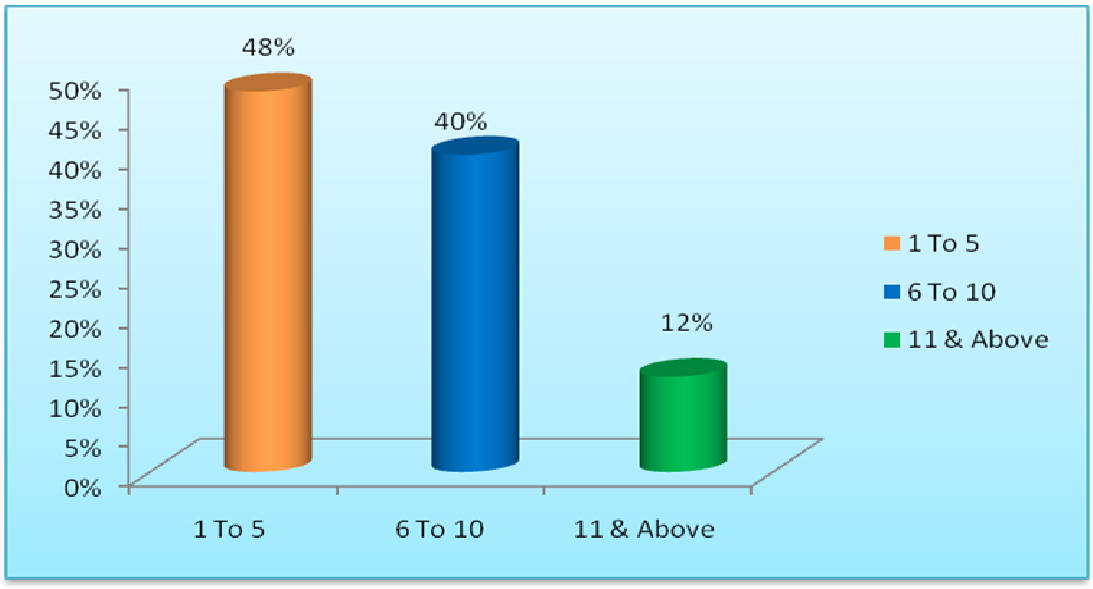


Fig 7: Percentage distribution of samples in terms of occupation of paramedical workers

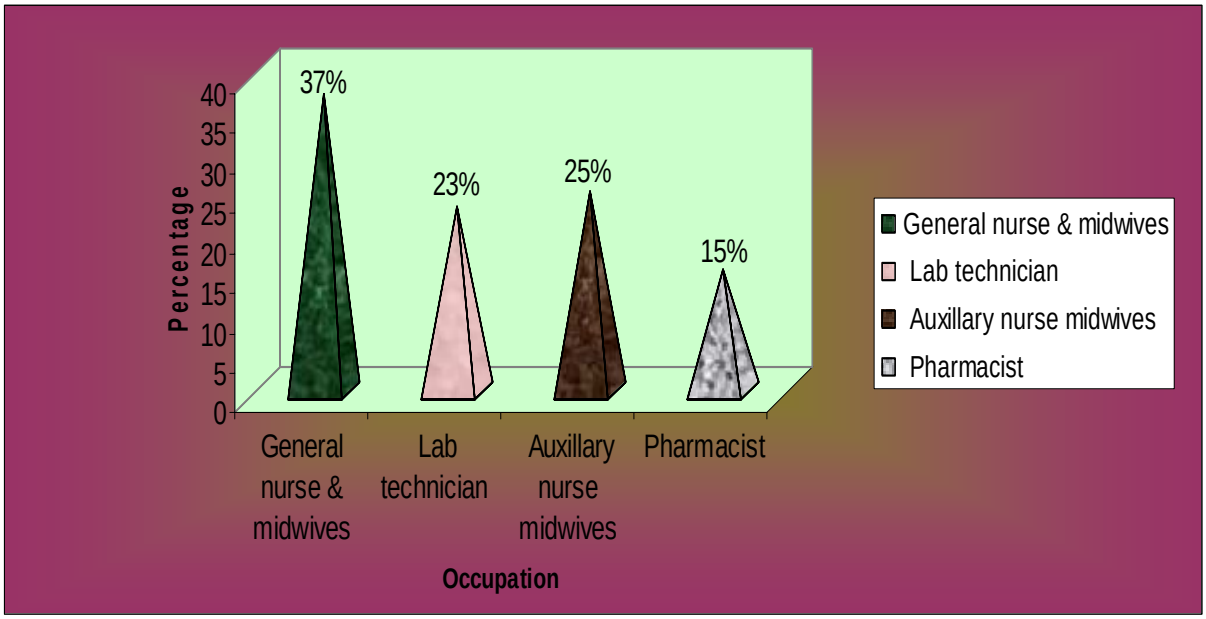


Fig 8: Percentage distribution of samples in terms of income of paramedical workers

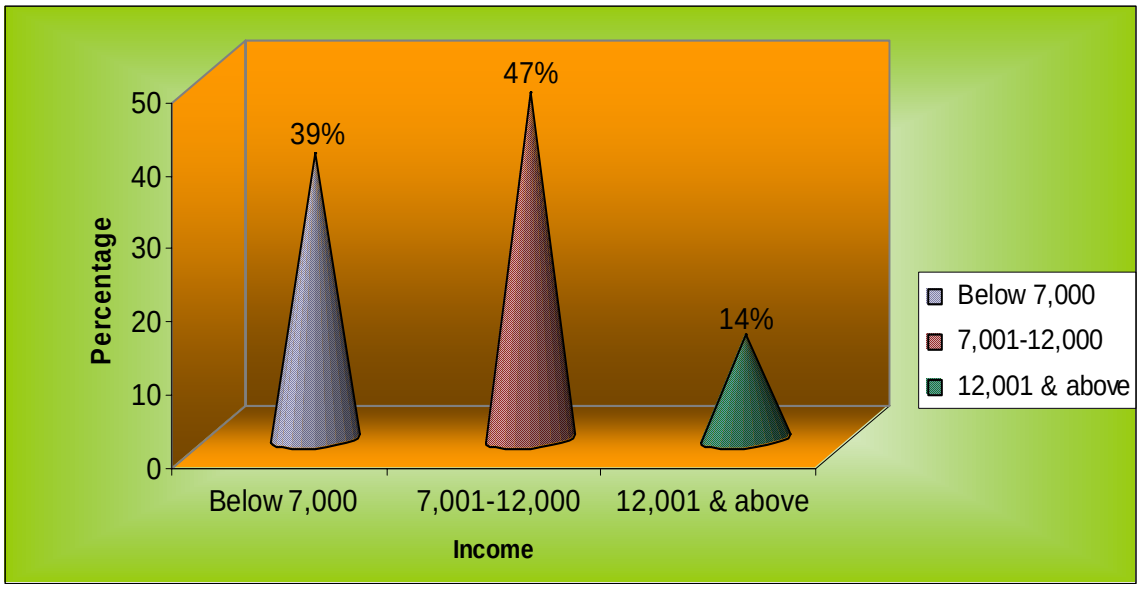
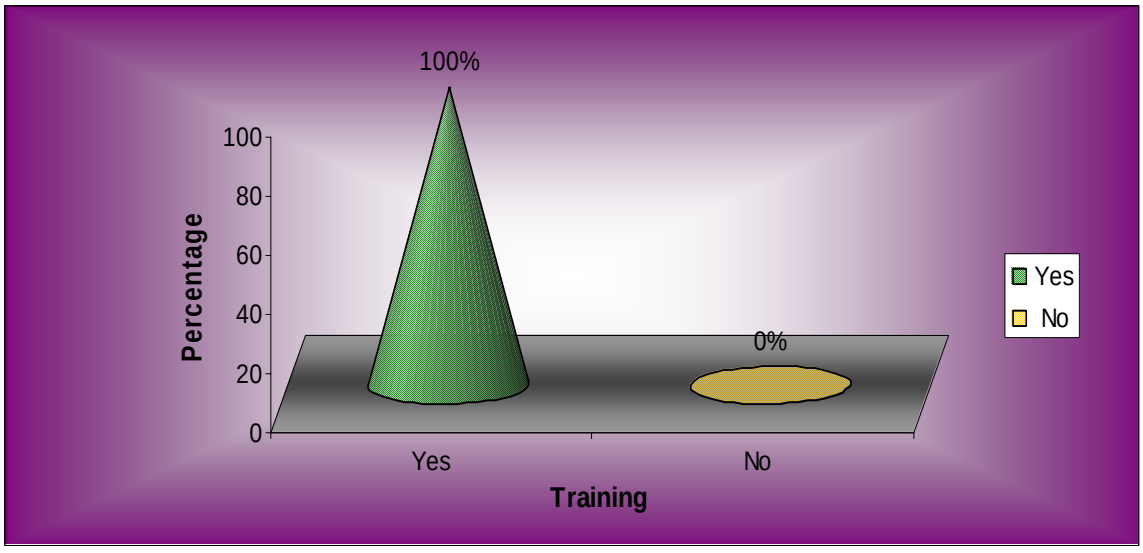


Fig 9: Percentage distribution of samples in terms of training of paramedical workers



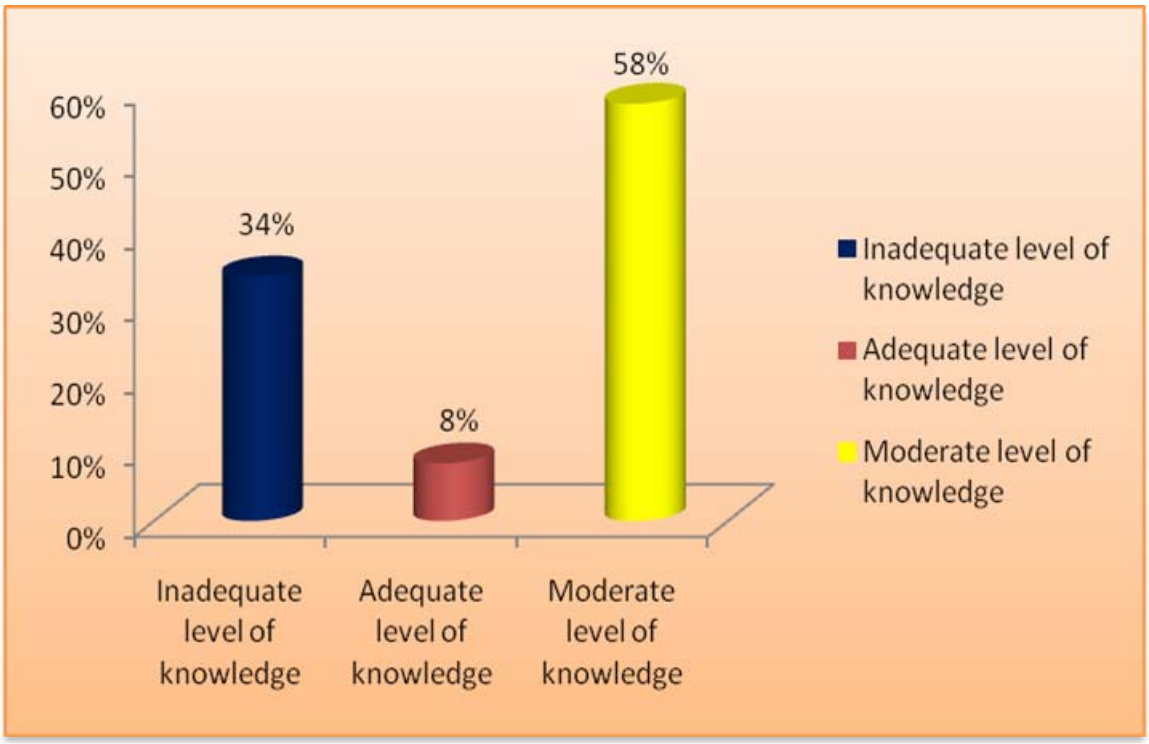
SECTION – II

Table 2: Distribution of samples based on level of knowledge regarding biomedical waste management

S.No	Level of knowledge	Frequency (n)	Percentage (%)
1	Adequate level of knowledge	8	8
2	Moderate level of knowledge	58	58
3	Inadequate level of knowledge	34	34

Table II - shows that frequency and percentage distribution of samples according to the knowledge score of paramedical workers regarding biomedical waste management. It reveals that 34% of paramedical workers had inadequate knowledge, 58% of paramedical worker had moderate level of knowledge, and 8% of paramedical workers had adequate knowledge.

Figure 10: Percentage Distribution of samples based on the level of knowledge regarding biomedical waste management



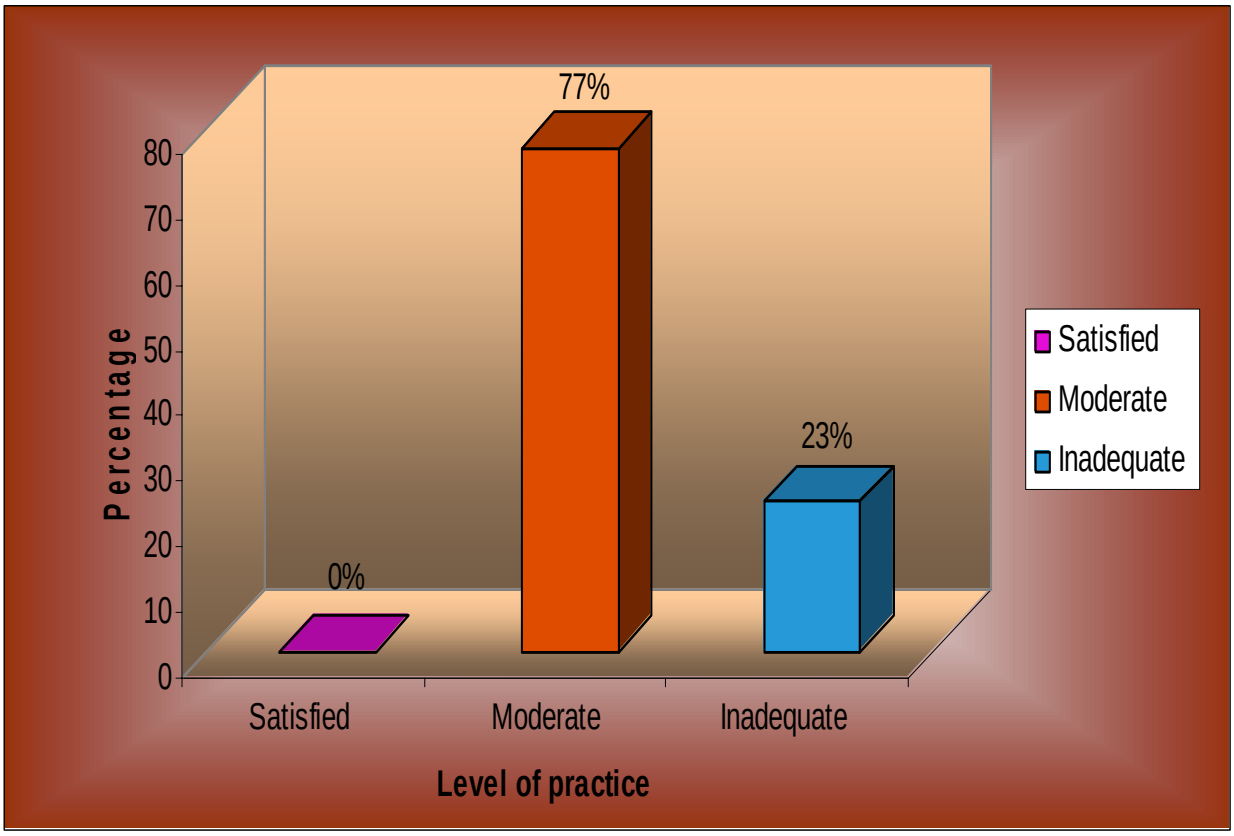
SECTION – III

Table 3: Percentage Distribution of samples based on the level of practice regarding biomedical waste management

S.No	Level of practice	Frequency(F)	Percentage (%)
1	Satisfied level of practice	0	0
2	Moderate level of practice	77	77
3	Inadequate level of practice	23	23

Table III - shows that frequency and percentage distribution of samples according to the practice score of paramedical workers regarding biomedical waste management. It reveals that of, 77% of paramedical worker had moderate level of practice, and 23 % of paramedical workers had inadequate practice, none of the paramedical workers had good level of practice.

Figure 11: Percentage Distribution of samples according to the level of practice regarding biomedical waste management among paramedical workers



SECTION – IV

Table 4 : Correlation co-efficient of Knowledge and practice regarding biomedical waste management among paramedical workers

S. No	Category	Correlation co-efficient 'r'
1	Knowledge	0.515
2	Practice	

Table IV- Indicate that there is a positive correlation between knowledge and practice (r= 0.515)

To find out the relationship between knowledge and practice correlation was used. The computed 'r' value is + 0.515. The positive correlation was found between knowledge and practice. Hence it was interpreted that paramedical workers who had adequate knowledge followed satisfied level of practice.

SECTION – V

Table 5 : Association between knowledge and demographic variables of paramedical workers

N=100

S. No	Demographic variables	Adequate level of knowledge	Moderate level of knowledge	Inadequate level of knowledge	X^2
1	**Age (in yrs)**				
	a) 21 - 25	3	26	0	
	b) 26 - 30	5	22	7	13.62*
	c) 31& above	0	27	0	
2	**Sex**				
	a)Male	0	12	5	33.18*
	b) female	8	61	14	
3	**Marital status**				
	a) Unmarried	3	27	0	9.25*
	b) Married	5	47	18	
4	**Religion**				
	a) Hindu	4	58	14	5.3#
	b) Christian	0	12	4	
	c) Muslim	1	5	2	
5	**Year of experience(in yrs)**				
	a) 1-5	4	34	10	
	b) 6-10	4	18	18	7.76#
	c) 11 & above	0	7	5	

6	**Occupation**				
	a) General nurse &midwives	7	30	0	
	b) Lab technician	4	19	0	27.9*
	c) Auxillary nurse midwives	6	18	1	
	d) Pharmacist	8	7	0	
7	**Income**				
	a) Below 7,000	5	29	5	
	b) 7,001-12,000	3	34	10	4.64#
	c) 12,001 & above	3	8	3	
8	**Training**				
	a) Yes	8	74	18	0#
	b) No	0	0	0	

* Significant

Not significant

Table IV-shows the association between knowledge and demographic variable of paramedical workers with biomedical waste management. The result shows that calculated value for knowledge and demographic variable such as age, sex, marital status, Religion, occupation of paramedical workers regarding biomedical waste management is greater than the table value. So it is concluded that there is a **significant association** between knowledge and demographic variables such as age, sex, marital status, Religion, occupation. The calculated value is less than the tabulated value for income, years of experience, and training of samples. So there is no association between knowledge and demographic variables such as income, years of experience, and training of paramedical workers regarding biomedical waste management.

SECTION – VI

Table 6 : Association between practice and demographic variables of paramedical workers

N=100

S.No	Demographic variables	Satisfied level of practice	Moderate level of practice	Inadequate level of practice	X^2
1	**Age (in yrs)**				
	a) 21 - 25	0	28	1	
	b) 26 - 30	0	24	10	8.78#
	c) 31& above	0	25	12	
2	**Sex**				
	a)Male	0	10	7	3.78#
	b) female	0	67	16	
3	**Marital status**				
	a) Unmarried	0	26	4	3.6#
	b) Married	0	46	24	
4	**Religion**				
	a) Hindu	0	58	16	
	b) Christian	0	12	4	11.7*
	c) Muslim	0	6	2	
5	**Year of experience(in yrs)**				
	a) 1-5	0	38	10	
	b) 6-10	0	31	9	2.9#
	c) 11 & above	18	8	4	

6	**Occupation**				
	a) General nurse & midwives	0	36	1	
	b) Lab technician	0	18	5	15.8*
	c) Auxillary nurse midwives	0	14	11	
	d) Pharmacist	0	9	6	
7	**Income**				
	a) Below 7,000	0	32	7	
	b) 7,001-12,000	0	35	12	3.395#
	c) 12,001 & above	0	12	2	
8	**Training**				
	a) Yes	0	77	23	0#
	b) No	0	0	0	

* Significant

Not significant

Table V- shows that association between practice and demographic variable of paramedical workers regarding biomedical waste management. The result shows that the calculated value for practice and demographic variable such as religion, occupation of paramedical workers regarding biomedical waste management is greater than the table value. So it is concluded that there is a **significant association** between practice and demographic variable such as religion, occupation of paramedical workers regarding biomedical waste management. The calculated value is less than the tabulated value for age, sex, marital status, income, years of experience, and training of paramedical workers regarding biomedical waste management. So there is **no association** between practice and demographic variables such as age, sex, marital status, income, years of experience, and training of paramedical workers regarding biomedical waste management.

CHAPTER – V
DISCUSSION

The aim of the study was to determine the level of knowledge and practice regarding Bio-medical waste management among para-medical workers in selected PHC at Manamadurai in Sivagangai District. The setting of the study was in the Primary health centers in Sivagangai District. The sample size was 100.

The objectives of the study were

1. To assess the level of knowledge regarding biomedical waste management among paramedical workers in selected primary health center

2. To assess the level of practice regarding biomedical waste management among paramedical workers in selected primary health center

3. To find out the relationship between Knowledge and practice regarding biomedical waste management.

4. To find out the association between knowledge of paramedical workers and selected demographic variables like age, sex, marital status, Religion, occupation, income, years of experience, and training

5. To find out the association between practice of paramedical workers and selected demographic variables like age, sex, status, Religion, , occupation, income, years of experience, and training.

1. **To assess the level of knowledge regarding biomedical waste management among paramedical workers in selected PHC**

Table – II shows that the majority of subjects 58(58%) had moderate level of knowledge 8 (8%) samples had adequate level of knowledge 34(34%) of subjects were having inadequate level of knowledge about Bio-medical waste management.

The findings were supported by **mostafacum etal**., (2009). He did a study to assess the knowledge about bio-medical waste management among doctors, nurses and housekeepers. The questionnaires were completed by 200 subjects. The result shows that only 27.4% of the nurses 32% of housekeepers and 36.8% of doctors had adequate knowledge score. The majority of doctors, nurses have in adequate knowledge.

On the view point of researcher point of view, it is ascertained that the paramedical workers have not enough knowledge regarding Bio medical waste management.

2. **To assess the level of practice regarding biomedical waste management among paramedical workers in selected PHC.**

Table – III shows that the majority of the subjects were having moderate level of practice 77%, 23 of them were having good practice regarding.

The study findings were supported by Habwatchs (2000) reported that about waste management and recycling practices of the urban poor and low income communities have environmentally friendly

social waste management. This study provide evidence that the urban poor and low income communities should be formulated to focous on promoting knowledge, education and the skill of the urban poor and empower them to improving their quality of life.

3. **To find out the relationship between Knowledge and practice regarding biomedical waste management.**

Table – IV shows that the relationship between knowledge and practice indicate that there is a positive correlation between knowledge and practice. The computed 'r' value is + 0.515. The positive correlation was found between knowledge and practice.

The findings were supported by **shazly mm etal** (2008) He did a study to assess the knowledge and practice regarding Bio-medical waste of health care among personnel.

The questionnaire were completed by 100 sample. The result shows that only 26% of nurse 33% of housekeepers and 26% of nurses 33% of housekeepers and 38% of the doctors had adequate knowledge but they did not implement it in practice. Nurses knowledge score had a statistically significant weak positive correlation was found.

In research point of view, the para-medical workers who are all having adequate knowledge, they follow satisfied level of the Bio-medical waste, Hence the researchers were **rejected the null hypothesis** and accept researcher hypothesis. The study suggest that those who have knowledge they follow adequate practices.

So it is controversy to note that those who are attending training programme or not implementing their knowledge and practice them in properly they are also had inadequate knowledge and practice the researcher found that, it is because of inadequate facility and they are not able to practice biomedical waste management. Most of the paramedical workers had not answering the twin bin system of disinfectant method because in Sivagangai District they are not following the twin bin system. Most of the primary health centre has not practicing the burning system. Only they are practicing the deep burial system during the time they are not segregating the waste.

The researcher found that biomedical waste plant which was situated in outer portion of Tanjore city, the waste is collected through the vehicle and degraded.

4. **To find out the association between knowledge of paramedical workers and selected demographic variables like age, sex, marital status, Religion, occupation, income, years of experience, and training.**

Hol- There is no significant association between knowledge and demographic variable of para-medical workers regarding Bio-medical waste management.

Table-IV shows the association between knowledge and demographic variables of paramedical workers regarding biomedical waste management. The result shows that the calculated value is greater than the tabulated value. So it is concluded that there is a significant association between knowledge and demographic variables

such as Age, sex, Marital status , Occupation of paramedical workers regarding Bio-medical waste management.

Hence the researcher **rejected the null hypothesis and accepted researcher hypothesis.**

It may be due to the following reason as the respondent age, sex, religion, Occupation of workers would receive more information about Bio-medical waste management from the training, mass media experts and programmes (Govt and Non govt) etc.,

The calculated value is less than tabulated value for Religion year of experience, Income, Training of samples. So there is no association between knowledge and demographic variables such as religion year of experience income training of para-medical workers regarding biomedical waste management. Hence the **researcher was unable to reject null hypothesis.**

Most of the samples were Hindus and the most of the samples were 1-5 years experience. Due to low income they are unable to implement their knowledge and their experience in proper way.

The study findings were supported by Prabakarn etal August (2004) A study was done to assess the knowledge of nursing management. The researchers interviewed 200 Health care professionals. The total 78.4% of Health care professional had good knowledge 35.9% of professional had good knowledge about occupation. There is no significant different between Religion, year of experience were significant associated with para-medical workers Age, sex, occupation.

5. **To find out the association between practice of demographic variables.**

Ho2- There is no significant association between practice paramedical workers with Bio-medical waste management.

Table 6 shows the association between practice and demographic variables. There is no significant association between practice and demographic variable paramedical workers with Bio-medical waste management.

There is no significant association between practice and demographic variables. The result shows that the calculated value is less than tabulated value for age, sex, marital status ,year of experience income and Training of paramedical workers. So there is no association between practice and demographic variable such as age, sex, marital status, year of experience income and training of paramedical workers. Hence the research enables to **reject the null hypothesis.**

It may be due to in adequate facilities. Even though they like to practice their income, Religion, are this absolutely for them to practice.

The study findings were supported by pandit NB June (2007). 900 samples were aware of the risk of HIV and hepatitis. B & C, where as auxiliary staff (ward boys, anadems, sweepers) had very poor knowledge. There was no effective segregation, collection, transportation and disposal system at any hospital. There is an immediate and urgent need to train & educate all doctors and the staff to adopt and follow effective waste management practices .

CHAPTER –VI

SUMMARY, IMPLICATION, AND CONCLUSION RECOMMENDATION

A descriptive study to determine the knowledge and practice regarding biomedical waste management among paramedical workers in selected primary health centers at Manamadurai .The research design was descriptive design with the Sample size of 100 purposive Sampling.

The quantitative research approach with descriptive design was used in this study. The purpose of the study to assess the knowledge and practice of biomedical waste management among paramedical workers. Semi structured questionaire to assess the knowledge regarding biomedical waste management verbal response / checklist to assess the practice of biomedical waste management. The Inferential descriptive statistics was used.

The aim of the study was to determine the level of knowledge and practice of biomedical waste management, to improve the knowledge and practice through preparing and giving health education and providing health teaching module, booklet, pamphlet, to the paramedical worker

Review of literature enabled the investigator to develop the conceptual frame work , methodology ,setting for the study, and plan for data analysis ,the conceptual model frame work adopted for this study was adopted for this study was based on the health belief model which is focused on providing knowledge and practice about the biomedical waste management.

A semi structured questionnaire was prepared by the investigator consisting of two section .In section I consist of demographic details. Section II - consist of two part (Part-I& Part-II). Part-I consist of question related to assess the level of knowledge .Part II consist of question related to assess the level of practice.

The gathered data were tabulated, grouped and analyzed . statically method (chi-square correlation) were used for analysis.

MAJOR FINDINGS OF THE STUDY

Majority of the paramedical workers 37(37%) were between above 31 years.

- ♣ Majority of paramedical workers 84 (84%) were females.
- ♣ Majority of paramedical workers 70(70%) were married.
- ♣ Majority of paramedical workers 74(74%)were Hindu
- ♣ Majority of paramedical workers 37(37%) were general nurse and midwives.
- ♣ Majority of paramedical workers 48(48%) were 1-5 years of experience.
- ♣ Majority of paramedical workers 47(47%) were 12,001-17,000 income
- ♣ Majority of paramedical workers 100 (100%) were attended training.
- ♣ Majority of paramedical workers have 58% moderate level of knowledge.
- ♣ Majority of paramedical workers 77% were having moderate level of practice.

- ♣ Overall result shows that association between knowledge and selected demographic variable such as religion, experience, income, training and occupation.
- ♣ Overall result shows that there is no association between practice and selected demographic variables such as age, sex, marital status, year of experience income and training.
- ♣ Overall result shows that there is a relationship between knowledge and practice correlation was used. The computed ‘r’ value is +0.515 the positive correlation was found between knowledge and practice. Hence it was interpreted that who had adequate knowledge follows satisfied level of practice.

IMPLICATION FOR NURSING PRACTICE

- Several implications can be drawn from the present study for nursing practice .Community health needs to create awareness among the paramedical workers regarding biomedical waste management in the particular primary health center and also motivate them to do the practice.

- Biomedical waste could be imparted through various methods like lecture, mass media, pamphlets, display etc.

- Any teaching strategy which is simple, clear and attractive learners to follow instruction easily .As a nurse play an important role in creating awareness ,motivate to practice ,provide information regarding Biomedical waste management in primary health centers. Hence nurses should take interest in preparing different strategies suitable for the primary health centers.

- Training should be give foe the paramedical workers experience.

- In present, future paramedical workers have to protect and prevent the infectious diseases through the primary health centers ; which may be helpful in achieving the goal of health for all. The student learning experience should be improved through the practice.

IMPLICATION FOR NURSING EDUCATION.

- The nursing curriculum should consist of bio medical waste management as a separate discipline.
- By using different methods of teaching nursing student should be made aware of their role in health protection, prevention of infectious disease.
- If we are including the biomedical waste management in our curriculum , we can prevent the infection and to clean the environment.
- Nurses in post graduate level need to develop their communication skill gaining confidence of people and providing them better practice of biomedical waste management.
- Nursing education should provide better platform to broaden the knowledge and is implications of practice.

NURSING ADMINISTRATION

- The nurse administrator should take interest in disseminating the information of biomedical waste management.
- Necessary in service education is to be provided to the paramedical workers, at various levels to make them aware of biomedical waste management.
- Update the nurse's knowledge about the current practices through workshop and conferences. This will enable them to provide health education holistically to the Para medical workers regarding biomedical workers regarding biomedical waste management
- Health teaching should be insisted as one of the responsibilities of nursing personnel.

NURSING RESEARCH.

- ♠ There is a lot of scope for the nurses to conduct research in this area .
- ♠ This study helps the future investigator to adopt different method.
- ♠ Findings of the study can provide baseline information for further research.
- ♠ An experimental study can be conducted with structured teaching programme on knowledge on practice.

RECOMMENDATION FOR FURTHER RESEARCH

- ♠ On the basis of present study following recommendation were made.
- • A similar study could be done with large samples.
- ♠ An experimental study could be conducted with structured teaching program on knowledge and practice
- ♠ A similar study conducted in the hospital ,nursing homes and clinics
- ♠ A similar study could be done on longitudinal basis.
- ♠ A similar study may be conducted to find out the incidence of infectious disease related to biomedical waste management
- ♠ A similar study could be conducted with Health care providers.

CONCLUSION

From the above findings the investigator would like to conclude that majority of paramedical workers have moderate level of knowledge; but none of them having adequate level of practices. It was noticed that the primary health centers were not providing adequate facilities to practice bio-medical waste management. The concerned authorities should also be vigilant and providing the proper facilities such as dust bin in different colors for the disposal of hospital waste material. The medical officer should create awareness among paramedical workers regarding bio medical waste management in primary health center and also motivate them to do practice of biomedical waste management; The success of the various scheme implemented by the Government through the medical department in eradicating certain diseases depend on the basic implementation of bio-medical waste management. In primary health centre and also motivate them to do practice of biomedical waste management.

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APPENDIX- I

LETTER SEEKING PERMISSION TO CONDUCT STUDY

To

Respected Sir/madam,

Sub: Matha College of Nursing, Manamadurai – Dissertation work of M.Sc. Nursing student, in selected area.

I am to state that Ms. Jolly. G.V is one of our final years M.Sc. Nursing student, Matha College of Nursing, Manamadurai has to conduct a research project, as the partial fulfillment of university requirements for the degree of Master of Science in Nursing.

The statement of the problem is:

"A study to compare the Awareness of mothers regarding child abuse in selected rural and urban areas at Sivagangai District, Tamilnadu."

I request you to kindly permit her to do the research in your esteemed institution and give your valuable guidance and suggestions.

Thanking you,

Place: Manamadurai yours faithfully

Date:

Prof. Mrs. Jebamani Augustine M.Sc (N),
Principal.

APPENDIX – II

LETTER SEEKING EXPERT'S OPENION FOR CONTENT VALIDITY OF TOOL

From

Ms. Jolly G.V.
M.Sc Nursing II Year,
Matha College Of Nursing,
Manamadurai.

To

Respected Madam/Sir.

Sub : Requesting opinion and suggestion for content validity of tool.

I am a final year Master Degree Nursing student in Matha College of Nursing, Manamadurai. In partial fulfillment of master degree in Nursing I have selected the topic given below, for the Research Project to be submitted to Dr. MGR Medical University, Chennai.

Problem statement: **" A study to determine the knowledge and practice regarding biomedical waste management among paramedical workers in selected primary health center at manamadurai in sivagangai district.**

I request you to kindly validate the tool and give your expert opinion for the necessary modification and I would be happy if you could refine the problem statement, the objectives and the questionnaire.

I have enclosed the following with this letter,

1. Problem statement, Objectives of the study, Demographic Performa,
2. Tool-I –Questionnaire to assess the knowledge of biomedical waste management
3. Tool-II Check list to assess practice of biomedical waste management waste management

Place: Manamadurai Yours sincerely,
Date:

Thanking you.

APPENDIX- III

LIST OF EXPERTS

PROF. **MRS. JEBAMANI AUGUSTINE** M.Sc., (N) RN.RM., Ph.D.,
PRINCIPAL, HOD MEDICAL SURGICAL NURSING,
MATHA COLLEGE OF NURSING,
MANAMADURAI

PROF. **MRS. HELEN RAJAMANIKAM**,
HOD COMMUNITY HEALTH NURSING,
MATHA COLLEGE OF NURSING,
MANAMADURAI.

PROF. **MRS. SHABERA BANU**, M.Sc., (N), Ph.D.,
VICE PRINCIPAL, HOD MATERNITY NURSING,
MATHA COLLEGE OF NURSING,
MANAMADURAI.

PROF. **MRS. KALAI GURU SELVI** M.SC., (N), Ph.D.,
VICE PRINCIPAL, HOD PEDIATRIC NURSING,
MATHA COLLEGE OF NURSING,
MANAMADURAI.

PROF. **MRS. THAMARAI SELVI** M.SC.(N)., Ph.D.,
MATERNITY NURSING,
MATHA COLLEGE OF NURSING,
MANAMADURAI

READER. **MRS. KALPANA** M.SC. (N).,
COMMUNITY HEALTH NURSING,
NARAYANA COLLEGE OF NURSING
NELLORE

READER. **MRS FEMILA DARLING**, M.SC(N)
COMMUNITY HEALTH NURSING,
CSI COLLEGE OF NURSING
NEYYURE.

DEMOGRAPHIC DATE

Dear Participant,

The questionnaire consists of items related to the demographic variables. Kindly put a tick mark [ ] for the most appropriate answer.

1. Age (in Years)
   a) 21 – 25 [ ]
   b) 26 -30 [ ]
   c) 31and above [ ]

2. Sex
   a) Male [ ]
   b) Female [ ]

3. Marital Status
   a) Married [ ]
   b) Unmarried [ ]

4. Religion
   a) Hindu [ ]
   b) Christian [ ]
   c) Muslim [ ]

5. Year of Experience
   a) 1 - 5 Years [ ]
   b) 6 – 10 Years [ ]
   c) 10 Years and above [ ]

6. Occupation

   a) Axillary Nurse Midwife. [ ]

   b) Lab technician [ ]

   c) General Nurse & midwife [ ]

7. Income

   a) below 7000 [ ]

   b) Rs. 7000 – Rs. 12000 [ ]

   c) above 12001 [ ]

8. Attended any training programme

   a) Yes [ ]

   b) No [ ]

The Following statement regarding knowledge of Biomedical waste management from the three responses given tick (✔) the most appropriate response in the box given at the right side

1. The waste which is produced during the course of healthcare activities are called.
   a) Solid waste [ ]
   b) Community waste [ ]
   c) Biomedical waste [ ]
   d) Don't Know [ ]

2. The Sources of Health care waste are except
   a) Hospital [ ]
   b) Educational Institution [ ]
   c) PHC [ ]
   d) Don't Know [ ]

3. Which of the following waste which can transmit infection
   a) Gaseous chemicals [ ]
   b) Blood and Blood Product [ ]
   c) Food Residues [ ]
   d) Don't Know [ ]

4. Biomedical waste which is suspected to contain pathogens are
   a) Chemical waste [ ]
   b) Infections waste [ ]
   c) Toxic waste [ ]
   D) Don't know [ ]

5. The waste such as solvent, reagent, ethylene oxide are called
   a) Pharmaceutical waste [ ]
   b) Chemical waste [ ]
   c) Radioactive waste [ ]
   d) Don’t know [ ]

6. The waste include outdated medication of all kind as well as residual of used drugs are called
   a) Chemical waste [ ]
   b) Pharmaceutical waste [ ]
   c) Radioactive waste [ ]
   d) Don’t Know [ ]

7. General waste are
   a) Food waste & Plastic Bag, etc [ ]
   b) Liquid waste, Sputum, Labwaste [ ]
   c) Used Culture media [ ]
   d) Don’t Know [ ]

8. The main health hazard related to medical waste is
   a) Infection [ ]
   b) Cancer [ ]
   c) Asthma [ ]
   d) Don’t Know [ ]

9. The Process of Separating and placing the Biomedical waste and General waste in the different colour coded bins are called
   a) Waste reduction [ ]
   b) Waste transportation [ ]
   c) Waste segregation [ ]
   d) Don’t Know [ ]

10. Colour coding which indicate the disposal of Lab waste, solid waste is

    a) Blue [ ]

    b) Black [ ]

    c) Red [ ]

    d) Don’t Know [ ]

11. Color which indicate to disposal of human tissue, organ & body parts is

    a) Black [ ]

    b) Yellow [ ]

    c) Red [ ]

    d) Don’t Know [ ]

12. Colour coding which indicate the disposal of sharp waste is

    a) Black [ ]

    b) Red [ ]

    c) Blue [ ]

    d) Don’t know [ ]

13. Color coding which indicate the disposal of out dated contaminated medicines & chemical is

    a) Red [ ]

    b) Blue [ ]

    c) Black [ ]

    d) Don’t know [ ]

14. How many type s of Red Bins are available

a) One [ ]

b) Two [ ]

c) Three [ ]

d) Don’t know [ ]

15. Twin Bin System of disinfection means

a) Chemical disinfection [ ]

b) Biological disinfection [ ]

c) Mechanical disinfection [ ]

d) Don’t Know [ ]

16. Colour coding which refers to disposal of food items, plastic cover, non infected plaster of pairs.

a) Yellow [ ]

b) Red [ ]

c) Green [ ]

d) Don’t know [ ]

17. Waste segregation is the responsibility of

a) Patient [ ]

b) Patient Attender [ ]

c) Health Care Provider [ ]

d)Don’t know [ ]

18. Waste segregation should be kept

a) During final disposal [ ]

b) During transportation [ ]

c) At the point of generation [ ]

d) Don’t know [ ]

19. The Routine hospital waste should be removed except when the bags/containers are
    a) Completely filled [ ]
    b) ½ filled [ ]
    c) ¾ filled [ ]
    d) Don’t know [ ]

20. The Process that modify the waste in some way before it is taken to its final resting place is
    a) Waste Rx [ ]
    b) Waste bandling [ ]
    c) Waste segregation [ ]
    d) Don’t know [ ]

21. The method for the treatment of human anatomical waste is
    a) Incineration [ ]
    b) Disinfection [ ]
    c) Autoclaving [ ]
    d) Don’t know [ ]

22. The incineration ash is disposed by
    a) Sanitary land fill [ ]
    b) Open dumping [ ]
    c) Pits [ ]
    d) Don’t know [ ]

23. The advantages of incineration is
    a) Reduction of waste volume [ ]
    b) High investment [ ]
    c) High maintenance [ ]
    d) Don’t know [ ]

24. Waste should not be disposed without

a) Mixing [ ]

b) Collecting [ ]

c) Segregating [ ]

d) Don’t know [ ]

25. Health and safety programme for health care providers include

a) Issuing personal protective devices [ ]

b) Adequate remuneration [ ]

c) Promotion [ ]

d) Don’t know [ ]

QUESTIONNAIRE TO ASSESS THE PRACTICE OF BEFORE WASTE MANAGEMENT

Sl. No		Score	
		Yes	No
1	Do you seal the waste bag?		
2	Do you thing that emptying waste daily is important?		
3	Do you dispose plastic waste in Red Bin?		
4	Do you dispose sharp material in blue Bin?		
5	Do you disgaurd anatomical waste in blue Bin?		
6	Do you dispose expired drugs in black Bin?		
7	Do you follow the disinfected Bio – medical waste collected in Red bag is autoclaved?		
8	Do you burn the anatomical waste?		
9	Do you dispose incineration ash by sanitary land fill?		
10	Do you feel that paramedical workers need more information regarding Bio medical waste management?		
11	Do you follow the disinfected Bio medical waste collected in Red bag is autoclaved?		
12	Do you practice Deep burial system for disposing small quantities of Biomedical waste?		
13	Do you wearing the Gloves while transporting the Biomedical waste?		
14	Do you practice twin system of disinfection?		
15	Do you weigh the Biomedical waste at the point collection at each unit?		
16	Do you Recording the quantitative details Registered in daily basis?		
17	Do you segregate the waste as per colour code?		
18	Do you Conduct regular visit to the Biomedical waste management?		
19	Do you monitor the Biomedical waste management regularly?		
20	Do you conduct monthly meeting with staff to discuss the issues and best practices in biomedical waste?		

தனிநபர் விபரம்

1. வயது (வருடத்தில்)
   அ) 21-25
   ஆ) 26-30
   இ) 31-ம் அதற்கு மேல்

2. பாலினம்
   அ) ஆண்
   ஆ) பெண்

3. திருமண நிலை
   அ) திருமணமானவர்
   ஆ) திருமணமாகாதவர்

4. மதம்
   அ) இந்து
   ஆ) கிறிஸ்டியன்
   இ) முஸ்லீம்

5. எத்தனை வருட பணி அனுபவம் உள்ளது.
   அ) 1-5 வருடம்
   ஆ) 6-10 வருடம்
   இ) 10-ம் அதற்கு மேல்

6. தொழில்
   அ) செவிலியர்
   ஆ) ஆய்வக பரிசோதகர்
   இ) சுகாதார செவிலியர்
   ஈ) மருந்தகப் பணியாளர்கள்

7. வருமானம்
   அ) 7000-க்கும் கீழ்
   ஆ) 7001 - 12000
   இ) 12001-க்கும் மேல்

8. இதற்கு முன் ஏதேனும் பயிற்சிக்கு போனீர்களா?
   அ) ஆம்
   ஆ) இல்லை

பகுதி - ஆ

1. நலவாழ்வு முறைகளை கடைபிடிக்கும் பொழுது வெளிவிடும் கழிவுபொருள் என்பது
   அ) திடப்பொருள் கழிவு
   ஆ) பொதுவான கழிவு
   இ) மருத்துவ கழிவு
   ஈ) தெரியாது

2. கீழ் கொடுக்கப்பட்டுள்ளதில் எது நலவாழ்வு அல்லாதது?
   அ) மருத்துவமனை
   ஆ) பாடசாலைகளிலிருந்து
   இ) சுகாதார நிலையம்
   ஈ) தெரியாது

3. எந்த கழிவு நோயை உருவாக்கும் கிருமியை தோற்றுவிக்கும்?
   அ) வாயு போன்ற வேதிபொருள்
   ஆ) இரத்தம் போன்ற பொருள்கள்
   இ) உணவு பொருள்
   ஈ) தெரியாது

4. வேதிகழிவு எந்த கழிவை சேர்ந்தது?
   அ) தனிம கழிவு
   ஆ) தொற்றக் கூடிய கழிவு
   இ) நஞ்சு தன்மையுடைய கழிவு
   ஈ) தெரியாது

5. கரையக்கூடிய, எத்திலின் ஆக்ஸைடு எந்த வகை கழிவை சார்ந்தது?
   அ) மருந்து கழிவு
   ஆ) வேதிக் கழிவு
   இ) கதிரியக்க கழிவு
   ஈ) தெரியாது

6. மீதியிருக்கும் காலங்கழிந்த மருந்து வகைகள் என்றால்

அ) வேதிக்கழிவு

ஆ) மருந்து கழிவு

இ) கதிரியக்க கழிவு

ஈ) தெரியாது

7. பொதுவான கழிவு என்றால்

அ) உணவு பொருள், பிளாஸ்டிக்பை

ஆ) திடப்பொருள் கழிவு, சளி, ஆய்வக கழிவு

இ) செயற்கைமுறையில் உபயோகப்படுத்தப்பட்ட கழிவு

ஈ) தெரியாது

8. மருத்துவ கழிவினால் ஏற்படக்கூடிய நோய் எது?

அ) தொற்றுநோய்

ஆ) கான்சர்

இ) ஆஸ்துமா

ஈ) தெரியாது

9. மருத்துவ கழிவை பிரித்து போட உபயோகிக்கும் நிறத் தொட்டிகள் என்றால்

அ) கழிவு பொருள்கள்

ஆ) கழிவை ஒரு இடத்திலிருந்து இன்னொரு இடத்திற்கு மாற்றுதல்

இ) கழிவு பிரித்தெடுப்பது

ஈ) தெரியாது

10. எந்த நிறத் தொட்டியில் ஆய்வக கழிவையும், திட கழிவையும் போடுவீர்கள்?

அ) நீலம்

ஆ) கருப்பு

இ) சிவப்பு

ஈ) தெரியாது

11. எந்த நிறத் தொட்டியில் மனிதனுடைய திசுக்கள் உடல் உறுப்புகளை போடுவீர்கள்?

அ) கருப்பு

ஆ) மஞ்சள்

இ) சிவப்பு

ஈ) தெரியாது

12. எந்த நிற தொட்டியில் கூரான கழிவை போடுவீர்கள்?

அ) கருப்பு

ஆ) சிவப்பு

இ) நீலம்

ஈ) தெரியாது

13. எந்த கலர் தொட்டியில் முடிவடைந்த மருந்து மாத்திரைகள், வேதியல் பொருள்களை போடுவீர்கள்?

அ) சிவப்பு

ஆ) நீலம்

இ) கருப்பு

இ) தெரியாது

14. எத்தனை வகையான சிவப்பு தொட்டி உள்ளது?

அ) ஒன்று

ஆ) இரண்டு

இ) மூன்று

ஈ) தெரியாது

15. இரண்டு தொட்டி கிருமிநாசினி என்றால்

அ) வேதியல் கிருமிநாசினி

ஆ) உயிரியல் கிருமி நாசினிமுறை

இ) மெக்கானிக்கல் கிருமி நாசினிமுறை

ஈ) தெரியாது

16. எந்த கலர் தொட்டியில் உணவு வகைகள் பிளாஸ்டிக் கலர், தொற்று ஏற்படாத பிளாஸ்டர் ஆப் பாரீஸ் எதில் போடுவீர்கள்?

அ) மஞ்சள்

ஆ) சிவப்பு

இ) பச்சை

ஈ) தெரியாது

17. கழிவை பிரித்தெடுக்கும் பணி செய்பவர் யார்

அ) நோயாளி

ஆ) நோயாளியை பார்ப்பவர்

இ) சுகாதார பணியாளர்

ஈ) தெரியாது

18. கழிவை எப்போது பிரித்தெடுப்பார்கள்

அ) செயல்முடிந்தவுடன் (பொருள்களை பயன்படுத்தி முடித்தவுடன்)

ஆ) ஒரு இடத்திலிருந்து இன்னொரு இடத்திற்கு எடுத்து கொண்டு போகும்போது

இ) எந்த இடத்தில் தோற்றுவிக்கப்படுதோ, அதே இடத்தில்

19. மருத்துவ கழிவை எப்போது நீக்குவீர்கள்

அ) முழுதும் நிறைந்தால்

ஆ) ½ நிறைந்தால்

இ) ¾ நிறைந்தால்

ஈ) தெரியாது

20. கழிவை கடைசி இடத்தில் கொண்டு போகப்படுவதற்கு முன் எந்த முறை கையாளுவார்கள்?

அ) கழிவு சுத்தகரித்தல்

ஆ) கழிவை

இ) கழிவை பிரித்தெடுக்கும் முறை

ஈ) தெரியாது

21. மனித கழிவை எந்த முறையில் மாற்றுவீர்கள்?

அ) எரித்துவிடுவார்கள்

ஆ) கிருமிநாசினிமுறை

இ) ஆட்டோக்ளேவ்

ஈ) தெரியாது

22. எரித்த சாம்பலை எப்படி நீக்கிவீடுவீர்கள்?

அ) துாய்மையான நிலத்தில் போடுவீர்கள்

ஆ) திறந்த வெளியில் மலைபோல் குவித்து வைப்பார்கள்

இ) ஆழமான குழிதோண்டி அதில் போடுவார்கள்

ஈ) தெரியாது

23. எரிப்பதால் ஏற்படும் நன்மை

அ) கழிவின் அளவை குறைக்கமுடியும்

ஆ) மூலதனம் அதிகமாகும்

இ) மேன்படுத்த முடியும்

ஈ) தெரியாது

24. கழிவை வெளியேற்றும் போது என்ன பண்ண கூடாது?

அ) ஒன்றாக கலக்காமல்

ஆ) ஒன்று சேர்த்து

இ) விரித்து வைத்தல்

ஈ) தெரியாது

25. சுகாதார பணியாளர்கள் கையாளும் பாதுகாப்பு உபகரணங்கள்

அ) அதிக வெகுமதி

ஆ) பாதுகாப்பு முறை

இ) பதவி உயர்வு

ஈ) தெரியாது

வ.எண்	பெயர்	ஆம்	இல்லை
1	கழிவு பையை முத்திரை போடுவீர்களா?		
2	தினசரி கழிவை காலி பண்ணுவது முக்கியம் என்று கருதுவீர்களா?		
3	பிளாஸ்டிக் கழிவை சிவப்பு கலர் தொட்டியில் போடுவீர்களா?		
4	கூர்மையான பொருள்களை நீலத்தொட்டியில் போடுவீர்களா?		
5	உடலுறுப்பு கழிவை நீலத்தொட்டியில் ஒதுக்குவீர்களா?		
6	காலங்கழிந்த மருந்துகளை கருப்பு தொட்டியில் போடுவீர்களா?		
7	கிருமி நாசினி உயிர் மருத்துவ கழிவை சேகரித்து சிவப்பு கலர் தொட்டியை ஆட்டோக்ளேவ் பண்ணுவீர்களா?		
8	உடலுறுப்பு கழிவை எரித்துவிடுவீர்களா?		
9	எரித்த சாம்பலை துாய்மையான நிலத்தில் போடுவீர்களா?		
10	மருத்துவம் சார்ந்த தொழிலாளர்களுக்கு உயிர் மருத்துவ கழிவை பற்றி அதிகமாக தெரிந்த கொள்ள வேண்டிய அவசியம் உள்ளது என்று நினைக்கிறீர்களா?		
11	மருத்துவ கழிவை கிருமிநாசினி முறை பயன்படுத்த நீலகலர் தொட்டியை ஆட்டோக்ளேவ் பண்ணுவீர்களா?		
12	கொஞ்சமாய் உள்ள மருத்துவ கழிவை குழி தோண்டி புதைக்கும் முறை செய்கிறீர்களா?		
13	மருத்துவ கழிவை எடுத்து செல்லும் போது கையுறை அணிவீர்களா?		
14	இரண்டு தொட்டி கிருமிநாசினிமுறை பயிற்சி செய்கிறீர்களா?		
15	உயிர் மருத்துவகழிவை எடுக்கும்போது எடை எடுப்பீர்களா?		
16	தினசரி எவ்வளவு கழிவை எடுக்கிறீர்கள் என்று குறித்து வைப்பீர்களா?		
17	நிற கூடைக்கு ஏற்றாற்போல் கழிவை பிரித்து வைப்பீர்களா?		
18	தினசரி மருத்துவ கழிவு சுத்திகரிப்பு செய்வதை சென்று பார்ப்பீர்களா?		
19	மருத்துவ கழிவு சுத்திகரிப்பு பண்ணுவதை தினசரி பரிசோதனை செய்வீர்களா?		
20	ஒவ்வொரு மாதமும் தொழிலாளர்கள் ஒன்று கூடி மருத்துவ கழிவு சுத்திகரிப்பை குறித்து விவாதிப்பீர்களா?		

SELF INSTRUCTIONAL MODULE
BIOMEDICAL WASTE MANAGEMENT

Current Scenario in Health Care Institutions

The Health care Institutions in India use approximately 80 crores injections in a year in various treatment and immunization practices.

It estimated that about 60% of it is infectious and often disposed improperly, which makes a path for transmission of infections such as HIV, HBV, etc to health care providers unknowingly.

The Health care waste generation ranges between 0.5 to 2.0 kg per bed day. At present, the bio-medical waste is being collected in mixed state and disposed along with municipal waste.

Poorly managed bio-medical waste not only poses a potential danger to patients and the community but also a great risk to health care providers themselves.

Bio-Medical waste (Management & Handling) Rules, 1998.

According to the Bio-Medical Waste (Management & Handling) Rules 1998, Bio-Medical Waste is defined as “any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities there to or in the production or testing of biologicals and including categories mentioned in Schedule – 1”.

The Government of India notified the Rules in 1998 and its is applicable across the country to al Health Care establishments. The Rules recognize that there are different kinds of waste generated from any health care institution. It identifies different categories of biomedical waste and specifies the kind of waste / disposal for each category.

Duty of the Occupier

It shall be the duty of every occupier of a Hospital / Health care unit generating Bio Medical waste to ensure that such waste in handled without adverse effect to human health and the environment.

Segregation

The Bio-Medical Waste should not be mixed with other waste. It should be segregated at the point of generation in accordance to the colour codes prescribed in the rules and should be properly labeled.

Storage

Untreated Bio-Medical Waste shall not be stored more than 48 hrs, but in case of emergency, prior approval must be sought from prescribed authority.

Transportation

Bio-Medical waste shall be transported only in such vehicles authorised by the competent authority.

Authorization

It means the permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, disposal or any other form of handling of Bio-Medical Waste in accordance with the Rules. The prescribed authority is the Tamilnadu pollution control Board for the state or the District Environmental Engineer for districts.

Maintenance of records

Every occupier shall maintain records on generation, collection, reception, storage, treatment, disposal or any other from of handling Bio-Medical waste and it is subjected to inspection and verification at any time.

Segregation of Waste

Segregation of waste means separating and placing the Hospital waste/ Biomedical Waste and General waste in the difference colour coded bins as per rules.

WASTE SEGREGATION STATION

Instructions for Good Segregation practices

- Segregation should be done immediately without delay at the point of generation itself.
- Colour bins should be kept at appropriate places like wards, OP, etc. Based only on its need.
- Bins should be covered with a lid and properly labeled.
- Bins should be cleaned a regular intervals.
- Place the appropriate poster against the appropriate colour bins.

Disinfection of Segregated Waste

Disinfection is a process of destroying micro-organisms that can cause potential danger by transmitting infections. It is an essential part in Bio-Medical Waste management.

Mode of Disinfection

- Disinfection can be done in two ways i.e, Chemical and Mechanical wherever essential.
- In the Chemical disinfection process, generally chlorine based chemical disinfectants like Sodium Hypochlorite Solution, bleach etc. are used.
- In the Mechanical disinfection process, devices like autoclave or microwave are use.

Instructions for accurate disinfection

- Disinfection process should begin after segregation at the point of waste generation (nursing stations, wards, etc.), itself. Freshly prepared 1% sodium Hypo chloride Solution from stock should used.

- In case of heavily soaked material or spill, 10% bleach solution may be used.
- Waste material has to be completely soaked / covered for a minimum contact time of 30 minutes should be allowed.
- Contained should be closed to prevent chlorine escape.

Path way of colour Bins for waste

- There are three types of Red Bins – Twin Bin, 25 Liters Red Bin (big), and 15 Liters Red Bin (Small)
- Clearly demarcate plastic and non- plastic wastes.
- Put the plastic waste such as syringes, I.V.Tubes, ryles tube, catheters, etc. In the Twin bin provided which has 1% freshly prepared Sodium Hypochlorite Solution in it.
- The plastic waste should be immersed at least for 30 minutes in the Twin for disinfection process.
- After disinfecting the plastic waste, shift it to the specially designed pictured Red colour bag with big bio-hazard symbol inside the red bin (25 liters – big)
- Non – plastic waste (used cotton, gauze, soiled bandages) should be placed in red bag with small bio-hazard symbol inside the small red bin (15 liters – small).

Twin Bin system of Disinfection

- It is a method of chemical disinfection
- It is closed double bucket system with perforated inner sleved container.
- The outer container contains the 1% Sodium Hypochlorite solutions where as the inner sieved container will contain the Bio Medical (Plastic) Waste.
- The disinfected waster after being soaked for 30 minutes in Sodium Hypochlorite solution will be transferred to the respective bag by lifting the inner sieve container.

Blue Bin

Bio – Medical Waste such as sharps including ampoules, vials, broken glasses, suture, slides, etc. should be placed in the Blue Bin.

Needles and suture lancets should be managed by using needle destroyer.

Needle Management with Needle Destroyer

HIV &HBV transmission can be largely minimized by adhering strict needle management plan by using the Needle Destroyer Instrument.

When the needle is inserted in the hold provided in the needle destroyer, a high temperature electric arc is passed which burns the needle.

The used needles should be destroyed immediately to reduce minimum handling of sharps.

All the nursing stations should have a needle destroyer and it should be used regularly.

The remnants should be handed over to the CTF in separate container.

The syringes should be placed in the red bin intended for plastic waste.

Instructions for safe Handling of Sharps

- Personal protective gear must be worn while managing sharps.
- Needles should never be recapped.
- Needles should be destroyed immediately after use.
- Syringes should be cut and disinfected in a Twin bin
- Other sharps like lancets, blades, scalpels, etc. can be directly put in disinfecting solution (Red colour twin bin).
- Sharps related accidents must be reported immediately to the administration.

Yellow Bin

Bio-Medical Waste such as anatomical waste, placental, tissues, body parts, etc. should be placed in the Yellow Bins.

Black pin

In the black bin, all expired drugs and cytotoxic drugs, etc should be placed.

Green bin

General waste such as food items, plastic covers, needle covers and non infected plaster of paris, etc should be placed in the Green bins.

Monitoring and Record Maintenance

Health Care Units and Hospitals should maintain the records for the Bio-medical waste generated and disposed from their premises.

Bio – Medical Waste management Registers includes four types.

1. Registers for Daily collection of Bio-Medical Waste at the source.
2. Register of Source wise collection of Bio – medical waste for the day.
3. Monthly consolidation register for collection Bio- Medical Waste.
4. Register for needle stick injuries.

Separate Registers should be maintained in each ward, OP, theaters, laboratories, etc. and the respective Staff-in-charge (Staff Nurse / Paramedical Staff) should fill the details daily as per Annexure - 1)

Sanitary Workers / Hospital workers should maintain source (wards, OP, etc.) ward wise Bio-Medical waste collection register as per Annexure -2 duly attested by Staff Nurse Nurse-in-Charge.

The hospital superintendent /Chief Medical officer is responsible to maintain consolidated Monthly register on Bio-Medical Waste Management as per Annexure -3 and the Register for Needle Stick Injuries as per Annexure – 4.

The Hospital Infection Control Officer is responsible for overall monitoring, payment to Common Treatment Facility and record maintenance of Bio-Medical Waste Management.

Transportation and Storage

After weighing the segregated Bio-Medical waste and registering its details in the wards/ OP/Lab/ Theaters, etc. it should be transported to the respective colours bins kept in the Trolleys.

The waste collected in the trolleys should be transported and stored in the Health Care Waste Storage Room in the Hospital for the disposal to the Common Treatment Facility.

Care should be taken that no Bio-Medical Waste should be spilled during transportation.

Treatment and Disposal

The segregated Bio-Medical waste collected from the Hospital should be transported to the Common Treatment Facility for further final disposal.

What is a common treatment Facility?

Common Treatment Facility (CTF) or Common Bio-Medical Waste Treatement Facility referred to a place or establishment where the Bio-Medical Waste collected from the Hospitals is treated and disposed in accordance to the Bio-Medical Waste (Management & Handling) Rules.

Technology used for Treatment and Disposal of Waste

Based on the kind of segregated waste various treatment technologies are used for final disposal.

- Autoclave
- Incineration
- Sharp pits
- Secured Land Fill

Autoclave

- Autoclave is the process in which the waste is treated under high pressure and temperature of about 1200 centigrade for a minimum period of 30 minutes thereby destroying all forms of fungus, bacteria and micro-organism. including virus.
- The disinfected Bio-medical waste collected in Red bag is autoclaved.
- The autoclaved waste is safe and sterile.

Incineration

It is a process of burning the anatomical waste such as human tissues, organs, placenta and the waste collected in yellow bag without disinfection, body parts in high temperature to destroy the waste.

The final residue is ash.

Secured Land fill

Secured Land fill is one which has containment measures such as liners and a leach ate collection system so that materials palced in the landfill will not migrate into the surrounding, soil, air and water.

The ash from the incinerators and the waste from black bags which includes cytotoxic drugs and expired drugs will be disposed to a secured land fill.

Deep burial

Deep burial is an alternate technology opted for disposing small quantities of Bio Medical Waste. A Separate pit is dug and used to dispose Bio-Medical Waste which can decompose naturally. The pits should be relatively distant (1-2 meters wide and 2-5 meters deep) and converted from human habitation.

Sharp pits

The sharps like disinfected needles which is stored in the puncture proof container in the hospitals and the wastes in blue are disposed to the sharp pits at the CTF.

Special situations in health Care Units

Some special situations may occur in any hospital such as HIV positive infected blood bag / blood spills / linens / mercury spills and

infected sputum cups, which needs a specific and different Bio-medical Waste Treatment methodology in the Hospital. Such treatment cases are given below.

Blood / Blood Bags & Body Fluid

Source : Laboratories, etc

Treatment :

- Ensure the gloves are fitted on before handling
- The Bag containing the discarded blood / body fluids should be emptied in a 5% sodium Hypochlorite Solution for 30 minutes. The emptied bag also should be immersed in the same be transferred to the Red plastic bag (big).
-  

Blood spills

Source : Wards / Laboratories, etc

Treatment :

- Ensure that the gloves are used before Handling
- Cover the spill with absorbent cotton or cloth.
- Discard this cloth in the small red bin intended for non plastic waste.
- Disinfect the surface with 5% Sodium Hypochlorite solution 5%, Phenol 10%, Bleach for 10-15 minutes or use phenolic disinfectants.

- Now use cloth or cotton to absorb the spill and discared it in the red small bag intended for non plastic waste.
- Finally, use the normal mop.

Linens

Source : Wards / Casualty/ Theaters / Labor rooms, etc

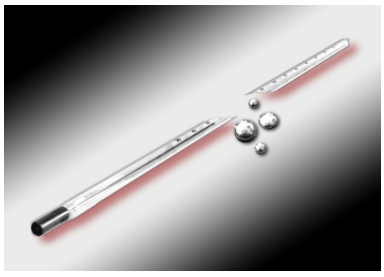
Treatment :

- ❖ Ensure that the gloves are fitted on before Handling
- ❖ Used Linens soiled with blood / body fluids should be transported very carefully with the tag tied on it making minimal handling only.
- ❖ They should be unloaded directly into the washing chamber (laundry) after disinfecting with 10% sodium Hypochlorite solution for 30 minutes. After which it can be mixed with regular linens.

Mercury Spills

Source : Wards / Dental OP, etc.

Treatment :



- ➢ Open all the windows immediately.
- ➢ Remove all the jewels and watches
- ➢ Ensure that the gloves are fitted on before handling.
- ➢ Spilled mercury should be collected with the cardboard sucked with the syringes.
- ➢ Empty the syringes with mercury in a container with water.
- ➢ It should be labeled as mercury waste and handed over to CTF.

Sputum Cups

Source : Laboratory, etc

Treatment :

- ❖ Ensure that the gloves are fitted on before Handling.
- ❖ Remove the lid from the sputum cups
- ❖ Place the sputum cup with its lid opened into a inner sieve container of a twin bin which contains 5% Sodium Hypochlorite solution and keep it for 12 hours.
- ❖ After 12 hours, lift the disinfected sputum cups form the inner sieve container of twin bin and transit to Red bins intended for plastic waste.
- ❖ Solution is drained into the main drain.

Universal Precautions for Health Providers

Universal precautions are a series of recommendations for health care providers to protect themselves, their patients and other health care workers from the spread of infectious diseases.

Methods of Universal Precautions

Hand Washing

- It is the single most essential practice, which reduces the risk of transmission of infection.
- Hand washing with soap water in an effective manner is essential.
- Hand washing is necessary even gloves wear used.

Protective Gears

Health care providers should use the protective Gears like Apron, Gloves and Mask wherever essential to reduce the cross contamination and the risk of transmitting infection from person to person in Hospital.

Immunization

Health care Staff are exposed to high risk of infections like HIV, HIV and Tetanus. It is recommended that all the Health Care Staff should be vaccinated. However, no vaccine exists to prevent HIV infection.

Post Exposure Prophylaxis (PEP) – Needle Stick Injuries

- Place the injured part under running water and allow the bleeding from the site of injury.
- Wash the wounds with soap.
- Apply antiseptic cream and cover the wound with the dressing.
- Report the incident immediately to the doctor/ nurse concerned to receive the PEP drugs.
- Needle Stick Injuries should be registered in the prescribed Annexure – 4

Essential Practices for Health Care providers

It is senses, Bio-Medical Waste Practices lead to some injuries and infections when handled without necessary precautions. The Health care staff such as sanitary workers / Hospital workers, Nurse / Para Medical Staff & Doctors are to be sensitized for effective management of Bio-Medical waste.

Essential Practices for Sanitary Workers / Hospital Workers

- ✓ Wear protective Gears such as apron, gloves and mask before handling Bio-Medical Waste.
- ✓ Do not mix the segregated waste.
- ✓ Collect and store the Bio-Medical waste in Health Care Waste Storage Rooms.
- ✓ Use and trolley for collection and transportation of Bio-Medical Waste in the Hospital premises.
- ✓ Avoid dragging of waste bags to prevent spillage
- ✓ Weigh the Bio-Medical Waste at the point of collection at each Health care unit and record the quantitative details in the prescribed Register on daily basis.

Essential Practices for Nurse / Para Medical Staff

- ➢ Segregate the waste as per color code
- ➢ Disinfect the segregated waste wherever essential.
- ➢ Avoid transferring sharp instruments directly from person to person
- ➢ Do not recap the needles.
- ➢ Record the quantity of weighed Bio-Medical waste in the prescribed register on daily basis.

Essential Practices for Doctors

Conduct regular visit in and around the Hospital and monitor the entire conditions of Bio-Medical Waste Management and rectify the drawbacks or violations immediately as per

guidelines prescribed. Maintain the Registers for Bio- Medical waste management dully filled by the respective staff/ officers in the Hospital.

- Create awareness amongst the Hospital Staff, Patients & public and build their attitude towards handling Bio-Medical Waste and General Waste meticulously.

- Convene monthly meetings with all the Staff and discuss the issues and best practices in managing Bio-Medical Waste. Recognize and encourage the persons who handle Bio-Medical Waste. Recognize and encourage the persons who handle Bio medical waste effectively.

- Promote ownership among the staff and public to sustain the proper practice of handling Bio-Medical Waste and also to keep the entire hospital atmosphere as hygienic, uncontaminated and safe in the long run.

- Mobilize sponsors to maintain the Hospital environment with lawn, plants and pleasing pictures depicting “Keep; our Hospital Clean and Green)”, etc.

சுயதகவல் அறிக்கை
மருத்துவக் கழிவு சுத்திகரிப்பு முறை

முன்னுரை

நல வாழ்வு மையங்களில் தற்போதுள்ள நிலவரப்படி ஒரு வருடத்திற்கு 80 கோடி ஊசிகள் போடப்படுகின்றன. இந்த ஊசிகள் தடுப்பூசி போடுவதற்கு பயன்படுத்தப்படுகின்றன.

இந்த ஊசிகளில் 60% ஊசிகள் தொற்று நோய்க்கு காரணிகள் ஆகும். இவை மஞ்சள்காமாலை மற்றும் எய்ட்ஸ் போன்ற நோய்களை உருவாக்குகிறது.

தற்போதைய நிலவரப்படி மருத்துவக் கழிவுகளில் 0.5 முதல் 2.0 கிலோ ஒரு படுக்கைக்கு மருத்துவக் கழிவு வருவதாக கணக்கிடப்படுகிறது.

இந்த கழிவு நோயாளிகள், மற்றும் மருத்துவ ஊழியர்களுக்கு பாதிப்பு விளைவிக்க கூடியதாக கருதப்படுகிறது.

மருத்துவக் கழிவு விதிகளை கடைபிடிக்கும் சட்டம், 1998

இந்த விதிமுறை சட்டத்தின் படி மருத்துவக் கழிவு என்பது நோயை கண்டுபிடிக்கும் போதும் சிகிச்சசையை அளிக்கும் போதும், தடுப்பூசிகளை மனிதர்களுக்கு மற்றும் கால்நடைகளுக்கு போடும் போதும் ஆராயச்சிகளை மேற்கொள்ளும் போதும் வெளியிடும் கழிவு மருத்துவக் கழிவு எனப்படும்.

நமது இந்திய அரசு சட்டத்தின்படி மருத்துவ கழிவு பராமரிப்பு முறைகளை பற்றி பின்வருமாறு காண்போம்.

மருத்துவமனை ஊழியரின் வேலை

மருத்துவ ஊழியர்கள் வேலை செய்யும் போது சுற்றுப்புற சூழல் மற்றும் சுகாதாரத்திற்கு கேடு விளைவிக்காதபடி செய்ய வேண்டும்.

பிரித்தெடுத்தல் முறை

மருத்துவக் கழிவை ஒன்றாக சேர்த்தல் கூடாது மருத்துவக் கழிவு சுத்திகரிப்பு முறைகளின் படி அந்தந்த வர்ண கூடைகளில் போட வேண்டும்.

சேமித்தல்

மருத்துக் கழிவை ஒரு போதும் 48 மணி நேரத்திற்கு மேல் சேமித்து வைத்தல் கூடாது.

போக்குவரத்து

மருத்துவக் கழிவை எடுக்கும் போது அதற்குரிய வாகனங்களில் ஒரு இடத்திலிருந்து இன்னொரு இடத்திற்கு எடுத்துச் செல்ல வேண்டும்.

அங்கீகாரம்

மருத்துவக் கழிவுகளை எடுத்துச் செல்லும் வாகனங்களின் அங்கீகாரத்தை தமிழ்நாடு மாசு சுகாதார மையம் மாவட்ட சுற்றுப் புற பொறியாளர்களால் அளிக்கப்படுகிறது.

பதிவேடு கையாளும் முறை

மருத்துவ ஊழியர்கள் பல்வேறு பதிவேடுகளை கையாள வேண்டும். எடுத்துக்காட்டு பராமரிப்பு, சேகரிப்பு, சுத்திகரிப்பு, அகற்றும் முறை.

மருத்துவக் கழிவு பிரித்தெடுக்கும் முறை

மருத்துவக் கழிவை விதிமுறைகளின் படி அதற்குரிய கூடைகளில் பிரித்தெடுக்கும் முறை

கடைபிடிக்கும் முறை

- எந்த இடத்தில் தோற்றுவிக்கபடுகிறதோ அதே இடத்தில் பிரிக்க வேண்டும்.
- கூடைகளை எப்போதும் மூடி வைக்க வேண்டும்.
- கூடைகளை அடிக்கடி சுத்தப்படுத்த வேண்டும்
- கூடைகள் வைக்கும் இடத்தில் பெரிய அட்டை வைக்க வேண்டும்.

மருத்துவ கழிவை சுத்திகரிக்கும் முறை

சுத்திகரிப்பு முறை என்பது நுண்ணுயிரிகளை மருத்துவ கழிவுகளை அழிப்பது ஆகும். இதன் மூலம் தொற்று நோய் வருவதை தடுக்கலாம்

மருத்துவ கழிவை சுத்திகரிக்கும் விதிமுறை

- ✓ 1% சோடியம் ஹைட்ரோ குளோரைடு திரவத்தில் ஊற வைக்க வேண்டும்
- ✓ அதிக மருத்துவ கழிவு இருப்பின் 10% பீனிச் திரவத்தில் வைக்க வேண்டும்
- ✓ மருத்துவ கழிவை ஊர வைத்த பின் கூடைகளை மூடி வைக்க வேண்டும்
- ✓ திறந்து வைத்தால் குளோரின் வாயு வெளியேறி நச்சு தனமை ஏற்பட வாய்ப்புள்ளது

கழிவுகளை பிரிக்கும் வர்ண கூடை

சிவப்பு கூடை

மூன்று பிரிவுகள் உள்ளன.

அ) இரட்டைக் கூடை
ஆ) 25 லிட்டர் சிவப்பு கூடை
இ) 15 லிட்டர் சிவப்பு கூடை

இதில் பிளாஸ்டிக் கழிவுகளாலான ஊசி, மூக்கு குழாய் கத்தீட்டர் மற்றும் பல பிளாஸ்டிக் கழிவுகளை இரட்டைக் கூடையில் 30 நிமிடங்கள் சுத்திகரிப்பு முறைக்காக ஊற வைக்க வேண்டும்

பிளாஸ்டிக் அல்லாத கழிவுகளை உபயோகித்த பஞ்சு, பருத்தி இழை, கழிவு கட்டுகள், இதை 15 லிட்டர் கொள்ளளவு கொண்ட சிவப்பு கூடையில் வைக்க வேண்டும்.

நீல கூடை

கண்ணாடி பொருள்களை நீல கூடையில் போட வேண்டும் உடைந்த கண்ணாடி பொருட்கள் மருந்து இருக்கும் கண்ணாடி புட்டிகள் ஆய்வகங்களில் உபயோகிக்கும் கண்ணாடி பொருட்களை போட வேண்டும்.

மஞ்சள் கூடை

மஞ்சள் கூடையில் அறுவை சிகிச்சையில் வெளியேற்றும் உடல் உறுப்புகள், நஞ்சுக் கொடி திசுக்களை போட வேண்டும்.

கருப்பு கூடை

நாளான மருந்துகள், நச்சு மருந்துகளை போட வேண்டும்.

பச்சை கூடை

உணவு பொருட்கள், பிளாஸ்டிக் உறைகள் ஊசி உறைகளை உபயோகப்படுத்தப்பட்ட மாவு பொருட்களை போட வேண்டும்.

தொழில் நுட்ப முறையில் கழிவுகளை வெளியேற்றுதல்

- நீராவி முறை
- எரித்தல் முறை
- ஆழமான முறை
- நிலத்தில் நிரப்புதல் முறை

நீராவி முறை

1200 செண்டி கிரேடு ஆவியில் 30 நிமிடங்கள் ஊர வைக்கும் போது , பாக்டீரியா, வைரஸ், பூஞ்சைகள் ஆகியவை அழிந்து விடும்.

சிவப்பு கூடையில் சேகரித்த கழிவை நிராவி முறையில் சுத்திகரித்தல் வேண்டும்.

எரித்தல் முறை

எரித்தல் முறை என்பது உடலியல் கழிவுகளாகிய மனித ஊறு திசுக்கள். உறுப்புகள், நஞ்சு கொடி ஆகியவைகளை மஞ்சள் தொட்டியில் சேகரித்தவற்றை எரித்தல் முறையை பின்பற்ற வேண்டும்.

நிலத்தில் நிரப்புதல் முறை

எரித்த சாம்பலை நிலத்தில் போட வேண்டும்.

அழமான குழி

கொஞ்சமுள்ள கழிவு பொருட்களை ஆழமான குழி தோண்டி புதைக்க வேண்டும்.

சிறப்பு சூழ்நிலைகளில் நலவாழ்வு பரிவு

சில சாதாரமான சூழ்நிலைகளில் மருத்துவமனைகளில் நிகழ வாய்ப்புள்ளது. அவைகள் HIV கிருமி தாக்கப்பட்ட இரத்த - , இரத்த சிந்துதல் படுக்கை விரிப்பு பாதரசம் சிந்துதல், மற்றும் கிருமி நிறைந்து சளி குவளை இவையனைத்திற்கும் தகுந்த மற்றும் பாதுகாப்பான முறையில் மருத்துவ கழிவு அகற்றும் முறை ஆகியவை மருத்துவமனையில் பின்பற்றப்படுகிறது.

இரத்தம் / உடல் திரவங்கள்

இடம் : ஆய்வகங்கள்

- கையாளுவதற்கு முன் கையுறைகளை போட வேண்டும்.
- 5% சோடியம் குளோரைடு 30 நிமிடங்களுக்கு முன் வைக்க வேண்டும்.

இரத்தம் சிந்துதல்

- கையாளுவதற்கு முன் கையுறைகளை போட வேண்டும்.
- சிந்திய இரத்தத்தை உறிஞ்சும் தன்மையுடைய பஞ்சுகளை பயன்படுத்த வேண்டும்.
- இந்த பஞ்சை சிவப்பு கலர் தொட்டியில் போட வேண்டும்.
- 5% Sodium hypo chloride திரவியம் 5%. பினோல் 10% போட்டு வைக்க வேண்டும்.

படுக்கை விரிப்பு

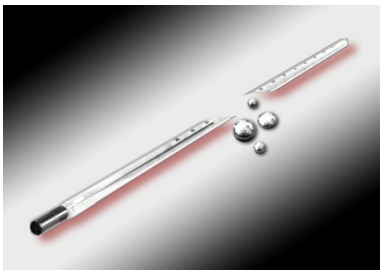
இடம்: மருத்துவ பிரிவு, அவசர சிகிச்சை பிரிவு அறை

- இரத்தக்கரை படிந்த துணிகளும், உடற்திரவம், பாதுகாப்பாக கையாள வேண்டும்.

பாதரசம் சிந்துதல்:

இடம்: மருத்துவ பிரிவு / பல் வெளிநோயாளி கண் பிரிவு

- எல்லா அன்னல்களையும் திறந்து விட வேண்டும்
- கைக் கடிகாரம், நகைகளை கழற்ற வேண்டும்
- சிந்திய பாதரசத்தை கார்ட் போர்டை பயன் படுத்தி எடுக்க வேண்டும்.



சளி குவளை

இடம் : ஆய்வகம்

- குவளையிலிருந்து மூடியை எடுக்க வேண்டும்
- குவளையினுள் 5மூ சோடியம் ஹைப்போ
- குளோரைடில் 12 மணி நேரம் ஊற வைக்க வேண்டும்
- 12 நேரத்திற்கு பின் சுத்திகரிக்கப்பட்ட சளி குவளையை எடுக்க வேண்டும்
- சுத்திகரிக்கப்பட்ட சளியை சாக்கடையில் விட வேண்டும்.

மருத்துவ ஊழியர்கள் கடைபிடிக்க வேண்டிய விதி முறைகள்

கை கழுவுதல்

- கை கழுவுதல் என்பது மிகவும் இன்றியமையாதது ஆகும். இதன் மூலம் தொற்று நோய் வருதை தடுக்கலாம்.
- கை கழுவும் போது சோப்பு உபயோகித்து கழுவுதல் வேண்டும்.
- கையுறை அணியுமுன் கை கழுவுதல் மிகவும் அவசியம்.

தடுப்பு உபயோகரணங்கள்

மருத்துவ ஊழியர்கள் சிறந்த உபயோகரணங்களான, ஏப்ரான் கையுறை முக மூடியை உபயோகிக்க வேண்டும்.

தடுப்பூசிகள்

மருத்துவ ஊழியர்கள் இரணஜன்னி தடுப்பூசியை எடுக்க வேண்டும்.

ஊசிகளால் ஏற்படும் ஆபத்துக்களை தடுக்கும் முறை

- காயப்பட்ட இடத்தை ஓடும் தண்ணீரில் கழுவ வேண்டும்.
- காயப்ப்டட இடத்தை சோப்பு போட்டு கழுவ வேண்டும்
- சிறந்த மருந்தை காயப்பட்ட இடத்தில் போட வேண்டும்.
- நடந்த சம்பவத்தை பற்றி மருத்துவமரிடம் கூற வேண்டும்.

கடைநிலை ஊழியர்கள் மற்றும் சுகாதார பணியாளர்கள் மேற்கொள்ள வேண்டிய விதிமுறை

- மருத்துவ ஊழியர்கள் கையுறை, ஏப்ரான் மற்றும் முக மூடியை அணிய வேண்டும்.
- பிரித்தெடுத்த கழிவை கலத்துதல் கூடாது
- மருத்துவ கழிவை சேகரிக்கும் போது எடை எடுத்தல் வேண்டும்.

தாதியர்கள் மற்றும் ஆய்வக பணியாளர்கள் கடைபிடிக்க வேண்டிய விதிமுறை

- வர்ண கூடைகளுக்கு ஏற்றார்போல் வழிவை பிரித்தெடுக்க வேண்டும்.
- ஊசிகளை பயன்படுத்தும் போது மற்றவர்களுக்கு தீங்கு விளைவிக்காதபடி உபயோகிக்க வேண்டும்.

மருத்துவர்கள் மேற்கொள்ள வேண்டிய விதிமுறை

- மருத்துவர்கள் அடிக்கடி மருத்துவ கழிவு முறைகள் பின்பற்றுகிறார்களா என்று அடிக்கடி ஆய்வு மேற்கொள்ள வேண்டும்.
- மருத்துவ கழிவு செய்யும் பதிவேடுகளை ஆய்வு செய்ய வேண்டும்.
- மருத்துவ ஊழியர்களுக்கும், மக்களிடமும் விழிப்புணர்வு ஏற்படுத்த வேண்டும்.
- மாதந்தோறும் பொதுக்கூட்டங்களை ஒழுங்கு படுத்த வேண்டும்

முடிவுரை

மருத்துவ கழிவு சுத்திகரிப்பு முறைகளை கடைபிடிப்பதன் மூலம் மருத்துவ ஊழியர்களுக்கும், மக்களுக்கு ஏற்படும் நோய்கள் ஏற்படுவதை தடுக்கலாம் மற்றும் சுற்றுப்புற சூழலையும் மற்றும் சுகாதாரத்தை மேம்படுத்த முடியும். நாம் மரங்கள் வளர்ப்பதன் மூலமம் மரத்துவமனை சுற்று சூழல் பசுமையானதாக மாற்ற முடியும்.