

Knowledge, Attitude & Practice (KAP) among Staff Nurses Regarding Biomedical Waste Management (BMW): A Correlational Study Design

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ABSTRACT

Background: The safe and effective management of biomedical waste generated in the hospital is a collective responsibility of all health workers involved in patient care. It is cardinal that the staff nurses must have up to date knowledge regarding handling and management of biomedical waste for the sake of both themselves and the patients. The aim of the study was to assess the knowledge, attitude and practice levels among staff nurses regarding biomedical waste management and to determine the relationship between knowledge, attitude and practice levels.

Materials and Methods: The following study adopted a Correlational design. 100 staff nurses from selected hospitals in Kollam, Kerala were assigned using convenience sampling. The data was collected using a structured knowledge questionnaire, a five-point Likert attitude scale and a verbal response checklist.

Results: Findings of the study revealed that the Spearman's Rank Coefficient (Rho) 'ρ' calculated at 0.65** for finding the relationship between knowledge and attitude levels was statistically significant at P<0.01 level. Also, the 'ρ' value (0.59**) calculated between knowledge and practice levels was significant at 0.01 level. The Chi square (χ^2) value calculated was statistically significant for Knowledge level and selected sociodemographic variables such as; Gender (χ^2 18.56**, df=02, P<0.01 level)

and Professional Experience (χ^2 11.59*, df=04, p<0.05 level); Also, between professional experience and Attitude (6.44**) and professional experience and practice levels (10.17**). The Fisher's exact test revealed association between Gender and Attitude (P# 0.016*, df=02, P<0.05 level) as well as Gender and Practice (P# 0.005**, df=01, P<0.01 level of significance).

Conclusion: The findings confirmed that there was a medium/moderate positive correlation between knowledge and attitude as well as knowledge and practice levels regarding biomedical waste management among staff nurses.

Key Words: KAP, BMW, Staff Nurses, Correlational Design.

INTRODUCTION

Biomedical waste is defined as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals, or in research activities pertaining thereto, or in the production or testing of biologicals. [1] Bio Medical waste includes all the waste generated from the Health Care Facility which can have any adverse effect to the health of a person or to the environment in general if not disposed properly. All such waste which can adversely harm the environment or health of

a person is considered as infectious and such waste has to be managed as per BMW Rules, 2016. [2] A 1990 report by the United States Agency for Toxic Substances and Disease Registry concluded that biomedical waste may pose an injury and exposure risks for doctors, nurses, and janitorial, laundry and refuse workers. [3] As per 2020 reports, in India, the National Green Tribunal (NGT) has been stringent on the application of the BMW rules 2016. There are now over 200 licensed Common Bio Medical Waste Treatment and Disposal Facilities (CBWTF) or Common Treatment Facility (CTF) in the country. [4] About 656 tons of bio-medical waste (BMW) was generated in the year 2020, out of which 590 tons was collected and treated by the Common Biomedical Waste Treatment facilities. Further, about 84.61 tons of incremental Covid BMW was generated between May 2020 to February 2022 in the country from healthcare facilities, quarantine centres/ camps, sample collection centres, laboratories, home care/ home isolations centres engaged in treatment, diagnosis and quarantine of COVID-19 infected or suspected patients. [5] Many studies took place in Gujarat, India regarding the knowledge of health workers in facilities such as hospitals, nursing homes, or home health. It was found that 26% of doctors and 43% of paramedical staff were unaware of the risks related to biomedical wastes after extensively looking at the different facilities, many were undeveloped in the area regarding biomedical waste. [4] The training of Health Care Facility staff and the awareness of the Hazards of Bio Medical waste is still a challenge in most of the country. [4] Nurses, being the primary care givers, spends maximum time with the patients in the ward than any other health workers, which increases their exposure and risk to the hazards present in hospital environment, including needle stick injuries and other biomedical waste exposure. [6] Though many studies have been conducted and suggest appreciable knowledge among staff

nurses, data pertinent to KAP (knowledge, Attitude & Practice and their relationship) remains inconclusive. Thus, the investigator(s) were prompted to conduct the study to assess the knowledge, attitude and practice among staff nurses regarding biomedical waste management.

OBJECTIVES OF THE STUDY

1. To assess the knowledge, Attitude and practice level(s) among staff nurses regarding biomedical waste management.
2. To determine the relationship between knowledge and attitude level of staff nurses regarding biomedical waste management.
3. To determine the relationship between knowledge and practice level of staff nurses regarding biomedical waste management.
4. To find out the association between knowledge, attitude and practice level(s) of staff nurses and selected sociodemographic variables.

HYPOTHESES

- ❖ H₁-There is significant co-relationship between the mean knowledge and attitude scores of staff nurses regarding biomedical waste management.
- ❖ H₂- There is significant co-relationship between the mean knowledge and practice scores of staff nurses regarding biomedical waste management.
- ❖ H₃- There is significant association between knowledge, attitude and practice level(s) of staff nurses with selected demographic variables.

METHODOLOGY

Research Approach: Quantitative research approach.

Research Design: Non-experimental, Descriptive-Correlational design.

Population: Staff Nurses in Kollam, Kerala.

Settings: 02 Selected Hospitals, Kollam District, Kerala.

Sample Size: 100 Staff Nurses working in selected hospitals.

Sampling Technique: Convenience Sampling.

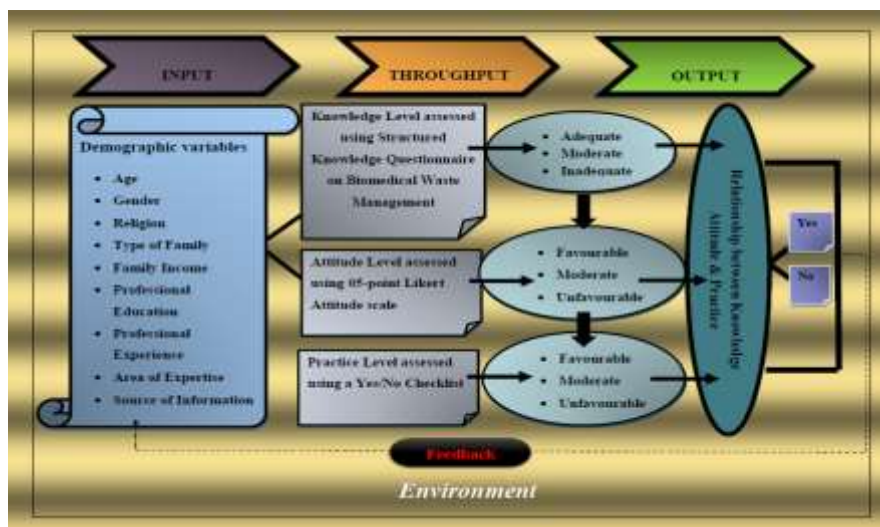


Figure 01: Conceptual Framework based on JW Kenny's Open System Model (Modified).

TOOLS AND TECHNIQUE

Tool-A: Demographic Performa was used to assess the demographic characteristics such Age, Gender, Religion, Type of Family, Family income er month, Professional Education, Professional Experience, Area of Expertise and Source of information.

Tool-B: Structured Knowledge Questionnaire was used to assess the knowledge level among staff nurses regarding biomedical waste management.

Tool-C: A Likert 05-point Attitude scale was used to assess the attitude level among staff nurses regarding biomedical waste management.

Tool-D: A Verbal response Checklist was used to rate the practice level among staff nurses regarding biomedical waste management.

Method of Data collection: The data was Collected from 100 staff nurses enrolled (using convenience sampling) from 02 selected hospitals in Kollam, Kerala from 10th Oct 2019 to 10th Nov 2019. After obtaining the formal permission to conduct the study, the investigator(s) then obtained Informed consent from the samples and ensured confidentiality throughout the conduct of the study.

Inclusion criteria:

Staff nurses willing to participate and available at the period of data collection.

Who can understand English/Urdu.

Exclusion criteria: Staff nurses not available during the data collection were excluded. Auxiliary staff/Nursing assistants, ANMs were not a part of the study.

STATISTICAL ANALYSIS

Both Descriptive and Inferential statistics were used to analyse the data [using SPSS version 22 (SPSS Inc., Chicago, IL)]. Descriptive statistics such as Frequency distribution and Percentage were used to describe the demographic data and Inferential statistics such as Spearman's Rank Coefficient ' ρ ' was used to establish the relationship between knowledge, attitude and practice scores among staff nurses regarding biomedical waste management. Chi Square and Fisher's Exact test statistics were performed to find out the association between knowledge, attitude and practice levels with selected Socio-demographic variables. ' $P < 0.05$ ' was ascertained as the minimum accepted level of significance.

RESULTS

Section-I: Description of Sample characteristics of Staff Nurses.

Table 01: Frequency distribution and Percentage of staff nurses. (N=100)

SL NO.	Demographic variables	Frequency (f)	Percentage (%)
01	Age (In years)		
	< 25 Yrs.	26	26%
	25-35 Yrs.	34	34%
	36-45 Yrs.	28	28%
	>45 Yrs.	12	12%
02	Gender		
	Male	21	21%
	Female	79	79%
03	Religion		
	Hindu	51	51%
	Muslim	45	45%
	Others	04	04%
04	Type of family		
	Nuclear	48	48%
	Joint/Extended	52	52%
05	Family Income Per Month		
	Up to 10000₹	28	28%
	10001-20000₹	39	39%
	20001-30000₹	27	27%
	Above 30000₹	06	06%
06	Professional Education		
	General Nursing & Midwifery	52	52%
	BSc. Nursing /Post Basic BSc.	40	40%
	MSc. Nursing and above	08	08%
07	Professional Experience		
	Up to 5 Yrs.	42	42%
	6-10 Yrs.	35	35%
	More than 10 Yrs.	23	23%
08	Area of Expertise		
	General Wards/OPDs	26	26%
	OT/LR	16	16%
	Emergency/ICUs	24	24%
	Post OP/Surgical/Speciality Wards	34	34%
09	Source of Information		
	Internet/social media/Mass Media	42	42%
	Books/Magazines/Newspapers	22	22%
	Colleagues/Mentor/Seminars/SDPs	36	36%

Section-II: Knowledge, Attitude and Practice levels among Staff Nurses regarding Biomedical Waste Management.

Table 02: Frequency distribution and Percentage of knowledge, attitude and practice levels among staff nurses regarding biomedical waste management. (N=100)

Knowledge Level						Attitude Level						Practice Level					
High >80%		Moderate 60-80%		Low <60%		Favourable >65%		Moderate 50-65%		Unfavourable <50%		Satisfactory >80%		Moderate 60-80%		Poor <60%	
f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
35	35	61	61	04	04	32	32	68	68	0	0	43	43	57	57	0	0

Figure 02: Cylindrical Diagram representing the percentage distribution of Knowledge Level among staff nurses.

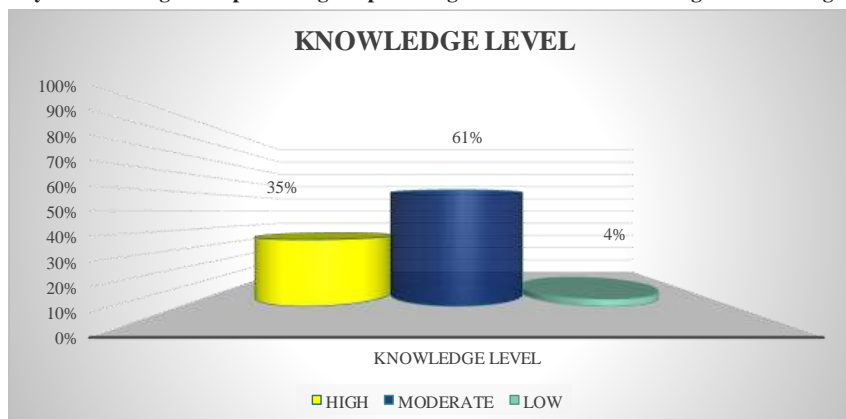


Figure 03: Pyramidal Diagram representing the percentage distribution of Attitude Level among staff nurses.

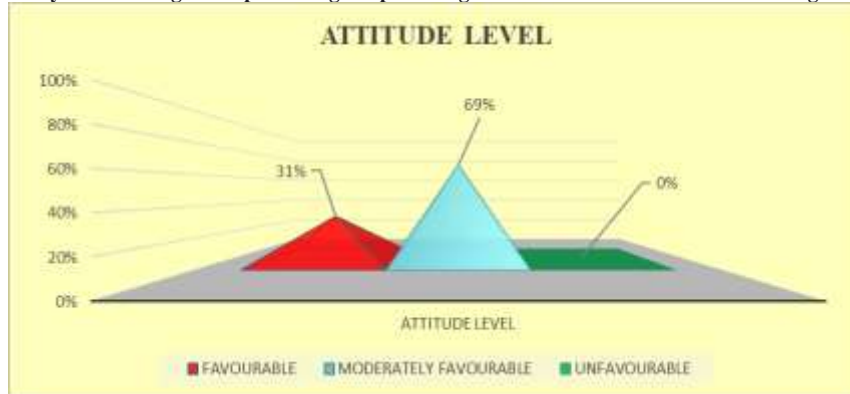


Figure 04: Conical Diagram representing the percentage distribution of Practice level among staff nurses.



Section-III: Relationship between Knowledge Attitude and Practice levels Staff Nurses regarding Biomedical Waste Management.

Table 03: Mean, Standard deviation and 'p' value of knowledge and attitude scores among staff nurses (N=100)

Parameter	Mean Score	Standard Deviation	Spearman's Rank Correlation Coefficient (Rho) ρ
Knowledge	22.47	± 3.68	0.65**
Attitude	67.69	± 12.23	

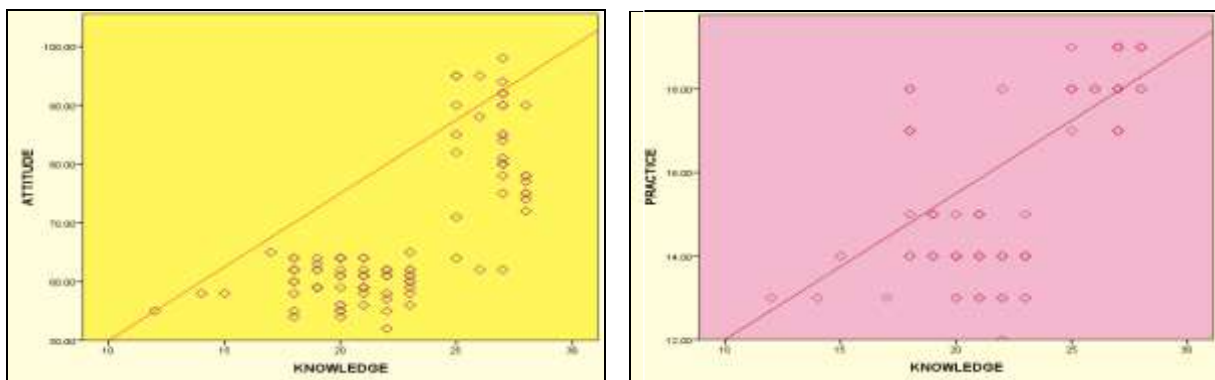
**Significant at the 0.01 level.

Table 04: Mean, Standard deviation and 'p' value of knowledge and practice scores among staff nurses. (N=100)

Parameter	Mean Score	Standard Deviation	Spearman's Rank Correlation Coefficient (Rho) ρ
Knowledge	22.47	± 3.68	0.59**
Practice	15.69	± 2.16	

**Significant at the 0.01 level.

Figure 05: Scatter Diagrams representing the a medium/moderate positive relationship between knowledge and attitude levels (Left) and between knowledge and practice levels (Right) among staff nurses regarding biomedical waste management.



Section-IV: Association between Knowledge, Attitude and Practice Levels with Selected Demographic Variables.

Table 05: Association between knowledge attitude and practice levels among staff nurses with selected demographic variables. (N=100)

Demographic variables		Knowledge level						df	χ^2	P value
Gender	High		Moderate		Low					
	(f)	(%)	(f)	(%)	(f)	(%)				
Male	13	61.9	05	23.8	03	14.3	02	18.56**	0.000	
Female	22	27.8	56	70.9	01	1.3				
Attitude level										
Gender	Favourable		Moderate		df	P# (Fisher's Exact test)				
	(f)	(%)	(f)	(%)						
Male	12	57.1	09	42.9	01	0.008**				
Female	20	25.3	59	74.7						
Practice level										
Gender	High		Moderate		df	P# (Fisher's Exact)				
	(f)	(%)	(f)	(%)						
Male	18	85.7	03	14.3	01	0.000**				
Female	25	31.6	54	68.4						
Knowledge level										
Professional Experience	High		Moderate		Low		df	χ^2	P value	
	(f)	(%)	(f)	(%)	(f)	(%)				
Up to 5	06	16.7	28	77.8	02	5.5	04	11.59*	0.021	
6-10 Yrs.	16	38.1	25	59.5	01	2.4				
More than 10 Yrs.	13	59.1	08	36.4	01	4.5				

* Significant at 0.05 level; **Significant at 0.01 level.

Attitude level							
Professional Experience	Favourable		Moderate		df	χ^2	P value
	(f)	(%)	(f)	(%)			
Up to 5 Yrs.	06	16.7	30	83.3	02	6.44*	0.04
6-10 Yrs.	16	38.1	26	61.9			
More than 10 Yrs.	10	45.5	12	54.5			
Practice level							
Professional Experience	Favourable		Moderate		df	χ^2	P value
	(f)	(%)	(f)	(%)			
Up to 5 Yrs.	08	22.2	28	77.8	02	10.17**	0.006
6-10 Yrs.	22	52.4	20	47.6			
More than 10 Yrs.	13	59.1	09	40.9			

* Significant at 0.05 level; **Significant at 0.01 level.

DISCUSSION

The study revealed an overall moderate level of knowledge (22.47 ± 3.68), favourable attitude (67.69 ± 12.23) and moderate level of practice (15.69 ± 2.16). Also, a medium positive correlation was evident between knowledge and attitude as well as knowledge and practice levels ($p < 0.01$ level). The findings of the study are in agreement with several studies. In a study conducted by Anand Et al. doctors, nurses and lab technicians had overall good knowledge there were still some scopes of improvement in BMW management. [7] The study findings are in partial agreement with a 2011 cross-sectional study conducted by Mathur Et al. to find out the knowledge, attitude and practices about biomedical

waste management among health care personnel. Results revealed that on all counts, doctors, nurses, and laboratory technicians had better knowledge regarding biomedical waste management. Knowledge regarding the colour coding and waste segregation at source was found to be better among nurses and laboratory staff as compared to doctors. [8] The study is in partial agreement with a 2021 study conducted by Basavaraj Et al. among 280 health workers in a hospital, Bangalore, India found out satisfactory level of knowledge, good attitude but suggested practice on BMW needs improvement that, there here have to be regular training programmes on biomedical waste management and its hazards for all the

healthcare workers including group D workers. Along with educational intervention, strict implementation of biomedical waste management guidelines with its monitoring at all levels is also very much essential. ^[9]

CONCLUSION

The study was conducted to assess the knowledge, attitude and practice levels and to determine their relationship among staff nurses regarding biomedical waste management. The results of the study confirmed that there was a medium/moderate positive co-relationship between knowledge and attitude as well as knowledge and practice, significant at 0.01 level. ($P < 0.01$).

LIMITATIONS

The study was limited to a small sample (100).

Study adopted a non-probability sampling; generalization of results remains limited.

RECOMMENDATIONS

A similar study can be replicated among hospital housekeeping staff.

An Interventional study can be conducted in similar settings to enhance the knowledge levels.

A Comparative study can be done among government and private settings.

Declaration by Authors

Ethical Approval: After obtaining the ethical consent from ethical committee; formal permissions were acquired from concerned authorities and an Informed consent was obtained from samples prior to the conduct of the study.

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Conflict of Interest: The authors declare no conflict of interest.

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